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Title Game, Shore, and water, birds of Indo

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# GAME, SHORE, AND WATER

# BIRDS OF INDIA

WITH ADDITIONAL REFERENCES TO THEIR
ALLIED SPECIES IN OTHER PARTS
OF THE WORLD.

BY

COLONEL A. LE MESSURIER, C.I.E., F.Z.S., F.G.S.
LATE ROYAL ENGINEERS.
AUTHOR OF "KANDAHAR IN 1879"; "FROM LONDON TO BOKHARA AND A RIDE THROUGH PERSIA."

WITH ONE HUNDRED AND EIGHTY NATURAL SIZE ILLUSTRATIONS
FROM ACTUAL SPECIMENS.

FOURTH EDITION.

LONDON:
W. THACKER AND CO., 2, CREED LANE, E.C.
CALCUTTA AND SIMLA: THACKER, SPINK AND CO.
1904.

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# PREFACE TO FOURTH EDITION.

THE old title has been preserved, but this edition includes references to all species in other parts of the world that are allied to the Game, Shore, and Water Birds of India.

These additions seem necessary, as owing to the facilities of travel Anglo-Indians are now engaged in most countries either on business or pleasure.

The scheme of the work is still as originally designed in 1874. The system of reference is comprised in three prime divisions, viz.:—

I. GAME BIRDS (Birds with feet like those of a Fowl), TABLE, pp. 49–52.

II. SHORE BIRDS (Birds that fly with legs out behind), TABLE, pp. 117–120.

III. WATER BIRDS (Birds with feet more or less fully webbed), TABLE, pp. 205–208.

The additional references have been taken chiefly from:—

| | |
|---|---|
| Blanford, *Fauna of British India*, vol. iv. | (B.) |
| Ogilvie-Grant, *Game Birds*, vols. i. ii. | (O.G.) |
| Bowdler Sharpe, *Birds of Great Britain*, vols. i.–iv. | (S.) |
| Mivart, *Elements of Ornithology* | (M.) |
| Oates, *Game Birds of India*, parts i. ii. | (O.) |
| Gordon, *Our Country's Birds* | (G.) |
| *Encyclopædia Britannica* | (E.B.) |
| *British Museum Catalogues* | (B.M.C.) |

The illustrations, 180 in number, are life size, and drawn from actual specimens within a few hours of their being brought to bag.

A. LE MESSURIER.

EALING, *May*, 1904.

## PREFACE TO THIRD EDITION.

OWING to the insertion of additional matter, the tabular form of previous editions has been abandoned, and the Notes are now given in paragraphs.

The system of reference, however, is intended to be the same. The Index (p. 151) shows the Order to which a bird belongs, and the Indices of the Orders (pp. 2–3, 36–37, 98–99) are divided into Families, with references to the pages on which the different species are detailed.

The illustrations were originally drawn from the specimens when shot, or when received from friends. Many of these were afterwards beautifully executed in pen and ink by Mr. W. W. Turner, of Simla.

The numbers, names, and descriptions, as given in Jerdon, have been adhered to as far as possible. The additions have principally been taken from *The Game Birds of India*, Messrs. Hume and Marshall (H. & M.), and *Stray Feathers* (S.F.).

The Introduction has been copied from the descriptive exhibits at the Natural History Museum, where I have received every assistance.

The derivations of names have been chiefly taken from *A List of British Birds compiled by a Committee of the British Ornithologists' Union.*

A. LE MESSURIER.

EALING, *August*, 1887.

## PREFACE TO SECOND EDITION.

IT was intended that an edition for the public should have been illustrated; but now that an expedition is starting for Central Asia, the Notes which were privately circulated in 1874 without the pictures are reprinted.

Some additions have been made, and the divisions into Families will now be found on pages 1, 9, and 22.

A. LE MESSURIER.

SIMLA, *October*, 1878.

# PREFACE TO FIRST EDITION.

(*For Private Circulation only.*)

To SIR WILLIAM MEREWETHER, C.B., K.C.S.I.
COMMISSIONER IN SIND.

---

DEAR SIR WILLIAM,

The accompanying Notes (commenced in 1861) on the Eastern Narra have been so often referred to by brother officers that, after an interval of thirteen years, I have been induced to complete and print them, not only to satisfy inquiry, but to remove, if possible, the difficulty that exists in tracing Birds to their proper names.

The plan adopted is, it is hoped, both simple and concise. The Index shows the Birds in Classes, and these again are divided into Families on pages 1, 6, and 19, with references to the intermediate sheets on which the different species are detailed.

Errors and omissions must occur, and if at the close of the shooting-season those receiving copies will return them to me, I shall hope to complete my first intention of presenting them with others fully illustrated in exchange for their suggestions, corrections, and illustrations.

These may be "Dry Leaves" from an "Unhappy Valley," but they tell of the advantages that Sind offers to the sportsman in the abundance of its small game.

A. LE MESSURIER.

KURRACHEE, *November*, 1874.

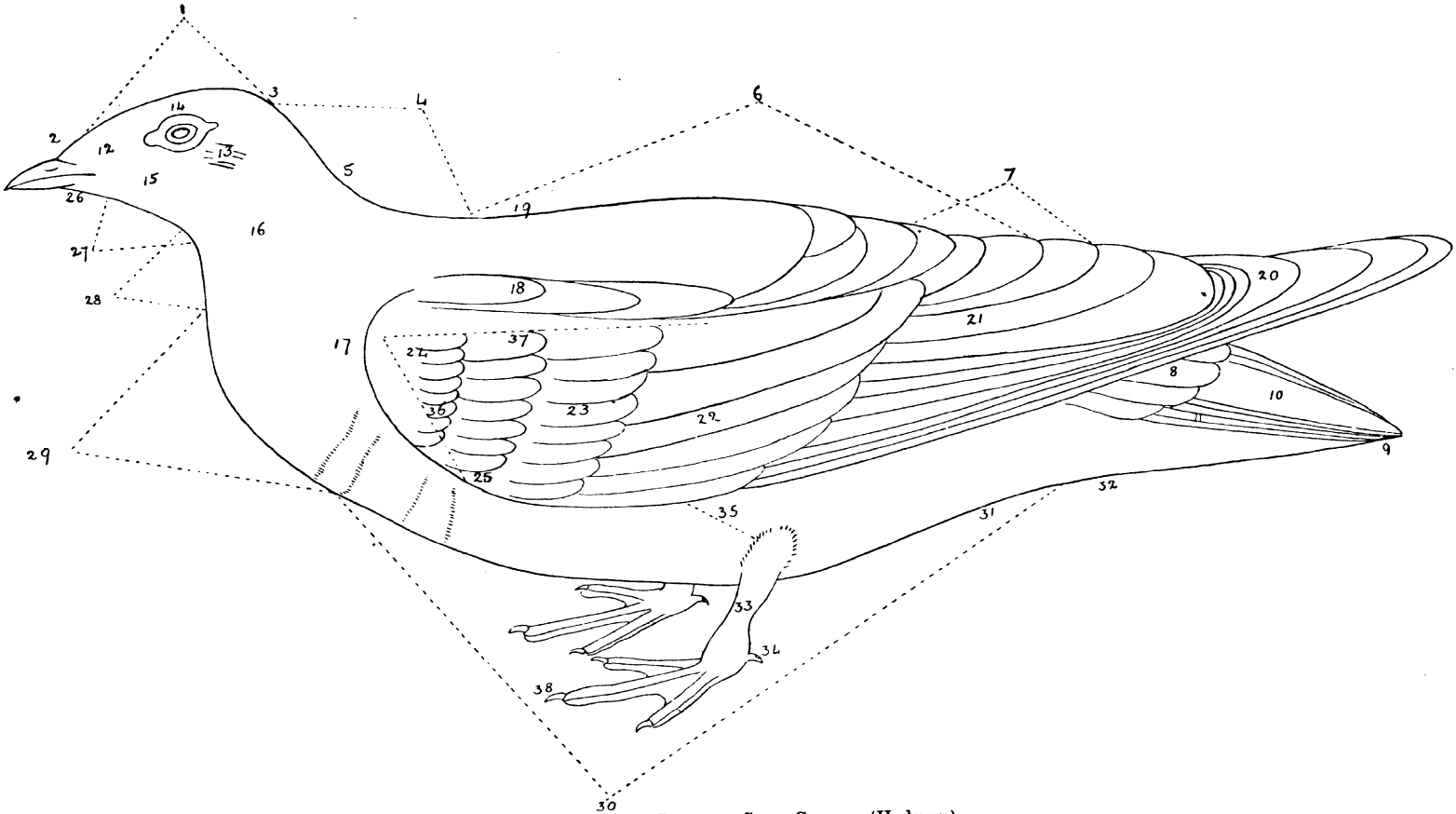
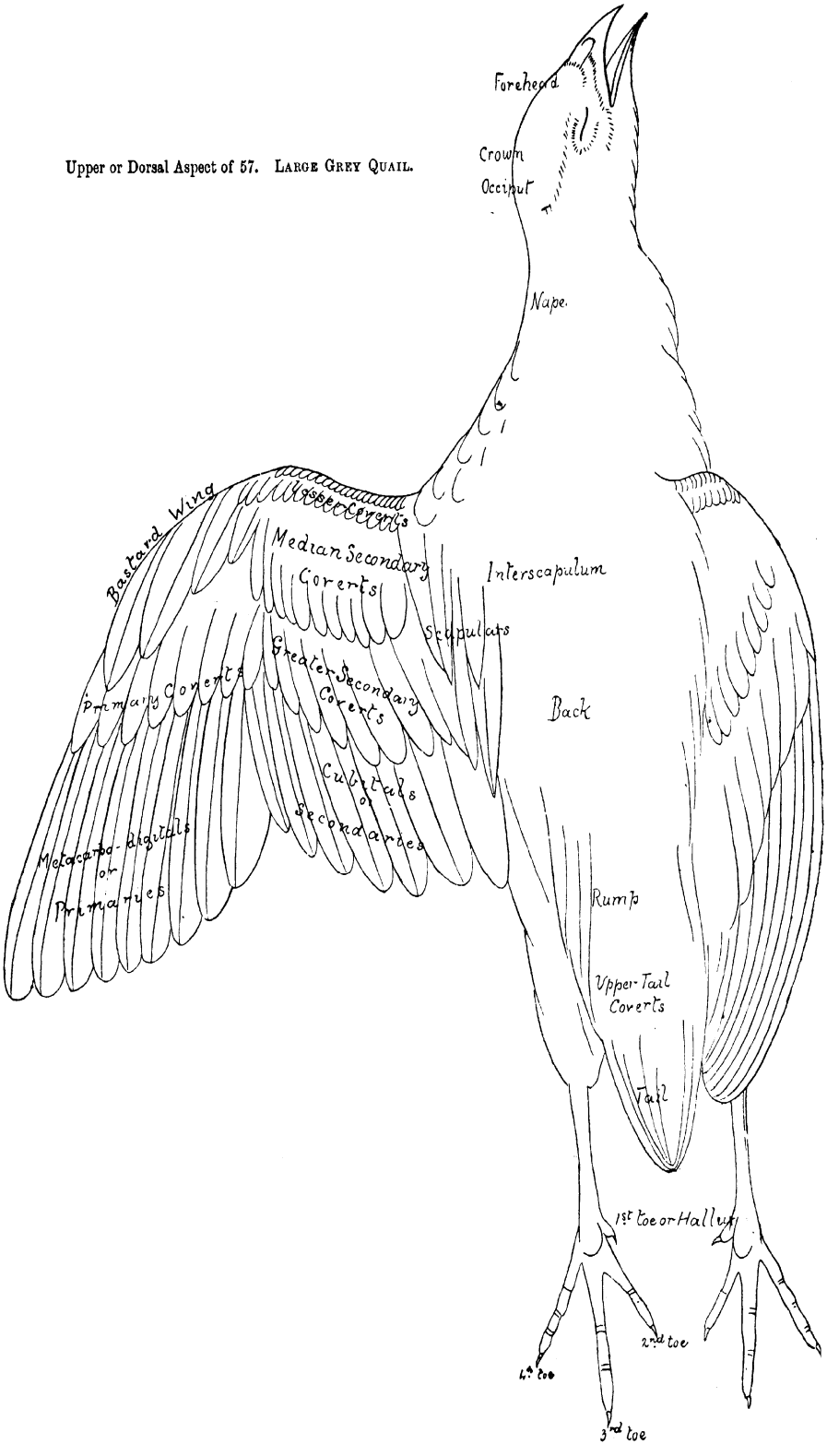



Diagram of 2. PAINTED SAND-GROUSE (Hodgson).

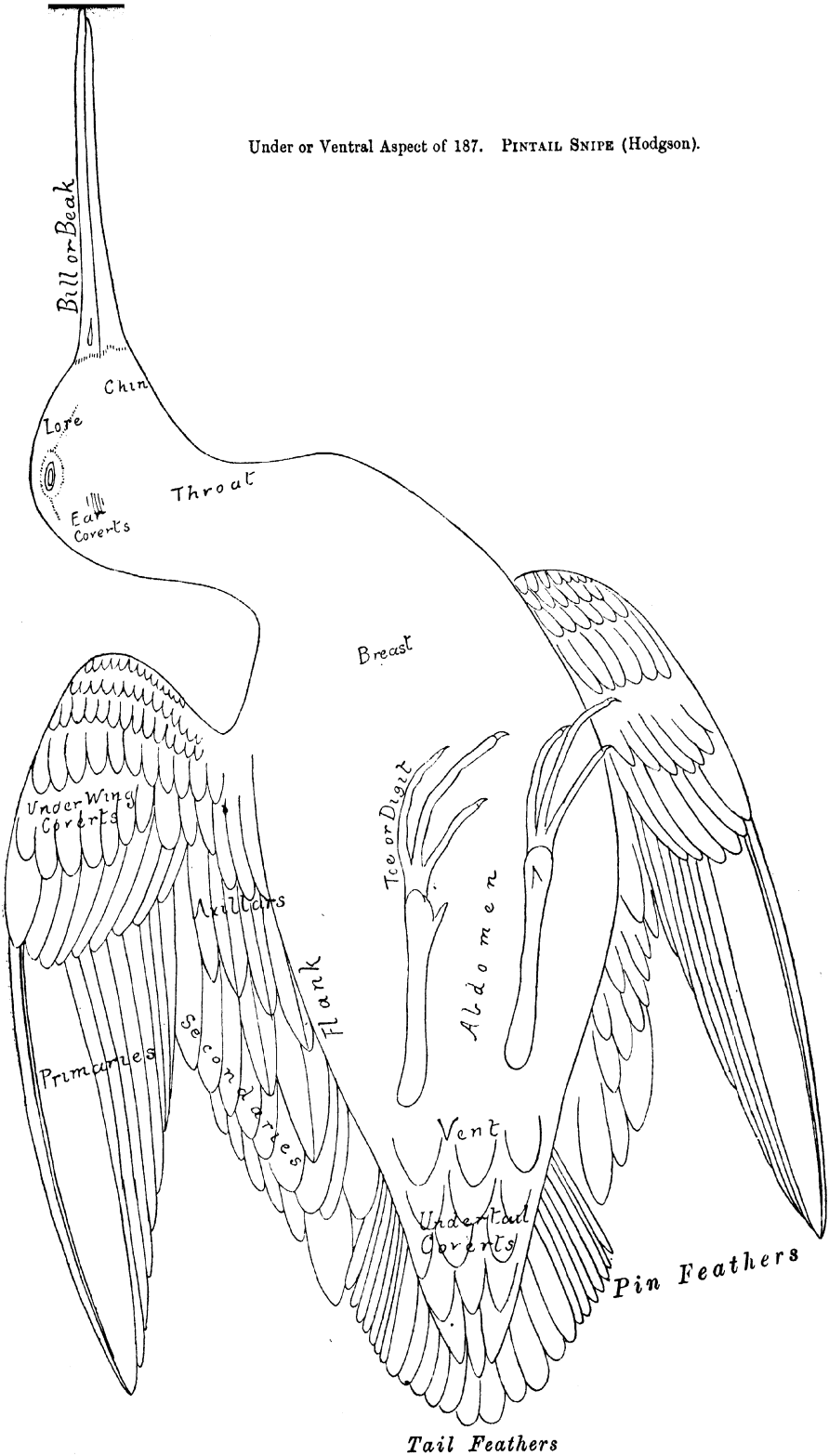
REFERENCES.

1. Crown (*Vertex*).
2. Forehead (*Frons*).
3. Hind head (*Occiput*).
4. Hind neck (*Cervix*).
5. Nape (*Nucha*).
6. Back (*Dorsum*).
7. Rump (*Uropygium*).
8. Upper Tail-coverts.
9. Tail-feathers (*Rectrices*).
10. Central Tail-feathers (*Uropygiales*).
11. Lateral or outer Tail-feathers.
12. Lore.
13. Ear-coverts (*Regio parotica*).
14. Eyebrow (*Supercilium*).
15. Cheek.
16. Side of Neck (*Collum*).
17. Shoulder (*Humerus*).
18. Scapulars or Humerals (*Parapteron*).
19. Interscapulary region (*Interscapulium*).
20. Primaries or Metacarpo-digitals
21. Secondaries or Cubitals } (*Remiges*).
22. Greater coverts
23. Middle coverts } (*Tectrices*).
24. Lesser coverts
25. Winglet or Bastard Wing (*Ala spuria* or *Alula*).
26. Chin (*Mentum*).
27. Throat (*Gula*).
28. Fore neck (*Jugulum*).
29. Breast (*Pectus*).
30. Abdomen.
31. Vent (*Crissum*).
32. Under Tail-coverts.
38. Tarsus.
34. First or Hind Toe (*Hallux*).
35. Tibia.
36. Carpus.
37. Radius and Ulna.
38. Digit or Toe.

Upper or Dorsal Aspect of 57. LARGE GREY QUAIL.



Under or Ventral Aspect of 187. PINTAIL SNIPE (Hodgson).



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# BIRDS.

PROFESSOR HUXLEY (*Proc. Zoo. Soc.*, 1867) showed, by the near approach of members of the class AVES to REPTILIA in all essential and fundamental points of structure, that the phrase "Birds are greatly modified Reptiles" would hardly be an exaggerated expression. After having detailed fourteen principal points in which Aves and Reptilia agree with one another and differ from Mammalia, he concluded that the class Aves, while well enough defined from all existing Reptiles, is nevertheless far more closely connected with the class Reptilia than with any other.

*Classification.* He divides Birds into groups :—

i. Where the tail itself (not the quill feathers it supports) is *longer than* the body—SAURURÆ.

ii. Where the tail is *shorter than* the body—RATITÆ and CARINATÆ.

The first group (i.), the SAURURÆ (lizard-tailed birds), is represented by the solitary fossil remains of *Archæopteryx lithographica.* These fossil remains, only discovered in 1861 by Andreas Wagner in the Upper Oolites of Solenhofen, in Bavaria, indicate that creatures existed in the Upper Jurassic geological age, which were undoubtedly birds in their general structure, although very different from those now existing. They were about the size of a Rook, and clothed with feathers, but the jaws were armed with teeth; three of the digits of the fore limb were free and furnished with claws, and the tail consisted of a series of elongated vertebræ gradually tapering to the extremity, each vertebra bearing a pair of well-developed feathers. As the skeleton of the tail rather resembled that of a reptile than that of a modern bird, the name SAURURÆ, signifying "lizard tailed," has been applied to the group.

The second group (ii.), where the tail is *shorter than* the body, is itself divided into the *Ratitæ* (ii.), those birds having the sternum or breast-bone *without* a keel, and the *Carinatæ* (iii.), having the breast-bone *with* a keel (see pp. 6–8).

## (ii.) RATITÆ.

(Breast-bone without a keel.)

These constitute a group, very distinct in many important characters from all other known birds. They derive their name from the sternum or breast-bone having no keel, and therefore resembling a raft or flat-bottomed boat (*ratis*). Their wings are so greatly reduced in size and strength that they do not possess the power of flight so characteristic of the majority of birds. The feathers are always soft and loose, the barbs being "disconnected," or not united together by minute hooks, as in most other birds, and there is no marked distinction between feathered and unfeathered tracts upon the skin. The oil gland is absent.

In addition, the *Ratitæ* (like the Tinamous) have the upper mandible covered

at the base with a membrane or cere, which also envelops the nasal grooves, and the fifth secondary is present. Incubation is performed by the male. Young when hatched are able to run.

This subclass (not represented in India) includes the giants of the bird kingdom, and approaches nearest to Mammalia. The existing members of the group are few in number, and are readily divided by well-marked structural differences into five families, viz.—

STRUTHIONIDÆ (true Ostriches).
RHEIDÆ (S. American Ostriches).
DROMÆIDÆ (Emeus).
CASUARIIDÆ (Cassowaries).
APTERYGIDÆ (Kiwis).

It has been remarked by some that Cassowaries and Emeus resemble Bustards in their anatomy, while Rheas and Ostriches are more like game birds. Owen says Cassowaries are modified Coots, and Parker considers there is a connection between Ostriches and Rails.

There are also other forms only known by their fossil remains. Though comparatively but few genera and species of this order now exist, they differ from one another considerably, and have a wide distribution, from Africa and Arabia, over many of the islands of Malayasia and Polynesia, to Australia and S. America. Hence in all probability the existing Ratitæ are but the waifs and strays of what was once a very large and important group.

## Order **STRUTHIONES.**

Only two toes (third and fourth). Fourth shorter and much padded. Nails stunted. The largest of living birds.

### Family STRUTHIONIDÆ. TRUE OSTRICHES.

No after shaft. Of the two toes the one corresponding to the middle of the three anterior toes in ordinary birds (the third of the complete set) is much the largest and supports the greater part of the weight; it has a short pointed nail. The smaller outer toe (or fourth) often wants the nail. Head, neck, and legs are bare or only covered with short down. The feathers of the wings and tail (corresponding to the "remiges" and "rectrices" of ordinary birds) are of considerable size, but soft and plumose. Widely distributed throughout Africa, Arabia, and Syria. Egg white.

### Genus **STRUTHIO.**

Body-feathers black in males, greyish in females. Three species.

*S. camelus.* 72″. Legs flesh colour. Bill yellow, tip brown. Naked parts reddish. Ring of white feathers on lower neck. Height about 8 feet. N. Africa, Arabia, and S. Palestine. Egg-shell smooth.

*S. molybdophanes.* Somewhat larger than *S. camelus.* Legs dull red. Bill pale red, tip yellow. Naked parts lead-grey. Horny shield on crown surrounded by downy hairs and no ring of white feathers on lower neck. Somaliland and C. Africa. Egg-shell deeply pitted, purple.

*S. australis.* Of same size as *S. molybdophanes.* Naked parts lead-grey. Vertex naked, but with no horny shield on crown and no white band at commencement of feathering on back. S. Africa. Egg-shell with small dark pores.

*S. epoasticus.* Doubtful whether name refers to *S. camelus* or *S. australis.*

*S. bidactylus.* A diminutive Ostrich reported to exist in C. Africa, not higher than *Otis arabs* (36″), but in figure and colour much like *S. camelus.*

Fossil remains of a true Ostrich have been found in the Tertiary deposits of the lower ranges of the Himalaya. In India there is an ostrich farm near Delhi. In Mysore, in the menagerie of the late Maharajah, an ostrich egg was hatched on April 5th, 1894, after forty-two days in an incubator.

# Order **RHEÆ.**

Three toes (second, third, and fourth). Second toe shortest. Nails strong and compressed.

## Family RHEIDÆ. RHEAS.

Distinguished from the true Ostriches by certain osteological characters and externally by the presence of three toes. Head and neck fully feathered. Tail indistinct. Wings covered with long slender plumes. Body-feathers single without after shaft. They associate in small flocks on the great open plains of S. America. Eggs white and laid on the ground.

### Genus **RHEA.**

Plumage grey or brown, with or without white tips. Three species.

*R. americana.* 52″. Legs and bill yellowish. General plumage grey. Head blackish. Neck whitish with black shaft stripes ; black band on nape. Bolivia to S.E. Brazil.

*R. macrorhyncha.* Similar to *R. americana*, but bill is longer and narrower. Colouring brown. Crown nearly black. N.E. Brazil.

*R. darwini.* 36″. Legs yellow. Bill brown. General plumage brown, tipped white. Patagonia to Tarapacá.

# Order **CASUARII.**

Three toes (second, third, and fourth). Second shortest. Claws strong and obtuse. After shaft very large. No tail. Australasia. Two families.

## Family DROMÆIDÆ. EMEUS.

No casque on head. The three toes (mid toe longest) have claws of similar form and nearly equal size. Wings exceedingly small. Feed on fruits, roots, and herbage, and generally keep in small companies. Confined to Australia. The nest is a shallow pit in the ground in which from nine to thirteen green eggs are laid.

### Genus **DROMÆUS.**

Plumage with black tips, uniform grey or barred grey and white. Three species.

*D. novæ hollandiæ.* 79″. Legs and bill blackish. Body-feathers uniform grey tipped black. Naked skin on sides of head and throat blue. Wings exceedingly small in proportion to the body and legs, and are entirely concealed under the general covering of feathers. E. Australia and formerly Tasmania.

*D. ater.* 55″. Similar to *D. novæ hollandiæ*, but neck feathers entirely black. Kangaroo Island, but now extinct.

*D. irroratus.* Similar to *D. novæ hollandiæ*, but plumage spotted white, grey, and rufous, tipped black. W. Australia.

## Family CASUARIIDÆ. CASSOWARIES.

Horny casque or helmet. Plumage loose and hair-like. Accessory plume as long as the main feather and a rudiment of a third. Wings rudimentary, with five or six rounded shafts without webs. Part of the neck bare, and generally ornamented with long hanging wattles. Powerful claw on second toe. Shy, solitary birds. Papuan subregion with N. Australia. Eggs light green.

### Genus **CASUARIUS.**

Body-feathers black. Ten species.

*C. tricarunculatus.* Similar to *C. galeatus*, but three caruncles, one median and two on sides of neck. Geelvink Bay.

*C. bicarunculatus.* Head greenish, neck blue. Two caruncles on throat purple. Body-feathers blackish. N. Aru Islands.

*C. galeatus.* 60″. Head greenish, neck purple. Two caruncles close together, flesh colour. Body-feathers black. Ceram.

*C. australis.* Similar to *C. galeatus*, but large. Two caruncles very large and red. N.E. Australia.

*C. salvadorii.* 60″. Allied to *C. galeatus.* Geelvink Bay.

*C. beccarii.* 63″. Head grey-blue ; band from base of lower mandible yellow. One long wattle on throat more or less divided at tip. Aru Island and S. New Guinea.

*C. uniappendiculatus.* 65″. Head, throat, and hind neck blue. Single pear-shaped caruncle on middle of fore neck yellow. New Guinea.

*C. occipitalis.* Legs and bill dark olive—similar to *C. uniappendiculatus*, but has a triangular yellow patch on occiput. Jobi.

*C. papuanus.* 55″. Head, throat, and fore neck blue. Casque blackish, like a triangular pyramid. No caruncles. N.W. New Guinea.

*C. picticollis.* 55″. Allied to *C. papuanus*, but throat is red, and lower neck light blue. S.E. New Guinea.

*C. bennetti.* 53″. Head and neck blue. Casque black. New Britain.

## Order **APTERYGES.**

Four toes with claws long and acute. New Zealand.

### Family APTERYGIDÆ. KIWIS.

The smallest of the *Ratitæ*. Hind toe as well as the three other digits of the foot. Legs and feet stout. Claws long, curved, and sharp-pointed. Bill greatly elongated, with nostrils near the tip. Lengthened hairs at base of bill. Plumage hair-like. No after shaft. Wings rudimentary and covered with feathers. No tail. Nocturnal in their habits, and feed mainly on worms. Eggs few in number, white, and remarkably large for the size of the bird.

### Genus **APTERYX.**

General plumage brown, edged darker or greyish brown, with light bars. Six species.

*A. australis.* ♂ 23″ ♀ 27″. Legs dark brown. Bill 3·75″, white. Head, neck, and breast grey-brown, tipped rufous and edged blackish. South Island.

*A. lawryi.* ♂ 30½″ ♀ 33″. Similar to *A. australis*. Bill 5½″. Rudimentary wings, with long and slightly curved claw. Stewart Island.

*A. mantelli.* ♂ 22″ ♀ 25″–27″. Similar to *A. australis*, but darker and more rufous. Upper feathers with stiffened points. North Island.

*A. oweni.* ♂ 12½″ ♀ 20″. Legs pale brown. Bill 2·85″, dark. Plumage grey, banded white. E. coast of South Island.

*A. occidentalis.* Similar to *A. oweni*, but as large as *A. australis*. Feathers barred black. W. coasts of North and South Islands.

*A. haasti.* ♂ 25″ ♀ 27″. Similar to *A. oweni*, but darker, with the light bands broader. Central South Island, and W. of North Island.

# FLIGHTLESS BIRDS.

Although the power of flight is very general in birds, it is by no means universal in the class, several species of different groups having wings too small and weak to raise the body from the ground. Among these are the Dodos, Penguins, some Auks and Rails, and all the *Ratitæ*, or birds with a flat or keelless sternum (including the various forms of Ostrich, Rhea, Cassowary, Emeu, Apteryx, and Dinornis.)

# FOSSIL BIRDS.

Among Oolitic birds mention has already been made of the *Archæopteryx* (p. 1).

Those from the Cretaceous or chalky fresh-water formation are rare. Chiefly they consist of six genera from the United States of America. *Odontornithes*, about the size of a Pigeon, possibly possessing teeth; a second belonging to the *Steganopodes* (Pelicans, etc.); a third related to the *Colymbidæ* (Divers, etc.); a fourth nearly as large as a Swan, still undetermined; a fifth to the *Limicolæ* (Plovers, etc.); and a sixth to the *Rallidæ* (Rails, etc.).

The Eocene, or earliest Tertiary period, is more fruitful. One *Gastornis*, as large as an Ostrich, incapable of flight, though able to swim; *Lithornis*, as resembling a Vulture; *Dasornis*, of Struthious character; *Odontoptoryx*, having jaws armed with true teeth; and others allied to the Kingfishers, Gulls, Herons, etc.

The fossils of the Paris basin contain several specimens of extinct birds allied to Flamingoes, Rails, birds of prey, game birds, etc.

In the Miocene or middle division of Tertiary strata remains have been found of extinct birds allied to Flamingoes, Storks, Snipes, Gulls, Divers, etc., and in the lower ranges of the Himalaya those, apparently, of a true *Struthio* (Ostrich), an *Argala* (Adjutant), and possibly a large species of *Phaëton* (Tropic Bird).

In the Pliocene or modern Tertiary deposits, those of a bird of prey, and of several water birds, Eagles, Cranes, etc. In the Post-Pliocene the remains of a Turkey, Crane, etc.

From caves in France a large and extinct Crane; in Malta a gigantic Swan; and in S. America a large Crax and a large Rhea.

# SUBFOSSIL BIRDS.

Birds' bones from the Danish kitchen middens reveal the existence of two species long since vanished from the spots where their remains are found, viz. the Capercailzie (*T. urogallus*) and the Great Auk or Garefowl (*A. impennis*).

From the fens of East Anglia a form of Pelican now extinct, not only in England, but even in Northern Europe.

New Zealand was formerly inhabited by a gigantic race of birds, *Dinornithidæ* (Moas, eleven species grouped in two families), some of which considerably exceeded in size the modern Ostriches. The situation and state of preservation of the abundant remains which have been found indicate that they existed down to comparatively recent times, and were probably exterminated by the present Maori inhabitants of the islands. Feathers which have been found associated with the bones show the presence of a large after shaft, as in Emeus and Cassowaries, but some of the species at least resemble the Kiwis, alone of existing Ratite birds in possessing a hind toe to the feet. The wings were quite rudimentary, if not altogether absent, no trace of a wing-bone having been found with any of the numerous skeletons discovered. Egg white and a foot long. In the same formation *Harpagornis*, a bird of prey—of stature sufficient to have made the largest *Dinornis* its quarry. *Cnemiornis*, a gigantic goose.

From Australia *Dromæornis*, an extinct Struthious bird allied to the well-known Emeu.

*Æpyornithidæ*. Fossil remains from superficial deposits in Madagascar show the existence in a very recent geological period of several species of Ratite birds, which bear much resemblance to the *Dinornithidæ*. One of the most striking characteristics was the enormous size (both absolute and relative) of the egg, in which they resemble the Kiwis rather than the Moas.

*Æ. maximus*, a species which laid an enormous egg (nearly a yard in circumference and over a foot in length) not unnaturally recalls the mythical Roc, of Arabian tales.

## BIRDS RECENTLY EXTIRPATED.

The Dodo (*Didus ineptus*), discovered by Mascaregnas in Mauritius in the beginning of the sixteenth century, a large bird, clumsy, flightless, and defenceless, but allied to the Pigeons. Also *Aphanapteryx*, a Ralline bird, abnormal, flightless, and long-billed.

The Solitaire of Réunion, allied to the Dodo and the Solitaire of Rodrigues, a Didine bird, but not so large as the Mauritian Dodo.

In the Antilles eight out of fourteen kinds have probably become extinct.

The Garefowl or Great Auk (*A. impennis*), nearly allied to the Razor Bill (*A. torda*), but flightless and about twice as big, seems to have become extinct since 1844, in which year the last two were taken on the rocky islet, Fuglasker, or Fowlskerries, S.W. of Iceland. But it was in the Newfoundland seas this Penguin, or "Pinwing," was most abundant. In 1536, English and French mariners killed these birds for food, and the practice was carried on till 1785, when Cartwright foresaw their speedy extirpation.

The Labrador Duck (*Anas labradora*), nearly allied to the Eiders, seems also doomed, for the last known was killed by Colonel Wedderburn in Halifax in 1852. The Philip Island Parrot (*Nestor productus*), peculiar to the New Zealand subregion, has also become extinct.

## BIRDS PARTIALLY EXTERMINATED.

The Common Crane in 1555 was breeding in the fens. The Spoonbill in 1688 bred in Suffolk. The Capercailzie (*T. urogallus*) frequented the pine forests of Ireland and Scotland till about 1760, but the species has been successfully introduced from Sweden into Scotland during the last fifty years. The Bustard vanished from Norfolk in 1838. All these four species were protected to a certain degree by Acts of Parliament, but these laws only gave immunity to their eggs, and none to the parent birds during the breeding season, thus showing how futile is the former when compared with the latter, since there are very many species whose nests from time out of mind have been and are yearly pillaged without any disastrous consequences arising from the practice. The singular wisdom of the old command (Deut. xxii. 6, 7), the most ancient "game law" (using the term in its widest sense) in existence, has here a curious exemplification.

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(iii.) The CARINATÆ, having the sternum or breast-bone *with* a keel.

All existing birds which do not belong to the *Ratitæ*, greatly as they differ externally, have so much in common in their structure that they are included in one great division, named CARINATÆ, because their sternum or breast-bone carries a median projecting ridge called the keel (*carina*). This keel forms a very obvious feature in the skeleton, as it affords a surface for the attachment of the great breast-muscles which move the wings in flying; its development is more or less in proportion to the exercise of this faculty. It should be noted that in some few birds (the Parrot, *Stringops;* the Rail-like bird, *Notornis;* and the Hoatzin, *Opisthocomus*) belonging to several different subdivisions of this great

group, the keel is greatly reduced in size, and the power of flight is almost or entirely lost. The division of Carinate birds into orders and families, and the mutual relations of these groups one to another, are subjects of great difficulty, and upon which zoologists are by no means as yet agreed.

The CARINATÆ are again separated into orders according to their palatal bones, viz.—

(A) Having the vomer *broad* behind.

(B) Having the vomer *narrow* behind.

The vomer (vōmer, a ploughshare), which is the key to the classification, varies more than almost any bone in the skull of a bird. It is a small bone, thin as a knife-blade, and rarely broader, standing on its edge in the very centre of the roof of the bird's mouth, a bone so delicate that it is one of the first to vanish when the student in search of it first prepares a skull.

(A) The DROMŒOGNATHÆ, or birds with vomer *broad* behind, are represented by the single family *Tinamidæ* of America. (Note.—All Ratite birds possess this form.)

(B) Among birds with vomer *narrow* behind a further separation occurs, according as the maxillo-palatines (bones on each side of the vomer) are free ($\alpha$), arrested ($\beta$), or united ($\gamma$); and again with those having the maxillo-palatines free a further distinction is drawn according as the former is pointed (i.) or truncated (ii.) in front.

Thus by taking as a basis the modifications introduced by Professors Newton and Parker, in communication with Professor Huxley, as set forth in the *Encyclopædia Britannica*, and combining therewith later information, a full morphological classification of the CARINATÆ can be prepared.

(B) The SCHIZOGNATHÆ ($\sigma\chi\acute{\iota}\zeta\omega$, to cleave), or birds with vomer narrow behind, pointed in front (i.); maxillo-palatines free (typical skull, *C. pluvialis*, the Golden Plover), embracing nine groups of allied families; viz.—

| | |
|---|---|
| (9) *Charadriomorphæ* (the Plovers) ($\chi\alpha\rho\alpha\delta\rho\iota\grave{o}\varsigma$—a Sea Lark.) | Stone Curlews, Crab Plovers, Coursers, Pratincoles, Jaçanás, Turnstones, Lapwings, Plovers, Oyster Catchers, Stilts, Avocets, Curlews, Godwits, Sandpipers, Ruffs, Stints, Phalaropes, Woodcocks, Snipes, etc. |
| (10) *Cecomorphæ* (the Gulls) (K$\grave{\eta}\xi$—a Gull.) | Gulls, Terns, Noddies, Scissorbills, Skuas, Petrels, Albatrosses, Divers, Grebes, Razorbills, Auks, etc. |
| (11) *Spheniscomorphæ* (the Penguins) (Spheniscus—a Penguin.) | A single family *Apterodytidæ*, comprising three genera, *Eudyptes*, *Spheniscus*, and *Apterodytes*. |
| (12) *Geranomorphæ* (part) (the Cranes) ($\Gamma\acute{\epsilon}\rho\alpha\nu\varsigma$—a Crane.) | Rails, Crakes, Moorhens, Watercocks, Finfeet, Cranes, Bustards, etc. |
| (13) *Alectoromorphæ* (the Fowls) ('$\Lambda\lambda\acute{\epsilon}\kappa\tau\omega\rho$—a Cock.) | Pea-Fowls, Jungle-Fowls, Pheasants, Spur-Fowls, Partridges, Quails, Bush Quails, Hill Partridges, Wood Partridges, Snow Cocks, Snow Partridges, Grouse, Megapodes, Curassows, etc. |

(14) *Pteroclomorphæ* (the Sand-Grouse).
(15) *Peristeromorphæ* (the Pigeons) (Περιστερα—a Dove.) } Pigeons and Doves.
(16) *Heteromorphæ* (the Hoatzins).
(17) *Coccygomorphæ* (part) (the Goatsuckers).

(C) The ÆGITHOGNATHÆ (Αἴγιθος—a Sparrow), or birds with vomer narrow behind, truncated in front, (ii.) maxillo-palatines free (α) (typical skull, *C. corax*, the Raven), embracing five groups of allied families, viz.—

(18) *Trochilomorphæ* (the Humming Birds).
(19) *Geranomorphæ* (part) *Thinocorinæ*, American Shore Plovers.
(20) *Turnicomorphæ* (the Hemipodes). Bustard and Button Quails.
(21) *Cypselomorphæ* (the Swifts).
(22) *Coracomorphæ* (the Passerines) { Orioles, Starlings, Tits, Waxwings, Dippers, Wrens, Ravens, Crows, Jays, Magpies, Finches, Sparrows, Wagtails, Swallows, Shrikes, Larks, Thrushes, etc.

(D) The SAUROGNATHÆ, or birds with vomer narrow behind, the vomerine halves permanently distinct and maxillo-palatines arrested (β).

(23) *Celeomorphæ* (the Woodpeckers). Woodpeckers and Wrynecks.

(E) The DESMOGNATHÆ (δεσμὸς—a bond), or birds with vomer small or none, but when it exists, pointed in front, maxillo-palatines united (γ) (typical skull, *N. crecca*, the common Teal), embracing seven groups of allied families; viz.—

(24) *Ætomorphæ* (the birds of prey). { Cariamas, Owls, Vultures, Hawks, Falcons, Eagles, etc.
(25) *Psittacomorphæ* (the Parrots).
(26) *Coccygomorphæ* (part) (the Cuckoos, Kingfishers, and Trogons).
(27) *Chenomorphæ* (the Anserine birds). } Swans, Geese, Ducks, Pochards, Smews, etc.
(28) *Amphimorphæ* (the Flamingoes).
(29) *Pelargomorphæ* (the Storks). { Ibises, Spoonbills, Storks, Herons, Egrets, Bitterns, etc.
(30) *Dysporomorphæ* (the Cormorants). { Pelicans, Frigate Birds, Cormorants, Darters, Gannets, Boobies, Tropic Birds, etc.

"The above scheme is a nail in a sure place, and on it for the present we may hang all that we know or are learning of the anatomical structure of this class of Vertebrates. That which relates to the *Carinatæ* must be regarded merely as a *list* of birds having a similar facial structure. For the general ornithologist it is very suggestive and helpful, and will save him from looking merely on outward appearances; for the study of structure and development is looking into the heart of the matter."

For more easy reference and correction, if necessary, a table is here inserted.

# GEOGRAPHICAL DISTRIBUTION OF BIRDS.

The surface of the globe has been divided by Mr. Sclater into six regions, termed respectively, Australian, Neotropical, Nearctic, Palæarctic, Ethiopian, and Indian.

*Wallace's Line.* A strait some fifteen miles or so in width, and separating the two fertile, but otherwise insignificant, islands of Bali and Lombok, makes such a frontier as can hardly be shown to exist elsewhere. The former of these islands belongs to the Indian region, and the latter to the Australian, and between them there is no true transition, that is, no species are common to both, which cannot be easily accounted for by the various accidents and migrations that in course of time must have tended to mingle the productions of islands so close to one another.

1. THE AUSTRALIAN REGION is divided from the INDIAN by the narrow but deep channel (Wallace's Line) which separates the small islands of Bali and Lombok, and determines the boundary between two entirely distinct portions of the earth's surface. A line is drawn midway along this channel, and carried N.N.E. up the Straits of Macassar, dividing Celebes on E. from Borneo on W., and continued N.E. between the Philippines and the Ladrones to the N. of the Sandwich Islands. Southwards from Lombok Strait, the boundary rounds the W. coast of Australia, and then runs S.E., to include New Zealand and its dependencies. After encircling the Low Archipelago and the Marquesas, the line travels N.W. to the N. of the Sandwich Islands, and so completes the demarcation of the region. The region so defined does not comprise the Aleutian Islands in Bering Sea, Japan, or the Loochoo Islands.

The Australian region possesses the most exceptional fauna, both with respect to groups here found and found nowhere else, and with respect to widely diffused groups which are here either remarkable by their absence or by having their headquarters within it. Thus the whole family of Birds of Paradise, the Bower Birds, the Lyre Birds, the Broad-billed, the Brush-tongued, and the Grass Parrakeets, the Emeus, the Cassowaries, the Apteryx, and the Kagu are absolutely peculiar to this region, while most of the Cockatoos, the Honey-Suckers (one exception), and Megapodes (two exceptions) are almost so.

Among birds which are feebly represented elsewhere, and here attain the maximum of development, are the Thick-Headed Shrikes, Caterpillar-Eaters, Flower-Peckers, and Swallow Fly-Catchers. Among groups of wider distribution, the Weaver Birds, Moreporks, Kingfishers, and Pigeons obtain a degree of prominence and beauty which is elsewhere unequalled. Two-fifths of the genera of Pigeons (including the great Crowned and the Tooth-billed) and ten genera of Kingfishers are peculiar to the region. Among those entirely wanting are the Bulbuls, Barbets, Vultures, and Pheasants. There are but few Thrushes or Woodpeckers.

The Australian region may be said to have four subregions, viz.—

(*a*) *The Papuan subregion*, with New Guinea as a centre, comprises Lombok, the Timorese, the Celebesian, and the Moluccan groups. Out of 350 species of land birds, 300 are peculiar to it. Generally they are remarkable for brilliancy of plumage, and twelve genera are decorated with metallic covering of the feathers. Its chief features are the extraordinary development of the Cassowaries, the richness and specialisation of the Kingfishers, its Parrots, Pigeons, and

Birds of Paradise, Honey-Suckers, and some remarkable Fly-Catchers. The Birds of Paradise, Racket-tailed Kingfisher, the largest and the smallest of the Parrot tribe, and the Crowned Pigeons are very characteristic. Hornbills do not extend beyond the Solomon Islands.

(*b*) *The Australian subregion* includes the island itself and Tasmania. Out of 630 species, nearly 490 are land birds, of which not more than twenty-five are found elsewhere. It is rich in Parrots, having several very peculiar forms, and poor in Picarians, certain Kingfishers, and Pigeons. It possesses two extraordinary families of abnormal *Passeres*, the Lyre Birds (*Menuridæ*) and the Scrub Birds (*Atrichiidæ*), the only two species of Emeu (one West, one East—the Emeu in Tasmania is extinct), and all the Bower Birds (*Ptilonorhynchidæ*), except two genera, which are both found in New Guinea. It is also the exclusive home of the Ocellated Megapodes (*Leipoa*).

(*c*) *The Polynesian subregion*, which extends from one tropic to the other throughout 90° of long. It includes—

The Palau (Pelew), Caroline, and Ladrone Islands.

New Hebrides and New Caledonia.

Central Polynesia (Fijian, Tongan, and Samoan groups).

The clusters from Cook's Islands to the Marquesas, with the Society Islands and the Low Archipelago.

The Sandwich or Hawaiian Islands.

Amongst the peculiar genera are a Reed Warbler (*Psæmathia*) in the Palau Islands; the Kagu (*Rhinochetus*) in New Caledonia; the Manu-mea, or Tooth-billed Pigeon (*Didunculus*) in the Samoan Islands, and a brevi-pennate Water-Hen (*Parendiastes*) from Savai. The Sandwich Islands possess all the *Drepanididæ*, and nine genera of small (Passerine) land birds, including two species of Honey-Suckers. There is also a Coot (*Fulica alai*) and the well-known Sandwich Island Goose (*Bernicla sandvicensis*), which has been very commonly domesticated in Europe.

(*d*) *The New Zealand subregion* includes its own three islands and surroundings, as Lord Howe's, Norfolk, and Kermadoc islands, with the Chatham, Auckland, and Macquarrie groups. This subregion was inhabited by the gigantic species of *Dinornis* (the hallux obsolete), now extinct, and by the extinct forms (with hallux present) *Palapteryx* and *Euryapteryx*. The most characteristic living form is the Apteryx, but one almost as remarkable is the Owl-like Parrot (*Stringops habroptilus*). The flightless Weka Rail, or Woodhen (*Ocydromus australis*); the Takahe (*Notornis mantelli*), a flightless Coot-like bird; the Parson Bird (*Prosthemadera novæ zealandiæ*); and the Huia Bird (*Heteralocha acutirostris*) are noteworthy peculiar forms. The genus of Parrots (*Nestor*) is also peculiar, and it is one of these, the Kea Parrot (*N. notabilis*), which is so destructive to sheep. A genus of ducks (*Nesonetta*) is said to be peculiar to the Auckland Islands.

2. The Neotropical Region (νέος—new, τροπικός—tropical), the tropical division of the New World, embraces the whole of S. America, from Cape Horn to the isthmus of Panama, all Central America, and reaches in N. America (the central plateau of Mexico excluded), to about 22° N. lat. It includes the Falkland Isles to the S.E.; the Galapagos to the W.; and the Antilles, or West India Islands, up to the Florida Channel. Of birds peculiar to the region are three species of Rhea, the Tinamous, and the Hoatzins. Of birds chiefly restricted

are the Curassows, Humming Birds, Tyrants, Tanagers, Piculules, and Ant Thrushes; while among the smaller groups equally defined are the Tapaculos, Toucans, Jacamars, Motmots, Todies, Trumpeters, and Screamers, besides such isolated forms as the Seriemas and the Sun Bitterns.

Its subdivisions are as follows :—

(*a*) *The Patagonian subregion*, extending from Cape Horn to Bahia Blanca on the east coast, thence N.W. to Mendoza and so northwards along the eastern and higher slopes of the Andes, crossing the equator and returning along the western slopes seaward to Truxillo in lat. 7° S. Of peculiar genera it has one belonging to the *Rheidæ* and two to the peculiar family of Game Plovers (*Thinocoridæ*), and of these almost restricted are the Plantcutters, Tyrants, and Screamers. In the Falkland Islands there is a peculiar species of water bird (*Chloephaga*), and about half a dozen species of Penguins resort to these islands for breeding quarters.

(*b*) *The Brazilian subregion* follows the foregoing from Bahia to Mendoza and continues to Potosi in Bolivia, then N.E. (avoiding watershed of the Amazons) to the Paranahyba, through or along which it probably makes its way to the Atlantic. It has no birds peculiar to itself, but is distinguished by the presence of the Rhea, Cariamas, and Plantcutters.

(*c*) *The Amazonion subregion* is continuous southwards with the Brazilian boundary. The western frontier (seems to turn off before the eastern confines of the Patagonian subregion are reached and to leave a space intervening) pursues a northward course at a lower level along the western bank of the Huallaga, and crossing the Amazon River about long. 77° W. and lat. 5° S., pursues its way to the mouth of the Orinoco. Two families are here peculiar—the Hoatzins and the Trumpeters. There is another genus (*Chenalopex*) belonging to the Geese, not found elsewhere in the New World, but common to the Ethiopian region.

(*d*) *The sub-Andean subregion.* This includes the narrow slip left between the Amazonian and Patagonian subregions, and extends from the frontiers of Bolivia to the table-land of Ecuador, lapping the western coast line to Truxillo, embracing the Galapagos Islands to the W., and on the E. following the Amazonian boundary to the Atlantic. It includes the islands of Trinidad and Tobago and those lying on the N. coast of S. America, Nueva Granada, and Venezuela, till it reaches the Central American subregion in Panama. There is only one family of birds peculiar to it, composed of a single species—the Guacharo or Oil Bird of Trinidad. It is especially rich in Tanagers and different kinds of Humming Birds. In Galapagos there is a peculiar species of Buzzard and possibly a Penguin also.

(*e*) *The Central American subregion* extends as far northwards as Guayamas in the Gulf of California and eastwards to the Rio Grande, the boundary between Texas and Mexico. The birds of two subregions here, and it has no family of birds peculiar to itself. The American Partridges and Quails (*Odontophorinæ*) are well represented.

(*f*) *The Antillean subregion*—the Antilles excepting Trinidad and Tobago. The family of Todies is entirely confined to this subregion.

3. The Nearctic Region (νέος—new, ἄρκτος—north), the northern division of the New World, includes the rest of the American continent, the Aleutian Islands and Bermudas, as well as the circumpolar lands lying westward of long. 60° W. and Greenland. Most of its birds are common either to the Neotropical

or Palæarctic regions. Of sixty-three families, only one is peculiar to this region, viz., *Chameidæ*, restricted by a single genus and a single species to the coast district of California. Of the remainder, forty-four are also Palæarctic and eighteen are common to the Neotropical region.

As the great majority of Nearctic families and genera of birds appear to be generally distributed throughout the region, the subdivisions are termed "provinces" as under.

(*a*) *The western or Californian province*, or California, Oregon, and part of British Columbia, including the Sierra Nevada and Cascade Mountains. Here is the peculiar Wren-like bird (*Chamæa*), the Plumed Partridge (*Oreortyx pictus*), the Californian Vulture and the Mocking Birds, while it is the chief home of the Passenger Pigeons.

(*b*) *The eastern or Alleghanian province.* The boundary starts from the Gulf of Mexico, near the eastern border of Texas, and runs northwards near long. 100° W. along the western edge of the Great Plains to the southern frontier of Canada, then inclining to the west, it includes the valleys of the Saskatchewan and the Athabasca, crosses the Rocky Mountains, and loses itself in the borders of the Arctic Ocean.

(*c*) *The middle province* lies for the most part between (*a*) and (*b*), and is roughly represented by the western and eastern slopes of the Rocky Mountains.

(*d*) *The Canadian province.* All Canada except the S.W. portion included in (*b*) and across Davis Straits to Greenland.

(*e*) *The Alaskan province*, which shows a Palæarctic element, although the Aleutian Isles do not appear to be used as a route of communication from the Old World to the New.

(*f*) *The Bermuda province* has not a single peculiar species. It appears to be a resting-place for migrants as they retreat southwards from Labrador and Greenland, and again on their journey northwards in the spring.

(*g*) *The Greenland province.* The Sea Eagle, Ringed Plover, and Snipe which breed in Greenland are those of Europe instead of their American congeners.

Among birds of wider range, the *Aridæ* are represented by a single species, the Carolina Parrakeet, and the *Tanagridæ*, small brilliant birds confined chiefly to tropical America, are exemplified by but one genus (out of forty) which occur within its limits. The American Partridges and Quails (*Odontopnorinæ*), partly Neotropical, are well represented. The turkeys are found only to the eastward of the Rocky Mountains. The most characteristic family is that named *Mniotiltidæ*, which contains brilliant little warblers which take the place of the Old World *Sylviidæ*.

4. THE PALÆARCTIC REGION (παλαιός—old, ἄρκτος—north, *i.e.* the northern division of the Old World) begins with the Atlantic Islands (the Azores, Canaries, and Madeiras) and includes that portion of N.W. Africa which was formerly known as the Barbary States, the whole of Europe and its islands (from Iceland and Spitzbergen to those of the Mediterranean), Asia Minor, Syria (excepting the Jordan valley), and all the rest of the Asiatic continent lying to the northward of the Himalaya Mountains, and of a line drawn eastward in prolongation between lat. 30° and 35° N. till it meets the Pacific Ocean, besides Japan, the Kurile Islands (connecting Japan with Kamschatka) and the Loochoo Islands.

The Palæarctic region (next to the Nearctic) has a much greater affinity to the Indian region than to any other. The entire number of families is computed at 67 and the genera 324 (less one). Of these, though there are neither Parrots, Humming Birds, Hornbills, nor Toucans, 128 are common to the Nearctic region, including Thrushes, Crossbills, Magpies, Goatsuckers, Woodpeckers, Swallows, Snowy Owls, Jerfalcons, and others. Species of 51 more seem to occur as true natives, both in the Ethiopian and Indian regions. Also 18 appear to be common to the Ethiopian without being found in the Indian region, and no fewer than 71 to the Indian without being found in the Ethiopian. Almost the only group which may be said to characterise the palæarctic region positively is that to which the Bearded Titmouse belongs. The true Hawfinches are also characteristic. The most conspicuous is the Capercailzie.

The subregions are distinguished as under:—

(*a*) *The European subregion* includes all Europe N. of the Pyrenees, the Alps, the Balkans, the Black Sea, and the Caucasus. It is bounded on the E. by the Ural Mountains. It does not seem to possess a single genus which can be accounted absolutely peculiar to it. The Spitzbergen Ptarmigan (*L. hyberboreus*) is nearly allied to the Rock Ptarmigan (*L. rupestris*) of the Nearctic region, which only occurs in the Palæarctic region in Iceland. Iceland is also the breeding place of the Falcon (*F. islandus*) and the Harlequin Duck. The Red Grouse (*L. scoticus*), restricted to the British Isles, differs in no essential character save colouration from the Willow Grouse (*L. albus*), which is circumpolar, inhabiting the Arctic tundras of Europe, Asia, and America.

(*b*) *The Mediterranean subregion.* The Barbary States, the Iberian and Italian peninsulas, as well as Turkey in Europe, extending eastward through Asia Minor and Persia until it touches the Indian region.

In the Atlantic isles there is a specific Bullfinch, a peculiar Chaffinch in the Canary Islands, while Madeira has also its peculiar Gold-crested Wren and peculiar Pigeon.

(*c*) *The Mongolian subregion.* Stretching from the eastern shores of the Caspian, and marching with the Mediterranean subregion till the Hindoo Koosh is reached, and thence coincident with its southern borders, possibly following the course of the Yang-tze-kiang to the Yellow Sea and Japan. Subregions (*b*) and (*c*) have many peculiar Chats and Shrikes, and possess Sand-Grouse, Larks, and Warblers. Pheasants abound in the more eastern parts. It has Vultures, Pelicans, and Flamingoes, which are wanting further north.

(*d*) *The Siberian subregion* has but one genus (*Eurynorhynchus*), the Spoonbill Stint, peculiar.

5. The Ethiopian Region. All Africa except the Barbary States, the Cape Verd Islands, and those in the Gulf of Guinea, Madagascar, the Mascarene group (from Réunion to the Seychelles), Socotra, and Arabia. The Ghor, or valley of the Jordan, and the depressed basin of the Dead Sea is considered as an outlier of this region. It possesses a number of Ratitæ in the very specialised form *Struthio*—the Ostrich—which is supposed at one time to have ranged as far to the east as Sind. Amongst the families of birds absolutely peculiar to it are Plantain-Eaters, Colies, Guinea Fowls, and the Secretary Bird.

Its subdivisions are distinguished thus:—

(*a*) *The Libyan subregion*, or all the northern part of Africa bounded by a

line drawn from Cape Verd parallel to 10° N. lat. as far as long. 15° E., and then S.E. to include the eastern watershed of the Great Lakes, Socotra, and Arabia. One of the most peculiar is the Shoe Bill, or Whale-headed Stork, on the Upper Nile, and the valley of the Lower Nile is overrun with migrants from the Palæarctic region during winter.

(*b*) *The Guinean subregion* occupies the western seaboard from Sierra Leone to the south of Congo. It has three species of Guinea Fowl and the Grey Parrot. It is essentially a forest region.

(*c*) *The Caffrarian subregion.* Africa S. of the Quanza, and the northern watershed of the Zambesi, with St. Helena. The Secretary Bird appears here as semi-domestic, and in St. Helena there is a small Ringed Plover which is not known to have occurred off the island.

(*d*) *The Mosambican subregion* includes East Africa between Abyssinia and the watershed of the Zambesi, as well as the islands of Pemba, Zanzibar, and Monfia.

(*e*) *The Madagascarian subregion* includes the Mascarene Islands. Except New Zealand, it may be safely deemed the most peculiar subregion on the earth's surface. The now extinct Dodo, Solitaire, and *Æpyornis* were birds of this subregion. The Dodo inhabited Mauritius, the Solitaire was found in Rodriguez, and *Æpyornis* was peculiar to Madagascar itself.

6. The Indian Region comprises all India south of the Himalayas, and the rest of Asia south of the Yang-tze-kiang; the Indian Archipelago, including the Philippines, Borneo, and the island of Bali. Characteristics of Himalayan avifauna are found showing themselves not only on the highlands of S. India and Ceylon, but far away to the eastward also, as in Formosa, Hainan, and Cochin China, and again in a lesser degree in the mountain ranges of Malacca and Sumatra. This region is the home of the most gorgeous Gallinaceous birds—the Peacock, the Argus, Firebacked, Polyplectron, and other Pheasants. It is also the home of the Jungle Fowl, and possesses most of the Asiatic Hornbills. Sunbirds, Barbets, Cuckoos, Bee Eaters, Kingfishers, Mynahs, and others are found, and three families of birds, viz. the Hill Tits (*Liotrichidæ*), the Bulbuls (*Pycnonotidæ*), and the Broad Bills (*Eurylæmidæ*) are peculiar out of upwards of seventy which occur within its limits.

The subregions are thus defined :—

(*a*) *The Himalo-Chinese subregion* includes all the middle slopes of the Himalayan range from an elevation of about 3,000 to 12,000 feet, and beginning with Kashmir, extends through Nepal, Bhotan, the highlands of Assam, and thence marching with the as yet undetermined frontier of the Palæarctic region to the sea-coast of China. To this subregion belong the islands of Formosa and Hainan, and it not only includes a great part of China proper, but probably the whole of Cochin China and Siam, with the hill country of Tenasserim and Burma, merging into the Malayan subregion somewhere about lat. 12° N. In its western part, Mr. Elwes observes, it is merely a narrow borderland in which the members of two very different fauna meet, and being inhabited during some part of the year by nearly all the principal Palæarctic genera and those of the proper Indian subregion, probably includes some of the richest portions of the world.

Taking the various countries in succession. In Kashmir, out of 116 genera

of land birds, 34 have a wide range, 32 are characteristic of the Palæarctic, 29 of the Indian, and 21 of the Himalo-Chinese subregion. Only one species is peculiar to Kashmir, a very normal Bullfinch (*Pyrrhula*).

Nepal is said to have 294 genera of land birds. Of these 62 are of wide range, 30 are characteristic of the Palæarctic, 122 of the Indian region, while 80 are characteristic of the Himalaya.

Sikkim seems to be richer still. Excluding the *Accipitres*, there are here found 423 species of land birds, of which 270 do not occur out of the Himalaya except as migrants or stragglers.

Assam seems to resemble Sikkim, but it has sixteen species which are not found in Sikkim, and of these one-half are Burmese. On its southern boundary there are a few genera which are not actually found in the Himalaya.

Burma and Tenasserim, the valley of the Irawadi, Aracan, and Pegu are very fairly known. Of 373 species of land birds, 97 are common to India and the rest to the Malay peninsula, 193 more are found in India and 27 in the peninsula alone, while 46 are peculiar to Burma or to Burma and Tenasserim. In Tenasserim there are 313 species of land birds, 93 being common to India and the rest to the peninsula, 117 more being found in India and 56 in the peninsula alone, while 47 are peculiar to Tenasserim or to Tenasserim and Burma. This country is especially rich in species of the peculiarly Indian family *Eurylæmidæ*.

The groups of islands, the Andamans and the Nicobars, from the similarity of their avifauna to that of Pegu, are included in this subregion. Lord Walden thinks the Andamans have a greater affinity to the highlands of India south of the Himalaya and west of the Brahmaputra, while Mr. Hume considers both groups to form an outlying bit of the proper Indian subregion on which many foreign intruders have established themselves. Many families which are common in Burma are wanting in the Andamans. The Andamans possess an avifauna of some 155 species, 17 of which (all land birds) are peculiar. The precise number of species in the Nicobars is not known, but Mr. Hume gives 10 as peculiar to that group, which is inhabited by two very noteworthy forms—*Calœnas*, a very remarkable genus of *Columbidæ*, widely spread throughout the Malayan archipelago, and a species of *Megapodius*, belonging to one of the most characteristic families of the Australian region. The presence of these two forms inclines one to place the Nicobars in the Malayan subregion.

In China and its islands 675 species are enumerated. In Formosa 144 species, assorted, as 74 of wide range, 47 common to Himalayan and Malayan subregions, and 5 to China itself; 18 are not found in the Malayan subregion, and no less than 34 are peculiar to the island. In Hainan 130 species, of which 54 belong to wide-ranging genera, 59 to genera characteristic of the Indian, and 16 of the Palæarctic region, while 16 are believed to be peculiar to the island.

(*b*) *The Indian subregion.* This consists of the remainder of the peninsula of India lying to the S. and W. of the last, as well as the island of Ceylon. For the Punjab there is no complete list of the birds, and we may infer that here we shall find the Malayan influence at its least, and the Palæarctic at its greatest. In Sind 150 species have been observed, of which 41 are peculiarly desert forms, and as such either very nearly allied to or identical with the like forms of the Palæarctic and Ethiopian regions; 40 are peculiar to the Indian subregion; 8 are common to the Malayan; 4 to the non-desert portions of the Ethiopian; and 12

to the similar parts of the Palæarctic region; while 45 do not come under any of these heads. Omitting the desert forms as not leading to any just conclusion, it would appear that Sind has less affinity to the Ethiopian region than to the Mediterranean subregion of the Palæarctic.

In Cutch 115 land birds were mostly migrants, or common Indian species of wide range.

Near Goona Dr. King observed 116 species of land birds, and more recently Mr. Adam noticed 171 species of land birds around the Sambhur Lake in its western portion.

In Oudh Colonel Irby obtained 108 species of land birds, but of these 23 were found only on the hills of Kumaon.

For the Central Provinces 190 species of land birds are enumerated, of which 38 have a very wide range, 57 belong to widely ranging genera, but are almost confined to India, 37 to genera common to tropical Africa and India, 8 to genera of Ethiopian type, and 53 to purely Indian genera.

In the Deccan there are 150 species of land birds, of which about 105 belong to genera common to the Himalayan and Malayan subregions, 27 to Himalayan but not Malayan genera, 30 to genera having Ethiopian or Palæarctic affinity, and the rest to widely ranging genera, or to genera peculiar to the Indian subregion.

The avifauna of Southern India seems to be small relatively to the extent and variety of the country, and most of its peculiar species are said to have a considerable range of latitude, though some, which are restricted to the highest hills, are only found to the southward of lat. 12° N., where several mountain ranges reach the height of 8,000 feet.

For Ceylon the list numbers 323 species, of which 224 are land birds, and an analysis shows that, though 37 species are peculiar, only 4 belong to genera not found in S. India, 22 belong to genera inhabiting the Himalaya but not the Malayan subregion, and only 6 to the Malayan but not Himalayan genera, while 14 are members of genera only found in India.

(*c*) *The Malayan subregion*, or that portion of the Indian region S. of Tenasserim, with the Philippine and Sunda Islands, but excluding Celebes and islands east of Bali Strait (Wallace's Line).

This subregion is distinguished by some striking and interesting approximation to the bird fauna of the Australian region. Thus in the Philippines we have a Cockatoo of the Australian genus *Cacatua*, and there, as well as in the Nicobar Islands and Borneo, the Australian mound-building *Megapodius* is met with. Hornbills are very characteristic of the subregion, as is likewise the Argus Pheasant, which is, however, also found in Siam. More than 36 genera are peculiar to this subregion.

In the Philippines Lord Walden enumerates 219 species, of which 150 are land birds; of these 106 species are peculiar to the Archipelago, 96 of them being land birds.

Borneo has, in common with Malacca and Sumatra, 226 species of land birds; in common with Java, 149; with the Philippines, 25; with the Indian subregion, 53; with China, 72; and with Celebes, 28.

To Sumatra not more than 240 species can be assigned, of which about 20 appear to be peculiar.

Java has 270 species of land birds, of which about 45 are peculiar, most of them being from the mountains in the western part of the island. The re-appearance in Java of several Burmese species (including *Pavo muticus*) which do not occur in the Malay peninsula south of Penang is very remarkable.

Of Bali, so interesting as the southern outpost of the region, we only know from Mr. Wallace that he saw there several birds highly characteristic of Javan ornithology, and whether the island has any peculiar species nowhere appears (*Enc. Brit.*).

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# THE BILL OR BEAK OF BIRDS.

The bill or beak of birds consists of two parts, generally called the upper and lower mandibles, but more properly *maxilla* and *mandible*.

The externally visible part of each is an epidermic sheath of horny, or sometimes leathery, consistence, which covers the anterior bony prolongation of the cranium in the one case (the *premaxillary* bone), and of the lower jaw in the other (the *dentary* bone).

In most birds the sheath (*rhamphotheca*) of each jaw is entire (as the Storks), but in some (as the Petrels) it is "pieced," or divided into distinct parts by various lines of slight connection.

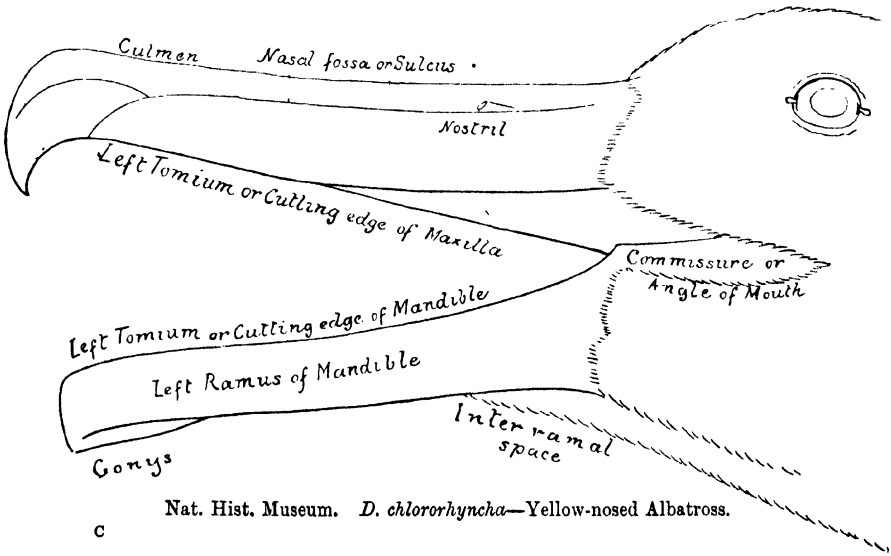
The different parts of the bill have received names useful for descriptive purposes. Of these the following are the most important:—

The whole length of the middle line of the upper surface, from the tip or apex to where the feathers commence on the forehead, is called the *culmen*.

The lateral sharp edge of the horny covering of either maxilla or mandible is the *tomium*.

The point at which the edges of the jaws meet behind is the *commissure*, or *angle* of the mouth (sometimes called the *gape*).

The mandible is composed of two lateral halves, called *rami* or branches, separate behind, but united in front; the space between them where they are separate is the *inter-ramal space;* the lower median edge of the mandible, from the point at which the *rami* unite to the tip, is called the *gonys*.




Nat. Hist. Museum. *D. chlororhyncha*—Yellow-nosed Albatross.

The nostrils are two in number, situated usually near the base of the maxilla. Their form and exact position vary considerably in different birds. They often open into a depression or groove (the *nasal fossa* or *sulcus*). In the Petrels (*Tubinares*) the borders of the nostrils are prolonged forwards in a tubular form. In some birds (as Hawks and Parrots) they open in a soft waxy-looking covering of the base of the maxilla, called the *cere*. In the *Apteryx* alone of existing birds the nostrils open near the tip of the bill.

The horny sheath of the bill grows continuously from the base, but in consequence of the wear to which the edges and the tip are subjected, it usually maintains its definite size and form throughout life. If from any cause the natural wear does not take place, the continuing growth produces a prolongation of the upper mandible in either straight, curved, or spiral form (Nat. Hist. Museum).

## TEETH OF BIRDS.

The nearest approach to teeth in any existing birds is seen in certain modifications of the edges of the horny coverings of the bill. These may be—

(i.) Dentate, having one or two tooth-like processes (*Cerchneis tinnunculus*, *Harpagus bidentatus*).

(ii.) Serrate, having many such processes (*Mergus serrator*, *Momotus brasiliensis*, *Pteroglossus bailloni*).

(iii.) Lamellate, produced into numerous ridges or fine plates, which act rather as strainers than as cutting or tearing organs (the Shoveller, Wild Duck, Goose, Swan, Flamingo, etc.).

In *Odontopteryx toliapicus*, a bird of the Eocene period, conical dry processes were developed on the jaws, presumably covered with horn (as in the Tortoise, *Hardella thurgi*), and closely resembling teeth functionally.

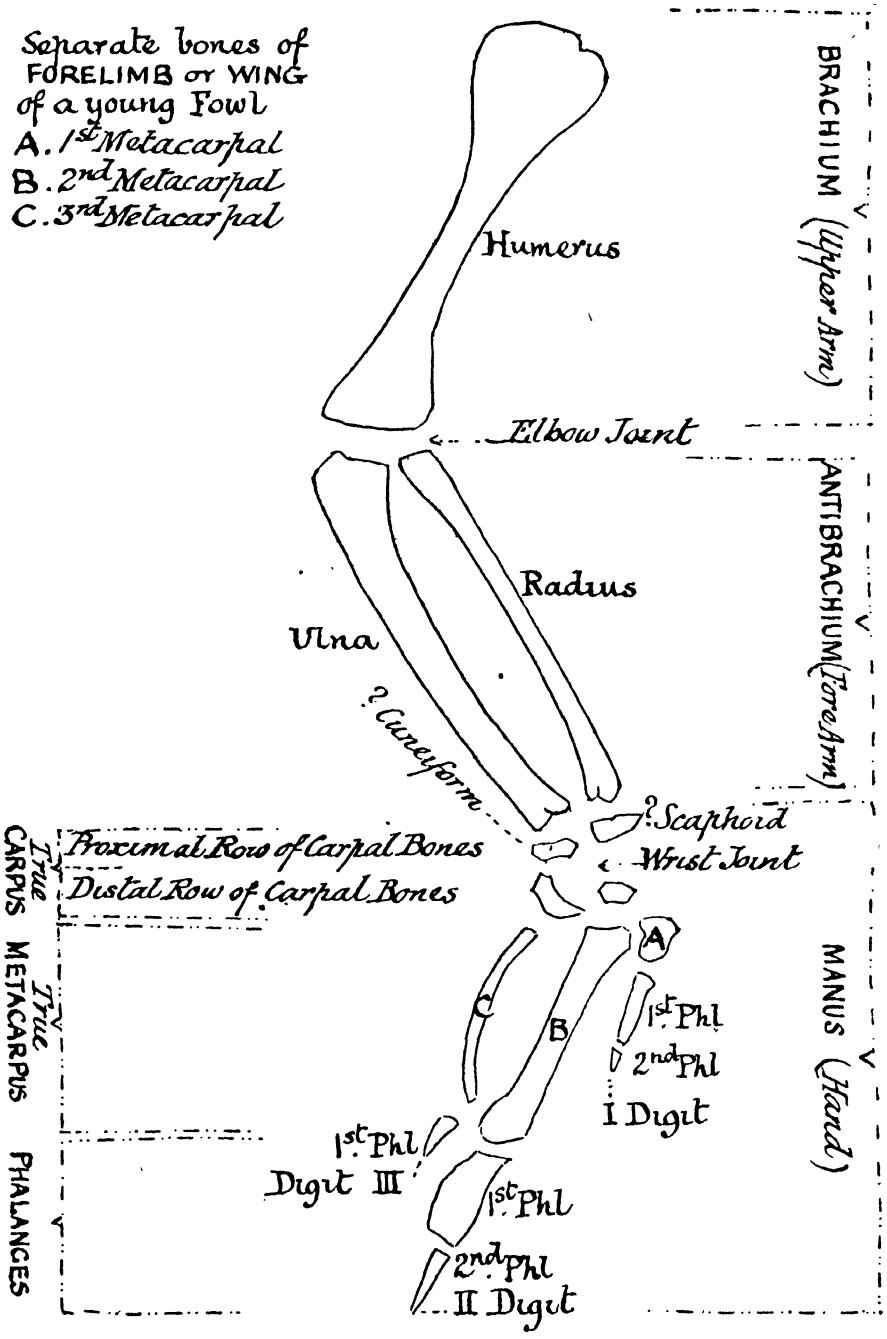
As far as it is at present known, only in the Mesozoic epoch did birds exist possessing true teeth composed of dentine, and with enamelled covered crowns. These were implanted either in a continuous groove (as in *Hesperornis regalis*) or in distinct sockets (as in *Ichthyornis dispar* and *Archæopteryx macrura*).

## FORELIMB OR WING.

The bones of the forelimb (wing) of a bird consist of *humerus* (upper arm), *radius* and *ulna* (forearm), and *manus* (hand). Ulna usually stronger than radius. There are only two carpal bones, one radial and one ulnar (excepting the Screamer, *C. chavaria*, which has three).

In Apterygidæ and in Casuariidæ there is but one complete digit in the manus, and it is provided with a claw. In Struthionidæ, Rheidæ, and in all the Carinatæ, there are three digits in the manus, which answer to the pollex and second and third digits of the pentadactyle forelimb, and the metacarpal bones of these digits are ankylosed together. As a rule the metacarpal of the pollex is much shorter than the other two; that of the second digit is strong and straight; that of the third is more slender and bowed.

The pollex has two phalanges, and the second of them is in many birds (Rhea, Chauna, etc.) pointed, curved, and ensheathed in a horny claw.


Separate bones of
FORELIMB or WING
of a young Fowl
A. 1st Metacarpal
B. 2nd Metacarpal
C. 3rd Metacarpal
BRACHIUM (Upper Arm)
Humerus
Elbow Joint
ANTIBRACHIUM (Fore Arm)
Radius
Ulna
? Cuneiform
? Scaphoid
Wrist Joint
Proximal Row of Carpal Bones
Distal Row of Carpal Bones
True CARPUS
True METACARPUS
PHALANGES
MANUS (Hand)
A
B
C
1st Phl
2nd Phl
I Digit
1st Phl
Digit III
1st Phl
2nd Phl
II Digit

The second digit has two, and sometimes three, phalanges (as in the Swan), and the terminal phalanx is similarly provided with a claw in sundry birds (Swan, Rhea). In the Ostrich both the pollex and the second digit are unguiculate.

The third digit possesses one phalanx, besides its ankylosed metacarpal, and is always devoid of a claw.

Starting from a typical five-fingered hand such as that of a lizard, passing through the Archæopteryx (the Lizard Bird of the Jurassic period) and the young Duck, it is seen how, by loss of certain carpal bones and fusion of others with the metacarpus, loss of digits v., iv., and part of iii., and fusion of the remaining metacarpals, the typical avian manus seen in the adult Duck is brought about (see diagram).

### *Integument and Feathers.*

The exoskeleton of birds consists almost entirely of epidermic structures in the form of horny sheaths, scales, plates, or feathers. No bird possesses dermal ossifications, unless the spurs, which are developed upon the legs and wings of some species, may be regarded as such.

### *The Remiges, or Flight-Feathers.*

The feathers of a wing of a bird have a very definite arrangement. They consist of the large quill-feathers (*Remiges*, or flight-feathers) and the coverts (*Tectrices*).

The *Remiges* are developed in the wing-membrane (*ala membrana*), and come into close and definite relation to the bones, forming two well-marked groups:—

(i.) The cubitals, or "secondaries," are attached to the ulna, and vary greatly in number in different groups of birds.

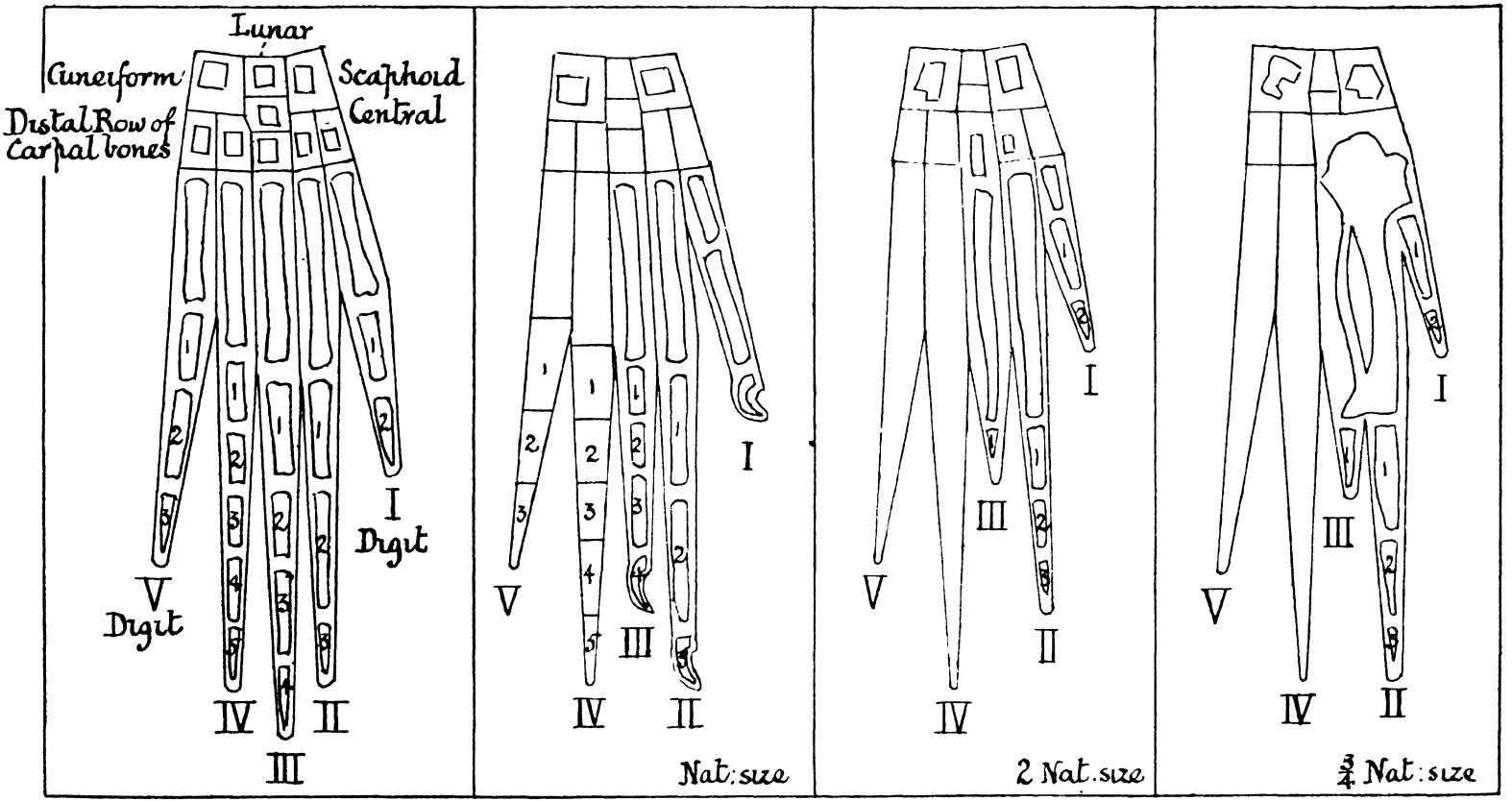
(ii.) The metacarpo-digitals, or "primaries," are attached to the bones of the manus, and are typically eleven in number. Of these the metacarpus bears six (the "metacarpals"), and the phalanges of the digits bear five (the "digitals"), disposed as follows: One (the "addigital") lying upon the phalanx of digit (iii.), and inserted at the metacarpo-phalangeal articulation; two (the "middigitals") inserted on the first phalanx of digit (ii.); and two (the "predigitals") inserted on the second phalanx of digit (ii.). The most distal of these (the "remicle") is always rudimentary, and sometimes absent. The bones of digit (i.) always bear a small number of more or less developed quill-feathers, forming the "bastard wing" (*ala spuria* or *alula*).

In many birds (notably, the Wild Duck) there is a development of large feathers lying over the distal half of the humerus, resembling remiges, but really continuous with the series of greater coverts; these are called "humerals" (*Parapteron*). Corresponding with these on the under surface of the wing are the "axillaries" (*Hypopteron*).

### *Modifications of the Metacarpo-digital or Primary Remiges.*

The typical condition of the metacarpo-digital remiges being as described above, the following are the principal modifications:—

I. The metacarpals may be increased to seven (as in Grebes, Flamingoes, and Storks).


Lunar
Cuneiform
Scaphoid
Central
Distal Row of Carpal bones
I Digit
V Digit
IV
II
III
Nat: size
2 Nat. size
¾ Nat: size
LIZARD
ARCHÆOPTERYX
Young DUCK
Adult DUCK

II. A decrease in the number of digitals may take place at distal end of wing.

(*a*) A remicle may be lost, its principal coverts being retained (as in the Turkeys, Grouse, etc.).

(*b*) The remicle and its coverts may disappear, and, in addition, the next predigital (2) may disappear also (as in "nine-primaried birds"), though generally some trace of it may be found. Among *Passeres* almost every gradation in the development of these feathers may be met with (Nat. Hist. Museum).

*The Arrangement of the Coverts.*

The coverts of the upper surface of the wing (*Tectrices superiores*) are divided into *Tectrices majores*, *T. mediæ*, and *T. minores*. Those of the lower surface are *Tectrices inferiores*. The relative development of these series of coverts varies much in different groups of birds.

The most important, or "Principal Coverts," are the *Tectrices majores*, consisting of one row of upper coverts attached to the bases of the remiges, and a row of inferior coverts attached in a similar way. Each remex has thus two principal coverts in relation to it, one on its upper or dorsal, and one on its lower or ventral surface.

The dorsal covert of the first metacarpal remex is generally rudimentary, in compliance with mechanical requirements in the folding of the wing.

*Modifications of the Cubital or Secondary Remiges.*

Beyond variation in number and form, the only important modification in this series consists in the absence in many birds (Owls, Eagles, Geese, Ducks, Pigeons, Grebes, etc.) of the fifth remex (counting from the carpal joint), the coverts being retained. This condition is "Aquin cubitalism"; when the feather is present the condition is called "Quin cubitalism."

*Wing Claws.*

Horny claws of the same nature as those of mammals and reptiles are not unfrequently present on the end of the first and sometimes the second digit, though not found on the third in any existing birds. More often they are absent, or occur only in an imperfect or rudimentary condition. Thus a claw is present on the terminal phalanx of the first digit (*pollex*, or bastard wing) of the Secretary bird (*Serpentarius reptilivorus*), and well-developed claws are seen on the end of both the first and second digits in the wings of the Hoatzin (*Opisthocomus cristatus*).

*Wing Spurs.*

Wing Spurs are conical bony outgrowths (the spurcore) covered by a sharp-pointed horny sheath, and therefore closely resemble the horns of ruminants. One or more may be present on the forelimbs of birds, being always placed on the radial side either of the carpus or the metacarpus, and forming weapons for fighting. They are not to be confounded with the claws which often ensheath the terminal phalanges of the digits. Thus a long curved black spur is found on the first metacarpal at the bend of the wing of the Indian Spur-winged Plover (*Hoplopterus ventralis*), and a small tubercular spur in the same position on the wing of the Bronze-winged Jaçaná (*Melopidius indicus*). A carpal spur is present in the Spur-winged Goose (*Plectropterus gambensis*); while the Derbian Screamer (*Chauna derbiana*) possesses two spurs, one on the first metacarpal and one on the second metacarpal, as well as a claw at the end of the first digit.

# POSTERIOR EXTREMITY, OR LEG, OF BIRDS.

The hind limb consists of three principal divisions:—

I. The thigh, or *femur*. II. The leg, or *crus*. III. The foot, or *pes*. The latter has a more or less undivided portion, called, in ornithological language, the *tarsus*, but the skeleton of which corresponds to the united three middle metatarsal bones of mammals, to which is also joined the lower or distal part of the tarsus proper. The other portion of the true tarsus is united to the lower end of the tibia. The ankle-joint is therefore not situated between the tibia and tarsus, as in mammals, but in the middle of the tarsus itself.

To the lower end of the tarso-metatarsal bone the three principal (second, third, and fourth) digits, or toes, are attached. The first digit has a separate, or accessory, metatarsal bone, of which only the lower end is developed, and which is usually attached loosely to the hinder surface of the principal bone.

The front, or dorsal, surface of the tarsus is called the *acrotarsium*, the back the *planta*, as it corresponds to the sole of the foot of man and plantigrade animals (Nat. Hist. Museum).

### *Spurs on leg.*

Spurs, consisting of a conical bony core covered by a horny sheath, are developed on the posterior or inner surface of the metatarsus in some birds. There is usually but one, though occasionally two, on each foot. There is one spur on the Grey Jungle-Fowl (*G. sonnerati*) and two spurs in the Red Spur-Fowl (*G. spadicea*). Spurs are usually present in the male sex only.

### *Covering of the feet.*

In some birds, notably the Owls and Grouse, the tarsi, and even the toes, are more or less covered with feathers or bristles. Usually that part of the limb which is devoid of feathers is covered, like the bill, by a hardened, thickened, modified integument, varying in texture from horny to leathery. This sheath is called the *podotheca*. It is more corneous or horny on land birds, and softer and more leathery in those that habitually live on the water. Its surface may be—

(i.) Scutellated, disposed in scales or scutella (like a Pheasant's).

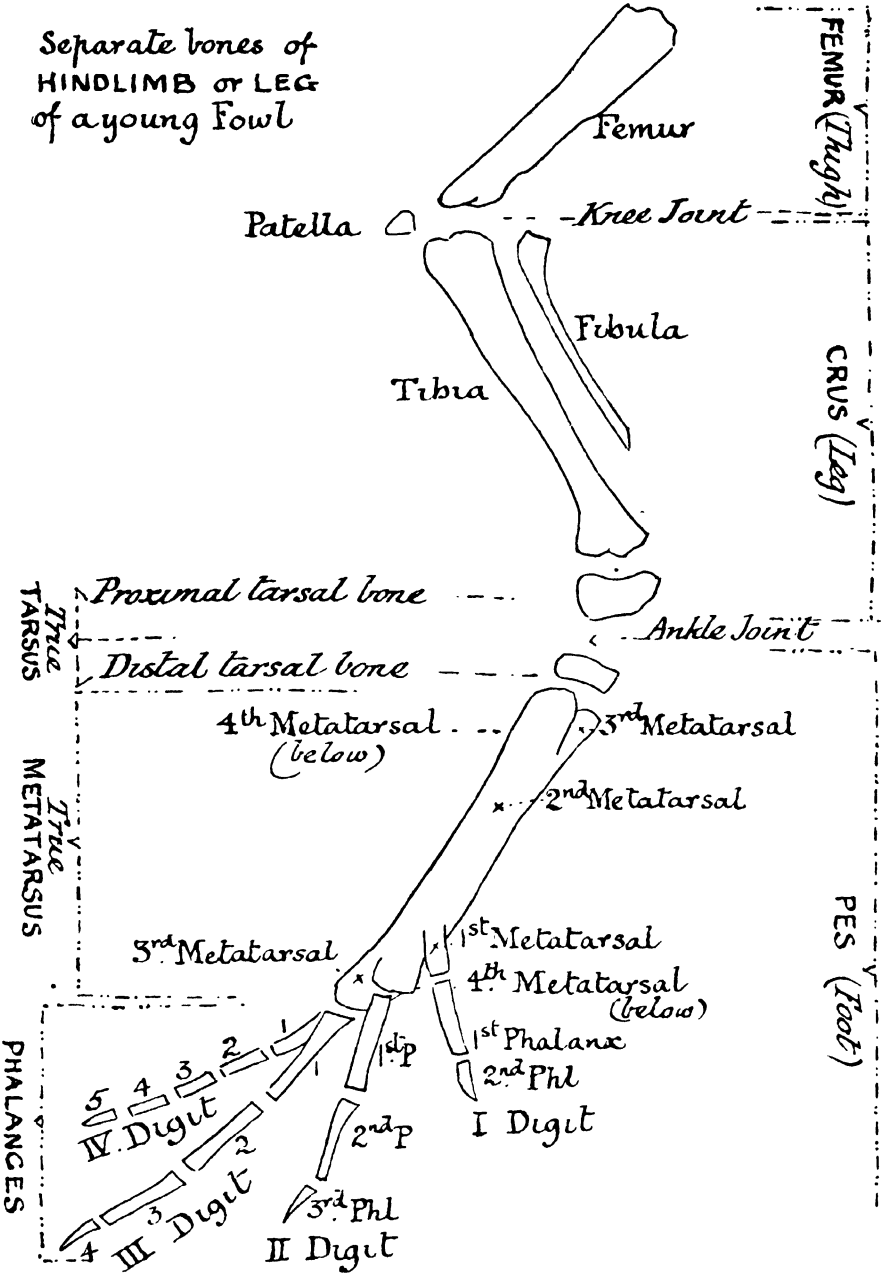
(ii.) Reticulated, cut up by cross lines, leaving polygonal plates between them (as in a Macaw).

(iii.) Granulated, or rugose, covered with little tubercles.

(iv.) Cancellated, covered with a lattice-work of cross lines not strong enough to produce distinct plates (like the web of a Wild Duck's foot).

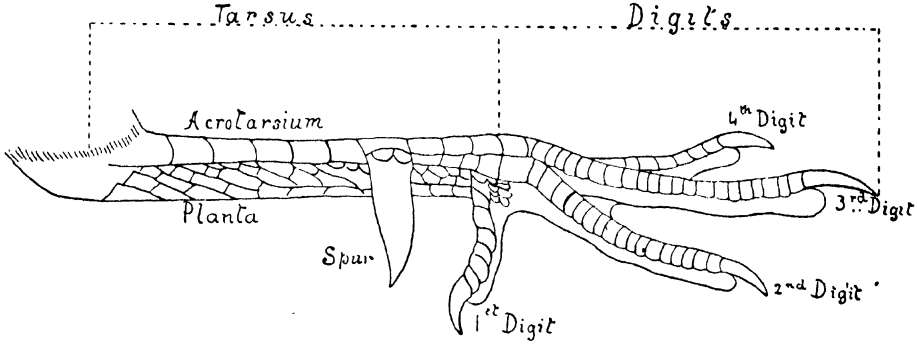
When the planta (sides and back of the tarsus) is covered with one pair of plates or laminæ, one on each side, meeting behind in a sharp ridge, the condition is called *laminiplantar*.

When there is no division of the podotheca in front (along the *acrotarsium*), or only two or three scales close to the toes, it is said to be "booted," "greaved," or *holothecal*. This occurs in the Thrushes and many other Passerine birds, but even these when young show scutella, which disappear by progressive fusion with age (Nat. Hist. Museum).


Separate bones of
HINDLIMB or LEG
of a young Fowl
FEMUR (Thigh)
Femur
Patella
Knee Joint
Fibula
Tibia
CRUS (Leg)
Proximal tarsal bone
Ankle Joint
True TARSUS
Distal tarsal bone
4th Metatarsal (below)
3rd Metatarsal
2nd Metatarsal
True METATARSUS
PES (Foot)
3rd Metatarsal
1st Metatarsal
4th Metatarsal (below)
1st Phalanx
2nd Phl
I Digit
dip
2nd P
3rd Phl
II Digit
III Digit
IV Digit
PHALANGES

*Number of the Digits, or Toes.*

Birds have usually four toes, never more; in some cases only three; in the Ostrich alone two. These are designated the first, second, third, and fourth. The one attached to the accessory metatarsal bone, and which is almost always directed backwards, being called the first, or *hallux*. The second toe, the inner one of those that turn forwards, has normally three phalanges. The third has four phalanges, and is the middle toe of those that are usually directed forwards. The fourth has five phalanges, and is the outer toe.




31. Red Jungle-Fowl (Gray).

*Reduction from the normal number of Toes.*

When one of the four normal toes is absent it is almost always the first, or hallux, which may be entirely suppressed or exist in a rudimentary condition the bones being present, but concealed beneath the skin.

It is not always the hallux which is absent in three-toed birds. In the Kingfishers of the genera *Ceyx* and *Alcyone* the hallux is well developed; but the second digit is reduced to its basal phalanx, appearing externally merely as a wart-like eminence.

In the Passerine genus *Cholornis* the fourth, or external, digit is in a rudimentary condition.

In the Ostrich two digits only are present, which represent the third and fourth of the normal foot. The small size of the latter, and the frequent absence of its nail, indicate a tendency to reduction to a single toe (the third), as in the Horse among Mammals.

*Supernumerary digits.*

The conditions of the feet above shown are not departed from among birds in a state of nature, except in individual variations. Under domestication, however, such variations may be perpetuated in particular races, as in the Dorking Fowl, a breed characterised by the constant presence of a supernumerary toe upon each foot (Nat. Hist. Museum).

*Variation in the number of Phalanges.*

The normal number of phalanges being, as shown above, 2, 3, 4, 5, in the respective digits counting from the first, or hallux, to the outer toe, the following variations are met with:—

(i.) In the Tubinares (Petrels) the number of joints of the hallux is reduced

to one, which is quite short and covered by a spur-like claw; the digital formula therefore becomes 1, 3, 4, 5.

(ii.) In the Swifts of the genera *Cypselus* and *Panyptila* (though not in the rest of the family) the number of phalanges in each digit external to the hallux is three; the formula being 2, 3, 3, 3.

(iii.) In the Sand-Grouse (*Pteroclidæ*) and true *Caprimulgidæ* (Nightjars) the fourth digit wants one of the normal phalanges; the formula being 2, 3, 4, 4.

### *Position of the Toes.*

In the vast majority of birds three toes are directed forwards (second, third, fourth) and one (the hallux, or first toe) backwards.

Exceptions:—

1. All four toes may be turned forwards, as in some of the Swifts (*Cypselidæ*).

2. The first toe may be versatile, turning backwards or forwards, as in the *Coliidæ*.

3. The outer (fourth) toe may be versatile, or capable of being turned backwards or forwards, as in most Owls and the Osprey (*Pandion*).

4. The toes may be permanently in pairs, two before and two behind, as in Woodpeckers, Toucans, Cuckoos, and others, a condition described as *Zygodactyle*, or yoke-toed. In these cases it is always the first and fourth that turn backward, except in the Trogons, where it is the first and second. The third toe is invariably directed forwards (Nat. Hist. Museum).

### *Leading Modifications of the Foot of Birds.*

There are three functional plans or types upon which birds' feet are constructed, each with various modifications and with transitional forms connecting them.

I. The PERCHING or INSESSORIAL type, in which the foot is best fitted for the grasping function required in perching on trees.

(*a*) The typical *Passerine* modification. All the toes free and movable, and the hinder one well developed; the foot is thus like a hand with three fingers and an opposable thumb. *Examples:* Song-Thrush (*Turdus musicus*), Sky-Lark (*Alauda arvensis*), Wood Pigeon (*Columba palumbus*), Nightjar (*Caprimulgus europæus*) and Lyre Bird (*Menura superba*).

(*b*) The *Raptorial* modification. The toes armed with powerful curved sharp claws and widely spread, so that they may have greater power in seizing and holding their prey. Their under surface bulbous, scabrous, or even spiny, for greater security in grasping. *Examples:* Osprey (*Pandion haliaëtus*) and Sea-Eagle (*Haliaëtus albicilla*).

(*c*) The *Syndactyle* modification, in which the outer and middle toes are coherent for most of their extent, with a broad sole in common. This occurs in perching birds, as Kingfishers, which scarcely use their feet for progression, but simply for sitting motionless. *Examples:* Kingfisher (*Ceryle torquatus*), Hornbill (*Buceros rhinoceros*), Cock of the Rock (*Rupicola crocea*).

(*d*) The *Zygodactyle*, or yoke-toed modification. Two toes are turned forwards

and two backwards. This occurs in many families of birds not otherwise related either in structure or habits. *Examples:* Wryneck (*Yunx torquilla*), Common Cuckoo (*Cuculus canorus*), Indian Koel (*Eudynamys honorata*), Red-and-Blue Macaw (*Ara macao*).

II. The Walking or Wading (*Cursorial* or *Grallatorial*) type. In this form the foot has the grasping power, but is especially adapted for walking on the ground. The hind toe is elevated above the level of the others, and reduced in size or totally lost. In some wading birds the intervals between the toes are completely or partially webbed. *Examples:* Apteryx (*A. oweni*), Pheasant (*Phasianus colchicus*), Heron (*Ardea cinerea*), Pheasant-tailed Jaçaná (*Hydrophasianus chirurgus*), Moorhen (*Gallinula chloropus*), Red-necked Avocet (*Recurvirostra avocetta*).

III. The Swimming or Natatorial type. By the development of webs between the toes the foot is transformed into a swimming instrument, usually with much loss of its power of perching and running.

(*a*) The *Lobate* modification. The toes not united together by webs, but furnished with lobes or flaps along the sides, as in the Coot (*Fulica atra*), Crested Grebe (*Podiceps cristatus*), and Grey Phalarope (*P. fulicarius*).

(*b*) The ordinary *Palmate* modification. All the front toes united by webs. The hind toe free, as in the Wild Duck (*Anas boscas*), Black-headed Gull (*Larus ridibundus*), Skimmer (*Rhynchops flavirostris*).

(*c*) The *Totipalmate* modification. Webs not only between the front toes, but also extending between the second and first, or hind toe; so that all four are united together, as in the Pelican (*Pelicanus onocrotalus*) (Nat. Hist. Museum).

# TAIL OF BIRDS.

In the extinct Jurassic bird, the *Archæopteryx*, the skeleton of the tail was elongated and consisted of about twenty free vertebræ. In all existing birds it is short. Among these the Ratitæ have the caudal vertebræ mostly free and gradually diminishing in size, a primitive condition, also seen in the early state of all birds. In the majority, however, a certain number of the terminal vertebræ become fused together and assume a peculiar shape, constituting the *pygostyle*, or "ploughshare bone," which supports the rectrices or tail-feathers and the uropygial oil-gland.

The feathers of the tail consist of the large quill-feathers, or *rectrices*, and the upper and lower coverts, or *tectrices*. The rectrices are so called because of their action in directing flight. They are arranged in pairs and are usually 12 in number; less commonly 10, 14, 16, or 18, and very exceptionally fewer than 10 or more than 18. They radiate more or less from the pygostyle, the innermost pair being placed above the level of the others. As a rule the upper coverts are shorter and fewer than the lower, but in the Peacock they are far longer than the rectrices, and form the gorgeous train which distinguishes that bird.

*Form of the Tail.* The tail may be—

(i.) Even at the end, "truncated," as in the Lapwing (*V. vulgaris*), 12 rectrices.

(ii). The inner rectrices may be longer than the other ones. This form in different degrees is called—

"Rounded," as in the tail of the Mallard, which has 20 rectrices, of which the four nearest the middle line are differently coloured from the rest and curled upwards. In the female Wild Duck there are 18 rectrices, similar in colour, and the middle ones are not curled upwards.

"Gradated," as in the Rook, 12 rectrices, and in the Bengal Eagle-Owl, 12 rectrices.

"Cuneate," or "acute," as in the Magpie, 12 rectrices.

"Long exserted." The two central feathers alone may be much longer than the others, as in the Common Sand-Grouse, 16 rectrices.

(iii.) The outer feathers may be longer than the inner. This form is called, according to the degree—

"Emarginate," as in the House-Martin, 12 rectrices.

"Forked," or "forficate," as in the Swallow, 12 rectrices.

Special modifications of this forked form are called "lyrate," as in the Black Grouse (*T. tetrix*), 18 rectrices; "racket-tailed," as in the Humming Bird (*S. underwoodii*), 10 rectrices.

## EXTERNAL COVERING, OR FEATHERS.

A feather consists of a stem, shaft, or scape (*scapus*) forming its axis, and bearing two webs, or vanes (*vexilla*), one on either side.

The stem is divided into two parts, that nearest to the body of the bird is a hard, hollow, horny, and semi-transparent cylinder called the "barrel," or "quill" (*calamus*). One end of this is embedded in the skin, the other is continued into the shaft proper (*rhachis*), which is four-sided, solid, elastic, and gradually tapers to a fine point. It is longitudinally grooved on the under side, or that towards the body of the bird. The stem has an inferior aperture at the apex, into which the vascular pulp ("pith" of the dried feather) penetrates, and a superior aperture (*umbilicus*) situated on its under surface at the junction of the calamus with the rhachis.

The vanes consist of a number of flat, narrow-pointed plates set obliquely on the rhachis by their bases, called "barbs." The edges of the barbs bear numerous smaller processes called "barbules." These in the most perfect feathers (those of the "plumous" or "pennaceous" type in the wing of an Argus Pheasant) are fringed with still smaller "barbicels" and hooklets (*hamuli*), by which the barbs are held together so as to present a continuous resisting surface to the air.

The various kinds of feathers are—

I. *Pennæ*, or *plumæ* proper, also called "contour feathers," because they lie on the surface and determine the contour of the body. They are exposed to the light. They have a perfect stem and vanes, mostly of a pennaceous structure, though generally more or less plumulaceous at the base. (They are distributed evenly over the body only in a few birds, as the RATITÆ, the Penguins, and some others.) Generally they are arranged in definitely circumscribed patches or bands, between which the skin is either bare or covered only with down.

These patches of contour feathers are termed *pterylæ* and their interspaces *apteria*. This general arrangement of the contour feathers, which prevails (with many modifications in detail) in nearly all birds, is related to the facility of movement of the body and limbs. The *pterylosis*, as the arrangement of the feather tracts is called, is of importance in determining the natural affinities of birds.

II. Down feathers (*plumulæ*). In these the stem is little developed, and the soft barbs have long, slender, thready barbules, with little knotty dilatations in place of barbicels, and no hooklets. They more or less completely invest the body, but are almost always hidden away beneath the contour feathers. If the contour feathers are removed from the breast of a Wild Duck, the thick covering of brown down feathers next the skin will be clearly seen. In a Swan the down is white, the downy layer is very thick, and is composed partly of true down feathers and partly of the plumulaceous or downy part of the contour feathers.

*Down feathers of the young.* The down of a duckling is replaced by the true feathers (*pennæ*). The rudiment of the new feather is formed at the base of the down plumule. As the new feather grows it pushes the down plumule out from the skin. The plumule remains attached to the apex till the new feather is about an inch long, when it is shed. This process is analogous to the shedding of the "milk" teeth in Mammals. The down feathers of a young Albatross are on a far more magnificent scale.

III. Semiplumes (*semiplumæ*). Many feathers are intermediate in character between the *pennæ* and the *plumulæ*, possessing the large and more rigid stem of the former and the downy barbs and barbules of the latter. The contour feathers from the breast of a Swan (*C. olor*) show the downy or plumulaceous character of the basal portion of the vanes and the plumous character of the terminal part. The feathers of the Common Heron show various transitions from the plumous to the plumulaceous or downy form. The under tail coverts of the Adjutant (*L. argala*) are semiplumous, and usually called Marabou feathers.

IV. Filoplumes (*filoplumæ*), or thread feathers, have a very slender stem, and barbs either rudimentary or wanting, so that they closely resemble hair. In the Golden Eagle these feathers have a slender stem with a small terminal tuft of barbs, and grow out from the edge of the folds of skin forming the sacks of the larger feathers.

V. Powder down (*pulviplumæ*). Certain down feathers are peculiarly modified, growing indefinitely from the follicle, and continually breaking down at the ends of the barbs. From the white dust-like material with which they are constantly covered, they are called "powder down," or "pulviplumes." They occur in some Hawks, Parrots, and other birds, and are especially developed in the Herons and their allies. Sometimes they are scattered over the surface, but more often are collected in definite tracts or patches. The breast of the Common Heron (*A. cinerea*) shows large "powder-down patches," which reach to the middle line in front, and there are a pair of such patches on the lower part of its back.

VI. After-shafts. In very many birds each quill bears two vexilla; the second is called the after-shaft. The after-shaft (*hyporhachis*), or accessory plume, when

present, springs from the under side of the stem of the main feather at the junction of the quill (*calamus*) with the shaft (*rhachis*) close by the *umbilicus*. Though occasionally (as in the Emeus and Cassowaries) almost as large as the main feather, it is generally very much smaller. It is never developed on the large wing and tail feathers, and is entirely wanting in all the feathers of some groups of birds. In the one-wattle Cassowary the accessory plume is as long as the main feather, and in the Emeu it is nearly so. In the feathers on the back of the Argus Pheasant the after-shaft is about one-third the length of the full feather (Nat. Hist. Museum).

*Peculiarities of the arrangement and structure of Feathers.*

In the Grey Jungle-Fowl (*G. sonnerati*) the ends of the shafts in the upper wing coverts show flattened horny expansions resembling sealing-wax, and in the American Wax-wing (*A. cedrorum*) the shafts of the cubital, or secondary flight feathers, are expanded in vermilion-coloured horny terminations.

The Great Crested Grebe (*P. cristatus*) has a double occipital crest, and the Cock of the Rock (*R. crocea*) carries a red fanlike crest, which extends from the crown past the eye to the gape.

The Australian Darter (*P. novæ-hollandiæ*) shows a ribbed structure in the vanes of its tail, and the Curl-crested Toucan (*P. beauharnaisi*) has peculiar expansions and curved prolongations of the shafts of the crown feathers.

In the Common Peacock (*P. cristatus*) the terminal portion of one of the tail coverts shows the beautifully coloured ocellus, or eye, surrounded above by the "transparent zone," an effect produced by the absence of the barbules on a limited portion of each of the barbs.

## EXTERNAL VARIATION IN THE TWO SEXES AND AT DIFFERENT SEASONS.

All individuals of many species of birds are, when full grown, closely alike externally, both male and female, and at all times of the year.

In some species the two sexes are more or less marked by different plumage at all times.

In others the two sexes are alike for part of the year, but differ in the pairing season.

## ADAPTATION OF COLOUR TO SURROUNDING CONDITIONS.

The genus *Lagopus* (Willow-Grouse and Ptarmigan) in summer more or less resemble in colour the rocks and plants among which they live, while in winter they change to white, like the snow which covers the ground around them.

Such complete changes only occur in latitudes and localities where the differences between the general external conditions in the different seasons are extreme, where the snow completely disappears in summer and remains continuously on the ground during the greater part of the winter. The change is in direct adaptation to the surroundings, the advantage gained being concealment from their enemies or their prey, as the case may be.

White, as a normal colour of any species of animal, is comparatively rare in nature. Compared with the immense number of species which inhabit the land-surface of the warm and temperate parts of the globe, which is continuously clothed with dark or richly coloured herbage, rocks, or soil, the number of those of which white is the prevailing colour is infinitely small. On the other hand, birds which habitually dwell among the foaming waves of the sea are usually either partially or entirely white, and white is rather the rule than the exception among the comparatively few inhabitants of the northern regions, where the ground is either permanently or during a considerable portion of the year covered with snow. Under such conditions, white, instead of being the most conspicuous style of colouration, is quite the reverse. The whiteness of these animals must not be confounded with albinism (whiteness occurring accidentally in individuals normally of a different colour).

## ALBINISM.

Albinism is a condition in which the pigment or colouring matter, usually present in the tissues constituting the external coverings of the body, and which gives them their characteristic hue, is absent.

When it occurs, the hair, feathers, etc., are of an opaque white, the claws and bill of a pale horn, and the skin and eyes are pink colour, in consequence of the colour of the blood which circulates through them being no longer concealed by the stronger hues of the pigments. An individual in this condition is called an Albino.

In *complete albinism* there is a total abstinence of pigment throughout the system. This condition occurs occasionally as an individual peculiarity among wild animals, but it has never become perpetuated among them in distinct races or species.

*Partial albinism*, a condition in which the absence of pigment is limited to portions of the surface, is much more common as an individual variation, and it certainly becomes perpetuated more frequently among domestic than among wild animals.

## MELANISM.

Melanism is the opposite condition to albinism, and depends on an excess of dark-coloured pigment in the skin and its appendages—hair, feathers, etc.—beyond what is normally met with in the species. As with albinism, melanism may be partial or complete. When partial, it may occur in either of two forms. In one the black colour may be confined to distinct patches, the remainder of the surface retaining its normal colour; in the other there is a general darkening of the whole surface not amounting to black. This condition, when transmitted by inheritance and maintained and intensified by natural selection or some similar agency, gives rise to the permanent dark or melanic varieties which occur in many species of animals of various classes in a wild state. Melanism as an individual peculiarity is not so frequent as albinism. It may be congenital or acquired. With birds in confinement this change frequently occurs, and is commonly attributed to errors in diet, especially feeding too freely on hempseed (Nat. Hist. Museum).

# MIGRATION.

Distribution should not be confounded with migration. Birds migrate year after year, according to a more or less fixed rule, from one locality to another, with the seasons.

Migration is perhaps the greatest mystery which the whole animal kingdom presents. "The Hawk that stretches her wings toward the south is as familiar to the latest Nile boat traveller or dweller on the Bosphorus as of old to the author of the Book of Job. The autumnal thronging of myriads of water-fowl by the rivers of Asia is witnessed by the modern sportsman as it was of old by Homer. Anacreon welcomed the returning Swallow. The Indian of the fur countries, in forming his rude calendar, names the recurring moons after the birds of passage whose arrival is coincident with their changes"—the theme of comment in all ages and in all lands—and yet our "ignorance is immense."

*Chief facts of migration.* In almost all countries there are—

(*a*) Some species which arrive in spring, remain to breed, and depart in autumn.

(*b*) Others which arrive in autumn, stop for the winter, and depart in spring.

(*c*) Others (birds of passage) which show themselves but twice a year, in passing through the country, their short transient visits occurring about spring and autumn.

All these three classes are affected by the *same* impulse, and the nature of their movements is almost uniform, inasmuch as—

(*a*) Have their winter abode nearer the equator.

(*b*) Have their breeding quarters much nearer the poles, and *in returning to them on the approach of spring* are but doing exactly as do those species which, having their winter abode nearer the equator, arrive in the spring.

(*c*) Like winter visitants, have their breeding places nearer the poles, but, like summer visitants, they seek their winter abode nearer the equator, and thus perform a somewhat longer migration.

*Partial migrants.* While there are some species in the British Isles, such as the Swallow or the Fieldfare, of which every individual disappears at one period of the year or another, there are other species, such as the Red Wagtail or the Woodcock, of which only the majority of individuals vanish, a few being always present, and these species form the so-called "partial migrants."

*Migration almost universal.* There is scarcely a bird of either the Palæarctic or Nearctic region, whose habits are at all well known, which is not subject to the migratory impulse, and hence we are led to the conclusion that every bird of the northern hemisphere is to a greater or less degree migratory in some part or other of its range. Such a conclusion brings us to a still more general inference, viz. that migration, instead of being the exceptional characteristic it used formerly to be thought, may really be almost universal, and though the lack of observations in other, and especially tropical, countries does not allow us to declare that such is the case, it seems very probably to be so. With the additional fact that birds exhibit a real partiality year after year to occupy the same quarters in the breeding season, we may begin to try and account for the cause or causes of migration.

*Causes of migration.* Want of food would seem to be enough, and it is the most obvious cause. Even among many of those species which we commonly

speak of as "sedentary," it is only the adults which maintain their ground throughout the year. Birds of prey drive away their offspring so soon as the young are able to shift for themselves, for the simple reason of the impossibility of both parents and progeny getting a livelihood in the same vicinity. Many other species do the same, and with some, the time of expulsion is deferred from the end of summer or the autumn to the following spring. As food grows scarce towards the end of summer in the most northern limits of the range of a species, the individuals affected thereby seek it elsewhere. Thus doing, they press upon the haunts of others, and these in like manner upon that of yet others, and so on, until the outward movement which began in the far north is communicated to the individuals occupying the extreme southern range of the species at that season, though but for such an intrusion these last might be content to stay some time longer in the enjoyment of their existing quarters.

This may explain the southward movement of all migratory birds in the northern hemisphere, but when we consider the return movement some six months later, it is doubtful whether scarcity of food can be assigned as its sole or sufficient cause. On one side it may be urged that the more equatorial regions, which in winter are crowded with emigrants from the north, though well fitted for the resort of so great a population at that season, are deficient in certain necessaries for the nursery. And it may be assumed that, even if such necessaries are not absolutely wanting, the regions in question may not supply sufficient food for both parents and offspring, the latter being, at the lowest computation, twice as numerous as the former, unless the numbers of both were diminished by the casualties of travel.

(If the relative proportion of land to water in the southern hemisphere were at all such as it is in the northern, we should no doubt find the birds of southern continents beginning to press upon the tropical and equatorial regions of the globe at the season when they were thronged with emigrants from the north, and in such a case it would only be reasonable that the latter should be acted upon by the force of the former, according to the explanation given of the southward movement of northern migrants. But though we know almost nothing of the migration of birds of the other hemisphere, yet, when we regard the comparative deficiency of land in southern latitudes all round the world, it is obvious that the feathered population of such as nowadays exists can exert but little influence, and its effects may be practically disregarded.)

On the other hand, we must remember the pertinacity with which birds return to their accustomed breeding places, and the force of this passionate fondness for the old home must be taken into account, even if we do not allow that in it lies the whole stimulus to undertake the perilous voyage.

Mr. Wallace suggests (*Nature*, x. p. 459) that "survival of the fittest" has had a powerful influence on the manner in which the habit of migration has come to be adopted. "Let us suppose that in any species of migratory bird, breeding can as a rule be only safely accomplished in a given area; and further, that during a great part of the rest of the year sufficient food cannot be obtained in that area. It will follow that those birds which do not leave the breeding area at the proper season will suffer and ultimately become extinct, which will also be the fate of those which do not leave the feeding area at the proper time. Now if we suppose that the two areas were (for some remote ance-
existing species) coincident, but by geological and climatic

diverged from each other, we can easily understand how the habit of incipient and partial migration at the proper seasons would at last become hereditary and so fixed as to be what we term an instinct. It will probably be found that every gradation still exists in various parts of the world, from a complete coincidence to a complete separation of the breeding and the subsistence areas; and when the natural history of a sufficient number of species is thoroughly worked out, we may find every link between species which never leave a restricted area in which they breed and live the whole year round, to those other cases in which the two areas are absolutely separated."

*Earlier return of male migrants.* In the spring movement of most species of the northern hemisphere the cock birds are always in advance some days or perhaps weeks before the hens. It is not difficult to imagine that, in the course of a journey throughout some 50° or 60° of latitude, the stronger should outstrip the weaker. Some observers assert that the same thing occurs in the return journey in autumn.

*Weather.* As a rule it would seem as if birds were not dependent on the weather to any great degree. The arrival of seafowl, it is said, is as regular as the almanac itself. Puffins (*F. arctica*) repair to some of their stations punctually on a given day as if their movements were regulated by clockwork. Nor is the regularity with which certain species disappear much inferior, for the Swift (*C. apus*) is rarely seen in its summer home in England after the first days in August.

*Routes of migrants.* Herr Palmén lays down the chief roads taken by most of the migratory birds of the Palæarctic region in their return autumnal journey southwards from their breeding quarters, and further asserts that in the spaces between these lines of flight such birds do not usually occur. These main routes are nine in number, viz.—

(*A*) Leaving the Siberian shores of the Polar Sea, Nova Zembla, and the N. of Russia, passes down the W. coast of Norway to the North Sea and the British Islands.

(*B*) From Spitzbergen and adjoining islands, follows much the same course, but is prolonged past France, Spain, and Portugal, to the W. coast of Africa.

(*C*) From N. Russia, and threading the White Sea and Lakes Onega and Ladoga, skirts the Gulf of Finland and the southern part of the Baltic to Holstein, and so to Holland, where it divides—one branch uniting with the main route (*B*), while the other running up the valley of the Rhine, and crossing that of the Rhone, splits up on reaching the Mediterranean, where one path passes down the western coast of Italy and Sicily, a second takes the line by Corsica and Sardinia, and a third follows the S. coast of France and eastern coast of Spain—all three paths ending in N. Africa.

(*D*) From the extreme N. of Siberia, ascending the River Ob, branches out near Tobolsk—one track diverging to the Volga, descends that river, and so passes to the Sea of Azov, the Black Sea, and thence by the Bosphorus and Ægean to Egypt; another track makes for the Caspian by way of the Ural and so leads to the Persian Gulf; while two more are lost sight of on the

(*E*) From extreme N. of Siberia, mounts the Yenesei to Lake Baikal, and so passes into Mongolia.

(*F*) From extreme N. of Siberia, ascends the Lena, and striking the Upper Amoor, reaches the Sea of Japan.

(*G*) From the eastern portion of Siberia to the Sea of Japan.

(*O*) From Kamschatka to the Sea of Japan.

(*X*) Starting from Greenland and Iceland, passes by the Faeroes to the British Islands, and so, joining (*B*) and (*C*), runs down the French coast.

These are the main routes, while nearly all river courses form minor routes.

*Return to former haunts inexplicable.* But lay down the paths of migratory birds, observe their comings and goings, or strive, as we will, to account for the impulse which urges them forward, there still remains for consideration the most marvellous thing of all. How do the birds find their way so unerringly from such immense distances? This seems to be by far the most inexplicable part of the matter.

Year after year the migratory Wagtail will build her nest in the accustomed spot, and year after year the migratory Cuckoo will deposit her eggs in that nest, and yet in each interval of time the former may have passed some months on the shores of the Mediterranean, and the latter, absent for a still longer period, may have wandered into the heart of Africa (absolute proof and identity of particular birds is, of course, wanting; but if that objection be raised, the circumstance becomes still more puzzling, for then we have to account for some mode of communicating precise information by one bird to another). Solution of this mystery does not lie in the "homing" faculty, for this depends on a knowledge of landmarks obtained by sight, and sight only is the sense which directs pigeons, while sight alone can hardly afford much aid to birds which at one stretch transport themselves across the breadth of Europe, or even traverse more than 1,000 miles of open ocean, to say nothing of those birds which perform their migrations by night.

*Instinct* is no explanation of this wonderful faculty; it is an evasion of the difficulty. Herr Palmén ascribes the performance of the flight to *experience* where migrants are led by the older and the stronger birds. It is likely that the strongest lead the flock, but not necessarily the oldest. Besides, many birds do not migrate in flocks; for example, while swallows do leave our shores in large companies, the majority of summer visitors slip away almost unobserved apparently without concert with others. Temminck states that among migrants the young and the old always journey apart, and most generally by different routes. The former can have no "experience," and yet the greater number of them arrive safely. The sense of sight, essential to a knowledge of landmarks, is insufficient to account for the success that attends birds which travel by night, or in a single flight span oceans or continents. Yet without it the idea of "experience" cannot be substantiated. We may admit that inherited but unconscious experience, which is really all that can be meant by instinct, is a factor in the whole matter, certainly, as Mr. Wallace seems to have proved, in originating the migratory impulse; but yet every aspect of the question is fraught

with difficulty, and we must leave to time the discovery of this mystery of mysteries.

*Exceptional migration* occurs when from some cause or other the ordinary practice is broken through. One of the most extraordinary events known to ornithologists is the irruption into Europe, in 1863, of Pallas's Sand-Grouse (*S. paradoxus*). Of this bird, hitherto known only as an inhabitant of the Tartar steppes, a single specimen was obtained at Sarepta, on the Volga, in 1848. In May, 1859, a pair were killed in Vilna, on the western borders of Russia; and a few weeks later five examples were procured—one in Jutland, one in Holland, two in England, and one in Wales. In 1860 another was obtained at Sarepta; but in May and June, 1863, a flock of at least 700 spread over Europe, reaching Sweden, the Faeroes, and Iceland in the N.W., and in the S. extending to Sicily, and almost to the frontiers of Spain. On the sand-hills of Jutland and Holland some of these birds bred. In 1872 another visitation to Great Britain was reported.

*Nocturnal concourse of migrants.* Towards the close of summer, in dark, cloudy, and still weather, a vast and heterogeneous concourse of birds may be heard hovering over our large towns. It is supposed that these noises proceed from migrating birds which have lost their way. Lord Lilford records that once at Corfu he was startled by an uproar like a conflict overhead (*Enc. Brit.*).

## SONG.

The deep booming of the Emeu, the harsh cry of the Guillemot, the wail of the Plover, the whistle of the Widgeon, "the Cock's shrill clarion," the bleating of the Snipe, or the drumming of the Ruffed Grouse, etc., are sounds made by birds under the influence of love, etc., which may be regarded as a "song."

*Gestures akin to song.* Akin to the "song" of birds are the peculiar gestures which males perform during pairing. The Ruff dances on his hillock; the Snipe and some allies mount aloft and execute wild evolutions in the clouds; the Woodcock and many of the Goatsuckers beat the same aerial path evening after evening with sudden and sharp turns; the Capercailzie and Blackcock on a height throw themselves into curious postures. Other species of Grouse assume strange attitudes, and run in circles till the turf is worn bare. The Peacock spreads his train.

## NIDIFICATION.

The making of a nest is a labour that is scamped, if not shirked, by many birds. Some of the Auk tribe place their single egg on a bare ledge of rock, where its peculiar conical shape is but a precarious safeguard against wind or accident. Stone Curlew and Goatsuckers deposit their eggs without preparation of the soil, but select carefully the spot for their procreant cradle. The Apteryx seems to trust its abnormally big egg to an excavation among the roots of a tree fern. Female Ostriches scrape holes in the desert sand and promiscuously drop their eggs, cover them, and leave incubation to the male, who discharges the duty by night only and trusts by day to the sun's rays to keep up the warmth.

Megapodes raise a huge hot-bed of dead leaves wherein to deposit their eggs, and the young are hatched without further care on the part of either parent. Some of the Grebes and Rails pile fragments of aquatic plants on some growing water weed. Gulls, Sandpipers, and Plovers lay their eggs in shallow pits. The Ringed Plover commonly places its eggs on shingle. Flamingoes erect mounds of earth two feet high. The Shelduck beds its nest with down from her own body.

## EGGS.

*Number.* The eggs laid in one nest which are sat upon together and hatched about the same time are called a *clutch.* Their number, though tolerably uniform in each species, varies greatly in different species. Some birds have only one, others two, and the majority of species four or five. Higher numbers are less common, but eight to twelve eggs in a clutch are frequent among Ducks and Rails, and even more among some game birds. Examples:—

Single egg. Manx Shearwater, Razorbill.
Two eggs. Black Guillemot, Swift, Ringdove.
Three eggs. Oyster-Catcher, Sand Grouse.
Four eggs. Golden Plover, Common Sandpiper.
Five eggs. Kestrel, Robin.
Nine eggs. Long-tailed Tit.
Twelve eggs. Red-legged Partridge.

*Form.* In form, eggs may vary from almost spherical to different modifications of elliptical or oval. The latter form, in which one end is smaller and more pointed than the other, though not universal, is the most frequent, and distinguishes the eggs of birds from those of reptiles. If there are many eggs in the nest, it is obvious that the conical form makes close packing more easy. Where only two eggs are laid they are seldom conical. Eggs having a pyriform shape, or narrowing very rapidly towards the smaller end, are mostly those of birds (as *Limicolæ*) which lay four in a nest, and are large in proportion to the size of the bird. Their pointed ends being turned inwards, they occupy as little space as possible, and are thus more easily covered by the brooding parent. A conical egg placed on the ground or ledge of rock is less liable to roll away from its place if disturbed than one of a spherical form. Examples:—

Spheroidal. Scops Owl, Tawny Owl, Green Bee-Eater, Diving Petrel.
Elliptical. Nightjar, Sand-Grouse, Shag.
Biconical. Grebe.
True oval. Wild Turkey, Dipper, Grey Partridge.
Conical or Pyriform. Dunlin, Jaçaná, Lapwing, Guillemot.

*Size.* The size of the egg has generally, but by no means constantly, some relation to that of the parent bird. It also depends very much upon the degree of development the young bird attains at the time of hatching. In the case of birds in which the young are hatched in a very immature and helpless state, the eggs are small relatively to the size of the parent. These birds usually build carefully constructed nests suitable to contain the young birds during the first period of their existence. When the young are well clothed with down, and can

run and feed themselves as soon as hatched, the eggs are large. Such birds usually lay on the ground in imperfectly formed nests. Other circumstances seem to influence the size of the egg in some cases. Thus the Cuckoo, which lays its eggs in the nests of birds much smaller than itself, has eggs of size nearly corresponding to theirs, and therefore relatively the smallest of any of the class.

Among birds of about equal size with different-sized eggs are the Guillemot, the Curlew, and the Raven, where their eggs are as $3{\cdot}2'' \times 2''$, $2{\cdot}6'' \times 1{\cdot}8''$, and $2'' \times 1{\cdot}3''$ respectively. The Snipe is about the same size as a Blackbird, and yet its egg is $\frac{1}{2}''$ longer and $\frac{1}{4}''$ wider. The Apteryx has a far larger egg than the Crowned Pigeon, while Cuckoos' eggs are but slightly larger than those of a House Sparrow. The smallest eggs are those of some species of Humming Birds. Of existing birds, the Ostrich lays the largest egg, but these were far exceeded by those of the extinct *Æpyornis* of Madagascar.

*Texture of surface.* The surface of the shell of the eggs of different birds varies much in texture. It may be—

(*A*) Extremely smooth and polished, as with Tinamous.

(*B*) Smooth and glossy, as in the Woodpecker, Kingfisher.

(*C*) Dull and chalky, as in the Ibis, Megapode, Duck.

(*D*) Covered with a distinct calcareous film, sometimes of considerable and irregular thickness, as in the Shag, Grebe, Flamingo.

(*E*) Distinctly granulated or pitted, as in the Emeu.

*Colour.* The colour of the egg has no relation to that of the parent bird. White is probably the primitive colour of birds' eggs, as it is that of the eggs of all reptiles. The eggs birds laid in holes, either in the earth or in trees, entirely concealed from the light, are mostly white (exceptions—Nuthatch, Tree-Creeper, Jackdaw). The largest number of eggs are variously coloured by the deposition of pigment on or near the outer surface of the shell. The colour may be uniform throughout the surface of the shell, or it may be in irregular washes, blotches more or less circular, spots or lines upon either a white or uniformly coloured ground. Examples:—

One colour. Tinamous, Virginian Colin, Owl, Grey Parrot, Bee-Eater, Wryneck, Woodpecker, Roller, Stork, Swan, Wild Duck, Francolin, Pheasant, Jaçaná, Warblers, Nightingale, Fly-Catcher, Redstart, Indian Minah, Jay, Thrush, Heron, Ibis.

Clouded. Godwit, Peregrine Falcon.

Blotched. Sparrow-Hawk, Sandwich Tern, Razorbill, Ptarmigan, Red Grouse.

Speckled. Red-legged Partridge, Jay, Carrion Crow.

Spotted. Hemipode, Pratincole, Diver, Sandpiper, Redshank, Golden Oriole, Wren Warbler, Willow Warbler, Tit, Song Thrush, Swift, Tern, Oyster-Catcher, Sand-Grouse.

With linear markings. Starling, Crow, Blackbird, Guillemot, Indian Jaçaná.

The signification of the various modes of colouration is very little understood at present. It often happens that the different species of a natural group of birds present a general similarity in the style of colouration of their eggs, or, in other words, that nearly allied birds have similar eggs, but the exceptions to this rule are very numerous. In certain cases there is evidently an adaptation of the

colour of the eggs to their natural surroundings for the purpose of concealment. Similarity of eggs in a natural group of birds is observable in Warblers and Buntings. Dissimilar eggs in closely allied species are seen in the Missel Thrush, Song Thrush and Blackbird; Black Redstart and Common Redstart; Red, Spotted, and Red-breasted Fly-Catchers; the Rook and the Cape Crow.

Though the greater number of species of birds lay eggs, all of which are of tolerably uniform character, varying only within narrow limits, there are some cases in which the eggs of different individuals of one species present a remarkable diversity. Similarity in all the eggs of one species is seen in the Water-hen (*G. chloropus*). Dissimilarity in the eggs of one species is to be observed in the Tree Pipit, Tree Sparrow, Fantailed Warbler, Guillemot.

## INCUBATION

is performed by the females of nearly all birds, but with most of the *Passeres*, and many others, the male seems to share the duties. Among the *Ratitæ* the male takes that office wholly on himself. Most of the smaller *Passeres* of Europe hatch their young in about thirteen days, and in a few species the time is believed to be shortened to ten or eleven days, while in the largest of the order (the Raven) it is lengthened to twenty-one. This is the ordinary time taken by the Barndoor Fowl, but the Pheasant takes twenty-eight. Most water birds seem to require as long a time, but in the Swan incubation is protracted to six weeks, the same period as for an ostrich.

## MOULT

This is the shedding of the old and often weather-beaten feathers, to be in turn replaced by an entirely new suit. As a general rule all birds are subject to an annual moult, which begins at the close of the breeding season. Such renovation is required in birds which nearly all have to depend upon their quills for the means of locomotion and hence of livelihood. Feathers do not last for ever, and they are liable to accidental breakage. The *remiges*, or quill feathers, are always shed in pairs, and the power of flight is only slightly deteriorated thereby. In the young of most species the original quills are not shed during the first year, but in the typical *Gallinæ*, which are able to fly at a very early age, often before they are one-third grown, the original quills are shed before the bird has attained its full size and are succeeded by others that serve it when it has reached maturity. In the Duck tribe, however, we have a very singular exception. Most of these birds shed their quill feathers all at once, and thus become absolutely incapable of flight for a season, and it is further to be particularly remarked that the males of most of two sections of the family (*Anatinæ* and *Fuligulinæ*) at the same period "go into eclipse," and put on for several weeks the garb of the female (*Kandahar in 1879*, p. 249), resuming their full-coloured plumage under an additional moult, when their new quills are grown and fit for flight. In the Ptarmigan (*L. mutus*), both sexes of which not only moult after the breeding season into a grey suit, but again as autumn passes away have an additional moult into their snowy winter clothing, and yet again in spring put on

a third and most distinctive dress. These changes, however, do not extend to the quills either of the wings or the tail. Though the annual moult commonly takes place in birds as soon as the breeding season is over, there are plenty of cases where it is delayed to a later period of the year, notably the Swallow, which has long been known to moult in midwinter. But unquestionably most birds accomplish the change much earlier, and before they leave their breeding quarters for their winter haunts, thereby starting on one of their great annual journeys with all the machinery of flight renewed, and in the best condition for escaping its attendant perils (*Enc. Brit.*).

## VELOCITY IN FLIGHT.

Mr. Tegetmeier regards as mere fiction the oft-repeated statement that the Homing Pigeon flies at the rate of 100 miles an hour. There is no recorded case of its flying 60. The Homing Pigeon requires to be well trained and strong to be enabled to fly at the rate of 45 miles an hour, and it may with safety be stated that it has never been known to exceed 50 miles in that time.

The "record" speed for a Homing Pigeon in 1898, as given in the *Daily Telegraph* (21.11.98) was in a flight from Berwick to London, 300 miles, at "an average of 1,551 yards to the minute," or nearly 53 miles an hour. The same edition also reported another flight from the Shetland Isles, 600 miles in 14½ hours, or at nearly 41½ miles an hour. The *Penny Magazine* (April, 1899) reports a flight of 182 miles from a ship off the Eddystone to the Naval Dovecote, Whale Island, Portsmouth, in 3½ hours, or at a rate of 52 miles an hour.

## AGE OF BIRDS.

The birds said to live to the greatest age are the Eagle, the Swan, and the Raven, which sometimes attain more than 100 years. The average life of a Wren is 3 years; the Heron, the Parrot, the Goose, and the Pelican live 60 years; the Peacock and the Linnet, 25 years; the Canary, 24 years; the Pigeon and the Crane, 20 years; the Goldfinch and the Pheasant, 15 years; the Lark, 13 years; the Blackbird and the Robin Redbreast, 12 years; the Thrush, 10 years.

# RASORES. *GAME BIRDS* (Generally).

## Scratchers. Type, DOMESTIC FOWL.

Gallinaceous (or Game) Birds, of which the Domestic Fowl may be taken as a type, are termed RASORES (*Rado, ĕre, rasi, rasum*, to scratch up), from their habit of scratching in the ground for grain, seeds, roots, and insects as food. They do not wash in water, but flutter in the dust, and almost all nestle on the ground. Many are polygamous, and in these the male bird is the larger and adorned with a much richer plumage. The female is prolific; the young are born covered with down (in Megapodes, fully feathered), and run as soon as hatched.

This order is remarkable in comprising so many species capable of domestication, in having the tarsal spur (considered as representing the thumb); in the presence (in most of the groups) of the accessory plume to the clothing feathers; and in the bastard secondary feather of the wing. Owing to the simple construction of the windpipe and muscles, they cannot modulate the voice.

Game Birds evince many interesting analogies with ruminating animals among Mammals. The crop may be said to represent the paunch, and the cæca of both are large. They both have a low degree of intelligence, are easily domesticated, and are more prone to variation than most other tribes. The head, too, is, in many of both orders, adorned with appendages—horns and crests—and they afford more wholesome food to man than any other orders.

Game Birds are found over the greater part of the world, but the finest groups and greatest variety of form are from Asia.

Bill strong, short, arched. Wings usually short and rounded. Legs very stout. FEET FORMED FOR WALKING.

This division herein includes—

1. The Tinamous.
2. The Sand-Grouse.
3. The true Game Birds, grouped under—
   - (i.) *Alectoropodes*, with hind toe raised (Grouse, Turkeys, Guinea-Fowls, Pea-Fowls, Pheasants, Jungle- and Spur-Fowls, Partridges, and Quails).
   - (ii.) *Peristeropodes*, with hind toe on same plane as others (Curassows, Penelopes, Guans, Hoatzins, Brush-Turkeys, and Megapodes).
4. *The Hemipodes.* The Bustard and Button Quails (no hind toe).

# Order **CRYPTURI.**

A very isolated group of birds, having the vomer broad behind (*Dromæognathæ*). In certain characters (especially in the construction of the skull) they approach the *Ratitæ*, but their general structure places them among the *Carinatæ*. Peculiar to the Neotropical region.

- Hind toe raised
  - TINAMUS . . .
  - NOTHOCERCUS . .
  - CRYPTURUS . .
  - RHYNCHOTUS . .
  - NOTHOPROCTA . .
  - NOTHURA . .
  - TAONISCUS . .
- No hind toe
  - CALOPEZUS . .
  - TINAMOTIS . .

} TINAMOUS.*

## Family TINAMIDÆ. TINAMOUS.

A single family, in external appearance and habits resembling Partridges. They inhabit either open plains, forests, or rocky mountains, but are always found on the ground, and fly badly. Their eggs are highly polished and uniformly coloured, the colour varying with the particular species. As in the *Ratitæ*, the male bird appears generally to perform the duty of incubation.

Tinamous have a small head and slender neck, clothed with very short feathers. Upper mandible of the bill is covered at base with a cere which also envelops the nasal grooves. The general plumage is inconspicuous, ranging from rufous to slaty, often more or less closely barred. In size they vary from that of a quail to that of a fowl, or from 6″ to 21″ in length. Wing short and rounded. Fifth secondary present. Ten primaries. Tail short, pendant, and generally hidden by the upper tail-coverts. Tarsus shielded or reticulated. Powder-down patches present, and these in some have after-shafts. Oil-gland tufted. Young are hatched covered with down, and resemble those of some of the *Ratitæ*.

The existing sixty-five known species are all inhabitants of the Neotropical region, being widely distributed throughout S. America, and as far N. as Central Mexico. The presence or absence of a small and elevated hind toe has given rise to a division into two subfamilies, viz.—

*Tinaminæ* (with hind toe raised), containing the large majority of the group; and

*Tinamotidinæ* (without hind toe), containing only three species.

## Subfamily TINAMINÆ.

With hind toe raised. Seven genera (sixty-two species), distinguished as under with—

(i.) *Ten tail-feathers, hidden by the upper tail-coverts.*

The genus *Tinamus*, with tarsus rough behind, toes short, ten species, varying from 15″–21″, and ranging from Mexico to Peru and Paraguay.

The genus *Nothocercus*, with toes, especially the middle one, long. Five species, varying from 12″–16½″. C. and N. of S. America.

The genus *Crypturus*, with tarsus smooth behind. Twenty-nine species, varying from 9″–13″. N. Mexico to Peru and Argentina.

* Not represented in India.

(ii.) *Tail-feathers rudimentary, and mixed with upper tail-coverts.*

*Bill round, and tapering to a point.*

The genus *Rhynchotus*, hind toe rather long. Primaries uniform, rufous. Two species varying from 14″–17″. Brazil and Bolivia to Argentina.

The genus *Nothoprocta*, hind toe short. Primaries not uniform, rufous. Eight species varying from 9½″–13½″. Ecuador to Chili and Argentina.

*Bill almost straight and not tapering.*

The genus *Nothura*, with upper tail-coverts not very long. Seven species, varying from 7½″–11″. S. Brazil and Bolivia to Patagonia.

The genus *Taoniscus*, with upper tail-coverts very long and abundant. One species, 6″. Paraguay and S. Brazil.

### Subfamily TINAMOTIDINÆ.

With no hind toe, two genera (three species).

The genus *Calopezus*, tarsus with transverse scales. One species, 14½″. Argentina and Lower Uruguay.

The genus *Tinamotis*, tarsus with hexagonal scales. Two species, varying from 15½″–18″. The Andes to Peru (B.M. Cat. xxvi.; 496–569).

## Order **PTEROCLETES.**

Inner notch of breast-bone sometimes reduced to a foramen. Wings long and pointed. First or second quill longest. Eleven primaries. Fifth secondary wanting.

| | | |
|---|---|---|
| Hind toe raised. Tarsus feathered in front. Toes naked | PTEROCLES | SAND-GROUSE. |
| | PTEROCLURUS | PINTAIL SAND-GROUSE. |
| No hind toe. Tarsus feathered throughout. Toes feathered | SYRRHAPTES | PINTAIL SAND-GROUSE. |

### Family PTEROCLIDÆ. SAND-GROUSE.

Classed midway between the Pigeons and game birds of the Grouse family. Found in Southern Europe, Africa, and Asia, but not E. of Bay of Bengal. Placed by Jerdon as a distinct natural family. Gray groups them as a subfamily of Tetraonidæ, with which they only agree in having feathered tarsus.

Tarsus feathered in front. Wings long and pointed. First or second quill longest. Hind toe raised, very short or none. Orbits more or less nude. Plumage pale yellow, variegated with brown. After-shaft. Primaries eleven. Fifth secondary wanting. Tail of sixteen feathers (*P. lichtensteini* excepted). Generally found in flocks in open plains. Flight rapid. Fly to water regularly morning and evening. Feed on seeds. Sexes differ. Generally three eggs, elliptical, pale olive, double-spotted brown and purple. Young are hatched covered with down. As in true Grouse, the flesh of breast is of two colours, white near the bone and dark in outer part.

### Genus **PTEROCLES.**

πτερόν = a feather; κλείς = a bar.

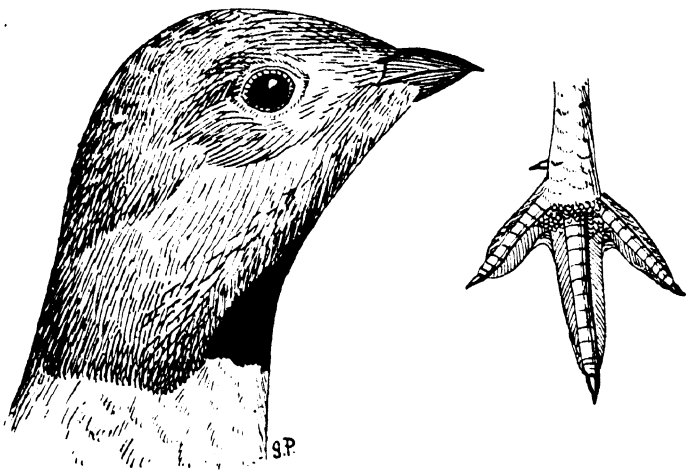
*Male* uniformly coloured.—*Female* more or less spotted or barred. First and second quills longest. Toes bare. Minute hind toe raised. Tarsus feathered in front, reticulated behind. Tail feathers graduated.

(i.) *With tail-feathers graduated.*

**1. Pterocles arenarius.** THE LARGE OR BLACK-BELLIED SAND-GROUSE.

*Ărēnārĭus*=pertaining to sand, *arēna*.

**Bhut-titur, Buk-tit,** *Upper India;* **Banchur,** *Peshawar;* **Siahsin** (Persian), *Khorassan;* **Bagrikara** (Turkish), *N. Persia.*



Jerome, Khojak, 1879.

♂ 13¼″ to 14¾″; 18 oz. ♀ 13″ to 14″. Legs dull yellow. Bill bluish. Central tail-feathers slightly lengthened, tipped dark grey, the others tipped white. Primaries slate, with black shafts. Abdomen and breast-band black.—*Male* above mottled ashy and fulvous. Orange wing-band. Chin deep chestnut. Black triangle on throat. Breast fawn, unspotted.—*Female:* Breast, head, and above fulvous, banded brown. Chin fulvous, with black edges and specks.

Range from Canary Islands and Spain through N. Africa and S.W. Asia to Turkestan. Cold-weather migrant to N.W. India, arriving about end of September and leaving in March. Eggs (1·85 × 1·33) found in S. Afghanistan in May. (J. 799. B. 1316. O. 5.)

Also *P. decoratus*, the Bridled S.G. from E. Africa, ♂ 8·8″, ♀ 8·6″; and *P. variegatus*, the Variegated S.G. from S. Africa, ♂ 9·8″, ♀ 9·8″. (O.G. 17.)

**2. Pterocles fasciatus.** THE PAINTED SAND-GROUSE.

*Fascĭo* (no perf.), *atum*=to swathe or envelop in bands.

**Bhut-titur, Bhut-bur,** *N.W.P.;* **Palki,** *Belgaum;* **Handeri,** *S. India;* **Pokundi** (Marathi); **Kal gowjal haki** (Kanarese), *Mysore;* **Sonda polanka** (Telugu).

♂ 10½″ to 11¼″; 6 to 7½ oz. ♀ 10″ to 10½″. Legs dull yellow. Bill red. Primaries brown-black, with pale edgings, shaft of first quill white. Abdomen black, with crescentic white marks. Under-tail and tarsus barred. Throat unspotted.—*Male* above yellow, banded brown. Four stripes on forehead. Triple breast-band. Wing-coverts banded black, edged white.—*Female:* No pectoral band. Breast and above finely barred. Abdomen and feet finely barred, chocolate and cream-white (see Frontispiece).

Peculiar to and resident in India, but not W. of the Indus or on the Gangetic alluvium. Eggs (1·42 × 0·98) generally found in April and May, salmon-pink, speckled, and blotched. (J. 800. B. 1317. O. 7.)

Also *P. quadricinctus*, the Painted S.G. from Africa. (O.G. 24.)

### 3. Pterocles lichtensteini. The Close-barred Sand-Grouse.

In honour of Lichtenstein.

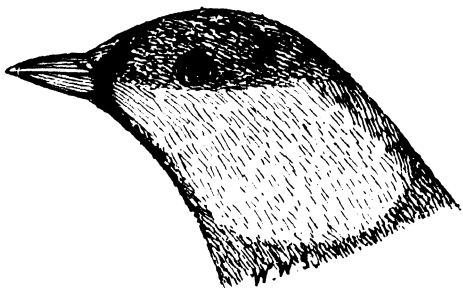
♂ 10¾″; 8 oz. ♀ 10⅓″. Tarsus white. Bill flesh-brown. Primaries hair-brown, margined dull white, shaft of first quill brown. Resembles *P. fasciatus*, but tail has only fourteen feathers and pectoral band has four bars.—*Male:* Abdomen white, with crescentic black marks. Neck-feathers yellowish white, tipped black spot.—*Female:* No pectoral band. Chin, throat albescent, closely speckled blackish brown. (S.F. i. 219.)

Cold-weather visitor to Sind, W. of Indus, from N.E. Africa and S.W. Asia. (B. 1318. O. 8.)

Also *P. bicinctus*, the Double-banded S.G. from S. Africa, ♂ 9·7″, ♀ 9·7″. (O.G. 21.)

### 4. Pterocles coronatus. The Coroneted Sand-Grouse.

*Cŏrōno, avi, atum* = to crown, wreathe.
**Katinga**, *Sind.*



Berot, 22.10.74.

♂ 10½″ to 11½″; 8 oz. ♀ 10″ to 10½″. Legs fawn. Bill bluish. Primaries umber, white shafts, some with inner webs edged rufous. Yellow cheek-patch. Under-tail not barred.—*Male:* Crown buff, edged grey and yellow. Black stripe on each side of the bill, and one from chin down throat. Above light brown, mixed grey. Abdomen buff.—*Female:* Crown wanting. Pale cinnamon throughout with crescentic black cross-bars. Abdomen fawn, faintly speckled. Throat yellow, without black bar.

Range from N.E. Africa to Sind and Punjab, W. of Indus. Probably breeds in Sind. Eggs (1·5 × 1·06) taken in Afghanistan in May and June. (B. 1319. O. 6.)

Also *P. gutturalis*, the Chestnut-vented S.G. from Africa, ♂ 12″, ♀ 11·6″; and *P. personatus*, the Masked S.G. peculiar to Madagascar, ♂ 11·6″, ♀ 11·5″. (O.G. 19.)

## Genus **PTEROCLURUS.**

*Male* uniformly coloured. *Female* more or less spotted or barred. First and second quills longest. Tarsus feathered in front, reticulated behind. Toes bare. Minute hind toe raised. Tail-feathers elongated.

(ii.) *With medial tail-feathers greatly elongated.*

**5. Pteroclurus alchatus.** Large Pintail or Solitary Sand-Grouse.

♂ 14″ to 15½″; 10 to 12 oz. ♀ 13½″ to 15″; 8 to 11¼ oz. Legs plumbeous. Bill brown. Primaries slate, inner webs brown. Median tail blackish. Abdomen white. Black eye-stripe.—*Male:* Bands on crown and nape. Broad breast-band buff, edged black above and below. In summer, throat black; in winter, white. Above olive-grey.—*Female:* Throat white. Double breast-band of grey and buff, fringed with three black bands. Above barred black, with ashy spots. Cold-weather visitor to N.W. India from S.W. and C. Asia. (J. 801. B. 1320. O. 2.)

Supposed Quail of the Israelites (Num. xi. 31, 32; Exod. xvi. 13).

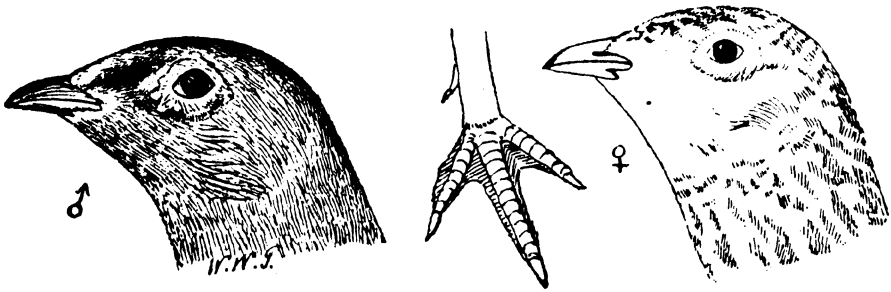
Also *P. pyrenaicus*, the Western Pintail S.G. from S. Europe and N. Africa. Annual complete moult in June, when male assumes female plumage without the double throat-bar, the female changing the white eye-stripe for a black one. And *P. namaquus*, ♂ 12″, ♀ 10·5″, from S. Africa. (O.G. 11.)

**6. Pteroclurus exustus.** The Common Pintail or Whistling Sand-Grouse.

*Exuro, ussi, ustum* = to burn up.

**Bur-titur, Kuhar,** *N.W.P.;* **Batiban,** *Sind;* **Popandi** (Bheel); **Pokandi,** *Deccan;* **Palki,** *Belgaum;* **Jam-polanka** (Telugu); **Kal-Kondari** (Tamil).

♂ 11¾″ to 13¾″; 8 to 10 oz. ♀ 11″ to 12¼″; 7½ to 8⅓ oz. Legs plumbeous. Bill plumbeous. Primaries black, tips, except of first four, white. Plain bar on wing.—*Male:* Above dusty green. Abdomen chocolate. Narrow black breast-




Dorbajee, 8.8.72.

band, edged white.—*Female:* Abdomen chocolate, closely barred, brown. Neck and breast spotted. Broken black gorget. Above fulvous, barred brown. Central feathers of tail not always elongated. *Young* have mixed plumage alternately edged and barred.

From S.W. and C. Asia, but resident also in N.W. India and Deccan. Eggs (1·45 × 1·03) buff-green and double spotted. (J. 802. B. 1321. O. 3.)

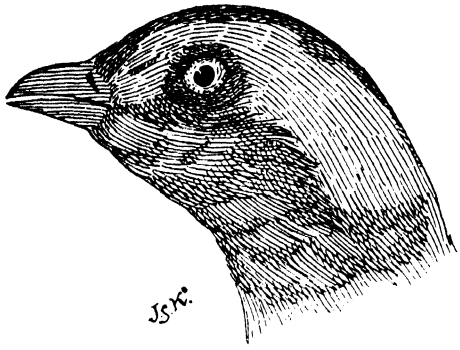
**7. Pteroclurus senegallus.** The Blue-browed Pintail Sand-Grouse.

**Gutu,** *Sind.*

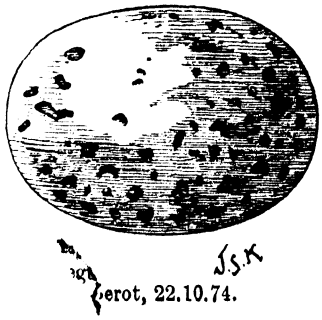
♂ 13½″ to 14¾″; 9 to 12 oz. ♀ 12½″ to 13½″; 8 to 9 oz. Legs blue-grey. Bill plumbeous, dark tip. Primaries pale madder-brown, black shafts, first three tipped black, rest tipped white. Chin and throat-patch yellow. Abdominal line sooty, fringed buff.—*Male:* Crown and nape dove-colour. Neck, breast, and

eye-patch ash-grey. Above fulvous yellow. Whole plumage unspotted.—*Female:* Neck and above dotted dusky grey on buff.

Eggs (1·6 × 1·12). From N.W. Africa and S.W. Asia. Cold-weather visitors, and also generally resident in W. India, but not known to breed E. of Indus. (B. 1322. O.G. 14. O. 4.)



Rindawaree, 27.12.72.



erot, 22.10.74.

## Genus **SYRRHAPTES.**

*Syrrhaptes* derived by Illiger from *συρράπτειν* = to sew or stitch together, because the last phalanges of the toes alone are free.

No hind toe. Tarsus feathered throughout. Toes broad and feathered to claws. First and second quills lengthened; second quill longest. Middle tail-feathers elongated.

### 8. **Syrrhaptes tibetanus.** The Tibetan Pintail Sand-Grouse.

**Kaling, Kuk,** *Ladak.*

♂ 18″ to 20″. ♀ 16½″ to 18″. Bill bluish. Primaries black, with white patch on inner web of hinder ones.—*Male:* Crown and nape white, closely barred. Narrow yellow band across back of neck. Black blotches on inner web of scapulars. Breast grey. Abdomen white, with no black patch. Wing finely barred.—*Female:* Whole breast lineated with zigzag brown lines. Closed wing boldly barred (*Lahore to Yarkand*, p. 259).

Eggs (2 × 1·33). From Tibet; common in Ladak and Sutlej Valley. (B. 1323. O.G. 6. O. 1.)

Also *S. paradoxus.* Pallas's Pintail S.G. from the Kirghiz steppes.

"*Baguerlac,*" the *Tetrao paradoxus* of Pallas, known as *S. pallasi*, is Marco's bird (Yule's *Marco Polo*, p. 240).

*Tĕtrăo* = *τετράων*, a bird mentioned by Athenæus and Pliny. *Paradoxus* = *παράδοξος*, strange, contrary to expectation; from the curious structure of its feet.

Pallas's Sand-Grouse, known also as the "Tartary Partridge," or "Partridge of the Steppes," is a rare and erratic visitant to Europe and Britain. Unknown in British Isles till 1859, when three were obtained (two in England, one in Wales). In May, 1863, the first great irruption occurred all over Europe and throughout Britain. In 1872 there was another visitation to Great Britain. During May, 1888, its appearance was reported in several places remote from one another. Nothing is known of the causes which are forcing it to quit its native Central Asian steppes for a new home in Germany and elsewhere. Throat and around eyes orange. Breast grey, with black patch on abdomen. Breast-band black and white. Eggs, three or four (1·7 × 1·5), pale olive, spotted brown. (O.G. 4.)

## Order **GALLINÆ** (Part).

### *GROUSE, TURKEYS, GUINEA FOWLS.*

Bill stout. Hind toe always present. Wings rounded. Ten primaries. Fifth secondary present. After-shaft. Oil-gland (except in *Argusianus*). Breast-bone has two deep incisions in the posterior border on each side of the keel. Palate is schizognathous. All nest on the ground and lay numerous eggs. Young are hatched covered with down (Opisthocomidæ, naked; Megapodiidæ, fully feathered) and able to run at once.

| | | |
|---|---|---|
| Nostrils covered with feathers | LAGOPUS * | WILLOW-GROUSE AND PTARMIGAN. |
| | LYRURUS * | BLACK GROUSE. |
| | TETRAO * | CAPERCAILZIES. |
| | CANACHITES * | CANADIAN GROUSE. |
| | FALCIPENNIS * | SHARP-WINGED GROUSE. |
| | DENDRAGAPUS * | AMERICAN CAPERCAILZIES. |
| | TYMPANUCHUS * | PINNATED GROUSE. |
| | CENTROCERCUS * | SAGE-GROUSE. |
| | PEDIŒCETES * | SHARP-TAILED GROUSE. |
| | BONASA * | RUFFED GROUSE. |
| | TETRASTES * | HAZEL HENS. |
| Nostrils never hidden by feathers | MELEAGRIS * | WILD TURKEYS. |
| | PHASIDUS * / AGELASTES * | BLACK GUINEA FOWLS. |
| | NUMIDA * | HELMETED GUINEA FOWLS. |
| | GUTTERA * | CRESTED GUINEA FOWLS. |
| | ACRYLLUM * | VULTURINE GUINEA FOWLS. |

## Order **GALLINÆ**. *TRUE GAME BIRDS.*

Bill stout. Hind toe always present. Wings rounded. Ten primaries. Fifth secondary present. After-shaft. Oil-gland (except in *Argusianus*). The breast-bone has two deep incisions in the posterior border on each side of the keel. Palate is schizognathous. All nest on the ground and lay numerous eggs. Young are hatched covered with down (Opisthocomidæ, naked; Megapodiidæ, fully feathered) and able to run at once.

## Suborder ALECTOROPODES.

Hind toe raised above level of other toes. Inner notch of breast-bone more than half the length of the entire breast-bone. Includes Grouse, Turkeys, Guinea Fowls, Pheasants, Partridges, and Quails.

### Family TETRAONIDÆ. GROUSE.*

Nostrils covered with feathers. Legs partially or entirely feathered and never armed with spurs. Hind toe raised. Toes densely feathered or naked, with a series of comb-like processes on each side. Bill very short. Tail of sixteen to twenty feathers. Not represented in India, being peculiar to northern parts of both continents. Eleven genera.

* Not represented in India.

## Genus **LAGOPUS**. Willow-Grouse and Ptarmigan.

Feet and toes densely covered with feathers. Tail of sixteen feathers. Six species, viz.—

*L. scoticus*. ♂ 15½". ♀ 15". Weight 28 to 30 oz. The Red Grouse or Moor-Cock. Primaries brown. Tail square. Male has a long moustache and a large red wattle. Female has no moustache and a smaller wattle. The peculiarity of Red Grouse is that changes of plumage in male and female occur at different seasons. Both have two distinct moults during the year, but in the male they occur in autumn and winter, and in the female in autumn and summer. The male has no distinct summer dress and the female has no distinct winter plumage. Considered by some as an insular form of *L. lagopus*.

The only species of game bird peculiar to the British Isles. The male bird in autumn plumage has the upper parts black, margined and irregularly barred buff. Chest widely barred buff and black. In *winter-summer* plumage, which begins to appear about 1st September, the upper parts are black, finely mottled chestnut. Head, neck, and chest dark chestnut, finely marked black, and when once the winter moult is complete, no change whatever takes place in the plumage of the male till the following autumnal moult. The female in *autumn-winter* plumage, commencing in November, has upper parts black, irregularly barred and mottled rufous, and a buff spot at tip of most feathers. Chest and flanks narrowly barred rufous and black. Below dark chestnut, mottled and barred black. In *summer* the upper parts are black, widely margined, barred and marked orange-buff, and this change is generally complete by the first week in May. "The summer flank-feathers are produced in two ways, either by a gradual rearrangement and change in the pigment of the autumn feathers or by moult." Inhabits open moors, covered with heath and ling from sea-level, but not found above the level where these plants grow. Monogamous. Nesting season April to May. Grouse shooting commences 12th August and ends on 10th December. Seven to fifteen eggs (1·75 × 1·32) buff, spotted and blotched reddish brown.

*L. lagopus*. ♂ 15½". ♀ 15". The Willow-Grouse, or Ripa. Primaries white. Outer tail-feathers black with bases and tips white. Three distinct changes of plumage in summer, autumn, and winter in both male and female alike. In *winter* both birds are white with outer tail-feathers black, and in *autumn* both birds have the head, throat, and chest pale chestnut, finely barred black. The flight-feathers, tail-feathers, and feathers of the feet are renewed at this season. In *summer* the male has head and neck chestnut. Upper parts chestnut, mottled, and barred black, and often tipped buff. Below white, and the female has the upper parts black, widely margined, and marked orange-buff. Found among birch and willow trees. Perch and roost on trees. Circumpolar, inhabiting Arctic tundras of Europe, Asia, and America. Eggs as in *L. scoticus*.

*L. mutus*. ♂ 14½". ♀ 14". The Common Ptarmigan. Primaries white. Tail rounded. Outer tail black, with base and tips white. Bill more slender than in the Red and Willow-Grouse. In *summer* the male has red wattles over the eyes, and is black and brown above, except on lower back and rump, where he is white. In *autumn* the black and brown have become greys, and in *winter* the plumage is almost white.

The *winter* plumage is more or less white, and mid-tail is white. The males have black lores, the females have not. It may be said to be complete by middle of November, and this dress lasts till the end of February.

The *summer* plumage is dark brown, mottled and barred grey and rusty. (The males have red wattles, lower back and rump white.) It commences in the beginning of March, is completed by end of May, and lasts till the end of July, when the autumn feathers begin to appear, and the feathers moult from the legs.

The *autumn* plumage, or change of colour from blacks and browns to greys, commences at end of July, and is complete by 20th August. The feathers are fading in September, and by mid-October the white feathers of the third moult begin to appear, and by the end of October the feet are again quite fully covered.

Monogamous. From Scotland to the Ural Mountains, and south to the Pyrenees and Alps, above the limits of tree growth and heather. Eggs similar to those of *L. scoticus*.

*L. rupestris*, the Rock-Ptarmigan. A climatic variety of *L. mutus*, from northern latitudes.

*L. hyperboreus*. The Spitzbergen Ptarmigan. Distinguished by having more white on basal part of tail-feathers at all seasons.

*L. leucurus*. ♂ 12½". ♀ 12". The White-tailed Ptarmigan. Outer tail-feathers pure white.

Changes of plumage are similar to those of *L. mutus*, but the black markings on the summer plumage of the male are much bolder, and in winter the black lores are wanting. Seldom found at a lower altitude than 8,000 or 9,000 feet at any time. Summits of Rocky Mountains, from Alaska to N. Mexico. Eggs (1·75 × 1·2) salmon-buff, blotched chocolate.

## Genus **LYRURUS.** Black Grouse.

Feet feathered, but toes naked and pectinate at sides. Tail of eighteen feathers, laterals curved outwards at extremities. Remiges twenty-five. Two species.

*L. tetrix.* ♂ 23½″. ♀ 17″. The Black Grouse. (Black cock and grey hen.) Plumage mostly black. White bar on wing. Under tail-coverts white. *Female:* Chestnut, freckled black. During the autumnal moult, when males are incapable of flight, they assume the female garb, and the throat then becomes white. The young male attains the black adult plumage at the first autumnal moult, and by December resembles the old male. Barren females assume male plumage and the white throat. Polygamous. Perch on trees. From Great Britain to N.E. Siberia, southwards to the Pyrenees, N. Italy, N. Caucasus, Tian Shan Mountains, and Pekin. Six to ten eggs (2·0 × 1·4), buff, spotted red-brown; hatching the eggs and rearing the young being exclusively the task of the females. Hybrids between the Black Cock and female Capercailzie (so-called *Tetrao medius*) are not uncommon.

*L. mlokosiewiczi.* ♂ 20″. ♀ 16½″. The Caucasian Black Grouse. Plumage entirely black. —*Female:* Rufous and buff, barred black. Young males retain hen-like plumage throughout first year, and probably till second moult. Caucasus.

## Genus **TETRAO.** Capercailzies.

Tail slightly rounded of eighteen feathers. Remiges twenty-nine. Extinct in Ireland and Scotland about 1760, and reintroduced from Sweden into Scotland since 1837. Three species.

*T. urogallus.* ♂ 35″. ♀ 25″. Weight 9 to 12 lbs. The Capercailzie. Above dark grey. Black chin-feathers forming a sort of beard. Metallic green chest-band. Breast and belly black.—*Female:* Back rufous, barred black. Breast and belly buff, barred black. Tail-feathers tipped white. Polygamous. In pine forests from Scotland to Lake Baikal, and south to Pyrenees, Alps, Carpathians, N.E. Turkestan, and the Altai Mountains. Five to fifteen eggs (1.25 × 1·65), light brown, spotted red-brown.

*T. uralensis.* A subspecies similar to *T. urogallus*, but mantle and back grey, finely mottled black. Breast and belly mostly white. Ural Mountains.

*T. parvirostris.* ♂ 35″. ♀ 25″. The Slender-billed Capercailzie. Mantle brownish black, not barred. White tips of shoulder-feathers forming a line of white spots.—*Female:* Mantle barred black. Breast and belly black, barred buff, tipped white. White line on shoulder broken. N.E. Siberia and Saghalien Island.

*T. kamschaticus.* ♂ 30″. ♀ 22″. Like *T. parvirostris*, but in females the white shoulder line is unbroken. Kamschatka.

*With toes naked and pectinate on the sides.*

## Genus **CANACHITES.** Canadian Grouse.

Tail of sixteen feathers, rounded. Two species from N. America.

*C. canadensis.* ♂ 15½″. ♀ 14″. The Canadian Grouse. Upper parts black barred brownish grey. Upper tail-coverts edged and tipped grey. Tail with terminal red band. Chin, throat, and below black.—*Female:* Chin and throat rufous, spotted black. Neck and chest black, barred rusty. Below the same, but tipped white. Frequent dense thickets and evergreen woods. Monogamous. Pairing begins end of April. E. of Rocky Mountains. Seven to thirteen eggs (1·75 × 1·25), reddish buff, heavily blotched dark brown.

*C. franklini.* Franklin's Grouse. Similar to *C. canadensis*, but upper tail-coverts tipped white and no terminal tail-band. W. of Rocky Mountains. Densely timbered mountain ranges from 5,000 to 9,000 feet altitude.

## Genus **FALCIPENNIS.** Sharp-winged Grouse.

Tail of sixteen feathers, rounded. Outer quills attenuated and sickle-shaped. One species.

*F. falcipennis.* ♂ 16⅓″. ♀ 14¾″. The Sharp-winged Grouse. Chest uniform smoky black. —*Female:* Chest black, barred buff. Regarded as the representative form of *C. canadensis* in the Old World. N.E. Siberia, Kamschatka, and Saghalien Island.

## Genus **DENDRAGAPUS.** American Capercailzies.

Tail of eighteen feathers, subequal. Male with inflatable air-sac on each side of neck. Two species.

*D. obscurus.* ♂ 19½″. ♀ 17″. The Dusky Capercailzie. Above smoky black, mixed brownish buff; below grey. Breast not barred. Mid tail with grey band.—*Female:* Breast-band buff. Tail with grey terminal band on laterals. Monogamous. Known also as "Blue Grouse," "Pine Grouse." S. Rocky Mountains. Eggs (1·9 × 1·4) creamy buff, dotted all over chestnut-brown.

*D. fuliginosus*, a subspecies distinguished from *D. obscurus* by the narrower tail-bands. N.W. Rocky Mountains.

*D. richardsoni.* Tail uniform black.—*Female:* No grey tail-band. E. Rocky Mountains.

## Genus **TYMPANUCHUS.** Pinnated Grouse.

Tail rounded, of eighteen feathers. Males have an inflatable air-sac and an elongated tuft of feathers on each side of neck. Three species.

*T. americanus.* ♂ 16½″. ♀ 16″. The Prairie Hen. Above barred brown and black. Below barred black and white. Neck-feathers three inches long, the longer ones parallel-edged with rounded tips. Chest feathers white with two brown bars. Outer tail black, tipped white.—*Female:* Ear-tufts short and outer tail barred rufous. In migration the females only are believed to change their quarters. Mississippi. Eleven to fourteen eggs, buff, faintly dotted brown.

*T. cupido.* The Heath-Hen, similar to *T. americanus*, but smaller. Longer feathers of ear-tufts lanceolate and pointed. Massachusetts.

*T. pallidicinctus.* The Lesser Prairie-Hen. Longer feathers of ear-tufts parallel-edged with square tips. Chest-feathers white with three brown bars. S.W. Kansas and Texas.

## Genus **CENTROCERCUS.** Sage-Grouse.

Tail pheasant-like of twenty feathers. Males with an inflatable air-sac on each side of neck. One species.

*C. urophasianus.* ♂ 28″; weight 8 lbs. ♀ 22″; weight 5 lbs. Above blackish, mottled buff. Breast and belly mostly black. Chin and throat white, spotted black.—*Female:* Chin and throat white. Plains of Rocky Mountain Plateau. Pairing begins in March. Males remain apart till young are grown up. Seven to nine eggs (2·2 × 1·5), olive-buff, spotted chocolate.

## Genus **PEDIŒCETES.** Sharp-tailed Grouse.

Tail of eighteen feathers, wedge-shaped. Males with an inflatable air-sac on each side of neck. Two species.

*P. phasianellus.* ♂ 16½″. ♀ 16″. The Northern S.T. Grouse. Above black, marked buff and white. Breast black, with white heart-shaped patch. British America. Seven to fourteen eggs (1·8 × 1·3), brown, spotted red-brown.

*P. columbianus.* ♂ 15″. ♀ 14″. The Columbian S.T. Grouse, or Prairie-Chicken. Above white and buff, marked black. Breast white, banded black. Plains of the United States.

## Genus **BONASA.** Ruffed Grouse.

Tarsi partially feathered. Tail of eighteen feathers. Frilled ruff on each side of neck. One species.

*B. umbellus.* ♂ 17″. ♀ 16″. The Ruffed Grouse. Plumage subject to great climatic variation. Males never congregate during breeding season. E. United States. Eight to fourteen eggs, pale buff, spotted pale brown. Besides this species (the lighter rufous), there are—a darker rufous variety, locally known as *B. sabinii*, in the W.; a lighter grey, *B. umbelloides*, in the Central Rocky Mountains; and a darker form, with dusky breast-bars more defined, from British Columbia.

## Genus **TETRASTES.** Hazel Hens.

Feet only partially feathered, lower part entirely naked. Tail of sixteen feathers, wedge-shaped. Three species.

*T. bonasia.* ♂ 14″. ♀ 13″. The Hazel Hen. Above grey or rufous, barred on head and back with black. Breast black, margined white, and sometimes with white spots. Chin and

throat black.—*Female:* Chin and throat mostly white. Known also as "Hazel Grouse," or "Gelinotte." Haunts hilly and wooded districts. From Scandinavia to Japan, and southwards to N. Spain, N. Italy, Transylvania, Altai Mountains, and N. China. Eight to twelve eggs, pale buff, spotted brown.

*T. griseiventris.* ♂ 14". ♀ 13". The Grey-bellied Hazel Hen. Breast sandy, with narrow black bars. Chin black. Throat black, tipped rufous. Chest reddish, barred and tipped grey.—*Female:* Chin white. Chest black, barred rufous, tipped grey. E. Russia.

*T. severtzovi.* 13½". Severtzov's Hazel Hen. Breast black, barred and tipped white. Outer tail black, barred white. Chin and throat black.—*Female:* Chin and throat buff, tipped black. N.E. Central Asia. (O.G. i. 26–77.)

## Family PHASIANIDÆ.

Head often furnished with crests or nude skin, or lappets and wattles. Tail of 8, 10, 14, 16, 18, 20, to 24 feathers, much developed. Nostrils never hidden by feathers. Legs partially or wholly naked, and often armed with spurs. Toes always naked and not pectinated. Hind toe raised. Frequent forests and thick cover. Roost on trees. This family is here divided into five subfamilies, viz. Turkeys, Guinea Fowls, Pheasants and Jungle-Fowl, Old World Partridges and Quails, and American Partridges and Quails.

### Subfamily MELEAGRINÆ. WILD TURKEYS.*

First primary about equal to the tenth. Fifth primary slightly the longest. Tarsus in males armed with large, stout spurs. Frequent American woodlands, and feed on nuts, fruit, seeds, and insects. Polygamous.

### Genus **MELEAGRIS.** WILD TURKEYS.

Head and neck naked and wattled, with a few hair-like feathers. An erectile fleshy process on forehead. Tail broad, of eighteen feathers. Three species, viz.—

*M. gallopavo.* ♂ 43". ♀ 40". The Mexican Turkey. Plumage black. Long black, hair-like feathers on breast. Upper tail-coverts and tail tipped white. Primaries equally barred brown and white. Naked skin on head and neck pale crimson.—*Female:* Crown-band of narrow feathers. No hair-like feathers on breast. Below fringed white. N. Mexico, Arizona, New Mexico, and W. Texas. Roost on trees. Eggs (2·7 × 1·9) creamy white, dotted red-brown. The origin of the domestic breed. Brought to Europe early in sixteenth century.

*M. ellioti,* a subspecies differing from *M. gallopavo* in having feathers of rump, upper tail-coverts, and tail tipped pale rufous-buff. E. Mexico and S.W. Texas.

*M. americana.* The American Turkey differs from *M. gallopavo* in having feathers of lower rump, flanks, upper and under tail-coverts, and tail tipped deep maroon. Eight to thirteen eggs. Nest, a slight depression in ground, either at foot of tree or under a thick bush, lined with dead leaves and grass.

*M. osceola.* The Florida Turkey, a subspecies, differs from *M. americana* in having white bands on quills very narrow and tips of tail-feathers pale chestnut. Usually in flocks of from two to twenty.

*M. ocellata.* ♂ 33". ♀ 33". The Honduras Turkey. Mantle, chest, and flanks brass-green, margined black and fringed green. Ocelli on tail greenish blue. Tail margined copper-red. Naked skin of head, neck, and fleshy process blue.—*Female:* Tarsi with small wart-like knobs. C. America. Eggs (2·4 × 1·8). (O.G. ii. 103–111).

### Subfamily NUMIDINÆ. GUINEA FOWLS.*

First primary shorter than tenth. Five genera, confined to Africa.

### Genus **PHASIDUS.**

Head and neck naked, excepting band of feathers along the crown. Tail of fourteen feathers. Fourth primary slightly the longest. Male with short, blunt spur. One species.

*P. nigra.* 16½". The Black Guinea Fowl. Naked skin of head and neck yellow or scarlet. Crown band black. Plumage blackish, mottled dark brown. W. Africa.

* Not represented in India.

## Genus **AGELASTES.**

Head and neck naked, with a few scattered plumes. Tail of fourteen feathers. Fifth to seventh primaries subequal and longest. Male with short, stout spur. One species.

*A. meleagrides.* 19″. The Turkey-like Guinea Fowl. Plumage black, mottled white. Neck, chest, and mantle white. Naked skin of head red. W. Africa.

## Genus **NUMIDA.**

Head and neck naked, bony helmet on crown. Cheek wattles. Tail of sixteen feathers. Fifth primary slightly longest. Plumage black, spotted white. Sexes similar. Eight species.

*N. meleagris.* 25″. The Common Helmeted Guinea Fowl. Wide collar, vinous grey. Naked skin on side of face, neck, chin and wattles red, rest of neck bluish. W. Africa and Cape Verd Islands. Twelve eggs (1·95 × 1·55), pale brown, thickly pitted red-brown.

*N. zechi.* 18½″. Allied to *N. meleagris*, but differs in having feathers of upper parts pale brown, spotted darker. W. Africa.

*N. coronata.* 20″. Large-helmeted Guinea Fowl. Bony helmet sloping backwards, basal part red. Naked skin on sides of head and neck pale blue. Wattle pale blue, tipped red. Feathers round base of neck banded black and white. E.S. Africa. Eggs 1·7 × 1·4.

*N. reichenowi.* 20½″. Differs from *N. coronata* in having helmet set vertically. Wattles crimson. E. Africa.

*N. marungensis.* 27″. Marunga Helmeted Guinea Fowl. Naked skin on sides of head and throat flesh colour. Black and white bands of neck continued on the chest. W. Africa.

*N. cornuta.* 21½″. Damaraland Helmeted Guinea Fowl. Helmet nearly cylindrical. Naked skin of face blue. Wattles blue, tipped scarlet. W.S. Africa. Fifteen to twenty eggs, pale buff, speckled grey.

*N. mitrata.* 20″. Helmet conical. Top of head scarlet. Naked skin on sides of head and neck blue. Wattles blue, tipped red. E. Africa. Eggs (1·9 × 1·4) pale brown, blotched and spotted pale red.

*N. ptilorhyncha.* 19″. Abyssinian Helmeted Guinea Fowl. Bunch of pale horny bristles at base of bill. Naked skin and wattles blue. Equatorial and N.E. Africa.

## Genus **GUTTERA.**

Crest of black feathers. Wattles small. Fold of skin at back of neck. Tail of sixteen feathers. Fifth primary slightly longest. Male without spur. Sexes alike. Plumage black, spotted pale blue. Outer webs of outer secondaries margined white. Four species.

*G. cristata.* 20″. The Black-collared Crested Guinea Fowl. Black collar at base of neck. Naked skin of head and neck cobalt. Chin and throat red. W. Africa.

*G. edouardi.* 20″. The Black-chested Crested Guinea Fowl. Black collar extending over whole chest. Naked skin of head and neck purple, black round eye, and yellowish on back of neck. S. Africa.

*G. pucherani.* 20″. The Curly-crested Guinea Fowl. No black collar. Naked skin of throat and neck red. Back and sides of head blue. Wattles red. E. Africa.

*G. plumifera.* 20″. The Straight-crested Guinea Fowl. Crest of thin, straight feathers. Naked skin bluish purple. W. Africa.

## Genus **ACRYLLUM.**

Head and upper neck naked. Band of feathers from ear-coverts round nape. Plumage long and hackled. Tail of sixteen feathers, mid-pair lengthened. Sixth primary slightly the longest. Tarsus in male with four or five knobs. One species.

*A. vulturinum.* 30″. The Vulturine Guinea Fowl. Nape-band velvety red-brown. Long hackles of neck, mantle, chest white, edged black and margined blue. Breast and belly blue. Naked skin blue. E. Africa. (O.G. ii. 84–102.)

## Subfamily PHASIANINÆ.

First primary considerably shorter than tenth (*Phasianus* and *Calophasis* excepted). Tail shorter or longer (often much longer) than wing. Sides of head feathered or entirely naked. (If first flight-feather is longer than the tenth, then the tail is always considerably longer than the wing; *Calophasis* ♀ excepted). Most typical Pheasant wing is found in *Argusianus argus*, where first flight-feather is shortest and tenth longest.

| | | |
|---|---|---|
| Tail longer than wing in both sexes (*Pavo* ♀ and *Calophasis* ♀ excepted) | PAVO | PEA-FOWL. |
| | POLYPLECTRUM | PEA-PHEASANTS. |
| | CHALCURUS* | PEA-PHEASANTS. |
| | ARGUSIANUS | PEA-PHEASANTS. |
| | RHEINARDTIUS* | PEA-PHEASANTS. |
| | CROSSOPTILUM | EARED PHEASANTS. |
| | LOBIOPHASIS* | WATTLED PHEASANTS. |
| | CATREUS | CHEER PHEASANTS. |
| | CHRYSOLOPHUS | GOLDEN PHEASANTS. |
| | PHASIANUS | TRUE PHEASANTS. |
| | CALOPHASIS | BARRED-BACKED PHEASANTS. |
| Tail longer than wing in ♂ and as long as wing in ♀ | GENNÆUS | KALIJ PHEASANTS. / SILVER PHEASANTS. |
| Tail longer than wing in ♂ and shorter in ♀ | GALLUS | JUNGLE-FOWL. |
| Tail slightly longer than wing in ♂ and shorter in ♀ | PUCRASIA | KOKLASS PHEASANTS. |
| Tail not longer than wing in ♂, shorter in ♀ | TRAGOPAN | HORNED PHEASANTS. |
| Tail shorter than wing in both sexes | LOPHURA | FIREBACK PHEASANTS. |
| | ACOMUS* | FIREBACK PHEASANTS. |
| | LOPHOPHORUS | MONAL PHEASANTS. |
| | ITHAGENES | BLOOD PHEASANTS. |
| | GALLOPERDIX | SPUR-FOWL. |
| | BAMBUSICOLA | BAMBOO PHEASANTS. |
| | PTILOPACHYS* | STONE PHEASANTS. |
| | OPHRYSIA | PIGMY PHEASANTS. |

## Subfamily PHASIANINÆ. PEA-FOWL, PHEASANTS, JUNGLE- AND SPUR-FOWL.

First flight-feather considerably shorter than tenth (*Phasianus* and *Calophasis* excepted). Tail shorter or longer (often much longer) than wing. Sides of head feathered or entirely naked. If first flight-feather is longer than tenth, then tail is always longer than wing (*Calophasis* ♀ excepted). Most typical form of Pheasant wing is in *A. argus*, where the first flight-feather is shortest and tenth longest.

* Not represented in India.

## Genus **PAVO.**

*Pavo* = proper name = Peacock; the same as Greek ταὼς, Anglo-Saxon *pawa*, English *Peafowl*. Argus, king of Argos. As he had one hundred eyes, of which only two were asleep at one time, Juno set him to watch Io, whom Jupiter had turned into a heifer; but Mercury, by order of Jupiter, slew him, by lulling all his eyes asleep with the sound of his lyre. Juno put the eyes of Argus on the tail of the Peacock, a bird sacred to her divinity.

Tail of twenty feathers. Occipital crest-feathers long and erect in both sexes. Upper tail-coverts lengthened and beautifully ocellated, forming a "train." Males with one spur on each tarsus. Short spur in females. Polygamous. Roost on trees.

The short, stiff feathers fixed in the uropygium represent the true tail, and serve as a fulcrum to raise and support the long and heavy train. When this train is erect only the head and neck of the bird appears in front of it, which would not be so if these long feathers sprang from the rump as in Turkeys (W.H.K.). Found wild in India, Indo-Chinese countries, and part of Malaya.

### 9. **Pavo cristatus.** The Common Pea-fowl.

*Cristatus* = formed with a tuft or crest, *crista*.

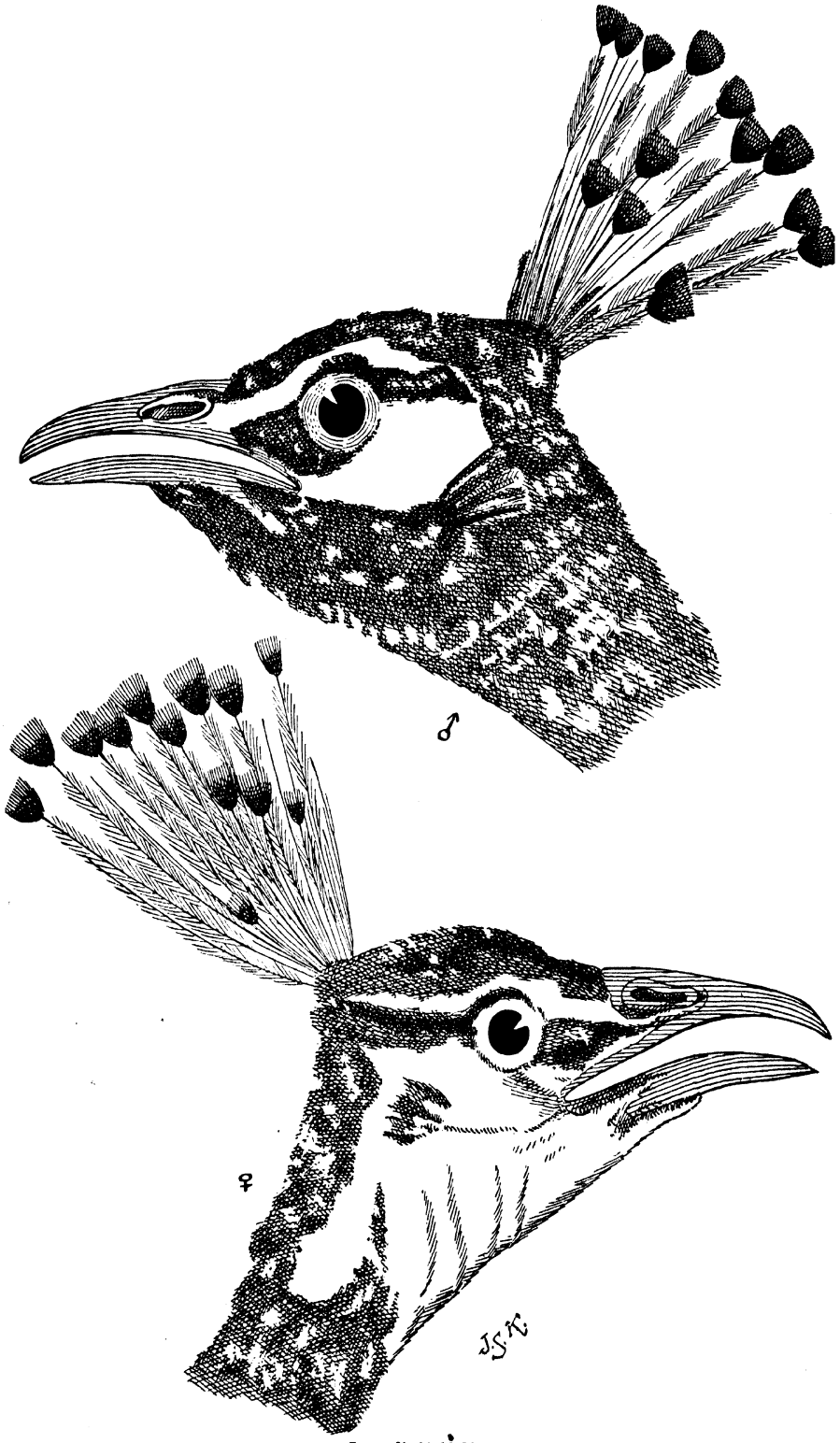
**Mor,** *India;* **Mujur,** *Terai;* **Myl** (Tamil); **Nimili** (Telegu); **Nowl** (Canarese); **Monara,** *Ceylon;* **Moir,** *Assam;* **Mabja** (Bhutia); **Mong-yung** (Lepcha); **Dodé,** *Garo Hills.*

♂ 42″ to 48″ to end of true tail, train 40″ to 48″; 9 to 11¼ lbs. ♀ 36″ to 40″, tail 12″ to 15″; 6 to 8½ lbs. Legs grey-brown. Bill horny brown. Facial skin white. Crest of twenty-four feathers, naked shafts, webbed at tips. Head, neck, and breast purple. Above green. Lesser and median wing-coverts, shoulder-feathers and inner secondary quills buff, barred and mottled black, glossed green. Primaries and tail chestnut. Train green. Thighs buff. Abdomen black.—*Female:* Head and nape chestnut. Above light brown, with faint wavings. Tail light brown, tips white.

"Cases of gradation are important, as they show that it is at least possible that highly complex ornaments may have been acquired by small successive steps."—*Darwin.*

The feathers of the Peacock are excellent examples of gradation in ornament, showing a gradual transition from a comparatively plain and simple feather merely marked with alternate dark and light bands and having no metallic lustre into the elaborate and gorgeous "eye-bearing" feather, one of the most beautiful objects in the world. Similarly there is a retrograde transition from the fully developed eye-bearing form of the elongated central tail-coverts to the curiously modified feathers which complete the margin of the train. The terminal portion of one of the tail-coverts shows the beautifully coloured ocellus or eye surrounded above by the "transparent zone," an effect produced by the absence of the barbules on a limited portion of each of the barbs.

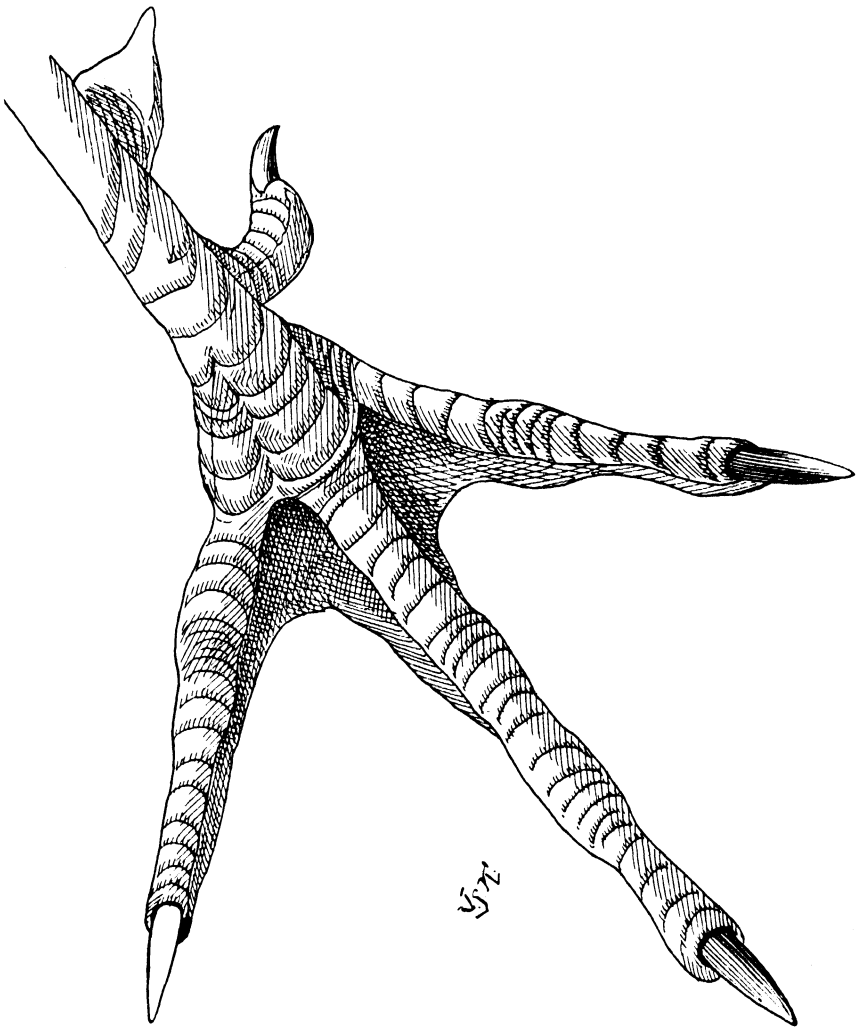
The Common Pea-fowl is distributed throughout India and Ceylon, ascending the Himalayas to 2,000 feet and the hills in Southern India to 5,000 feet. It inhabits the whole Assam valley up to Sadiya, but none are found in Sylhet, Cachar, or Manipur. Males moult about September in N. India, and the train




Larsauli, 28.10.89.

is not fully grown till April. Six or fifteen eggs (2·74 × 2·05), unspotted, glossy, closely pitted, white to reddish buff in colour. (J. 803. B. 1324.)

Also *P. nigripennis*, the Black-shouldered P.F., differing from *P. cristatus* in having the lesser and median wing-coverts, shoulder-feathers, and inner secondary quills brownish black. Hitherto only observed among birds in captivity, and supposed to be a reversion to the ancestral type. It is not known if this form ever occurs among wild Indian birds. (O.G. ii. 81.)



9. Larsauli, 28.10.89.

**10. Pavo muticus.** THE BURMESE PEA-FOWL.

*Mŭtĭcus* = curtailed or docked.

**Doun, Doung** (Burmese); **Marait** (Talain); **Tusia** (Karen); **Bourong marah**, *Malay.*

♂ 40″ to 48″, train 24″ to 44″; 8½ to 11 lbs. ♀ 36″ to 44″, tail 16″. Legs horny brown. Bill greyish. — *Male:* Long crest of ten or more feathers regularly barbed from base. Blue crown. Facial skin blue, fringed beneath

with chrome-yellow. Neck-feathers olive-bronze, with purple and green centres and narrow black borders. Lesser wing-coverts, tertiaries, and their coverts and scapulars of uniform colour and unbarred. Thighs black.—*Female:* Neck as in the male. Back and rump brown, barred and mottled buff. (H. & M. i. 93).

Found wild in Chittagong and Aracan, Burma to Siam, Cochin China, Malay Peninsula, and Java. Sumatra doubtful. Eggs similar to those of *P. cristatus*. The train begins to grow at the autumn moult, and attains its greatest development by December. (B. 1325. O. 58.)

Note.—The tail is longer than wing in both sexes of the following, viz. *Polyplectrum*, *Argusianus*, *Crossoptilum*, *Catreus*, *Phasianus*, and *Chrysolophus*.

## Genus **POLYPLECTRUM.**

πολύς = many, πλῆκτρον = an instrument to strike with, a quill.

Crown-feathers soft and hair-like. Tail long, full and rounded, of twenty to twenty-four feathers. Each tail-feather beautifully adorned with one or a pair of metallic green or pink ocelli. These ocelli are rudimentary or absent in some females. Two or three spurs on each tarsus in males. Found in Indo-Chinese countries and the Malay Archipelago. None occur W. of Bay of Bengal.

### 11. **Polyplectrum chinquis.** The Grey Pea-Pheasant.

**Dounkalah,** *Aracan and Pegu;* **Munnowar, Deyodahuk,** *Assam;* **Deodurug,** *Garo Hills;* **Kat-mor,** *Chittagong;* **Shwe-doun,** *Burma.*

♂ 24½″ to 26″, tail 12½″ to 14″; 1½ to 1¾ lbs. ♀ 19″, tail 8″; 14 oz. to 1 lb. Legs plumbeous. Bill horny brown. Spots grey-white on grey-brown ground. White chin. Facial skin pale yellow. Crest brush-like.—*Male:* Plumage brown, dotted white, with glossy violet ocelli, edged with successive rings of black, brown, and grey. Tail-coverts and tail with divided pairs of greenish purple ocelli, one on each side of the shaft.—*Female:* Head and neck dark brown, finely barred. Black, blotchy ocelli. Primaries and greater coverts liver-brown. Back, rump, and upper tail-coverts minutely pencilled buff-brown. Breast and abdomen hair-brown, minutely speckled. Ocelli on central tail-feathers rudimentary, on outer tail-feathers obscure, and on upper tail-coverts absent. (S.F. i. 36; H. & M. i. 110.) Found from Sikkim to Assam, throughout Burma (except Pegu) to Mergui and Siam. Eggs (2 × 1·44) buff. (B. 1327.)

### 12. **Polyplectrum germaini.** Germain's Pea-Pheasant.

♂ 20″. ♀ 18½″. General colour black-brown, irregularly spotted light brown. Head, back of neck black, each feather barred white. Back, wing, and tail-coverts with metallic spots, lustrous green and rich purple. Primaries dark brown. Bill black. Feet black. (S.F. vii. 426.)—*Male:* Like *P. chinquis*, but the spots above are smaller and closer together. No white on throat. Facial skin crimson.—*Female:* Ocelli on mantle and upper tail-coverts comparatively well marked. Scapulars bordered with narrow black and buff bands. Found in Cochin China. (O.G. ii. 64.)

### 13. Polyplectrum bicalcaratum. The Malayan Pea-Pheasant.

*Calcar, aris* = a spur.

**Quon-chermin** (Malay).

♂ 20½″. ♀ 18″. Legs dusky. Bill blackish. Spots hair-brown on buff ground. Orbital space red. (S.F. i. 36. H. & M. i. 114.) *Male:* Violet crest. Only mid-tail and longer upper tail-coverts with pairs of ocelli, confluent and not divided. Outer tail-feathers with only one ocellus on outer web.—*Female:* Feathers of mantle and wings with black blotch near tip. Mid-tail with paired ocelli; no ocelli on outer tail. Range from Malay Peninsula and Sumatra to S. Tenasserim. (O.G. ii. 65.)

*P. schleiermacheri.* ♂ 20″. ♀ 14″. The Bornean P.P., allied to *P. bicalcaratum*, but feathers on sides of neck and chest with heart-shaped metallic spots of golden green.—*Female:* No ocelli on longer upper tail-coverts.

*P. napoleonis.* ♂ 19″. ♀ 14½″. Elongate crest dark green. Longer upper tail-coverts and tail with pair of bluish green ocelli, each framed in a black and grey ring. White triangular patch on each side of head.—*Female:* Crest well developed. No ocelli on long upper tail-coverts. Palawan Island.

Also the genus *Chalcurus*, an aberrant type from Sumatra, with tail of sixteen feathers, as in *Phasianus*, with no ocelli. Sides of face feathered. Male with two or more pairs of spurs. Sexes alike.

*C. chalcurus.* ♂ 18″. ♀ 15¾″. General colour brown. Above barred and fringed rufous. Throat and neck with white shaft streaks. (O.G. ii. 66–69.)

## Genus **ARGUSIANUS.**

*Argus*, king of Argos, had one hundred eyes, of which two only were asleep at one time. Juno put the eyes of Argus on the tail of the Peacock, a bird sacred to her divinity.

Tail of twelve feathers, mid pair elongated. Most typical form of Pheasant wing where first primary is shortest and tenth longest. Secondary quills largely developed, marked with ocelli, and longer than primaries in both sexes. Sides of face, throat, and foreneck naked. Short hairy occipital crest. No spurs. These birds never live in pairs, the female visiting the male.

### 14. Argusianus argus. The Argus Pea-Pheasant.

**Quon** (Malay); **Kyek-wah**, *Siam.*

♂ 70″ to 73″, tail from vent 49″ to 52″; 4½ to 5½ lbs. ♀ 27″ to 30″, tail from vent 12½″ to 13″; 3¼ to 3¾ lbs. Legs bright red. Bill white. Facial skin dull pale indigo.—*Male:* Mantle black, mottled buff. Back and rump buff, with rounded black spots. Secondary quills with a row of large ocelli on outer webs. These eye-like spots are remarkable, and resemble balls lying loosely in sockets. The series of feathers in the wing show gradation in ornament from the more ordinary forms of feather marking, through what Darwin calls the "elliptic ornaments" of the smaller feathers, up to the perfect "ball-and-socket ocelli" on the larger quills.—*Female*: Primary quills chestnut, irregularly marked with black. No ocelli on wings. Seven or eight eggs (2·6 × 1·9), creamy, speckled red-brown. Range from Malay Peninsula to Siam and S. Tenasserim. (B. 1326. O. 59.)

Also *A. grayi.* ♂ 60″. ♀ 29″. Differs from *A. argus* in having mantle and wing-coverts mottled, white, and rufous. Lower back and rump rufous-buff.—*Female:* Neck rust-red. Below sandy brown. Borneo.

*A. bipunctatus.* Wood's Argus Pheasant. Primary with red-brown band minutely dotted white on both webs. Range unknown.

Also the genus *Rheinardtius*, the Crested Argus Pheasant from Tonkin. One species.

*R. ocellatus.* ♂ 84″. ♀ 31″. General colour dark brown, mixed rufous, thickly spotted and marked white.—*Female:* Amber-brown, transversely mottled black and buff.

## Genus **CROSSOPTILUM.**

κροσσύς = shaggy hair, a tuft of hair; πτίλον = a feather.

Tail longer than wing, of twenty to twenty-four feathers, mid pair elongated, webs long and decomposed. Sides of face naked, red, and covered with small papillæ. Ear-coverts forming long white tufts. Sexes alike. Male with short, stout spurs. Found in companies. Roost on trees.

### 15. Crossoptilum tibetanum. Hodgson's Eared Pheasant.

♂ 38″ to 40″, tail 19″ to 20″. Legs bright red. Bill dull red. Eye-patch and cheek red. Crest-feathers black, short, erect, velvety, and thick-set. Sixth quill longest. Twenty tail-feathers, satin-green or black. Neck, back, and abdomen yellowish grey-white. Plumage ample, unglossed, and wholly dishevelled. (H. and M. i. 115). Found in the mountains of W. China and E. Tibet, from 10,000 to 12,000 feet.

Also *C. leucurum.* The White-tailed Eared Pheasant. Distinguished from *C. tibetanum* in having greater part of tail white, tipped black.—*Female:* Tail white, margined and tipped grey. E. Tibet.

*C. manchuricum.* ♂ 40″. The Manchurian Eared Pheasant differs from *C. tibetanum* in having mantle brownish black and an indistinct white band across crown. Tail twenty-two feathers, basal part dirty white, tips brownish.—*Female:* No spurs. The feathers formerly worn by Tartar warriors. Twelve to sixteen eggs (2·3 × 1·7), pale stone colour. Time of incubation twenty-eight to thirty days.

*C. auritum.* 40″. Pallas's Eared Pheasant. Mantle slate-blue. An indistinct white band bordering black crown behind. Tail twenty-four feathers. Kokonor, Kansu, and N.W. Szechuen. Five to seven eggs (2·6 × 1·6), olive-grey.

*C. harmani* resembles *C. auritum*, but with a wide white band bordering the crown behind and without any white on basal part of outer tail. Tail twenty-four feathers (?). Tibet.

Also the genus *Lobiophasis*, the Wattled Pheasants. Tail-feathers, ♂ thirty-two, ♀ twenty-eight, by far the largest number in any of the *Phasianidæ*. Sexes differ. In males, head naked with three pairs of wattles: one pair large and erect on sides of head, a second pair large and drooping on sides of throat, and a third pair small on sides of bill. Pair of spurs.

*L. bulweri.* ♂ 35″. ♀ 20″. Bulwer's Wattled Pheasant. Neck and chest crimson. Plumage black, margined blue. Naked skin and wattles blue. Tail white.—*Female:* Brownish buff, mottled black. Tail chestnut. Sarawak. (O.G. i. 248–257.)

## Genus **CATREUS.**

Occipital crest of long narrow feathers in both sexes. Tail eighteen feathers, long and wedge-shaped; longer than wing in both sexes. Sides of face naked, crimson. Males have one spur on each tarsus, and females sometimes a knob.

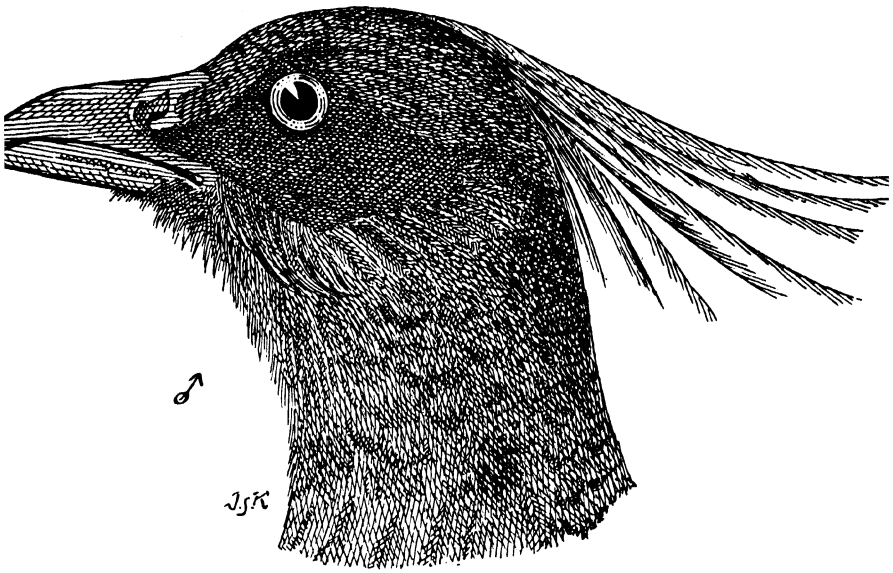
### 16. Catreus wallichi. The Cheer Pheasant.

**Kahir, Chihir,** *Nepal;* **Cheer,** *Kumaon;* **Bunchil,** *Mussoorie;* **Chaman,** *Chamba.*

♂ 34″ to 40″, tail from vent 20″ to 23″; 3 to 3½ lbs. ♀ 24″ to 30″, tail from vent 13½″ to 15½″; 2 to 3 lbs. Legs brown. Bill pale horny. Head dark ashy, with crest of hair-like feathers. Chin, throat, and cheeks pale ashy. Nape, breast, shoulders, back, and wing-coverts yellowish, with curving black bars

tipped white. Tail long, barred and blotched; below dusky.—*Female:* Resembles male, but more closely marked. Back minutely mottled. Chin plain, Throat and breast-feathers yellowish, centred dark brown. Above, the dusky oval spots are separated by the white shaft.

Found from Khatmandu to Chamba at from 4,000 to 10,000 feet. Breeds from April to June. Nine to fourteen eggs (2·13 × 1·5), pale stone colour, slightly speckled. (J. 809. B. 1333. O. 60.)



R. Le M., Mussoorie, 1864.

Also the genus *Chrysolophus*, the Golden Pheasants with tail longer than wing in both sexes. Tail eighteen feathers, vaulted, and mid pair very long. Males with full crest of heavy feathers, and a cape-like development of erectile feathers. Pair of spurs. Two species, viz.—

*C. pictus.* ♂ 40″. ♀ 24″. The Golden Pheasant. Deemed by Cuvier to be the type of Phœnix of the ancients. Crown, crest, and rump golden. Cape-like feathers, orange, tipped black. Eye-ring entirely feathered. Breast crimson. Mid-tail black, with rounded, pale brown spots.—*Female:* Head and mantle brown, barred black and buff. Lower back and rump pale brown, mottled black. S. and W. China. Eggs (1·75 × 1·35) creamy buff. Hybrids with the Bantam, the Common and Reeves' Pheasant.

*C. obscurus.* A domestic variety of Golden Pheasant, differing from *C. pictus* in having mid-tail pale brown, obliquely barred, and marked black.

*C. amherstiæ.* 50″. Lady Amherst's Pheasant. Top of head bronze-green, crest blood-red. cape-like feathers, white. Eye-ring naked and coloured blue. Breast white, barred black on flanks. Mid-tail white, with black bars on both webs. W. China and E. Tibet. Eggs (1·8 × 1·4) pale buff. (O.G. ii. 45-47.) A male bird of this species was recently shot in the Myitkyina or the Bhamo district. (O. ii. 497.)

## Genus **PHASIANUS.**

*Phāsiānus* = *φασιανός*, the Phasian bird in Aristophanes; from the River Phasis, in Colchis, whence it is said to have been first brought by the Argonautic expedition.

True Pheasants. Tail longer than wing in both sexes, eighteen feathers, long and wedge-shaped. Wing exceptional, as first flight-feather is considerably longer than tenth. No crest. Males have lengthened ear-tufts, facial skin naked red, and a spur on each tarsus. Range from Eastern Europe to Japan. Not repre-

sented in Himalayas, but two species are found in Manipur and Burma. Crowns green, or red-brown, or white. With no white neck-ring, or with traces of one, or with white neck-ring. The ringed forms may be regarded as the northern, and those without a neck-ring as the southern type. Lower back, rump, and upper tail-coverts maroon glossed green on slate-grey, with nest-coloured patches on each side (*P. versicolor* excepted). All maroon-rumped species are found W. of about 90° E. long., while those with grey rumps are only found E. of this line. Most of the Pheasants in England are hybrids between *P. colchicus* with maroon rump and no neck-ring and *P. torquatus* with grey rump and white neck-ring.

The various species may be distinguished as under—

A. With crown green. Lower back, rump, and upper tail-coverts slate-grey, with rust-coloured patches on each side.

(i.) *With no white neck-ring, or only traces of one.*

**17. Phasianus elegans.** STONE'S TRUE PHEASANT.

♂ 27½″. ♀ 21″. Legs lead colour.—*Male:* Head, neck, and breast dark green. Mantle chestnut. Lower back and rump dark green, broadly edged with grey. Upper tail-coverts greenish grey, with outermost on each side rusty red. Tail rufous-brown, cross-barred black. Lower plumage steel-blue.—*Female:* Above black, edged grey. Below buff, speckled and banded blackish. Tail rufous, irregularly barred black. From Szechuen in S. China, Yunnan, and N. Shan States. (B. 1332. O. 61.)

Also *P. decollatus.* ♂ 34″. ♀ 25″. The Chinese Ringless Pheasant from W. China, similar to *P. torquatus*, but the white ring is absent in typical examples, though some show traces of a white ring. Crown of head and margins of breast-feathers dark green. Flank-feathers buff. Chest orange-red.

*P. strauchi.* ♂ 36½″. ♀ 23½″. Chest and sides orange-red. N.W. Kansu.

*P. vlangalii.* ♂ 31½″. ♀ 22½″. Differs from *P. elegans* in having mantle and scapulars sandy red. Sides and flanks golden. Tsaidam to Kokonor.

*P. versicolor.* ♂ 29″. ♀ 24″. The Japanese Pheasant. Below uniform dark green, and no rust-red patches on sides of rump. Mantle dark green, with concentric lines of buff.

(ii.) *With white neck-ring.*

*P. torquatus.* ♂ 35″. ♀ 24½″. The Chinese Ring-necked Pheasant. Mantle and flanks orange-buff. Scapulars margined Indian-red. From Lower Amoor to Canton.

*P. satscheunensis.* Paler form of *P. torquatus.* Scapulars margined sandy brown. Chest and below margined purple-green. Satschen.

*P. formosanus.* The Formosan Ring-necked Pheasant differs from *P. torquatus* in having ground colour of mantle and flanks pale primrose.

B. With crown green. Lower back, rump, and upper tail-coverts maroon, glossed green.

(iii.) *With no white neck-ring, or only traces of one.*

*P. colchicus.* The Common Pheasant from Asia Minor. ♂ 37½″. ♀ 24½″.—*Male:* Head and neck dark green. Mantle, chest, breast, and flanks fiery orange, margined purplish green. Below dark brown, mixed rufous. Tail olive, edged rufous, with narrow black bars wide set.—*Female:* Sandy brown, barred black. Mantle, sides of breast and flanks chestnut, with black centres and grey margins. Evidence tends to show that in a really wild state the genus *Phasianus* is monogamous. Barren females generally assume male plumage. Eight to twelve eggs (1·8 × 1·4), olive-brown or bluish green.

*P. talischensis.* Intermediate between *P. colchicus* and *P. persicus.* Wing-coverts sandy brown. Feathers of chest and breast narrowly margined purple. Talisch, a district S.W. of Caspian Sea.

*P. persicus.* ♂ 35″. The Persian Pheasant differs from *P. colchicus* in having lesser and median wing-coverts nearly white.

*P. principalis.* The Prince of Wales' Pheasant, from N.W. Afghanistan and N.E. Persia. ♂ 35½″. With greater part of wings white. Rump bronze-red. Skins brought to England by Dr. Aitchison, and some live specimens by Major Peacocke, R.E., of the Afghan Boundary Commission, from Bala Murghab in 1884, at the request of Sir Peter Lumsden.

*P. zarafshanicus.* The Zarafshan Pheasant from Bokhara, allied to *P. principalis*, but scapulars are not margined with dark greenish purple, and breast-feathers have narrow, heart-shaped, purplish margins, as in *P. persicus*. Breeds and nests in reed swamps and marshes.

*P. shawi.* ♂ 35½″. ♀ 23½″. Differs from *P. colchicus* in having lesser and median wing-coverts white. Chest and breast edged dark green. Mid-breast and sides dark green. Yarkand and Kashgar. Twelve to fifteen eggs (1·74 × 1·41), grey-stone colour.

*P. tarimensis.* 30½″. The Tarim Pheasant, closely allied to *P. shawi*, but lesser and median wing-coverts are yellowish brown. Feathers of chest and sides without marginal bands. Karaschar to Lob-nor.

*P. chrysomelas.* ♂ 34″. ♀ 24″. The Oxus Pheasant, distinguished from *P. shawi* by having a triangular dark green spot at tip of each feather of mantle, back, and rump. Chest, breast, and flanks tipped green. Amu-darya.

(iv.) *With broad white neck-ring.*

*P. mongolicus.* ♂ 36½″. ♀ 26″. The Mongolian Ring-necked Pheasant. Broad white ring (interrupted in front) round the neck. Resembles *P. persicus*, but mantle, chest, and breast are orange-red, glossed purple-carmine. Throat purplish red, breast and flanks tipped dark green. Mid-breast and sides of belly dark green. Syr-darya to Issikul.

*P. semitorquatus.* Severtzov's Ring-necked Pheasant, a subspecies similar to *P. mongolicus*, but mantle, rump, throat, chest, and upper breast are glossed dull oily green. Dzungaria.

C. With crown reddish brown.

*P. sæmmerringi.* ♂ 50″. ♀ 21″. Sæmmerring's Copper Pheasant. Lower back maroon. Breast and below chestnut. Japan. Eggs (1·8 × 1·35), greenish white.

*P. scintillans.* A variety of *P. sæmmerringi*, the feathers above margined on each side with a white black-edged band.

D. With crown white.

*P. reevesii.* ♂ 78″. ♀ 32″. Reeves' Pheasant. Crown white, surrounded by a wide black band. Chin, throat, and nape white, margined by black neck-ring. Above cinnamon, bordered black. Wing-coverts white, centred and margined black. Mid-tail very long, white down middle, barred black and chestnut, and margined brownish buff. Below black. N. and W. China. Hybrids with the Golden Pheasant. (O.G. ii. 6–40.)

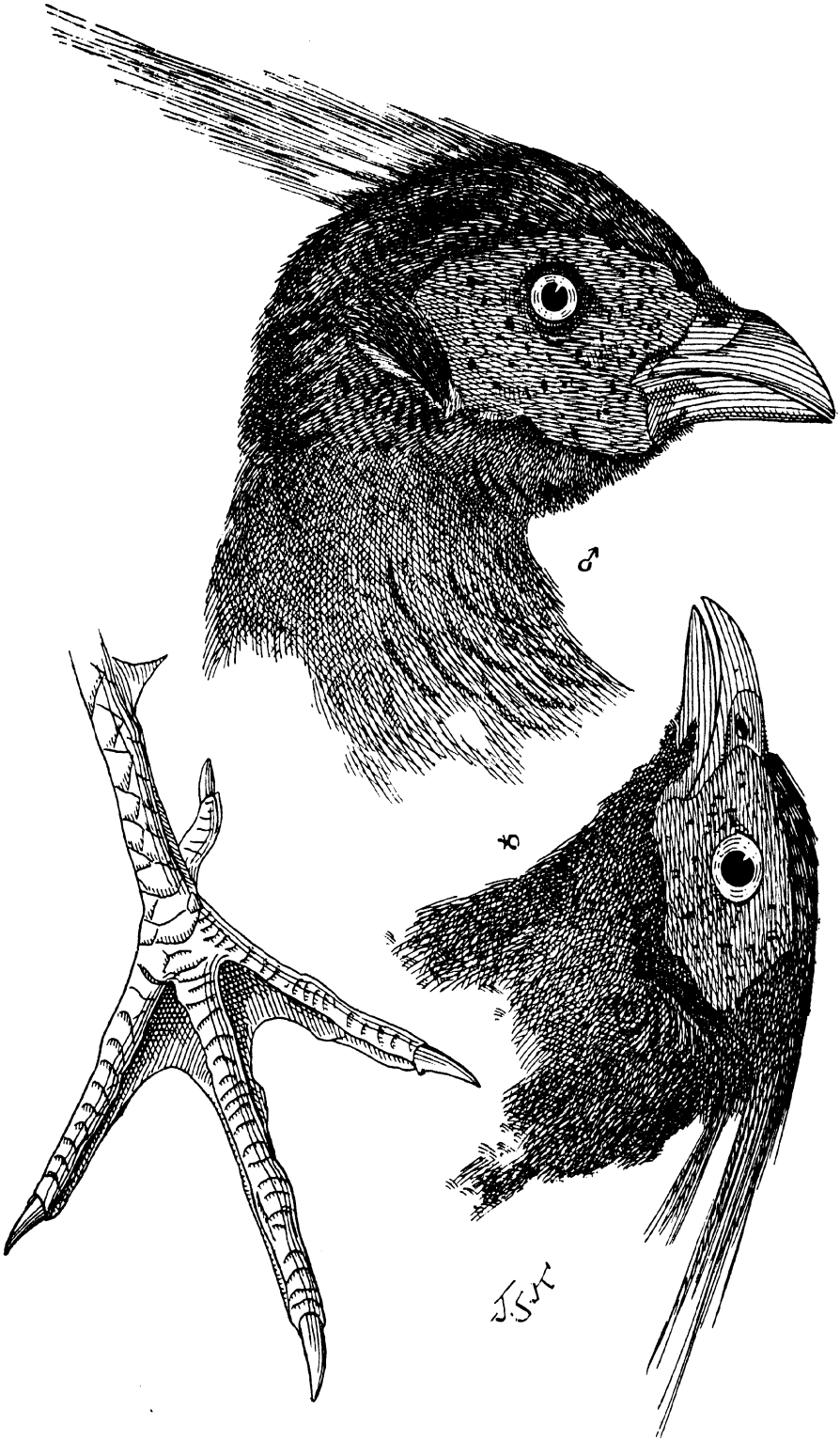
## Genus **CALOPHASIS.**

As in *Phasianus*, but with only sixteen tail-feathers. Males have lower back and rump transversely barred black and white. No ear-tufts. In females the tail is shorter than the wing.

### 18. Calophasis humiæ. Mrs. Hume's Barred-backed Pheasant.

Loi-nin-koi, *Manipur.*

♂ 33″. ♀ 22″. Bill greenish. Legs drab.—*Male:* Upper mantle and upper breast glossy blue-black, each feather with triangular black velvet spot. Lower mantle and lower breast maroon with similar spots. Back and rump pale blue, narrowly fringed white. Closed wing maroon with broad blue-black band with white band on either side. Mid-tail grey, barred black and chestnut.—*Female:* Brown blotched with black, each feather of mantle with triangular white mark. Wing-bar imperfect, mixed chestnut. Mid-tail and next four pairs barred chestnut. From Manipur and Upper Burma. (B. 1331. O. 62.)




20. Theog, 1.9.89.

**19. Calophasis burmannicus.** The Burmese Barred-backed Pheasant.

**Yit,** *Burma.*

Mantle maroon. Rump black, each feather broadly margined white. Wing-bar imperfect, mixed chestnut. Mid-tail and next four pairs distinctly barred chestnut. (O. 63.)

Also *C. ellioti.* Elliot's Pheasant from S.E. China. ♂ 32″. Sides of neck and belly white. ♀ 20″. Throat and foreneck black. Eggs (1·7 × 1·3) creamy buff. (O.G. ii. 41.)

Note.—In *Gennæus* the tail is longer than the wing in males, and as long as the wing in females.

## Genus **GENNÆUS.**

Crest long and hairy, of unequal feathers in both sexes. Tail longer than wing in males and equal to the wing in females; of sixteen feathers, long and laterally compressed like that of the game fowl. Sides of head naked, crimson, in both sexes, with additional lappet in males. Male with spur on each tarsus. Forest birds, inhabiting the Himalayas, Burma, China, and Formosa. They may be separated into Kalij and Silver Pheasants, viz.—

### KALIJ PHEASANTS.

With upper plumage black, fringed white or black. Plumage lanceolate (*G. horsfieldi* excepted).

**20. Gennæus albicristatus.** The White-crested Kalij Pheasant.

**Kalij,** *Kumaon;* **Kookera,** *Mussoorie;* **Kaleysur,** *Kulu;* **Kolsa,** *Punjab.*

♂ 24″ to 29″; 2½ lbs. ♀ 20″ to 23″; 1¼ to 2¼ lbs. Legs grey-brown. Bill greenish.—*Male:* Head, neck, upper back, wings, and tail blue-black. Crest long, white, and hairy. Lower back and rump black, broadly fringed dull white. Eye-patch crimson. Throat and breast hackled light grey; below long grey hackles with white shafts.—*Female:* Light brown, with each feather fringed white-brown and showing shaft white. Chin whitish. Tail except mid pair glossy black.—*Young* assume full plumage in first year. In the Himalayas from Kumaon to Hazara, not W. of Indus or in Nepal. Breed from April to June. Eight or nine eggs (1·94 × 1·44), cream-white to reddish buff, glossy and finely pitted. (J. 810. B. 1336.) See illustration, p. 76.

**21. Gennæus leucomelanus.** The Black-crested or Nepal Kalij Pheasant.

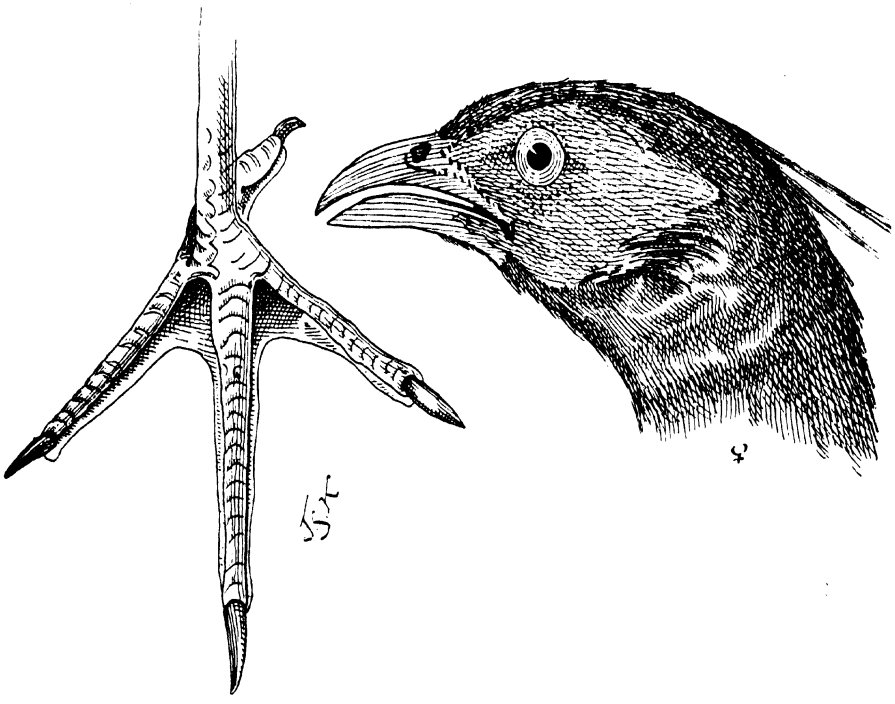
**Kalich, Rechabo,** *Nepal.*

♂ 23″ to 26″, tail from vent, 10¾″ to 12″; 1¾ to 2½ lbs. ♀ 19″ to 20½″; 1¼ to 2 lbs. Legs brown. Bill greenish. Orbital skin crimson. Small black crest.—*Male:* Rump and upper tail-coverts dark green, white-tipped. Feathers of throat and breast grey-white and lanceolate. Lower plumage variegated, not black.—*Female* as in *G. albicristatus*, but generally darker and middle rectrices more rufous. Throughout Nepal. Usually seen in pairs, or in parties of from three to ten. (H. & M. i. 191. B. 1337. O.G. i. 262. O. 68.)

### 22. Gennæus melanonotus. The Black-backed Kalij Pheasant.

**Muthura** (Bengali); **Kirrik** (Bhutia); **Kar-rhyak** (Lepcha).

♂ 21″ to 25″, tail from vent 9½″ to 12⅓″; 2¼ to 3 lbs. ♀ 15″ to 21″, tail from vent 8″ to 8¾″; 2 to 2¼ lbs. Legs horny brown. Bill pale yellow. Crest black. Orbital skin bright red.—*Male:* Above glossy black. No white on rump. Breast hackled white. Abdomen dull black.—*Female:* Brown, with feathers white-shafted, tipped grey on back, and broadly edged white below. From E. Nepal to Bhutan. Six to ten eggs (1·91 × 1·47), creamy white to brownish. (J. 811.)



Pedong, 7.6.88.

### 23. Gennæus horsfieldi. The Black-breasted Kalij Pheasant.

**Doreek,** *Debrugurh;* **Durug,** *Garo Hills;* **Muthoora,** *Sylhet;* **Mathura,** *Chittagong.*

♂ 23″ to 24½″; 2½ to 3 lbs. ♀ 21″ to 22½″; 2 to 2½ lbs. Legs plumbeous. Bill greenish. Orbital skin crimson.—*Male:* Crest black. Entire lower surface and neck-feathers rounded, not lanceolate, black, with blue-black patches. Lower back, rump, and upper tail fringed white. Coverts and long scapulars white-tipped.—*Female:* Mid-tail plain rufous. Breast-feathers with narrow buff shaft lines. From Bhutan to S. Manipur and Bhamo. Breeds from March to June. Eight or ten eggs (1·85 × 1·5), buff. (H. & M. i. 197. B. 1339. O. 70.)

## SILVER PHEASANTS.

With upper plumage vermicellated or irregularly marked white or buff. Plumage ordinary, not lanceolate.

**24. Gennæus lineatus.** The Vermicellated Kalij Pheasant.

*Lineo, avi, atum* = to fashion to a straight line.

**Yit, Kayit** (Burmese); **Phoogyk** (Karen); **Rak,** *Aracan;* **Synklouk** (Talain).

♂ 25½″ to 30″; 2½ to 3 lbs. ♀ 20″ to 24″; 2 to 2½ lbs. Legs pinkish brown. Bill greenish horny. Facial skin blood-red.—*Male:* Crest black. Above, and nearly whole tail, black, finely zigzagged white; inner webs and tips of mid-tail feathers entirely white. No white fringes on rump. Chin and throat black. Below black, with white shafts.—*Female:* Above pale olive-brown, with white across head, and with bars on side of neck. Neck and mantle with arrow-headed white marks. Below chestnut, with white shafts. Found in the greater part of Burma and N.W. Siam. Breeds in March or April. Six or seven eggs (1·97 × 1·46), pale buff. (S.F. iii. 166. B. 1340. O. 75. O.G. i. 272.)

**25. Gennæus andersoni.** Anderson's Silver Pheasant.

**Yit,** *Burma.*

Oates says (p. 337) that this bird is described by Ogilvie-Grant (i. 271) as *G. davisoni.* ♂ 24″. Crest black. Mantle, upper back, and wing-coverts black, with several zigzag white lines following the margin of each feather. On wing-coverts usually three, and on mantle and upper back five or six such lines. Quills of closed wing black, obliquely barred white. Lower back and rump black, widely vermiculated white, each feather edged with a white fringe on a black band. Mid pair of tail-feathers black, with white lines more or less parallel to the shafts, the three outer pairs black. Below glossy black.—*Female:* Not known. Kachin Hills, E. of Bhamo. (O. 71.)

**26. Gennæus williamsi.** The Chindwin River Silver Pheasant.

**Yit,** *Burma.*

♂ 24″. ♀ 21″. Legs dark flesh colour. Facial skin crimson.—*Male:* Crest glossy black. Mantle, back, and rump coarsely vermiculated, across the shafts buff. Each feather of lower back and rump with a firm black band, fringed broadly white. Wing-coverts black, with five or six buff lines on each web parallel to the margin of feather. Tail black, obliquely barred buff. Below glossy blue-black.—*Female:* Upper plumage and wings red-brown, edged paler, and minutely freckled black. Throat ashy white. Below, ash-brown, edged grey, with grey shaft streak. Mid-tail chestnut, mottled, and barred black; intermediate feathers mottled and barred white; and the outermost pair black. Chindwin River, Upper Burma. (O. 72.)

**26a. Gennæus wickhami.** The Chin Hills Silver Pheasant.

**Yit,** *Burma.*

♂ 24″. Mantle and back finely but irregularly vermiculated, and speckled pale buff. Rump and upper tail-coverts plain black, broadly fringed white. —*Female:* Not known. Chin Hills, Upper Burma. (O. ii. 495.)

**27. Gennæus cuvieri.** The North Aracan Silver Pheasant.

**Rak,** *Aracan;* **Yit** (Burmese).

♂ 23″. ♀ 21″. Legs brown. Facial skin crimson.—*Male:* Crest glossy black. Upper plumage and closed wing blue-black, finely freckled buff across shafts. Each feather of rump and lower back with broad black band, broadly

fringed white. Tail with three outer pairs black, the others black with narrow oblique pale buff lines. Below glossy black. No white central stripes to any feathers.—*Female:* Back and wings olive-brown, closely freckled, edged paler. Mid-tail chestnut, dotted black, the outermost pair black. (H. & M. i. 201. O. 73. O.G. i. 271.)

### 28. Gennæus oatesi. The South Aracan Silver Pheasant.

**Yit,** *Burma.*

♂ 24″. ♀ 21″. Legs brown, facial skin crimson.—*Male:* Crest glossy black. Upper plumage and wing-coverts black with fine vermiculations across shafts. Closed wing obliquely barred white. Each feather of lower back and rump with narrow white fringe, but no black band. Mid-tail with outer web and half of inner web black with oblique white lines, the exterior half of inner web white; intermediate feathers black, diagonally barred white; outermost pair chiefly black. Lower plumage glossy black.—*Female:* Crest brown. Upper plumage and wing chestnut, minutely freckled black. Throat pale brown. Below red-brown with broad yellow shaft streak edged black. Central tail pale chestnut, closely barred black; outer tail deep chestnut, mottled black on inner webs. (O. 74. O.G. i. 276.)

### 29. Gennæus sharpii. The Salween Silver Pheasant.

**Yit,** *Burma.*

Oates says (p. 359) that this bird is described by Hume (i. 203) as *E. crawfordi*, and by Ogilvie-Grant (i. 276) as *G. andersoni* (see No. 25 *ante*).

♂ 30″; 2¾ lbs. ♀ 24″. Legs pink. Bill pale blue. Facial skin crimson.—*Male:* Crest glossy black. Upper plumage and wing-coverts black, each feather with five or six white lines on each web curved and parallel to the margin. Rump-feathers more finely marked than those of the back, but no fringe of white at the tips. Tail and lower plumage as in No. 24, *G. lineatus*.—*Female:* Differs from *G. lineatus* in having inner quills barred with narrow buff lines reaching to the shafts and broader white shaft stripes on lower plumage. (O. 76. H. & M., *E. crawfordi*, i. 203. O.G., *G. andersoni*, i. 276.)

### 30. Gennæus rufipes. The Ruby-mines Silver Pheasant.

**Yit,** *Burma.*

♂ 34″. Legs red, facial skin crimson. Crest glossy black. Upper plumage and wing-coverts white, each feather with four or five firm black lines on each web parallel to the margin. Closed wing black, with broad oblique white bars. Lower plumage glossy black. Tail-feathers obliquely barred black and white except inner web of mid pair, which is white.—*Female:* Not known. (O. 77.)

Also *G. nycthemerus*, the Chinese S.P. from S. China. ♂ 40″. ♀ 20½″. Crest black. Above white, with black concentric lines. Mid-tail pure white. Eggs (2·1 × 1·6), brownish buff, finely pitted.

*G. swinhoii.* Swinhoe's S.P. from Formosa. ♂ 29½″. ♀ 19½″. Crest, mantle, and mid-tail pure white. Eggs (2·4 × 1·7) buff, dotted white. (O.G. i. 277–279.)

Note.—In *Gallus*, *Calophasis*, and *Pavo* the tail is longer than wing in males and shorter than wing in females.

## Genus **GALLUS.**

*Gallus*=a cock.

Tail of fourteen to sixteen feathers, laterally compressed and curved downwards, mid pair elongated.—*Males:* High fleshy comb with margins serrated or entire. Sides of face, chin, and throat naked, with two pairs of wattles, or with single wattle. Long sharp spur on each tarsus. In females the comb is rudimentary; wattles absent. Tail uniform. No spurs. Forest birds; found singly, or in pairs, or in small parties. Found throughout the greater part of the Oriental region.

### 31. Gallus ferrugineus. The Red Jungle-Fowl.

*Ferrūgĭneus*=of the colour of iron-dust, dusky.

**Jungli-moorghi, Ban-moorghi,** *Upper India;* **Bunkokra,** *Sundarbans;* **Natsu-pia** (Bhutia); **Pazoktchi,** *Sikkim;* **Gera-gogor,** *Gondwara;* **Lall,** *Chanda;* **Taugyet,** *Burma;* **Ayamootan,** *Malay;* **Kura,** *Chittagong.*

♂ 25″ to 28″, tail from vent 11″ to 14″; 1¾ to 2¼ lbs. ♀ 16″ to 18″, tail from vent 5½″ to 6½″; 1⅛ to 1⅝ lbs. Tail of fourteen feathers. Bill and legs slaty brown.—*Male:* Flesh comb with serrated margin and wattles red. Gold hackles on head, neck, and breast, with black shaft streaks. Ear-coverts white. Back purple. Sides and upper tail-coverts orange. Inner quills of wing margined chestnut on outer web. Tail and wing-coverts black, glossed green. Below black. —*Female:* Yellow, minutely mottled dark brown, with white shaft streaks. Red throat line passing up behind ear. No comb or wattles. Tail dark brown, mottled at edges with buff. Below rufous, with pale shafts. In June hackles and long tail-feathers are moulted, and replaced by short black feathers, to be renewed again in the second moult in September. The natural range is throughout the Himalayas, from Assam to Kashmir, Malay, Sumatra, Siam, and Cochin China. Forsyth shows that their limit coincides with that of the sál tree. Five or six eggs (1·78 × 1·36), yellowish brown (see illustration of foot, p. 29). (J. 812. B. 1328. O. 78. O.G. ii. 48. H. & M. i. 217.)

### 32. Gallus sonnerati. The Grey or Madras Jungle-Fowl.

**Komri,** *Abu;* **Jungli-murghi,** *India;* **Pardah, Komri,** *Chandah;* **Kombadi,** *Deccan:* **Katu-Koli** (Tamil); **Koli,** *Mysore;* **Adavi-kode** (Telugu).

♂ 28″ to 32″, tail from vent 14″ to 16″; 1⅝ to 2½ lbs. ♀ 18″ to 20″, tail from vent 6″ to 7″; 1½ to 1¾ lbs. Legs yellowish. Bill yellowish. Tail fourteen feathers.—*Male:* Comb with serrated margin and wattles crimson. Grey hackles, with yellow spots; each feather blackish, with shaft white and two spots, the terminal one like wax. Ear-coverts rufous. Plumage black and grey, with white shafts. Wing-quills brown or black. Wing-coverts with oblong wood-brown spots.—*Female:* Above mottled brown. Breast white, fringed and marked with black, and without thick black cross-bars. Below black-brown, broadly centred pure white. Whole head feathered, except a space round the eye. No comb or wattles. Found in S. and W. India. Seven to thirteen eggs (1·84 × 1·38), buff. (J. 813. B. 1330. O. 79. O.G. ii. 55. H. & M. i. 232.)

### 33. Gallus lafayetti. The Ceylon Jungle-Fowl.

**Wali-kukula,** *Ceylon;* **Kada-koli** (Tamil).

♂ 19″ to 30″, tail from vent 8″ to 14″; 2⅛ to 2¼ lbs. ♀ 15″ to 17″, tail from vent 5″ to 6″; 1⅛ to 1⅜ lbs. Tail fourteen feathers. Legs pale yellow. Bill brown.—*Male:* Comb with serrated margin red; wattles purplish red with yellow

oval spot. Neck-hackles straw-yellow, dark shafted; those on lower back and rump with heart-shaped spot of glossy violet. Chest and sides orange, with maroon central band. Belly black, mottled chestnut. Tail purplish black.—*Female:* Brown mottled, each feather margined dark brown. Chin white. Differs from *G. ferrugineus* in having the secondary quills irregularly barred buff. Breast white, fringed and marked with black. Ceylon. Two to four eggs (1·71 × 1·30), yellowish brown, minutely speckled. (B. 1329. O. 80. O.G. ii. 53. H. & M. i. 243.)

Also *G. varius*, the Javan J.F. ♂ 28″. ♀ 15½″. With comb entire and single throat-wattle. Tail of sixteen feathers.

*G. æneus.* From Sumatra, a hybrid between the Domestic Fowl and *G. varius.*

*G. temmincki.* From Batavia, with toothed comb, throat-wattle, and a small lateral pair. A hybrid between *G. ferrugineus* and *G. varius.*

*G. violaceus.* A hybrid from Borneo.

*G. stramineicollis.* From the Sulu Islands, the offspring of a domestic variety run wild. (O.G. ii. 60.)

On 7.8.88 Jamrach's agent showed me in Delhi two pairs of what he called Wild Bantams. The cocks were combed, and had a rudimentary spur. The legs green. The hens were coloured ordinary brown. He said they had been reared from eggs by a tame fowl. Mr. Wright, of the E. I. Railway, told me he had seen these birds wild on the Jubbulpore line. They belong to the subfamily *Phasianinæ*. But what is their genus? Not *Gallus*, for it has a long curved spur; and not *Galloperdix*, for that has two or more spurs.—A. Le M.

NOTE.—In *Pucrasia* the tail is but slightly longer than wing in males, and shorter in females.

## Genus **PUCRASIA.**

Crested in both sexes. Sides of head feathered. Tail of sixteen feathers, upper tail-coverts nearly as long as tail. In males plumage lanceolate and cock-like; central drooping crest outflanked by greatly elongated ear-coverts. One spur on each tarsus. From Afghanistan to Nepal (none in the Eastern Himalayas), and China.

A. With basal part of outer tail never grey.

### 34. Pucrasia macrolopha. THE COMMON KOKLASS PHEASANT.

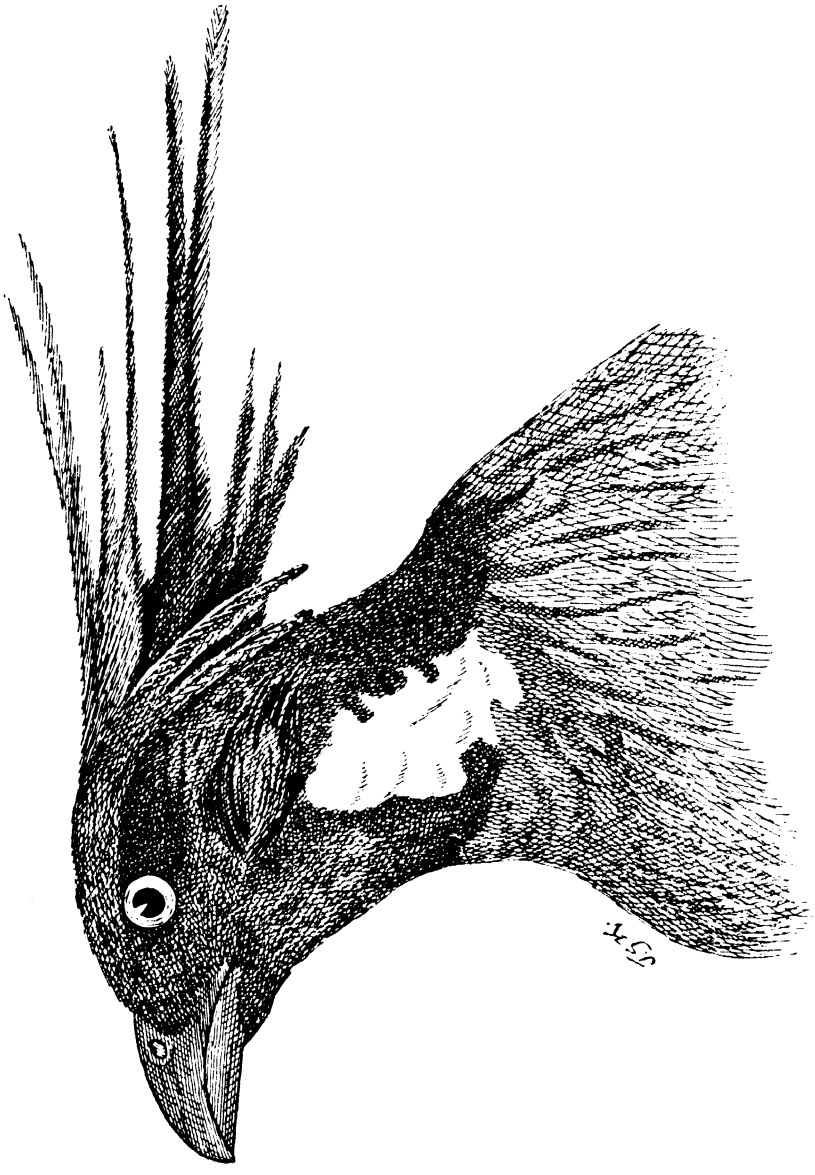
*μακρός* = long; *λόφος* = crest.

**Phokrass,** *Kumaon;* **Koklass,** *Simla;* **Koak,** *Kulu;* **Plas,** *Kashmir;* **Kukrola,** *Chamba.*

♂ 23″ to 25″; 2½ to 3 lbs. ♀ 20″ to 22″; 2 lbs. Legs ashy. Bill black.—*Male:* Head dark green. Long buff crest. Ear-coverts longer than crest. Large white spot on side of neck. Above light ashy, with long black streaks. Breast and below chestnut. Outer tail black (basal half rufous on outer web), tipped white.—*Female:* Short crest. Above pale brown, varied and barred with brown. Throat white. Below light chestnut, with dark markings. From Kumaon to Chamba. Five to nine eggs (2·08 × 1·47). (J. 808. B. 1334. O. 64. O.G. i. 281. H. & M. i. 160.) See illustration, p. 83.

### 35. Pucrasia biddulphi. BIDDULPH'S KOKLASS PHEASANT.

Differs from *P. macrolopha* in having the dark chestnut of foreneck extended more completely round the neck. Lower plumage chocolate.—*Female:* Like *P. macrolopha.* N.W. Himalayas and Kashmir. (O. 65.)



34. R. Le M., Mussoorie, 1864.

**36. Pucrasia nipalensis.** The Nepal Koklass Pheasant.

**Pokrass,** *Nepal.*

♂ 24″; 2 lbs. ♀ 21″; 1½ to 2 lbs. Legs bluish grey. Bill dusky. Triangular white patch on throat, edged with black-brown markings. Mantle, sides of neck, and flank-feathers striated black, chestnut, and grey.—*Female:* As in *P. macrolopha*, but more rich in colour. Central Himalayas and W. Nepal. (H. & M. i. 165.)

**37. Pucrasia castanea.** The Chestnut-mantled Koklass Pheasant.

Differs from *P. macrolopha* in having nape and upper part of mantle deep chestnut.—*Female:* Not yet described. N. Afghanistan and Kafiristan. Possibly may be found in Kashmir. (S.F. v. 188. O. 312. O.G. i. 285.)

*P. meyeri.* Meyer's K.P. from W. China and C. Tibet, with well-marked yellow nuchal collar. Outer tail rufous.

B. Basal part of outer tail grey.

*P. xanthosphila.* The Yellow-necked K.P. from N.W. China and E. Tibet, the feathers black with grey margins and grey shaft stripes. Outer tail grey, banded black.

*P. darwini.* Darwin's K.P. from E. China, with no yellow collar. (O.G. i. 285–287.)

Note.—In *Tragopan* the tail is not longer than wing in males and shorter in females.

## Genus **TRAGOPAN.**

Tail comparatively short, of eighteen (sometimes twenty) feathers. Axillary feathers very long. Sides of head naked or thinly feathered. Crested in both sexes. Males have an erectile fleshy horn above each eye and a gular wattle. Brilliant plumage with white or grey spots. Spur on each tarsus.—*Female:* Crest shorter than in males. Plumage plain. Rarely spurred. Forest birds, rarely seen. Himalayas, Assam, and China. The Argus of European sportsmen.

**38. Tragopan satyra.** The Crimson Horned Pheasant.

σάτυρος=a satyr, companion of Bacchus; at first represented with long, pointed ears, a goat's tail, and small knobs, like horns, behind the ears.

**Loongee,** *Kumaon;* **Moonal,** *Nepal;* **Nunal,** *Sikkim;* **Dafia,** *Bengal;* **Tirriak-pho** (Lepcha); **Omo** (Bhutia).

♂ 26″ to 28½″; 4½ lbs. ♀ 21½″ to 24″; 2¼ to 2½ lbs. Legs yellow-brown. Bill brown. Orbits blue.—*Male:* Gular wattle orange with blue cross-bars. Horns blue. Crest black in front, red behind. Sides of head with black feathers. Above brown, finely barred black, with white spots. On wing-covers white ocelli edged black. Neck, breast, and below crimson, with white spots edged black. Tail black.—*Female:* Brown, with dark mottlings, and spotted with triangular buff marks. Below sandy, finely mottled black, with triangular white or buff shaft spots, the white lines below increasing in size from breast to vent. Common between 7,000 and 10,000 feet. From Kumaon through Nepal and Sikkim to Bhutan. Males generally outnumber females four to one. Eggs (2·58 × 1·82) nearly white, slightly freckled lilac. (J. 805. B. 1344. O. 50. O.G. i. 220. H. & M. i. 137.)

**39. Tragopan melanocephalus.** THE WESTERN HORNED PHEASANT.

μέλας = black ; κεφαλή = a head.

**Jewar,** *Garhwal;* **Jaghi,** *Bussahir;* **Sing-moonal,** *N. W. Himalaya;* **Fulgoor,** *Chamba;* **Jigurana,** *Kulu.*

♂ 27″ to 29″; 4½ lbs. ♀ 24″; 2¼ to 2½ lbs. Legs ashy. Bill black. Orbits bright red.—*Male:* Gular wattle purple, spotted and edged pale blue. Horns sky-blue. Crest black, tipped red. Sides of head naked. Above brown, irregularly barred and spotted white on black. Breast and below black, dashed dull red, with white spot. Tail black, barred buff except at tips.—*Female:* Above mottled grey and brown, the feathers edged brown with white shafts. Below ashy brown, with shafts more broadly marked, thus forming a series of white splashes in regular lines from throat to under-tail.—*Young:* Second year head and neck red. W. Himalayas to Kashmir. Six eggs (2·51 × 1·7), pale buff, finely freckled. (J. 806. B. 1345. O. 51. O.G. i. 224. H. & M. i. 143.) See illustration, p. 86.

**40. Tragopan temminckii.** TEMMINCK'S HORNED PHEASANT.

♂ 25″. ♀ 23″. Legs reddish. Bill black. Orbits blue.—*Male:* Gular wattle deep blue, margined red. Occipital crest orange-red. Sides of head naked. Above Indian red, with grey spots edged black. Below dark Indian red, spotted grey.—*Female:* Above dark rufous and grey, with triangular white patches on back and wings. Below rufous and buff, blotched white. Tail black, mottled and barred pale rufous. From Mishmi Hills, S.W. and C. China. (O. 52. O.G. i. 227.)

**41. Tragopan blythii.** THE GREY-BELLIED HORNED PHEASANT.

**Hur-huria,** *Assam;* **Gnu,** *Naga Hills;* **Chingto** (Kuki).

♂ 21″ to 23″. ♀ 18″ to 20″. Legs light brown. Bill dusky. Orbital skin orange.—*Male:* Horns azure. Gular wattle brimstone. Forehead black. Nape and breast maroon. Abdomen light sepia, with brown markings. Above maroon with buff and black bars, spotted white on red.—*Female:* As *T. satyra*, but blacker and less ferruginous above and creamy below. Three or four eggs (2·42 × 1·71), pale buff, minutely speckled brown. N.E. Assam to N.E. Manipur. (B. 1346. O. 53. O.G. i. 228. H. & M. i. 151.)

Also *T. caboti*, the Buffy H.P. from S. and E. China. ♂ 23″. Above olive-brown, with black shafts and buff spots.

NOTE.—The following genera of the subfamily *Phasianinæ*, viz. *Lophura*, *Lophophorus*, *Ithagenes*, *Galloperdix*, *Bambusicola*, and *Ophrysia*, all have the tail shorter than the wing in both sexes.

## Genus **LOPHURA.**

Tail long, of sixteen feathers, laterally compressed. Crested, with naked face and pair of wattles in both sexes.—*Male:* With long spur on each tarsus.—*Female:* Rather handsomely plumaged. S.E. Asia and some of the islands.

**42. Lophura rufa.** VIEILLOT'S CRESTED FIREBACK PHEASANT.

**Knokwah,** *Siam;* **Mooah-mooah** (Malay).

♂ 27″ to 29″; 4½ to 5 lbs. ♀ 23″ to 24″; 3 to 3½ lbs. Legs vermilion. Bill white. Naked face and wattles blue.—*Male:* Crest brush-like with bare shafts, black. Upper back and below black, glossed purple. Lower back and rump




39. Sungri, 10.7.92.

fiery red. Mid-tail white.—*Female:* Above chestnut, mottled black. Tail dark chestnut. Siam and S. Tenasserim, Malay Peninsula, and Sumatra. Eggs pale brown (2·25 × 1·68). (B. 1335. O. 81. H. & M. i. 213.)

Also *L. ignita.* The Bornean Crested F.P. ♂ 23″, with lower plumage fiery gold and mid-tail buff. ♀ 22″, with tail black.

*L. diardi.* Diard's Crested F.P. From Shan States, Siam, Cambodia, and Cochin China. ♂ 24″, with neck, mantle, and chest grey, finely mottled black, and mid-tail black. Face and wattles red. ♀ 21″, with wing-coverts and scapulars black, banded buff. (O.G. i. 246–248.)

Also the genus *Acomus.* The Crestless Fireback Pheasants, with tail of fourteen feathers. Crestless. Red face-patch, and spurred in both sexes.

*A. erythrophthalmus.* The Malayan Crestless F.P. ♂ 20″, general colour black, finely mottled white. ♀ 18½″, black, glossed steel-blue.

*A. pyronotus.* The Bornean Crestless F.P. ♂ 20″, with neck and mantle grey, mottled black with white shafts.

*A. inornatus.* The Black Crestless F.P. from Sumatra. ♂ 18½″. (O.G. i. 240–243.)

## Genus **LOPHOPHORUS.**

λόφος = a crest; φορέω = I carry.

Tail rounded, of eighteen feathers. In males the plumage is brilliantly metallic. Crest elongated or short and curled. Naked eye-space. Stout spur on each tarsus. From Afghanistan, throughout Himalayas to W. China.

### 43. **Lophophorus refulgens.** The Common or White-backed Crested Moonal Pheasant.

**Nil-mor,** *Kashmir:* **Moonal,** *Himalayas;* **Datteya,** *Kumaon;* **Dafia,** *Nepal;* **Cham-dong,** *Sikkim;* **Nilgur,** *Chamba;* **Fo-dong** (Lepcha).

♂ 26″ to 29″; 4½ to 5¼ lbs. ♀ 24″ to 26″; 4 to 5 lbs. Legs ashy green. Bill dark horny. Eye-patch cobalt.—*Male:* Crest of bare shafts, spade-tipped, metallic green. Head and throat metallic green. Above glossed purple and green. Lower back white. Tail cinnamon. Below black.—*Female:* Head and small crest of brown feathers, centred white. Chin and throat white. Crown, mantle, rump, and chest black with buff centres. Lower back irregularly barred black and buff. Tail black, barred rufous.—*Young* in first year resemble females, with chin, throat, and vent spotted black. Males in second year spotted all over with glossy green. Seventh quill retains brown till third year. From E. Afghanistan to W. Bhutan. Seldom found at a lower elevation than 10,000 feet. Four to six eggs (2·55 × 1·78), dull white, speckled brown. See illustration, p. 88.

Note.—Oates (p. 260) considers that this is Latham's bird, *P. impeyanus.* (J. 804. B. 1342. O. 54. O.G. i. 231. H. & M. i. 125.)

### 44. **Lophophorus impeyanus.** The Chamba or Bronze-backed Crested Moonal Pheasant.

♂ 26″. Differs from *L. refulgens* in having the lower back and breast golden green. Lower plumage highly glossed blue, and some of the tail-coverts maroon, tipped glossy green.—*Female:* Not known. Chamba.

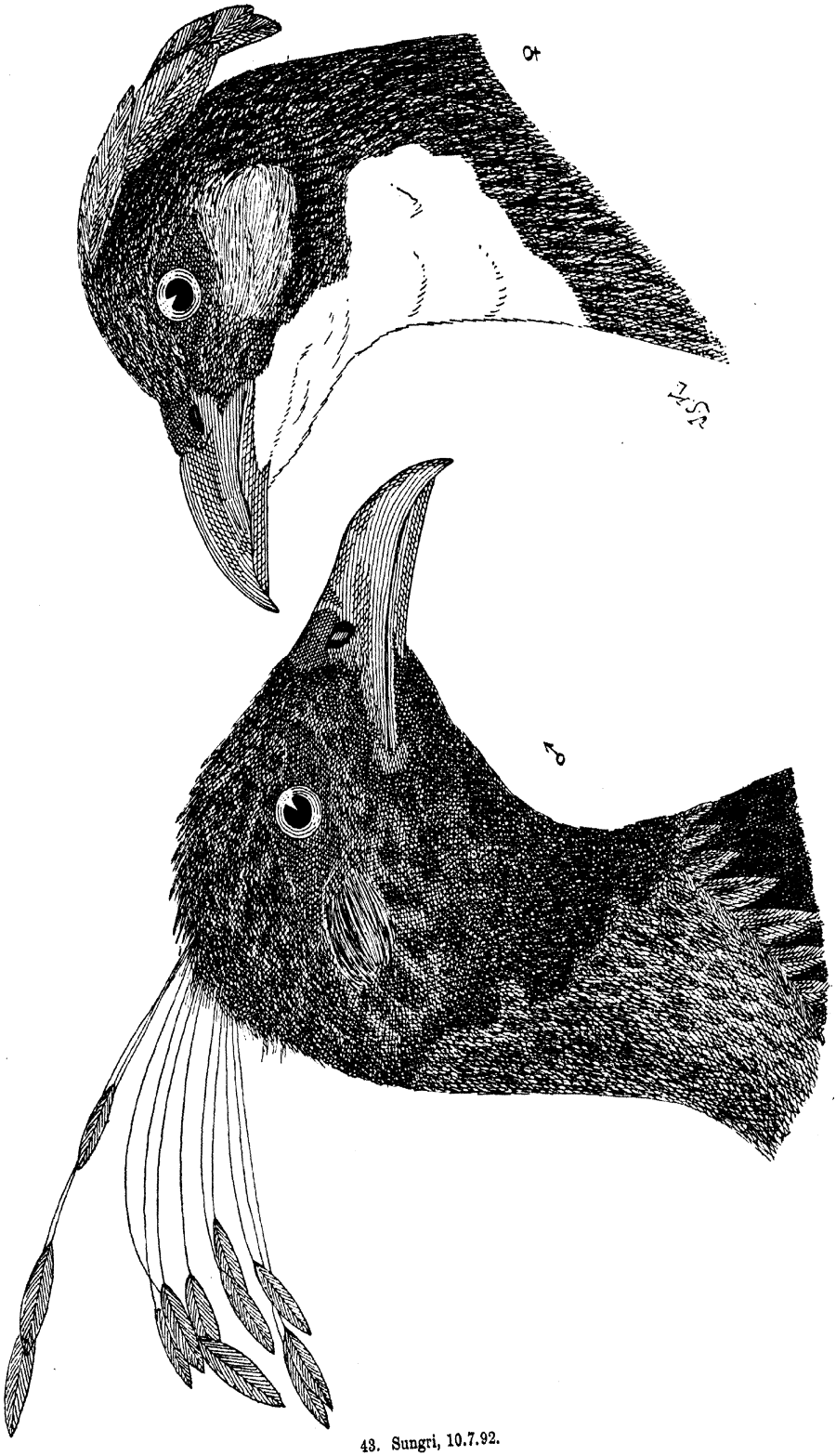
Note.—Oates considers (p. 261) that this should be called *L. chambanus.*

(B. 1343. O. 55. O.G. i. 237.)

Also *L. mantoni.* A variation of *L. refulgens,* with no bronze-red on neck.

*L. obscurus.* A variation of *L. refulgens,* with crest, neck, and mantle very deep green.

*L. l'huysii.* De l'Huys's Crested M.P. from W. China. ♂ 30″. With crest of ordinary feathers, and the tail bluish green. ♀ With lower back white.



43. Sungri, 10.7.92.

**45. Lophophorus sclateri.** THE CRESTLESS MOONAL PHEASANT.

♂ 27″. ♀ 24″. Legs dark brown. Bill yellowish. Bright blue eye-patch.—*Male:* Short crest of curly golden green feathers. Mantle and wings steel-green. Entire lower parts and wing-lining velvet-black. Side of the face blue. Middle back, rump, and upper tail-coverts silver-white, with black shafts. Tail chestnut with white band.—*Female:* Lower back pale yellow, mottled brown. Tail black, tipped and barred whitish. N.E. Assam. (O. 56. O.G. i. 240. H. & M. i. 135.)

## Genus **ITHAGENES.**

*ἰθαγενής* = well-known.

Tail slightly rounded, of fourteen feathers. Bill very short and stout. Large naked eye-patch. Plumage long and soft.—*Male:* With full crest and feathers lanceolate. Two or more spurs on each tarsus.—*Female:* Sometimes with a blunt knob on tarsus. Found in flocks of twenty or thirty at altitudes of from 12,000 to 15,000 feet. The principal food consists of tops of pine and juniper in spring; berries, mosses, and bamboo leaves in winter. The flesh is tough, and has a strong flavour. Cocks have often five spurs on one leg, and four on the other. Out of thirty-six birds shot on 10.4.80 by Masson near Sundukphoo. twenty-two were cocks. Nepal, Sikkim, Tibet, and China. The link between the Pheasant and the Partridge.

**46. Ithagenes cruentus.** THE BLOOD PHEASANT.

*Cruentŭs, a, um* = bloody, gory, blood-stained.

**Selmung,** *Nepal;* **Soomong-pho,** *Sikkim.*

♂ 17″ to 19½″; 1 to 1¼ lb. ♀ 16½″ to 17″; 12 oz. to 1 lb. Legs coral-red, Bill black. Crest grey. Orbital skin scarlet.—*Male:* Forehead and feathers round eye black. Chin, throat, and cheeks crimson. Above dark grey, with white shaft and black edging. Upper tail-coverts widely margined crimson. Breast and below pale green, blotched blood-red.—*Female:* Brown, finely mottled. Forehead, chin, and throat rusty yellow. Nepal to Tibet. (J. 807. B. 1347. O. 48. O.G. i. 215. H. & M. i. 155.)

Also *I. geoffroyi.* Geoffroy's B.P. from Tibet and China. ♂ 17″. Differs from *I. cruentus* in having long crest-feathers grey with white shafts, and chin, throat, and chest grey. ♀ 16″. Forehead, chin, and throat brown. Eggs (1·95 × 1·31) buff, spotted brown.

*I. sinensis.* The Northern B.P. from N. China. ♂ 17½″. Crest black-brown. Chin, throat, and foreneck dark grey, with white shaft stripes. ♀ 16″. Above brown, throat grey, breast pale brown. (O.G. 218, 219.)

## Genus **GALLOPERDIX.** SPUR-FOWL.

*Gallus* = a cock; *πέρδιξ* = Partridge in classical authors.

Of small size. Nude orbits. No comb or wattles. Tail rounded, of fourteen feathers.—*Male:* With two or more spurs on each tarsus.—*Female:* One or more spurs, rarely none. India (between Bay of Bengal and Indus River) and Ceylon. Shy, solitary birds, keeping much to wooded ravines.

**47. Galloperdix spadiceus.** THE RED SPUR-FOWL.

**Chota jungli murghi,** *C.P.;* **Kustoor,** *Deccan;* **Sarava-koli** (Tamil); **Yerra kodi** (Telugu); **Kokatri** (Mahratta).

♂ 14″ to 15″; 11 to 14 oz. ♀ 13″ to 14½″; 9 to 12 oz. Legs vermilion. Bill dusky. Orbital skin red.—*Male:* Head olive-brown. Forehead black, with grey edges. Chin and throat pale brown. Plumage above and below chestnut, with pale grey margins. Tail brown, mottled rufous.—*Female:* Forehead grey,

streaked black. Neck olive. Above brown, banded black, minutely speckled. Breast red, tipped black. Throat smoky brown. Tail brown, mottled rufous. India. Four to seven eggs (1·67 × 1·28), pale brown. (J. 814. B. 1349. O. 45. O.G. i. 206. H. & M. i. 247.)

**48. Galloperdix lunulatus.** The Painted Spur-Fowl.

*Lūnŭlatus, lūnŭla, æ,* f. = a little moon, an ornament worn by women.

**Askol,** *Orissa;* **Hootkah,** *Chanda;* **Kul-koli** (Tamil); **Jitta-kodi** (Telugu).

♂ 12″ to 13½″; 9 to 10 oz. ♀ 12″ to 12½″; 8 to 9 oz. Legs horny brown. Bill blackish. Space in front of eye feathered.—*Male:* Head and neck black, with white streaks and spots. Above chestnut, with white spots, black edged. Breast buff, with black triangular marks. Tail black.—*Female:* Crown black, with chestnut shaft stripes. Above dull olive-brown, with dusky margins. Nape chestnut. Pale ruff and moustache. Below brown, with marginal spots or bands. —*Young* have the female plumage, with tertiaries and tail chestnut, banded black. Young females partly spotted black. India (restricted). Five eggs (1·62 × 1·11), pale brown. (B. 1350. O. 46. O.G. i. 208. H. & M. i. 255.)

**49. Galloperdix bicalcaratus.** The Ceylon Spur-Fowl.

**Haban-kukula,** *Ceylon.*

♂ 12½″ to 14½″; 11 to 13 oz. ♀ 11″ to 11¼″; 7 to 10 oz. Legs pale red. Bill pale red. Orbital skin red.—*Male:* Crown, neck, mantle, and sides black, with white shaft streaks. Chin and throat white. Chest black, with white patches. Below white, edged black. Back chestnut. Tail black. Generally four and sometimes six spurs. Wing-coverts chestnut, spotted white, edged black.—*Female:* Chin and throat white. Plumage chestnut, mottled black. Seldom devoid of spurs, and often have two or three. Ceylon. Four to six eggs (1·42 × 1·12), pale buff. (B. 1351. O. 47. O.G. i. 210. H. & M. i. 262.)

## Genus **BAMBUSICOLA.**

Tail graduated, of fourteen feathers. Males, and sometimes females, have spurs. Sexes similar. A connecting link between Pheasants and Partridges.

**50. Bambusicola fytchii.** The Indo-Chinese or Western Bamboo Pheasant.

**Vengte** (Kuki).

♂ 14″; 10 to 14 oz. ♀ 12½″ to 13½″; 9 to 12 oz. Legs plumbeous. Bill brown. Eyebrow stripes, sides of head and throat buff. Black band from behind the eye down side of neck. Plumage above brown. Upper back chestnut, mottled white. Chest brown, marked chestnut and white. Side- and flank-feathers have velvet-black heart-shaped spots. Lower back and rump olive-brown, irregularly barred. Tail rufous, conspicuously banded. N.E. Bengal, Assam, and N. Burma. Eggs (1·45 × 1·11), pale rufous. (B. 1352. O. 44. O.G. i. 202. H. & M. ii. 97.)

Also *B. thoracica.* The Chinese B.P. ♂ 11·8″. ♀ 11″. With eyebrow stripes and chest grey.

*B. sonorivox.* The Formosan B.P. ♂ 9·6″. ♀ 9″. With chin and throat chestnut, and sides of face dark grey. Seven to twelve eggs (1·38 × 1·0), cream colour.

Also the genus *Ptilopachys.* With tail of fourteen feathers. Naked space behind eye. No spurs. Sexes similar. One species, viz.—

*P. fuscus.* The African Stone P. ♂ 11″. ♀ 10″. With sides of head and throat brown, edged white. Above brown, finely mottled white. Mantle and chest sienna, with dark shaft stripes. Breast buff. Belly brown. Sides and flanks chestnut, irregularly barred white. Eggs yellowish white, like miniature eggs of the Golden Pheasant, *C. pictus.* (O.G. i. 202.)

## Genus **OPHRYSIA.**

Tail of ten feathers. Plumage long and soft. No spurs. Supposed to be a winter migrant from Tibet. Met with in coveys of from six to ten at altitudes of 5,000 to 7,000 feet. Neither Pheasant, Partridge, nor Quail.

**51. Ophrysia superciliosa.** THE PIGMY PHEASANT, or MOUNTAIN PHEASANT QUAIL.

ὀφρύς (a plant with two leaves) = an eyebrow.

♂ 10″. ♀ 10″. Bill coral-red. Legs dull red.—*Male:* Spots before and behind eye and beneath ear white. Mid-crown and nape brown-grey, with black shaft stripes. Forehead and wide band on each side of crown white. Sides of head, chin, and throat black, with white band on each side of throat. General plumage grey, edged black. Tail olive-brown.—*Female:* Spot before and behind eye white. Eyebrow stripes and sides of head pink-grey. Black band on each side of crown. Above brown, with black shaft stripes. Tail irregularly barred and mottled black. No other species of this genus is known. Mussoorie and Naini Tal. (B. 1348. O. 23. O.G. i. 212. H. & M. ii. 106.)

## Subfamily PERDICINÆ.

Cutting edge of lower mandible not serrated. First primary equal to or longer than tenth (two species of *Francolinus* excepted). Tail shorter (usually much shorter) than wing. Sides of head feathered, with or without naked eye-patch. Extreme form of Partridge wing is found in the Snow-Partridge (*Lerwa*), where first primary is equal to third, and but slightly shorter than second (longest). Also among Quails (*Coturnix* and *Synœcus*), where first primary is equal to third and but slightly less than second, and sometimes the first three primaries are subequal and the first primary the longest.

| | | |
|---|---|---|
| 4th primary longest. Tail 12 . | PERDICULA . . | BUSH-QUAILS. |
| 4th, 5th, and 6th primaries longest. Tail 10 . . . . . | MICROPERDIX . | BUSH-QUAILS. |
| 2nd primary longest . Tail 10 or 12 . | COTURNIX . . | TRUE QUAILS. |
| 2nd primary longest . Tail 8 . . . | EXCALFACTORIA . | PAINTED QUAILS. |
| 4th and 5th primaries longest . | ARBORICOLA. . | HILL-PARTRIDGES. |
| | TROPICOPERDIX . | HILL-PARTRIDGES. |
| 5th primary longest. Tail 12 . | ROLLULUS . . | WOOD-PARTRIDGES. |
| 5th primary longest. Tail 14 . | CALOPERDIX . | WOOD-PARTRIDGES. |
| 3rd primary longest. Tail 14 . | CACCABIS . . | RED-LEG PARTRIDGES. |
| 3rd primary longest. Tail 12 . | AMMOPERDIX . | SAND-PARTRIDGES. |
| 3rd and 4th primaries longest . | FRANCOLINUS . | FRANCOLINS. |
| | ORTYGORNIS. . | FRANCOLINS. |
| 4th primary longest. Tail 16 to 18. | PERDIX . . | TRUE PARTRIDGES. |
| 2nd primary longest. Tail 20 to 22. | TETRAO GALLUS . | SNOW-COCKS. |
| 4th primary longest. Tail 18 . | TETRAOPHASIS* . | GROUSE PARTRIDGES. |
| 2nd primary longest. Tail 14 . | LERWA . . | SNOW-PARTRIDGES. |
| | ODONTOPHORINÆ*. | AMERICAN PARTRIDGES AND QUAILS. |

* Not represented in India.

## Subfamily PERDICINÆ. OLD WORLD PARTRIDGES AND QUAILS.

Cutting edge of lower mandible not serrated. First primary equal to or longer than tenth (two species of *Francolinus* excepted). Tail shorter (usually much shorter) than wing. Sides of head feathered, with or without naked eye-patch. Extreme form of Partridge wing is found in the Snow-Partridge (Lerwa), where first primary is equal to third and but slightly shorter than second (the longest); also among Quails (*Coturnix* and *Synœcus*), where first primary is about equal to the third and but slightly less than second, and sometimes the first three primaries are subequal or first the longest.

(i.) *With outer webs of primaries irregularly barred buff.*

### Genus **PERDICULA.**

Bill short and thick. Upper plumage buff, barred black with white shaft streaks. Shaft streaks on sides wanting. Lower plumage cross-barred or plain. First primary intermediate between seventh and ninth (fourth longest). Tail of twelve feathers about half length of wing. Males with blunt spurs. Resemble Quails in size, but agree better with Partridges in structure and habits. India.

**52. Perdicula asiatica.** THE JUNGLE BUSH-QUAIL.

**Lowa** (Hindi); **Juhar**, *Manbhoom*; **Girza-pitta** (Telugu); **Kari lowga**, *Mysore*.

♂ 6½″ to 7″; 2 to 3 oz. Legs yellow. Bill dusky red.—*Male:* Chin and throat chestnut. White superciliary stripe from nostril to nape 1⅛″. Upper plumage dark red-brown, bordered black, with black bars and buff shaft streaks. Quills brown with buff spots on outer webs, inner webs plain. Under surface white or grey barred black.—*Female:* Lower plumage spotless rufous, with white shafts. Superciliary stripe nearly 1″ long. India and Kashmir. Five to seven eggs (1·0 × 0·85), cream colour. (J. 826. B. 1357. O. 21. O.G. i. 153. H. & M. ii. 109.)

**53. Perdicula argoondah.** THE RED or ROCK BUSH-QUAIL.

**Lowa** (Hindi); **Lawunka** (Telugu); **Kemp lowga**, *Mysore*.

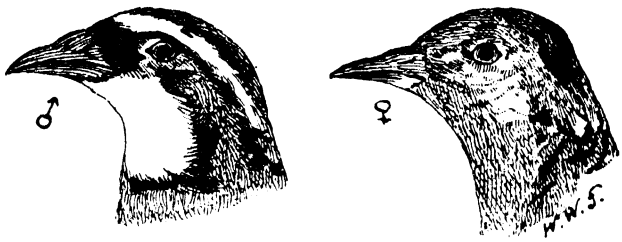
♂ 6¾″ to 7″; 2¼ to 3 oz. ♀ 6¾″. Legs dull red. Bill dark slaty.—*Male:* Head and neck rufous, tipped black. Supercilium from nostril to ear-covert scarcely perceptible. Throat and chin dull red. Above brown, transversely barred and edged black. Breast closely barred black and white. Inner webs of primaries barred like the outer.—*Female:* rufous. Chin, abdomen, and under tail-coverts whitish. India. Five to seven eggs (1·02 × 0·84), glossy white, tinged buff.

### Genus **MICROPERDIX.**

μικρός = small.

Allied to *Perdicula*. Slender bill. Upper plumage brown or grey, spotted black. Lower plumage with round, oval, or cross-shaped black spots. Shaft streaks on sides wanting. First primary equal to the tenth (fourth, fifth, and sixth longest, and subequal). Tail of ten feathers, rather longer than half length of wing. Male wants tarsal tubercle. India, including Sind, Assam, and Manipur.

**54. Microperdix erythrorhynchus.** THE PAINTED BUSH-QUAIL.




Sapoora, 9.8.75.

**Kokni-lowa** (Hindi); **Kadai** (Tamil).

♂ 6½″ to 7½″; 2½ to 3 oz. Legs fine red. Bill fine red.—*Male:* Crown black with white band. Back olive, spotted black. Throat and cheeks white, with black gorget. Below light chestnut with black spots. Quills brown, with outer webs barred.—*Female:* Head brown. Chin rufous. Above olive, blotched black. Ten to twelve eggs (1·22 × 0·91), glossy pale brown. Western India and Sind.

**55. Microperdix blewitti.** THE EASTERN PAINTED BUSH-QUAIL.

**Sirsee-lowa,** *Mandla, Chanda.*

♂ 6″ to 6½″; 1⅘ to 2⅓ oz. Legs coral-red. Bill coral-red.—*Male:* Narrow black frontal band, with broader white band on crown. Breast and below chestnut, widely spotted black. Above grey.—*Female:* Grey, with broad pale frontal band. Sides spotted. C.P. India. (H. & M. ii. 129.) Shaped something like a small Guinea Fowl.

**56. Microperdix manipurensis.** HUME'S PAINTED BUSH-QUAIL.

♂ 7½″; 3 oz. Legs orange. Bill dusky.—*Male:* Forehead, supercilium, cheeks, chin, and throat maroon. Spots behind eye and ear white. Upper plumage olive-grey, with central black marks. Shaft streaks on sides wanting. Below buff, with black shaft streak transversely barred, forming cross-shaped black marks. Outer webs of primaries barred rufous.—*Female:* Head, chin, and throat grey. Below rufous. Sikkim and S.E. Manipur. (B. 1361. O. 20. O.G. i. 159.)

## Genus **COTURNIX.**

*Coturnix*=a Quail, in classical Latin. Etymology unknown.

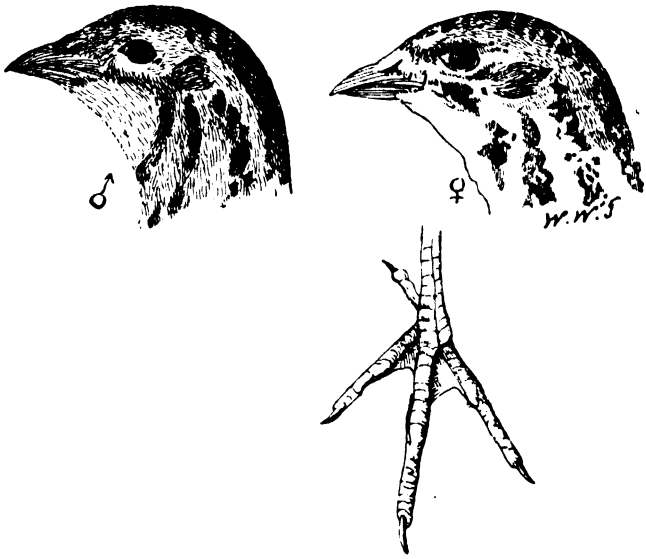
Bill small and slender. Plumage prominently streaked on back and sides. Axillaries long and white. First primary equal to third (second longest), or first second, and third quills are subequal or first longest. Outer web of primaries barred or plain. Tail of ten or twelve feathers less than half the length of the wing. No spurs. Flight rapid, close to the ground, and very straight.

True Quail (*Coturnix* and *Synœcus*) are most common in S. Asia, but occur throughout the whole of the Old Continent as far as New Zealand. Of the Blue Quail (*Excalfactoria*), one species occurs in India and China, another extends from Malaya to the Philippines and Australia, a third off New Guinea, and a fourth in Africa; but none in Central and Western Asia. The species from the islands E. of New Guinea (*E. lepida*) is the smallest game bird in the world. Bush-Quail (*Perdicula* and *Microperdix*) are peculiar to the Indian Empire.

### 57. Coturnix communis. The Common or Grey Quail.

**Bateyr,** *Upper India;* **Batairo,** *Sind;* **Batri,** *Lower Bengal;* **Soipol,** *Manipur;* **Botah-surrai,** *Assam;* **Burganji,** *Deccan;* **Burli,** *Belgaom;* **Sipalé-haki,** *Mysore;* **Watwalak,** *Kashgar.*

♂, ♀ 6¾″ to 8½″; 3 to 4½ oz. Legs fleshy pink. Bill grey-brown. *Male:* Double collar with black band down middle of throat. Above brown with yellow shaft streaks, black patches, and cross marks. Quills brown, the first with outer border white, the other primaries and secondaries barred on outer webs rufous (see illustration). Lower plumage and sides pale rufous, with paler shaft streaks (see illustration).—*Female:* Larger than male, with brown spots on breast. No black throat line. Feathers on chin and throat short and rounded.—*Young* birds ashy, spotted black or brown.




Mulleer, 22.9.72.

Sykes, Yarrell, and others say this was the Quail of the Israelites (see No. 5).

The Grey Quail is migratory, and is found throughout the greater part of Europe, Asia, and Africa. They generally arrive in N. India from C. Asia in September; occasionally in Sind as early as 16th August, but these come probably from Arabia and Persia, and remain for a few days only. They leave N. India in December and January for the south, returning for the wheat and barley harvests in February, March, and April, finally leaving northward in May. A few breed in India, and Hume asks (ii. p. 136), "Are these birds the representatives of a permanently resident race?" Six to ten eggs (1·18 × 0·89), buff, speckled brown.

The call of the Grey Quail is trisyllabic—*Whit! Whit-whit!*

"A group of men talking and lounging round a field of waving barley clearly indicates that something is on hand, and this something is merely the preliminary to net such Quail as may have sought shelter in the cover before the crop is cut. The arrangement is very simple. A few cone-shaped cages, covered with coloured cloth, containing the call birds, are suspended

from poles at the end of the field; a large stop net is then spread at this end, reaching from the ground, and resting so as to cover some 6 or 8 feet on the top of the barley; two men then go off with a long rope to the other end of the field, and beating is commenced by drawing this rope backwards and forwards through the tops of the barley; the rope is very gradually brought forward, and the Quail, disturbed by the rustling noise, are supposed to run forward into that part of the field which is covered by the stop net. When the rope has been drawn to the net, the beaters drop the rope and enter the field, taking the net in one hand, and beating the barley with the other, while the birds, scared by the noise, jump up and catch themselves in the net. The birds so caught are at once operated on by the wily Afghan, who draws the whole of the quills of one wing by a simple bite of his teeth, and the game is popped into a bag for market, the stronger male birds being selected and reserved for fighting purposes. Many of the birds fly back, and probably alight in a field less grown; a hawk is then flown across the field to make these birds lie till they are secured by a small hand net drawn over the spot. Quail-fighting seems to be a favourite pastime, for, go where you will, every other urchin you meet will have a quail in his hand, handling and smoothing its feathers, and training it to be strong by jumping it up and down. Again in the market-place of a morning, the farmers in the intervals of buying and selling will have a round or two, betting one, two, and even three rupees, and for the moment all thoughts of business are absorbed in the issue of the bet" (*Kandahar in 1879*, pp. 180, 181). The system of netting is also the same in Hazara.—A. Le M.

(J. 829. B. 1355. O. 14. O.G. i. 180. H. & M. ii. 133.)

### 58. Coturnix japonica. The Japanese Quail.

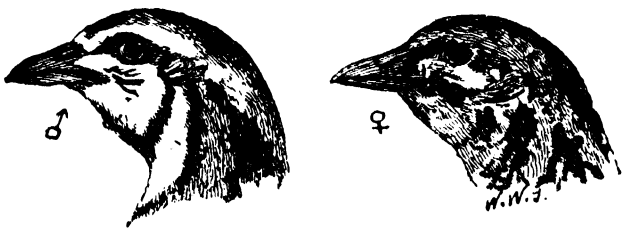
♂ 5·7″. Resembles *C. communis*, but in males the throat and sides of head are brick-red, without any black bands, and in females the throat is pale buff, with feathers on chin and throat lengthened and pointed. Japan, Mongolia, China, and N. India. (O. 15. O.G. i. 184.)

Also *C. capensis*. The Cape Quail from S. Africa and adjacent islands. ♂ 6·3″. Differing from *C. communis* in having the head, chin, and throat bright chestnut. (O.G. ii. 183.)

(ii.) *With outer webs of primaries uniform brown without bars.*

### 59. Coturnix coromandelicus. The Black-breasted or Rain Quail.

**Bateyr**, *Upper India;* **Chanac**, *Nepal;* **Batairo**, *Sind;* **Kade** (Tamil); **Chinna-yellichi** (Telugu); **Ngon**, *Pegu.*




Sapoora, 7.8.75.

♂ 6½″ to 7¼″; 2 to 3 oz. Legs fleshy yellow. Bill dusky. Chin pure white. Primaries unspotted brown.—*Male:* Like *C. communis*, but black bands on throat and neck more strongly marked, and there is a large black patch on breast. Sides of body buff-streaked black. Below pale buff.—*Female:* Larger than male, breast merely spotted with black.

The Rain Quail is a resident or partially migratory bird, shifting its ground with the seasons and extending from India to Assam, Sylhet, Burma, and Pegu. Not observed in Ceylon. (In 1875 they were in full breeding at Sapoora, in

Sind, on 7th August, and the young were running about at the Hubb River on the 1st September, when the Grey Quail came in.—A. Le M.) Four to nine eggs (1·18 × 0·89), buff, speckled and blotched brown.

The call of the Rain Quail is disyllabic—*Whit! whit!* and stronger than that of the Grey Quail. (J. 830. B. 1356. O. 16. O.G. i. 185. H. & M. ii. 151.)

### 60. Coturnix delegorguei. Delegorgue's Quail.

♂ 6″. Under parts chestnut with large black breast-patch. Africa S. of 15° N. lat. Recently obtained at Aden.

Also *C. pectoralis*. 7″. The Australian Quail. Head, chin, and throat dull brick-red. Lower plumage white, with black shaft stripes and a black chest-patch.—*Female:* Chest and breast longitudinally barred black, with central buff interspace. Known as the "Stubble Quail" in Tasmania. Seven to fourteen eggs (1·2 × 0·94), yellowish white, blotched brown. Australia and Tasmania.

*C. novæ zealandiæ*. 7½″. The New Zealand Quail, like *C. pectoralis*, but head, chin, and throat are chestnut, with black bar on each side of throat.—*Female:* Buff interspace on breast small or wanting.

Also the genus *Synœcus*, the Swamp-Quails, like *Coturnix*, but axillary feathers are short and grey. Three species.

*S. australis*. 7½″. The Australian Swamp-Quail. Sides of head and throat dull grey. Below buff, with grey centres, and almost devoid of black cross-bars.—*Female:* Sides of crown black. Chest pale rufous, barred black. S.E. New Guinea, Australia, and Tasmania. Weight 4¾ oz. Ten to eighteen eggs (1·17 × 0·92), bluish white, dotted light brown.

*S. raalteni*. 7½″. Raalten's Swamp-Quail. Head, chin, throat, and below rufous.—*Female:* Chest rufous, with black bars nearly obsolete. Timor and Flores.

*S. plumbeus*. The Grey Swamp-Quail. Resembles *S. australis*, but plumage more grey. S.E. New Guinea.

## Genus EXCALFACTORIA.

*Excalfactorius, a, um* = warming, heating.

First primary subequal to or shorter than second (longest). Sides without shaft streaks. Outer webs of primaries plain. No spurs. Tail of eight feathers entirely hidden by upper tail-coverts and less than half length of wing. Monogamous. The Oriental region, Australia, and Africa.

### 61. Excalfactoria chinensis. The Blue-breasted or Painted Quail.

**Khair-butai**, *Nepal;* **Burli**, *Deccan;* **Ngon**, *Burma;* **Peeyo**, *Malay.*

♂ 5¾″ to 6″; 1½ to 2 oz. ♀ 5″. Legs bright yellow. Bill black.—*Male:* Rich plumage. Chin and throat black, enclosing white cheek-patch. Above brown, blotched black, with white shaft stripes. Narrow red wing-band. Quills plain. Breast blue. Below chestnut—*Female:* brown; breast with dark cross-bars; chin and throat white. Ceylon, India, Indo-Chinese countries, Formosa, and Celebes. Four to six eggs (0·98 × 0·76), olive-brown, speckled purple. J. 831. B. 1354. O. 17. O.G. i. 193. H. & M. ii. 162.)

Also *E. lineata*, the Island Painted Quail. Differs from *E. chinensis* in being darker above and more strongly blotched with black. Philippines, Sulu Islands, Borneo, Java, Sumatra, and Australia.

*E. lepida*. 4·8″. The New Britain Painted Quail. No trace of chestnut on wing-coverts. Below slaty blue. Vent and under tail-coverts chestnut. The smallest game bird. New Britain to E. of New Guinea.

*E. adansoni*. 5·2″. Adanson's Painted Quail. Above blackish brown washed slate. Wing-coverts and upper tail-coverts chestnut. Below slate-grey. Sides and flanks bright chestnut. Africa S. of 5° N. lat. (O.G. i. 195.)

## Genus **ARBORICOLA**.

A peculiar row of superorbital bones present. Tarsus not spurred. Toes with very long claws. Tail of fourteen soft feathers less than half length of wing. Sexes alike in all except *torqueolus*. Throat and foreneck often thinly covered or naked. Feathers of neck or throat, or of both, spotted. Patch of downy feathers under the wing grey. First primary intermediate between eighth and tenth (fourth and fifth longest). Quills uniformly coloured.

The Hill-Partridges occur throughout the Himalayas, but are found nowhere else in India proper. They extend into Assam, Burma, and China. They inhabit hill forests from 7,000 to 11,000 feet, and are usually seen solitary or in pairs. Of short flight. Occasionally perch. Six to eight eggs, white.

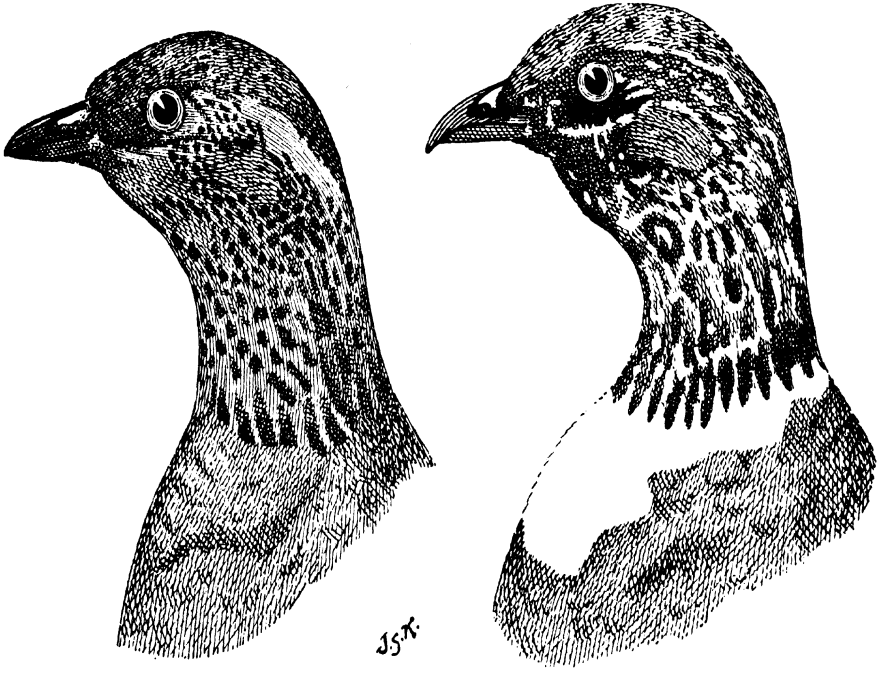
### (i.) *With upper back barred with black.*

### 62. Arboricola torqueolus. The Common Hill-Partridge.

*Torquis* or *torques*=a twisted neck-chain, necklace.

**Roli,** *Chamba;* **Peura,** *Kumaon;* **Kaindal,** *Kangra;* **Kangkom,** *Sikkim.*

♂ 10½″ to 12″; 13½ oz. ♀ 8 oz. Legs slate-grey. Bill black.—*Male:* Crown bright red. Broad necklace, grey, heavily marked dark brown. Foreneck white. Back olive-brown, barred black. Breast pale ashy. Flank grey, edged chestnut, with white central spot.—*Female:* Breast grey, tinged rusty, with middle of throat rufous, unspotted. Crown brown, with black shaft stripes. Face and neck rust-red, spotted black. Large white spots on flanks. Chamba to Sikkim and Manipur. Six to eight eggs (1·58 × 1·25), pale grey, minutely speckled. (J. 824. B. 1362. O. 26. O.G. i. 160. H. & M. ii. 69.)

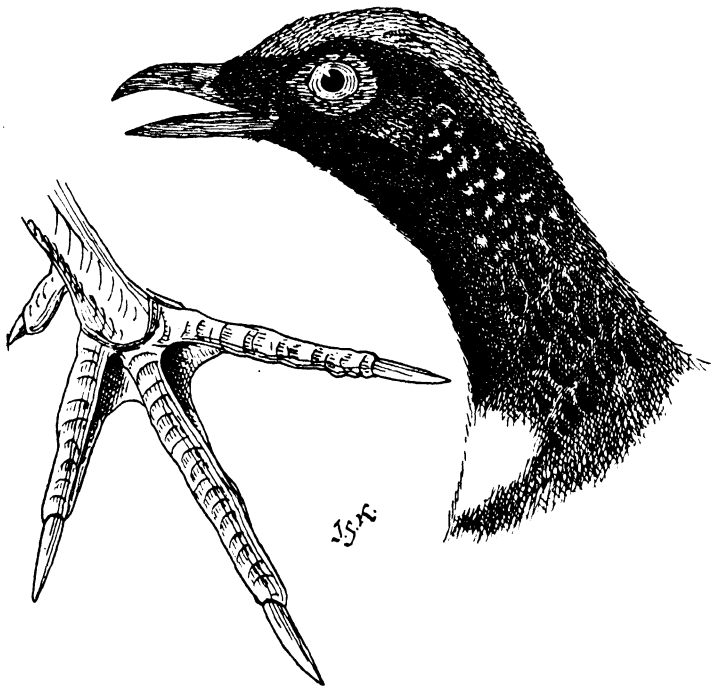


R. Le M., Mussoorie, 1864.

**63. Arboricola atrigularis.** THE BLACK-THROATED HILL-PARTRIDGE.

**Peura,** *Sylhet;* **Duboy,** *Assam;* **Sanbatai,** *Chittagong.*

♂ 10″ to 11″; 7 to 10 oz. ♀ 7 to 10 oz. Legs orange-red. Bill black. Resembles *A. torqueolus*, but foreneck is black and flank-feathers are edged olive-brown with white spots near tips. Crown olive. Cheeks white. Back broadly barred and tipped black. Breast pale grey. From E. Assam to E. Bhamo. Four eggs (1·38 × 1·12), glossy white. (B. 1365. O. 30. O.G. i. 163. H. & M. ii. 79.)



Darjeeling, 11.4.88.

Also *A. ardeus.* The Hainan H.P. Like *A. atrigularis*, but with orange-red chest-patch. ♂ 8″.

*A. crudigularis.* The Formosan H.P. Like *A. atrigularis*, but with lower part of throat black. ♂ 9½″. (O.G. i. 164.)

*A. javanica.* The Javan H.P. ♂ 11″. Crown red-brown. Above grey, barred black. Chest grey. Below chestnut.

*A. rubirostris.* The Red-billed H.P. from Sumatra. Above olive, barred black. Chest brown. Flanks barred black and white. (O.G. i. 168.)

**64. Arboricola brunneipectus.** THE BROWN-BREASTED HILL-PARTRIDGE.

**Toun-hka,** *Pegu.*

♂ 10½″ to 11½″; 9 to 13 oz. ♀ 10″ to 10⅔″; 8 to 12 oz. Legs red. Bill black. Crown brown. Forehead, supercilia, and cheeks buff. Middle of throat fawn, densely spotted black. Breast tawny. Above olive, barred black. Wings strongly marked chestnut. Flanks with white spots, near tips banded black. Burma and Tenasserim. (B. 1367. O. 31. O.G. i. 169. H. & M. ii. 87.)

Also *A. hyperythra.* Treacher's H.P. from N.W. Borneo. Like *A. brunneipectus*, but crown is black. Supercilia and cheeks ashy. 10½″.

*A. erythrophrys.* Whitehead's H.P. from N. Borneo. Like *A. hyperythra*, but the supercilia are black. (O.G. i. 170.)

(ii.) *With upper back not barred.*

**65. Arboricola intermedius.** THE ARACAN HILL-PARTRIDGE.

**Toun-hka,** *Burma.*

♂ 10″ to 11″. Legs red. Bill black. Crown olive. Lower margin of rufous throat meeting grey of breast, without black line. Black patch on throat. Above olive, without bars, but sometimes with dusky margins. N.E. India to Bhamo. Eggs (1·50 × 1·15) white. (H. & M. ii. 85.)

**66. Arboricola rufigularis.** THE RUFOUS-THROATED HILL-PARTRIDGE.

**Lakom,** *Sikkim;* **Pokhu,** *Daphla Hills;* **Peura,** *Kumaun.*

♂ 10″ to 11″; 7 to 10 oz. ♀ 9″ to 10½″; 7 to 10 oz. Legs red. Bill black. Resembles *A. intermedius*, but lower margin of rufous throat has sharply defined black line. Breast grey. Flanks grey, spotted white, with chestnut borders. Above unbarred. Lower back, rump, and upper tail-coverts with semi-oval black spots. Kumaon to Tenasserim. Eggs (1·5 × 1·2) white, with grey specks. (H. & M. ii. 75.)

Also *A. gingica.* Sonnerat's H.P. Like *A. rufigularis*, with triangular black patch on fore-neck, with bands of white and maroon.

(iii.) *With upper back freckled and mottled.*

**67. Arboricola mandellii.** THE BHUTAN HILL-PARTRIDGE.

♂ 8½″ to 11″. Legs red. Bill black. Crown chestnut. Back olive, margined, not barred. Cheeks rust-red, spotted black. Lower margin of rufous throat with sharply defined black line. Breast maroon. Patch in neck pure white. Flanks grey, with central white spots and chestnut edges. Sikkim. (H. & M. ii. 83.)

Also *A. orientalis.* Horsfield's H.P. from E. Java. 11″. Eyebrow, cheek, and throat white. Above dark brown, fringed blackish. Flanks grey, irregularly barred black and white.

*A. sumatrana.* The Sumatran H.P. Differs from *A. orientalis* in having the back fringed and barred, no white eye-stripe, and flank-feathers with triple bands.

## Genus **TROPICOPERDIX.**

Differs from *Arboricola* in wanting the peculiar row of superorbital bones, and the patch of downy feathers under the wing is white.

**68. Tropicoperdix chloropus.** THE GREEN-LEGGED HILL-PARTRIDGE.

χλωρός = pale green; πούς = a foot.

**Toun-hka,** *Pegu.*

♂ 11½″ to 12″; 9 to 12 oz. ♀ 10½″ to 11½″; 8 to 10 oz. Legs pale green. Bill greenish. Crown and above brown, barred black. Chin, throat, eye-stripe, and sides of neck white, spotted black, not enclosed by black band. Breast olive, banded black. Flanks buff, irregularly barred black. Axillaries and patch of downy feathers white. Outer webs of secondaries with rufous bars. Tonghoo to Tenasserim. (B. 129. O.G. i. 172. O. 32. H. & M. ii. 91.)

Also *T. charltoni.* The Malayan H.P. Differs from *T. chloropus.* Above finely mottled. Flanks regularly barred. Irregular neck-band of black spots.

## Genus **ROLLULUS.**

Remarkable for wanting the claw of the hind toe. From their colour, fan-like crest, and different colour of the sexes, they might rather be placed with the Jungle-Fowl than with the Partridges. The crest is similar to that of the Crowned Pigeons, and the bare frontal plumes are only represented elsewhere in this family by some of the American Partridges (Jerdon, iii. p. 580). Placed by Gray in *Tetraoninæ*. Called by Blanford "the Green Wood-Quail." Long hair-like bristles on forehead in both sexes. Male with full crest. Tail of twelve feathers about two-fifths length of wing. First primary equal to tenth (fifth longest). Claw on hind toe rudimentary or wanting. Naked eye-patch. No spurs.

### 69. **Rollulus roulroul.** The Red-crested Wood-Partridge.

**See-oul** (Malay); **Baniul**, *Sumatra.*

♂ 10¾″ to 11″; 8 to 10 oz. ♀ 9½″ to 10½″; 8 oz. Legs red. Bill black. No spurs.—*Male:* Red crest. Facial skin and eyelids bright red. Head black, with white band between eyes. Below black. Back green. Wings umber.—*Female:* Black head, grass-green body, and umber wings. (H. & M. ii. 103.) S. Tenasserim to Borneo. Eggs (1·52 × 1·21) buff.

Also the genus *Melanoperdix.* The Black Wood-Partridges, with tail of twelve feathers. No crest. Hind toe with rudimentary claw. Sexes differ. One species.

*M. nigra.* 10½″. The Black Wood-Partridge. Plumage glossy black. ♀ above chestnut, finely mottled black. Throat and belly whitish. Chest dark chestnut. Malay Peninsula to Sumatra and Borneo. Five eggs (1·65 × 1·3), white.

Also the genus *Hæmatortyx.* The Crimson-headed Wood-Partridges, with tail of twelve feathers. Hind toe with small but well-developed claw. Male with three pairs of spurs, none in female. Sexes differ. One species.

*H. sanguiniceps.* 10½″. The Crimson-headed Wood-Partridge. Crown, nape, cheeks, and throat dull crimson. Foreneck, chest, and under tail-coverts bright crimson. ♀ 10½″. Throat pale rufous. Foreneck and breast chestnut. N. Borneo. (O.G. i. 174.)

## Genus **CALOPERDIX.**

Tail, as in *Arboricola*, of fourteen feathers, less than half length of wing, but feet and claws are shorter, and the claw on hind toe is rudimentary. First primary is equal to the tenth (four, five, six longest). Sexes alike, but male has one or more pairs of spurs.

### 70. **Caloperdix oculeus.** The Ferruginous Wood-Partridge.

καλός = beautiful; πέρδιξ = Partridge; *ŏcŭlus* = an eye.

**Burong, Trung** (Malay), *Sumatra.*

♂ 10¾″ to 11¼″; 8 oz. Legs dirty green. Bill black. Head and breast and below chestnut. Back black, with feathers fringed white. Wings olive-brown, with round black spots. Flanks barred black and white. Males often double-spurred. Might be classed with the Pea-Pheasants or Spur-Fowl. It extends up the Malayan Peninsula.

Also *C. sumatrana.* The Sumatran W.P. A subspecies which differs from *C. oculeus* in having back irregularly cross-barred pale yellow, and basal half of breast-feathers mottled and barred black.

*C. borneensis.* The Bornean W.P. Allied to *C. oculeus*, but the mantle is black.

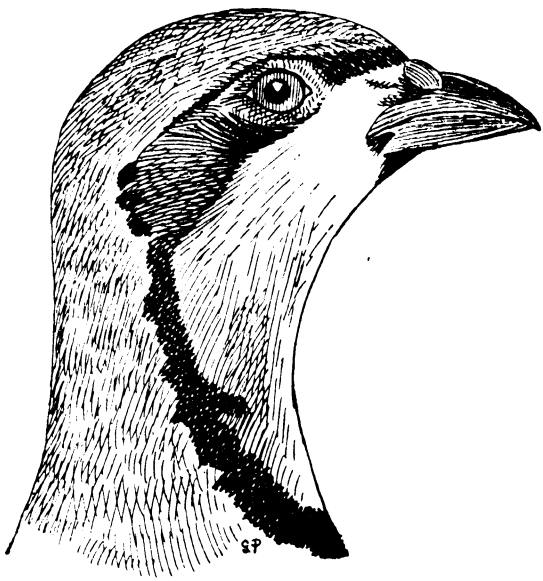
## Genus **CACCABIS.**

*Caccăbis* = *κακκαβίς*, a collateral form of *κακκάβη*, a Partridge, in classical Greek.

Nude eye-patch. Plumage uniformly coloured, not mottled, with flanks transversely banded grey-buff, black, and chestnut. Tail of fourteen feathers from five-eighths to two-thirds length of wing. First primary equal to fifth or sixth (third longest). Primaries brown, unbarred, with part of outer web near tip buff. Sexes alike, but males generally larger. Males with a pair or more of blunt spurs on each tarsus. Chiefly Palæarctic, one species ranging into N. India.

### 71. Caccabis chucar. The Chukor Red-legged Rock-Partridge.

**Chukor,** *India;* **Chukru,** *Chamba;* **Kaukau,** *Kashmir;* **Keklik,** *Yarkand;* **Kabk,** *Persia.*



Khojak, 2.6.79.

♂ 14¼″ to 16″; 19 to 27 oz. ♀ 13″ to 14½″; 13 to 19 oz. Legs red. Bill red. Crown grey. Black band across forehead, behind eye, round throat, forming a gorget. Above grey or rufous. Breast ashy. Flanks grey, with transverse bands of black, buff, and chestnut. Lores buff, ear-coverts chestnut. Closely allied to *C. saxatilis* (the Western form). From W. Asia to China. Seven to twelve eggs (1·68 × 1·25), light brown, speckled darker. (J. 820. B. 1370. O. 38. O.G. i. 91. H. & M. ii. 33.)

Also *C. saxatilis.* The Rock R.L.P. from S. Europe. ♂ 15″. ♀ 13½″. With throat and neck white, encircled with black band. Lores black, and ear-coverts black mixed with buff.

*C. magna.* Prjevalsky's R.L.P. from N. Tibet. With double collar.

*C. rufa.* The Common or Spanish R.L.P. from S.W. Europe. Resembles *C. saxatilis*, but necklace is margined on chest with black spots. ♂ 13½″. ♀ 13″. Introduced into Britain about a century ago. Ten to eighteen eggs (1·55 × 1·2), buff, dotted darker.

*C. petrosa.* The Barbary R.L.P. from N.W. Africa, Sardinia, and the Canaries. ♂ 12½″. With crown dark chestnut and collar chestnut, spotted white. (O.G. i. 90–97.)

*C. spatzi.* Spatz's R.L.P. from S. Tunis; a paler form of *C. petrosa.* (O.G. app. ii.)

*C. melanocephalus.* The Black-headed R.L.P. from S.W. Arabia. ♂ 16½″. With crown black and outer tail grey. (O.G. i. 98.)

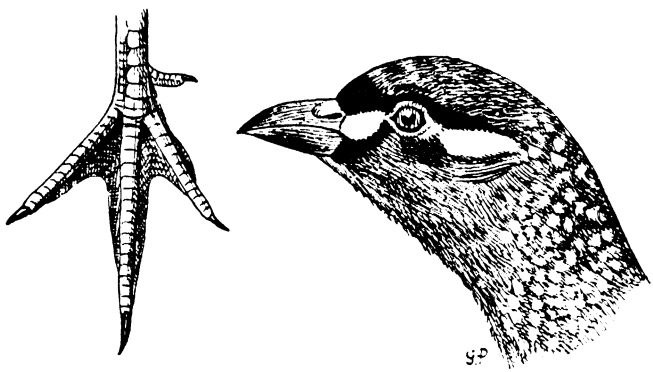
## Genus **AMMOPERDIX.**

Of small size. No spur. Tail of twelve feathers, subequal and about half length of wing. First primary equal to sixth (third longest). Cheek and throat feathered. Flanks of male longitudinally barred. From Egypt to the Indus.

### 72. **Ammoperdix bonhami.** The Seesee or Sand-Partridge.

**Sisi,** *Punjab;* **Tihu,** *Persia.*

♂ 9½″ to 11″; 7 to 8 oz. ♀ 9″ to 9¾″; 6 to 8 oz. Legs olive-yellow. Bill pink. Pale brown, freckled. Breast grey. Black streak from forehead across



Chaman, 31.5.79.

eye to behind the ear. Neck blue-grey, spotted white. Lower back, wings, rump, upper tail-coverts, and mid-tail grey, finely marked buff. Primaries brown, and all (except first) barred rufous on outer web. Tail chestnut.—*Female:* Grey, finely mottled all over. From Euphrates to Indus, Transcaspia to Aden. Eggs (1·42 × 1·02) cream colour, minutely pitted. (J. 821. B. 1371. O. 39. O.G. i. 99. H. & M. ii. 45.)

Also *A. heyi.* Hey's S.P. from Arabia. ♂ 9½″. Differs from *A. bonhami* in having no frontal black band. Chin and throat chestnut. (O.G. i. 101.)

*A. cholmleyi.* Cholmley's S.P. from Egypt and Palestine. ♂ 9½″. Differs from *A. heyi* in wanting white forehead and lores. (O.G. ii. 293.)

## Genus **FRANCOLINUS.**

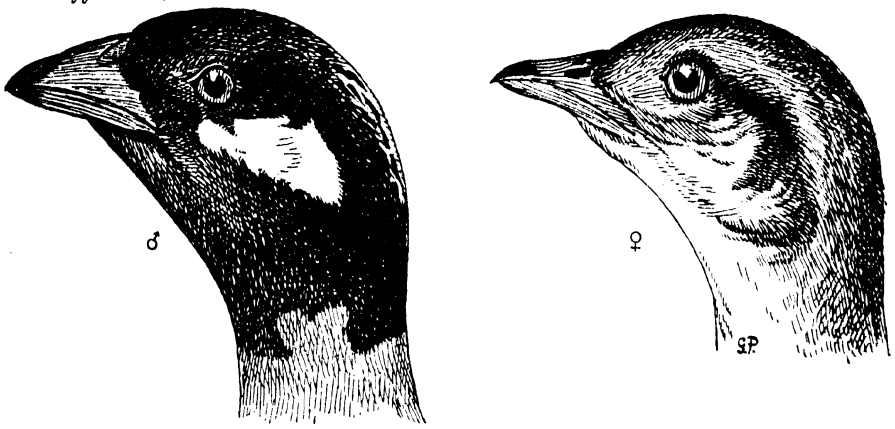
*Francolinus* = proper name.

Rich spotted plumage. Tail of fourteen feathers, even or rounded, rather more than half the length of the wing. First primary between seventh and tenth (three and four longest). Two exceptions—*F. squamatus* and *F. schuetti*—where first primary is shorter than tenth. Throat feathered. Sexes usually similar. —*Male:* Without spurs, or with one pair, or with two pairs. Old females sometimes with blunt tubercles. From Cyprus to China, including Ceylon. Here restricted to three species (originally of African descent), which have a well-defined row of rufous or buff spots on both webs of the primary flight-feathers, and a black tail more or less barred with white.

(i.) *With defined row of rufous spots on both webs of primaries.*

**73. Francolinus vulgaris.** The Common Francolin or Black Meadow-Partridge.

**Kala-titur,** *India;* **Kais-titur,** *Nepal;* **Tetra,** *Garhwal;* **Vrembi,** *Manipur;* **Taroo,** *Afghanistan.*




Khairadera, 12.10.72.

♂ 12¾″ to 14½″; 10 to 20 oz. ♀ 12¼″ to 14″; 8 to 17 oz. Legs yellow. Bill black. Spurs in both sexes.—*Male:* Head black. White ear-patch. Chestnut collar. Upper back and sides of breast black, with white spots on each web. Lower back, rump, upper tail-coverts, and tail black, with narrow white bars.—*Female:* Plumage below buff, with black spots arrow-shaped. Chestnut patch on back of neck. Rump and tail brown, with dark-edged buff bars. Throughout N. and W. India to Assam, but not E. or S. of Manipur. Persia, very common on the banks of the Tigris, Mesopotamia, Asia Minor, and Cyprus. Six to ten eggs (1·56 × 1·28), stone colour. Monogamous and pairs for life. Roosts on the ground, and but rarely perches on trees. (J. 818. B. 1372. O. 33. O.G. i. 103. H. & M. ii. 9.)

**74. Francolinus pictus.** The Painted Francolin or Southern Meadow-Partridge.

**Titur,** *Deccan;* **Kakora-kodi** (Telugu).

♂ 11″ to 13″; 8½ to 13 oz. Legs yellow-red. Bill blackish. No spurs. Sides of head chestnut, without bands or spots.—*Male:* Upper back, breast, and flanks black, with white spots. Scapulars black, with submarginal buff bands.—*Female:* Lower plumage variegated black and white. Throat unspotted. W. and C. India and Ceylon. Six to ten eggs (1·4 × 1·18), drab. The southern representative of *F. vulgaris.* Found in pairs. Roosts on bushes and trees. (J. 819. B. 1373. O. 34. O.G. i. 106. H. & M. ii. 19.)

**75. Francolinus chinensis.** The Chinese Francolin or Eastern Meadow-Partridge.

**Hka,** *Pegu;* **Nock-kahtah,** *Siam.*

♂ 12″ to 13½″; 10 to 14 oz. Legs brown-orange. Bill black. Crown dark brown.—*Male:* Black eye-streak, and a second black band from gape to ear-coverts. Neck, wing-coverts, sides, and breast black, with a row of oval white or buffy spots on each web of every feather. Comparatively large spur.—*Female:* Feathers regularly and closely barred black and fulvous white. Burma and China. Six to eight eggs (1·5 × 1·2), pale buff. (B. 1374. O. 35. O.G. i. 107. H. & M. ii. 27.)

## Genus **ORTYGORNIS.**

*Ortyx* = ὄρτυξ = the Quail, in classical Greek; from the root of *verto* = I turn, from its whirling flight. Cf. Sanskrit *vartakas* = a Quail, *vart* = to roll. ὄρνις = a bird.

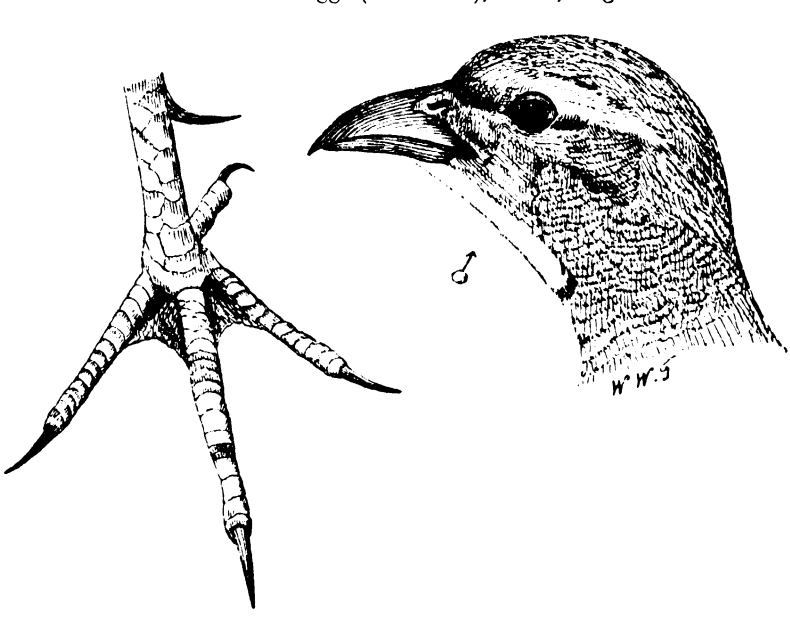
Tip of bill well turned over. Included by Blanford and Ogilvie-Grant under *Francolinus*, but herein separated to include those species which want the defined row of rufous spots on both webs of primaries. The feathers of the back and scapulars with or without white or buff shaft streaks.

(ii.) *With no defined row of buff spots on both primaries. Back and scapulars with white or buff shaft streaks. Breast and flanks buff, uniformly barred black.*

**76. Ortygornis pondicerianus.** The Grey or Spurred or Bush-Partridge.

**Titur,** *India;* **Goujul-haki,** *Mysore;* **Kondari** (Tamil); **Kuwunzu** (Telugu); **Oussa-watuwa,** *Ceylon;* **Jirufti** (Persian).

♂ 11½″ to 13½″; 9 to 12 oz. ♀ 10″ to 12″; 7 to 11 oz. Legs bright red. Bill plumbeous.—*Male:* Band over eye and cheeks rufous. Sides of neck delicately barred black and white. Back, upper tail, and wing-coverts red-brown, with three bars cream-yellow. Below buff finely but irregularly barred black. Tail chestnut. Quills brown.—*Female* smaller, with no spurs. India, Ceylon, and Persian Gulf. Six to nine eggs (1·3 × 1·03), white, tinged brown.



Mayting, 4.11.75.

Also *F. lathami.* 10″. Latham's Francolin from W. Africa. Throat and foreneck black. Breast black, with white heart-shaped spots.—*Female:* Above faintly and irregularly barred rufous and black.

*With breast and flanks whitish buff uniformly barred black.*

*F. coqui.* 11″. The Coqui Francolin from E., S., and S.W. Africa. Nape and below white, regularly barred black. Pair of spurs.—*Female:* Eyebrow stripes black. Nape and breast dull chestnut, with white shaft streaks. No spurs.

*F. hubbardi.* 10″. Hubbard's Francolin from Victoria Nyanza. Similar to *F. coqui*, but entire breast is uniform buff, unbarred.

*F. schlegeli.* Schlegel's Francolin from Equatorial Africa. Differs from *F. coqui* in having shoulders, wing-coverts, and outer webs of secondaries uniform light red. (O.G. i. 108–112.)

(iii.) *With no defined row of buff spots on both primaries. Back and scapulars with white or buff shaft streaks. Breast and flanks not buff, uniformly barred black.*

**77. Ortygornis gularis.** THE KYAH OR SWAMP-PARTRIDGE.

**Kyah,** *Bengal;* **Buntitur,** *India;* **Koi,** *Assam;* **Bhil-titar,** *Cachar.*

♂ 15″; 17 to 22 oz. ♀ 14″. Legs dull red. Bill black. Sexes alike, but male has a spur on each tarsus. Above brown, with transverse black-edged buff bars. Lower plumage streaked, each feather white, with double border black and brown. Chin and throat chestnut.—*Female* smaller, with no spur. N.W.P. to Assam. Five eggs (1·47 × 1·2), cream colour.

Also *F. streptophorus.* The Ring-necked F. from C.E. Africa. With eyebrow stripe and throat white, and neck-ring black and white. ♂ 11″. No spurs.

*F. sephæna.* Smith's F. from S. Africa. Like *F. streptophorus,* but neck-feathers are chestnut, edged white. ♂ 12″. Pair of spurs.

*F. granti.* 11″. Grant's F. from E. Africa. Smaller than *F. sephæna.*

*F. kirki.* Kirk's F. from E. Africa and Zanzibar. With oblong spots of chestnut on breast and belly. ♂ 11″. Resembles *F. sephæna* and *F. granti.*

*F. spilogaster.* The Spotted F. from N.E. Africa. Like *F. kirki,* but larger.

*F. albigularis.* The White-throated F. from W. Africa. Back chestnut, blotched and barred black. ♂ 9″. Pair of spurs.

*F. spilolæmus.* Harris's F. from N.E. Africa. Chin and throat white, with round black spots. ♂ 12·3″. Pair of spurs.

*F. gutturalis.* Ruppell's F. from N.E. Africa. Breast and below buff, with black shaft streaks. Like *F. spilolæmus.* ♂ 12½″.

*F. uluensis.* The Ulu F. from E. Africa. An intermediate form between *F. gutturalis* and *F. africanus.* ♂ 12″. Pair of spurs.

*F. africanus.* The Pearl-breasted F. from E.S. Africa. Neck-patch of black and white barred feathers. ♂ 13″. Pair of spurs.

*F. finschi.* Finsch's F. from S.W. Africa. Head and throat reddish. ♂ 14½″. Pair of spurs.

*F. castaneicollis.* The Chestnut-naped F. from N.E. Africa. Nearly allied to *F. finschi.* Forehead with black rigid feathers. ♀ 12″.

*F. levaillanti.* Levaillant's F. from S. Africa. Known as the "Redwing." Rufous throat encircled by defined line of black and white. ♂ 13″.

*F. crawshayi.* Crawshay's F. from Lake Nyasa. Allied to *F. levaillanti,* but has the throat white, bordered rusty. ♂ 11″.

*F. gariepennis.* The Gariep F. from E.S. Africa. Differs from *F. levaillanti* in that the upper black and white stripes do not meet on the nape. ♂ 13½″. Pair of spurs. ♀ sometimes with a blunt knob on one or both legs.

*F. jugularis.* Buttikofri's F. from W.S. Africa. A paler form of *F. gariepennis,* but neck-patch black and white.

*F. shelleyi.* Shelley's F. from E.S. Africa. Breast and belly white, with black V-shaped marks. ♂ 13½″.

*F. elgonensis.* The Elgon F. from C.E. Africa. Nape and upper back rufous, spotted black. ♂ 12″.

(iv.) *With no defined row of buff spots on both webs of primaries. Back and scapulars without white or buff shaft stripes.*

*F. adspersus.* The close-barred F. from W.S. Africa. Mantle and below narrowly barred black and white. ♂ 12·6″. Pair of spurs.

*With inner webs of primaries buff, largely barred and mottled.*

*F. griseostratus.* The Grey-striped F. from W. Africa. Above chestnut, margined black and grey. ♂ pair of spurs.

*F. bicalcaratus.* The Double-spurred F. from W. Africa. Below pale buff, margined chestnut, with racket-shaped black marks. ♂ 12½″.

*F. clappertoni.* Clapperton's Double-spurred F. from the Soudan. Olive-brown, margined and irregularly barred buff. Chest buff, with black shaft stripes. ♂ 14″.

*F. gedgii.* Gedge's F. from C.E. Africa. Like *F. clappertoni*, but crown and above chocolate, narrowly margined white. ♂ 12″. Pair of blunt spurs.

*F. hartlaubi.* Hartlaub's F. from W.S. Africa. Allied to *F. clappertoni*, but tail is blackish, barred and edged white.

*F. dybrowski.* Dybrowski's F. from Upper Congo. Allied to *F. gedgii.* Buff bands on outer web and on margin of inner web of primaries.

*F. icterorhynchus.* Heuglin's Double-spurred F. from N.C. Africa. Allied to *F. clappertoni.* Below buff, with brown shaft stripes, and often with round black spot. ♂ 13½″. ♀ with one or two pairs of blunt knobs.

*F. sharpii.* Sharp's Double-spurred F. from Abyssinia. Allied to *F. clappertoni.* Breast dark brown, margined white. ♂ 13½″.

*With inner webs of primaries uniform dark brown, sometimes dotted buff towards marginal extremity.*

*F. capensis.* The Cape F. from S. Africa, known as the "Cape Pheasant." Above black, with white lines parallel to margins. Below black, with white shaft stripes. Throat spotted black. ♂ 16″. With one or two pairs of spurs.

*F. natalensis.* The Natal F. from E.S. Africa. Below whitish, with V-shaped black marks. ♂ 13½″. With one or two pairs of spurs.

*F. hildebrandti.* Hildebrandt's F. from E. Africa. Similar to *F. natalensis*, but without black shaft streaks. Below white, with heart-shaped black spots near tips. ♂ 13½. With two pairs of spurs.

*F. johnstoni.* Johnston's F. from Nyasaland. Like *F. hildebrandti*, but no heart-shaped marks.

*F. fischeri.* Fischer's F. from E.C. Africa. ♀ 12·8″. Below clear ochre. Spots at extremities of flight-feathers.

*F. squamatus.* The Scaled F. from W. Africa. First primary is shorter than tenth. Above red-brown, blotched black, edged white. ♂ 13½″. With one or two pairs of spurs. ♀ no spurs.

*F. schuetti.* Schuett's F. from W. Africa. Similar to *F. squamatus.* Above margined grey. ♂ 13″.

*F. ahantensis.* The Ahanta F. from W. Africa. Below brown, with submarginal white band, edged blackish brown. ♂ 14″.

*F. jacksoni.* Jackson's F. from E. Africa. Below bright chestnut, widely margined on both webs white. Bill and feet coral-red. ♂ 15½″. With pair of spurs and supplementary knob on left foot.

*F. erckeli.* Erckel's F. from N.E. Africa. A few outer scapulars have buff shaft stripes. Grey-brown, margined chestnut. Bill black, feet yellow. ♂ 17″. Two pairs of spurs. ♀ no spurs.

## Genus **PTERNISTES.** Bare-throated Francolins.

The same as *Francolinus*, but the throat and large eye-patch is naked. Males with one pair of spurs. Females without spurs.

(i.) *Feathers of back and scapulars with dark shaft stripes.*

*P. nudicollis.* The Cape Bare-throated F. from S. Africa. ♂ 15½″. Naked skin round eye and throat crimson. Neck-feathers black, margined grey.

*P. humboldti.* Humboldt's B.T.F. from E. Africa. ♂ 14″. Naked skin blood-red.

*P. afer.* Sclater's B.T.F. from S.W. Africa. Like *P. nudicollis*, but eyebrow stripe and cheek are pure white. ♂ 14″.

*P. cranchi.* Cranch's B.T.F. from W. Africa. Naked skin crimson. ♂ 14″. Neck, mantle, chest, and below finely mottled black and white.

*P. boehmi.* Boehm's B.T.F. from C.E. Africa. Like *P. cranchi*, but under plumage with black shaft stripes.

*P. swainsoni.* Swainson's B.T.F. from S. Africa. Naked skin rose colour. ♂ 14″.

*P. rufopictus.* Reichenow's B.T.F. from Equatorial Africa. Naked skin orange. ♂ 15½″. Neck-feathers white, with black and rufous margins.

(ii.) *Feathers of back and scapulars with white shaft stripes.*

*P. leucoscepus.* Gray's B.T.F. from N.E. Africa. Chest and breast white, margined brown. Naked skin orange. ♂ 15″.

*P. infuscatus.* Cabani's B.T.F. from E. Africa. The southern representative of *P. leucoscepus.*

## Genus **RHIZOTHERA.** Long-billed Francolins.

The same as *Francolinus*, but tail is of twelve feathers. First primary is equal to the tenth (sixth longest). Bill stout, long, and curved. Pair of spurs in both sexes. Sexes quite different.

*R. longirostris.* The Long-billed F. from Malay Peninsula to Borneo. ♂ 14½″. Crown rich brown. Above chestnut, blotched black. Neck, chest, and upper mantle grey. Below rufous. ♀ neck and breast chestnut.

*R. dulitensis.* Hose's L.B.F. from Borneo. Chest and breast grey. Below white. (O.G. i. 112–142.)

## Genus **PERDIX.**

*Perdix* = πέρδιξ, a Partridge, in classical authors.

No spur. Tail of sixteen or eighteen feathers more than half the length of the wing. First primary intermediate between seventh and eighth (fourth longest). Sexes nearly alike.

(i.) *Tail of sixteen feathers. Chest and breast barred black.*

**78. Perdix hodgsoniæ.** The Tibetan Partridge.

**Sakpha,** *Tibet.*

♂ 13″; 1 lb. Sexes alike. Legs green. Bill green. Nude crimson eye-patch. Crown chestnut. Rufous collar. Cheek, chin, and mid-throat white. Black cheek-patch. Above olive-brown, cross-barred black and buff. Below white, barred black, with belt of black-edged feathers below representing the horseshoe of English birds. S. Tibet, Kashmir, N. India, Kumaon, and Sikkim. Ten eggs (1·77 × 1·2), pale drab. (B. 1377. O. 40. O.G. i. 143. H. & M. ii. 65.)

Also *P. sifanica.* Prjevalsky's P. from Kansu. Like *P. hodgsoniæ*, but smaller and with no black breast-patch. ♂ 10½″.

(ii.) *Tail of eighteen feathers. Chest and breast not barred black.*

*P. perdix.* The Common Partridge from Europe, W. and C. Asia. Crown brown. Head, neck, and throat chestnut. Breast grey, finely mottled black, below which is horseshoe-shaped chestnut patch. Above brownish, narrowly cross-barred black. Lesser and median wing-coverts and scapulars blotched chestnut *but not barred*, with only buff shaft stripes. Below whitish. First flight-feather with extremity rounded in old birds of both sexes and pointed in birds of the year. ♂ 12·6″; weight 14 oz. ♀ with lesser and median wing-coverts and scapulars black, *cross-barred buff*, and with buff shaft stripes. Sometimes with horseshoe breast mark, but generally small or none. Ten to fifteen eggs (1·4 × 1·1), pale olive-brown. English Partridges pair about February. The young appear about middle or end of July. Male watches the nest, but hen alone sits.

*P. montana.* A curious rufous variety of *P. perdix*, with whole head and neck rust-red. Plumage dark chestnut. Grey and cream-coloured and white examples of *P. perdix* are sometimes met with.

*P. damascena.* The Migratory P. 10″. A smaller variety of *P. perdix*, visiting S. and C. Europe.

*P. daurica.* The Bearded P. 11½″. The Asiatic representative of *P. perdix*, but chin and throat feathers elongated with dark shafts, forming a beard. Breast buff, with black horseshoe patch. In the female the black breast-patch is much reduced. Common in S.E. Siberia, Mongolia, and N. China, extending to the Kokonor Mountains and other localities in N.E. districts of Chinese Tibet. (O.G. i. 143–151.)

## Genus **MARGAROPERDIX.**

Tail of twelve feathers about half the length of the wing. First primary between sixth and seventh. No spurs. Sexes differ.

*M. madagascariensis.* The Madagascar P. ♂ 10″. Above red-brown, with white shaft stripes. Head and throat black, with white eye-stripe. Mid-chest chestnut. Sides grey. Breast and belly black, with oval, white spots. Tail black, barred reddish white.—*Female:* Sides and flanks barred black. (O.G. i. 152.)

## Genus **TETRAOGALLUS**. Snow-Cocks.

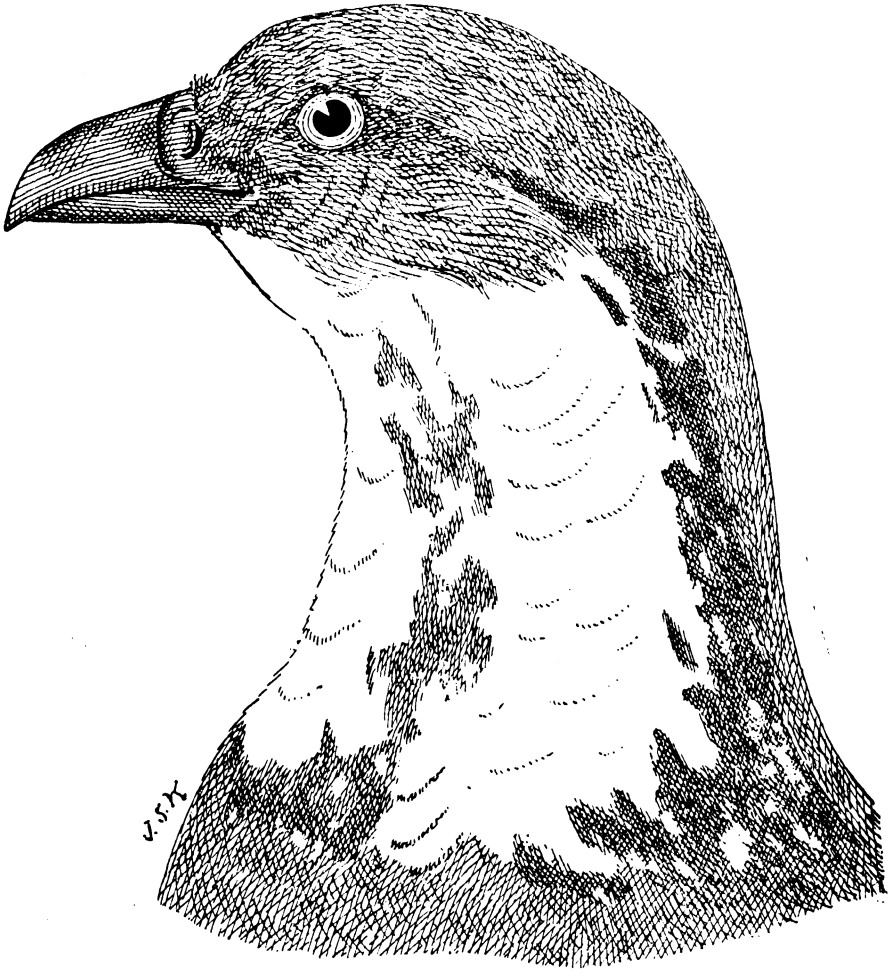
τετράων = proper name; *gallus* = a cock.

Sexes alike, or differing but slightly. Naked eye-patch. Tail of twenty or twenty-two feathers, five-eighths length of wing. First primary equal to fifth (second longest). Blunt spurs in males. Confined to Highlands of Asia and Himalayas. The larger forms approach the Capercailzies in size.

### 79. **Tetraogallus himalayensis.** The Himalayan Snow-Cock.

**Kullu,** *Nepal;* **Huinwal,** *Kumaon;* **Jer-moonal,** *Mussoorie;* **Leep,** *Kulu;* **Kubuk,** *Kashmir;* **Galound,** *Chamba;* **Kauk-i-durra,** *Afghanistan;* **Kabk-i-dareh,** *Persia;* **Utar,** *Turkistan.*

♂ 26″ to 29″; 5 to 6½ lbs. ♀ 21″ to 24″; 3 to 4 lbs. Legs yellow-red. Bill pale horny. Naked eye-patch yellow. Above ashy grey, minutely freckled. Primaries white, tipped dusky. Breast white, barred black. Below dark grey. Under-tail white. Chestnut bands from eye and mouth meet and form a collar.



R. Le M., Mussoorie, 1864.

Only traces of white on basal part of secondaries.—*Male* has a blunt spur; *female* has none. From Himalayas to Altai Mountains. Five to twelve eggs (2·72 × 1·85), olive, spotted brown. Found near the snow-line in flocks of from five to thirty. The "Snow-Pheasant" of Himalayan sportsmen.

Also *T. caspius*. The Caspian S.C. from Asia Minor, the Caucasus, and Persia. ♂ 24". ♀ 23". Like *T. himalayensis*, but chest is grey and no chestnut on sides of nape and head. Basal part of secondaries white.

*T. caucasicus*. The Caucasian S.C. ♂ 21". Resembles *T. caspius*, but back of head and nape are rust-red, with chocolate band down each side of throat. Above barred and mottled black and buff. (O.G. i. 89, 90.)

(J. 816. B. 1378. O. 42. O.G. i. 86. H. & M. i. 267.)

### 80. Tetraogallus tibetanus. The Tibetan Snow-Cock.

**Huinwal, Ular** (Kirghiz); **Hailik** (Mongol); **Cunmo** (Tanguts); **Hrak-pa**, *Sikkim*.

♂ 19" to 21½". ♀ 18". Legs ♂ coral, ♀ orange. Bill ♂ orange-red, ♀ blackish, orange tip. Naked eye-patch red. Above pale grey, tinged pink, fine freckled. Primaries French grey, tipped white. Below white, striped black. Under-tail black. White wing-band. Gorget freckled grey and buff. No white on basal half of outer quills.—*Female:* Ear-coverts white (*Lahore to Yarkand*, p. 281). Tibet to Himalayas. Seldom met with below 15,000 feet in summer.

Also *T. henrici*. Prince Henry's S.C. Differs from *S. tibetanus* in having throat and chest grey, with narrow white band down middle of chin and throat. ♂ 26".

*T. altaicus*. The Altai S.C. Differs from *S. tibetanus* in having the sides and below uniform white, the basal part of outer primaries white, and no white at the base of the secondaries. ♂ 23". (O.G. i. 85, 86.)

## Genus **TETRAOPHASIS**. Grouse Partridges.

Tail of eighteen feathers about three-quarters length of wing. First primary equal to eighth or ninth (fourth longest). Sexes alike. Males have spurs. Two species of Grouse-like Partridges from Tibet and W. China.

*T. obscurus*. The Dusky Grouse Partridge from E. Tibet. ♂ 18·6". Above olive, barred buff on wings. Below grey, spotted black. Chin, throat, and foreneck chestnut.

*T. szechenyii*. Szecheny's G.P. from C. Tibet to Mekong River. ♂ 17·6". Differs from *T. obscurus* in having chin, throat, and foreneck fawn.

## Genus **LERWA**. Snow-Partridge.

*Lerwar* = vox barbara.

Eyelids covered with plumelets. Wing expansive. First primary equal to third, second quill longest. Upper part of tarsi feathered. Tail of fourteen feathers, four-sevenths length of wing. Males with spur. Sexes similar. A single species. Combines the colours of a Grouse with the naked leg of a Partridge. Generally found near rocks and shrubs, very seldom amongst trees. Feeds on shoots, moss, and roots.

### 81. Lerwa nivicola. The Snow-Partridge.

**Larwa**, *Nepal;* **Jungooria**, *Kumaon;* **Koor-monal**, *Garhwal;* **Barf-ka-titur**, *Kulu*.

♂ 14" to 16"; 16 to 22 oz. Legs red. Bill bright red. Above minutely barred black and grey. Below chestnut, with broad white splashes on the flanks. —*Male* has short spurs.—*Female* like the male, but no spurs. From Kashmir to

Bhutan and China. Eggs dull white, freckled red-brown. (J. 817. B. 1380. O. 41. O.G. i. 79. H. & M. ii. 1.)



R. Le M., Mussoorie, 1864.

### Subfamily ODONTOPHORINÆ. AMERICAN PARTRIDGES and QUAILS.

Distinguished from all the other subfamilies of *Phasianidæ* by having the cutting edge of the lower mandible more or less distinctly serrated. Crested (except in *Ortyx* and *Rhynchortyx*). No spurs. Fourth quill longest (except in *Dendrortyx*). Tail of twelve feathers (except in *Callipepla* and *Rhynchortyx*). It includes the following genera:—

*Dendrortyx.* Three species of Long-tailed Partridges from Mexico and C. America. Males varying in length from 13½″ to 15″.

*Callipepla.* Two species of Scaly Partridges with tail of fourteen feathers. One from New Mexico, called also the "Blue Quail" or the "White Top-knot Quail," and the other from Texas. 10″.

*Oreortyx.* The Plumed Partridge or "Mountain Quail" from W.N. America. 9½″ long.

*Lophortyx.* Four species of Californian Quail from W.N. America and Mexico. Varying from 9″ to 10″ in length.

*Philortyx.* The Mexican Barred Partridge. 7½″ in length.

*Eupsychortyx.* Eight species of Crested Quails from C. and S. America. Varying from 8″ to 9″ in length.

*Ortyx.* Ten species of Colins or Bobwhites from U.S. America and Mexico. Varying from 7½″ to 9″.

*Cyrtonyx.* Three species of Harlequin Quails from Mexico and C. America. With long claws, and varying from 7¾″ to 8¼″ in length.

*Dactylortyx.* The Long-nailed Partridge from C. America. 9″ in length.

*Odontophorus.* Fifteen species of Thick-billed Partridges from S. and C. America. Varying from 9½″ to 11½″ in length. Six of these species have the chest and breast spotted with white.

*Rhynchortyx.* Two species of Long-legged Colins. With tail of ten feathers. From C. America. 7½″ in length. (O.G. ii. 112–163.)

## Suborder PERISTEROPODES.

Hind toe on same level as the other toes. Inner notch of breast-bone less than half the length of the entire breast-bone.

This suborder includes three families, viz. Curassows (Curassows, Mountain Pheasants, Penelopes, Guans), Hoatzins, and Megapodes (Brush-Turkeys, Maleos, and Megapodes).

## Family CRACIDÆ. Guans and Curassows.

No spurs. Toes long and slender. Hind toe long and on same level as the other toes. Tail of twelve feathers. The young when hatched are covered with down. Exclusively American. By their habits they appear to be the link that joins the Pigeons to the Game Birds.

Guans and Curassows differ from true Game Birds (*Tétraonidæ* and *Phasianidæ*), and resemble Megapodes in the position of the hind toe and form of the sternum, but they differ entirely from the latter in their breeding habits; the eggs (white and usually two in number) being laid in a nest, made either in a tree or on the ground, and incubated in the usual manner.

Fifty-six species are known, all inhabitants of the forest regions of C. and S. America, where they seem to take the place of the ordinary large game birds of the Old World. These may be grouped into three subfamilies, viz.—

(i.) *Cracinæ*, with the height of the upper mandible greater than its width, which includes the following genera: *Crax* or True Curassows, large birds, 30″ to 35″ in length, comprising eleven species, with curly recurved crest; *Northocrax*, one species, 24″ long, with flat crest; *Mitua*, three species of razor-billed birds, 28″ to 35″ in length, with crests not curled; and *Pauxis*, one species, 33″ long, with short velvety crest and an egg-shaped helmet covering the base of the bill and forehead.

(ii.) *Oreophasinæ*, with height of upper mandible less than its width, containing one species of Mountain Pheasant, 36″ long, with crest almost bare, a straight cylindrical casque on the top of the head, and cheeks and base of bill densely feathered.

(iii.) *Penelopinæ*, with height of upper mandible less than its width, which includes the following genera:—

*Penelope* or Penelopes, large Pheasant-like birds from 22″ to 35″ long, comprising sixteen species, with feathered crest, the eye-patch, chin, and throat being naked, with median wattle; *Ortalis* or Guans, like Pigeons or Partridges, from 16″ to 25″ long, comprising seventeen species, with long tail, a band of thin feathers on a bare throat, and no wattle; *Pipile*, containing three species of Piping Guans, 30″ long, the front neck naked, with a median wattle; *Aburria*, a species of wattled Guan, 29″ long, having the foreneck feathered with a long vermiform wattle; and *Champetes*, containing two species of Sickle-winged Guans, 24″ long, with chin and throat feathered, and no wattle. (O.G. 200-258.)

## Family OPISTHOCOMIDÆ.

Sexes similar. Elongated crest of stiff-shafted feathers. Sides of head naked. Tail of ten feathers. Fifth secondary quill present. Hind toe very long. The young are hatched naked. The thumb and first finger being provided with claws, enables them to climb and grasp the branches soon after they are hatched; the bill as well as the legs and wings being used for a similar purpose. They are able to swim and dive with facility. Eggs are double-spotted like those of a Rail and are laid in a nest of loose twigs built high up over water or soft mud. Only one genus from S. America.

*O. hoazin*. 23″. Plumage dark brown, glossed olive. (O.G. ii. 259.)

## Family MEGAPODIIDÆ. Mound-Birds.

Large strong feet and large claws. Tail of from twelve to eighteen feathers, not always developed. Hind toe long and on same plane as the other toes. No spurs. Plumage dull green-brown. Frequent sandy soil.

The Brush-Turkeys, Maleos, and Megapodes, varying from 10″ to 25″ in length, differ widely in their habits from all other birds. Their eggs (very large for the size of the bird and laid at considerable intervals) are deposited in the sand or in a mound raised by one or more pairs of birds. The young are hatched fully feathered (without the intervention of the parent bird) and able to fly

almost from birth. Limited geographically to Australia, New Guinea, and certain of the adjacent islands. One species (*M. nicobariensis*), which is found far to the west in the Nicobar Islands, may, however, have been imported. Twenty-six species are known grouped in two subfamilies, viz.—

### Subfamily TALEGALLINÆ. TALEGALLAS,

which includes the following genera:—

*Tallegallus.* The Brush-Turkeys. Four species from New Guinea, birds varying from 20″ to 23″ in length, with tail of sixteen feathers, no wattle, and a crest of narrow hair-like feathers.

*Catheturus.* One species (*C. lathami*). The Australian Wattled Brush-Turkey. 25″ to 26″ long, with tail of eighteen feathers, and a large wattle at the base of the neck.

*Æpypodius.* Two species of Papuan Wattled Brush-Turkeys. 17″ to 19″ in length, with tail of sixteen feathers, and a pendulous wattle at the base of the foreneck, and an elevated fleshy crest extending from the base of the bill to the crown.

*Megacephalon.* The Maleo. 22″ long. From Celebes. With tail of eighteen feathers, a large gourd-shaped helmet, and a rounded tubercle behind each nostril. (O.G. ii. 188-200.)

### Subfamily MEGAPODINÆ.

Large strong feet, placed far back. Tail of twelve and sixteen feathers. Sexes alike. Jerdon thought that the Lyre Bird of Australia (*Menura superba*) was more nearly allied to the Megapodes than to the Wrens and Warblers.

### Genus **MEGAPODIUS.**

μέγας = great; πούς = a foot.

Dull green plumage. Long hind toe. Claws long and straight. Tail of twelve feathers. First primary equal to or shorter than tenth (fifth longest). Secondaries as long as the primaries. Fore part of legs covered by a single row of large scales. From the Friendly Islands and Australia to the Philippines and Celebes.

#### 82. **Megapodius nicobariensis.** THE NICOBAR MEGAPODE.

♂ 14½″ to 17″; 1¼ to 2⅛ lbs. Legs dark horny. Bill greenish. Orbits brick-red. Crown pale olive, grey behind ears. Above olive-brown, below grey-brown. Breast tinged grey.—*Young* snuff-brown, with tail-like bunch of fur (*Stray Feathers*, ii. 276). Eggs (3·25 × 2·07) pink.

Also fifteen other species of True Megapodes, varying from 9½″ to 17″ in length.

Also *Eulipoa.* The Painted Megapode, with secondary quills much shorter than the primaries. 14″ long, with tail of twelve feathers.

Also *Lipoa.* One species (*L. ocellata*) of Ocellated Megapode (the Australian Pheasant). 24″ long, with tail of sixteen feathers.

## Order **HEMIPODII.**

Single notch of breast-bone about two-thirds length of entire breast-bone. Fifth secondary quill present.

| | | |
|---|---|---|
| No hind toe. . . | TURNIX . . | BUSTARD AND BUTTON QUAILS. |
| Rudimentary hind toe . | PEDIONOMUS* . | PLAIN WANDERERS. |

* Not represented in India.

# Order **HEMIPODII.**

Single notch of breast-bone about two-thirds the length of the entire breast-bone. Fifth secondary quill present. This suborder contains two genera—*Turnix*, with three toes, found throughout the warmer parts of the Old World, including Australia, and *Pedionomus*, with rudimentary hind toe, peculiar to Australia. The females are larger and more handsomely coloured than the males. Males generally incubate the eggs and tend the young, while the females fight among themselves for possession of the males. The young are hatched covered with down and able to run as soon as they leave the eggs.

## Family TURNICIDÆ. THREE-TOED QUAILS and PLAIN WANDERERS.

Jerdon (p. 594) places the Bustard and Button Quails as a subfamily of *Tinamidæ*.

Of small size. Bill slender. Wings moderate. Tail short or none. Lateral toes short. No spurs. No hind toe (*Pedionomus* excepted). Frequent bushes and grass-jungle.

NOTE.—Bustard Quails differ more from Quails than the latter do from Pea-Fowl in structure.

## Genus **TURNIX.**

*Turnix*, shortened from *Coturnix*, *q.v.*, to show that it was a mutilated form, wanting the hind toe.

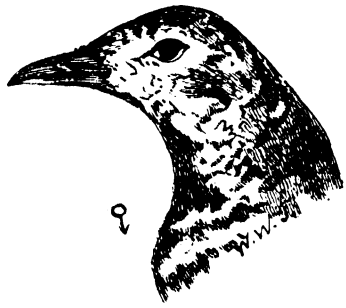
First quill as long as others. No hind toe. Tail very short, of twelve feathers in a bundle. None are truly migratory.

(i.) *Leg (metatarsus) longer than mid-toe and claw.*

A. *Entire breast cross-barred black. Belly spotless. Sexes differ.*

### 83. **Turnix pugnax.** THE INDIAN BUSTARD QUAIL.

**Gulu**, *India;* **Durwa**, *Rutnagiri;* **Karehaki**, *Mysore;* **Timok** (Lepcha); **Ngon**, *Burma.*



Sapoora, 9.8.75.

♂ 5½″ to 6⅓″; 1½ to 2 oz. ♀ 6″ to 6½″; 1½ to 2¼ oz. Legs plumbeous. Bill dark slaty. No rufous collar.—*Male:* Chin and throat white. Chest barred black and buff. Above rufous.—*Female:* Chin and throat black. Above rufous, mottled black, margined pale buff.

*T. pugnax* is figured by Hume (H. & M. ii. 169), and he also represents the Burmese form (*T. plumbipes*) as a separate species (H. & M. ii. 177). Ogilvie-Grant also describes this species as *T. taigoor*, and calls the Island Bustard Quail from Ceylon and Java *T. pugnax* (O.G. ii. 265–268). Blanford unites all these, the range being from Sind (see illustration), India, Ceylon, Burma, Malay Peninsula, and Java, to S. China. Three or four eggs (0·93 × 0·79), pale lilac, with brown specks and blotches. (J. 832. B. 1382. O. 9. O.G. ii. 265. H. & M. ii. 169.)

Also *T. fasciata*. The Philippine B.Q. ♂ 5·2″, like *T. pugnax*. ♀ 6″, but with well-defined rufous collar.

*T. rufilatus*. The Celebean B.Q. ♂ 5·6″, like *T. pugnax*, but with chest barred black and white. ♀ 6·6″, with chin and throat white, barred black.

*T. powelli*. The Sumbawa B.Q. Like *T. rufilatus*, but the male has no rufous on belly, thighs, and under tail-coverts, and the female has them whitish.

B. *Mid-breast not cross-barred black. Throat never black. Sexes similar. Mid-tail lengthened, pointed, and edged white or buff. Plumage above edged white or buff, giving the back a scaly appearance.*

*Mid-breast and belly spotless; sides spotted or barred black.*

### 84. Turnix dussumieri. The Little Button Quail.

**Chota Lowa**, *India*; **Chimnaj**, *Muttra*; **Tatu-bateyra**, *Sind*; **Durwi**, *Ratmagiri*; **Sán-gúndlú**, *Orissa*.



Sapoora, 9.8.75.

♂ 5″ to 5½″; 1 to 1½ oz. ♀ 5½″ to 5¾″; 1¼ to 1½ oz. Legs fleshy white. Bill plumbeous. Head brown, barred black. Chin and throat pure white. Mid-breast buff. Sides of breast buff, with black spots. Shoulder-feathers edged golden buff. Abdomen whitish. Rise once only. Single note. Sexes similar. Migrates all over India, and extends to Pegu and Formosa. Four to six eggs (0·76 × 0·67), pale yellow, spotted and mottled darker. (J. 835. B. 1383. O. 10. O.G. ii. 273. H. & M. ii. 193.)

### 85. Turnix lepurana. Smith's Button Quail.

♂ 5″. ♀ 5·7″. Sexes similar. Shoulder-feathers margined white. Mid-breast rust-red. Sides of breast pale buff, with heart-shaped black spots. Plumage above dull red, the scale-like margins extending to the back of the head. S. Africa, and recently obtained at Aden. Four eggs (0·88 × 0·72), white, spotted and blotched red-brown. (O.G. ii. 272.)

Also *T. sylvatica*. The Andalusian B.Q. from S. Europe and N. Africa. Differs only from *T. lepurana* in being larger. ♂ 6″. ♀ 7″.

*T. nana*. The African B.Q. Differs from *T. dussumieri* in having sides of breast cross-barred black and white. ♀ 5·8″.

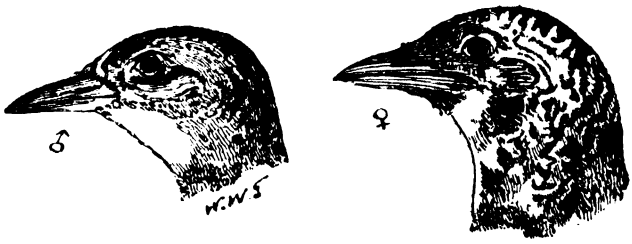
*Mid-breast and belly with round black spots.*

*T. hottentotta*. The S. African B.Q. Resembles *T. nana*, but feathers of mid-breast and belly have round black spots. ♀ 6·6″.

*Mid-breast* [*not cross-barred black. Throat never black. But sexes differ, and mid-tail is neither lengthened, pointed, nor edged. Above uniformly coloured, without scaly appearance. Shoulder-feathers not edged with golden buff.*

### 86. Turnix tanki. The Larger Button Quail.

**Lowa**, *Upper India;* **Pedda-dubba-gúndlú** (Telugu).




Sapoora, 9.8.75.

♂ 5½″. ♀ 6½″. 1⅛ to 1½ oz. Legs bright yellow. Bill yellow. Chin and throat whitish. Sides of breast with round or crescentic black spots. Wing-coverts light brown, with small black spot margined yellow. Outer primaries brown, with narrow buff outer margins.—*Male* has no rufous collar.—*Female* has one. Seen singly.

Jerdon wrongly names this *T. dussumieri.* Throughout India, from the Himalayas to Travancore. Four eggs (0·88 × 0·75), yellowish with purple specks and blotches. (J. 834. B. 1384. O. 11. O.G. ii. 278. H. & M. ii. 187.)

### 87. Turnix albiventris. The Nicobar Button Quail.

**Mool**, *Nicobars.*

♂ 6″; 1¼ oz. ♀ 6½″; 1¾ oz. Legs yellow. Bill yellow. Plumage similar to *T. tanki.*—*Female* has broad half-collar chestnut. Two black stripes from crown to nape. Outer web of first primary nearly white. (H. & M. ii. 199.) Found in Nicobar and Andaman Islands.

### 88. Turnix blanfordi. The Burmese Button Quail.

**Ngon**, *Burma.*

♂ 6½″. ♀ 7″. Legs yellow. Bill brown. A larger race of *T. tanki.* Throughout Assam, Burma, and China, but not S. of Tenasserim. (B. 1386.)

*Also with shoulder-feathers edged golden buff.*

*T. whiteheadi.* Whitehead's B.Q. from the Philippines. ♂ 4·4″. Mid-tail lengthened. Back nearly uniform in colour.

*T. maculosa.* Temminck's B.Q. from Australia to the Celebes. Like *T. blanfordi,* but shoulder-feathers edged golden buff. ♂ 5·1″. ♀ 5·8″.

*T. saturata.* The New Britain B.Q. Like *T. maculosa,* but with no rufous collar. ♂ 5″.

*T. rufescens.* Wallace's B.Q. from Timor. ♂ 5·2″. Upper plumage as in *T. maculosa,* and with rufous breast as in *T. saturata.* (O.G. ii. 281, 282.)

C. *Neck and breast uniform rufous. Upper tail-coverts covering the true tail. Sexes differ.*

*T. ocellata.* The Chestnut-breasted B.Q. from the Philippines. ♂ 6·4″. Chin and mid-throat white. No rufous nuchal collar. Black ocelli on wing-coverts. ♀ 6·9″. Throat black. Neck, chest, and breast uniform chestnut. A rufous collar.

(ii.) *Leg (metatarsus) equal to or shorter than mid toe and claw.*

*T. nigricollis.* The Madagascar B.Q. ♂ 5·5″. Chin and throat white. Mid-chest and flanks buff, barred black. ♀ 5·8″. Chin, throat, and mid-chest black. Breast and belly grey.

*T. melanogaster.* The Black-breasted B.Q. from E. Australia. ♂ 6·3″. Chin and mid-throat pure white. Chest and breast buff, with V-shaped black bars. ♀ 7·5″. Sides of face and throat black. Chest and breast black, tipped white.

*T. varia.* The Variegated B.Q. from Australia. ♂ 6·4″. No rufous collar. Chest buff, irregularly spotted grey. ♀ 7·6″. Wing-coverts with irregular white spots, black edged. Chest grey, with spatulate buff shaft stripe.

*T. castanonota.* The Chestnut-backed B.Q. from N. Australia. Male like female, but smaller. ♀ 6″. Wing-coverts with white and black ocelli. Chest and breast grey, with white shaft stripes.

*T. pyrrhothorax.* The Rufous-chested B.Q. from N.E., E., and S. Australia. ♂ 5·2″. Resembles female. ♀ 6″. Chest, sides of breast, and flanks rufous.

*T. velox.* The Swift B.Q. from Australia. ♂ 5½″. Similar to female. ♀ 5·5″. Above dull red. Sides of head and chest light red.

## Genus **PEDIONOMUS.**

Distinguished from *Turnix* by having a small hind toe.

*P. torquatus.* The Collared Plain Wanderer from Australia. ♂ 5·8″. Neck-collar buff. Upper chest washed bright buff. ♀ 6·3″. Neck-collar black feathers, white tipped. Neck and upper chest rust colour. Chin and mid-throat white. (O.G. ii. 283–291.)

# GRALLATORES. *SHORE BIRDS.*

## Waders.

The term GRALLATORES (derived from *grădĭor*, to take steps) is applied by ornithologists to the Shore Birds, from their stalking, walking, or wading. Shore Birds frequent edges of rivers, seas, lakes, and a few dry plains and deserts; they feed on fish, reptiles, molluscs, insects, and a few on vegetable matter. In large numbers there is a vernal moult, and plumage changes considerably, in many becoming more or less black, in others rufous.

Lower part of tibia bare. Tarsus elongated. Wings usually long. Tail usually short. Bill straight or inclining. Outer toe usually joined to middle one by short web, and to inner toe occasionally. In a few, toes are bordered by loose web. ALL FLY WELL, WITH LEGS OUT BEHIND.

## Order GRALLÆ.

Hind toe, when present, slightly raised. Legs generally long, and part of the tibia bare. Schizognathous. Young hatched covered with down and able to run. (*Heliornis*, helpless and nearly naked). Eggs double-spotted.

| | | |
|---|---|---|
| Single notch on each side of posterior margin of breast-bone. Hind toe present | RALLUS | RAILS. |
| | HYPOTÆNIDIA | |
| | CREX | |
| | PORZANA | CRAKES. |
| | RALLINA | WATER-HENS. |
| | AMAURORNIS | |
| | GALLICREX | WATER-COCKS. |
| | GALLINULA | MOORHENS. |
| | PORPHYRIO | |
| | FULICA | COOTS. |
| | MESITES* | |
| | HELIOPAIS | FINFOOTS. |
| No notches on posterior margin of breast-bone. Hind toe present | GRUS | CRANES. |
| | ANTHROPOIDES | |
| | ARAMIDÆ* | LIMPKINS. |
| | EURYPYGIDÆ* | SUN BITTERNS. |
| | RHINOCHETIDÆ* | KAGUS. |
| | PSOPHIIDÆ* | TRUMPETERS. |
| No hind toe. Two small notches on each side of posterior margin of breast-bone | OTIS | BUSTARDS. |
| | EUPODOTIS | |
| | HOUBARA | |
| | SYPHEOTIS | FLORIKINS. |

* Not represented in India.

## Order **GRALLÆ**

Includes Rails, Crakes, Water-Hens, Water-Cocks, Moorhens, Coots, Finfoots, Cranes, Limpkins or Courlans,* Sun Bitterns,* Kagus,* Trumpeters,* Bustards, and Florikins. Hind toe, when present, slightly raised. Legs generally long, and part of tibia is bare. Breast-bone with one or two notches on each side of posterior margin, or none. Oil-gland tufted, or none. Schizognathous, or birds with vomer narrow behind, pointed in front; maxillo palatines free. Young are hatched covered with down and able to run (except in *Heliornithidæ*, where the young are helpless and nearly naked). Eggs double-spotted, one set of spots distinct and deeply coloured on the surface, the second set purplish or grey, less distinct, and apparently beneath the surface.

## Suborder FULICARIÆ.

A single notch on each side of posterior margin of breast-bone. Oil-gland tufted. Hind toe present and raised (*Mesitidæ* excepted). Young are hatched covered with down and able to run or swim at once (*Heliornis* excepted). Includes Rails, Crakes, Water-Hens, Water-Cocks, Moorhens, Coots, and Finfoots.

### Family RALLIDÆ.

*Rallus* = thin.

The Rails, Crakes, Water-Hens, and Coots are marsh birds, varying in length from 4½″ to 21½″. The breast-bone resembles that of *Turnix* with its single notch.

Bill short and wedge-shaped, longer in True Rails, shorter and stouter in Crakes, and very deep in the Gallinules. Large feet, short legs. Hind toe always raised. Tail short, of ten to fourteen feathers, or none. Wing rounded, often with spur. Second or third quill longest, sometimes two, three, four subequal. Remiges twenty-three to twenty-six. Fifth secondary wanting. Small after-shaft. Forehead feathered or with a shield. Feet slender and long. Toes free, or sometimes webbed and scalloped.

Extensively represented in Australia and Oceania; less so in Malayan Islands. General aspect and partially vegetable diet give them the appearance of Gallinaceous birds. Many eggs double-spotted. Nest in grass or rushes. Young hatched with down, and able to run or swim within a few hours. Cosmopolitan.

#### Subfamily RALLINÆ. RAILS.

No frontal plate. Beak much compressed. Plumage soft and loose, brown, streaked, and often banded. Sexes alike in colour. Mostly of small size.

(i.) *Culmen longer than mid toe and claw. Tarsus equal to or less than mid toe and claw.*

##### Genus **RALLUS.**

*Rallus*, the Latinised form of the French *Râle* (spelt *Rasle* in Bélon, 1555); our *Rail*, Dutch *Ral;* akin to *rattle.*

Bill longer than head (tip slightly curved) and grooved for two-thirds of length. Nostril in groove nearer base of bill than tip. Forehead of bristly feathers.

* Not represented in India.

Wing short. Second quill longest usually. Remiges twenty-six. No white marks on back. Tail short. Toes slender and free. Mid toe and claw varying from $1\frac{1}{3}''$ to $2\frac{3}{5}''$.

### 89. Rallus indicus. The Indian Water-Rail.

♂ $10\frac{1}{2}''$ to $12''$; $4\frac{1}{2}$ to 6 oz. Legs dingy pink. Bill $1\frac{1}{2}''$, dull red. Eye-streaks, cheeks, and sides of throat grey. Chin and mid-throat white. Above olive-brown, with black streaks. Under-tail white, rufous, and black. China, Siberia, and Japan, but visits India in cold season. (J. 914. B. 1387. H. and M. ii. 257.)

### 90. Rallus aquaticus. The Water-Rail.

*Aquātĭcus*=living in or by the water, *ăqua.*

**Yekan tokhisi,** *Yarkand.*

♂ $12''$; 3 to 5 oz. Legs flesh-brown. Bill $1\frac{3}{4}''$, red. More grey than *R. indicus.* No facial stripe. Throughout Europe and the Palæarctic region as far E. as Cabul and Yarkand. A rare winter visitor to Himalayas. Eight to ten eggs (1·4 × 1·05), stone colour, spotted purple. (B. 1388. H. & M. ii. 261.)

Also *R. peruvianus.* Similar to *R. aquaticus*, but smaller.

*R. elegans*, $14\frac{1}{2}''$, from N. America; and two subspecies, $15''$ and $16''$, from California and Mexico.

*R. longirostris*, $10\frac{1}{2}''$, from Guiana; and six subspecies, varying from $12''$ to $15''$, from Brazil, N. America, W. Indies and Cuba.

*R. virgianus.* $8\frac{1}{3}''$. From N. and C. America.

*R. æquatorialis.* $7\frac{1}{2}''$. From W.S. America.

*R. antarcticus.* $7\frac{1}{2}''$. From S. America.

*R. semiplumbeus.* $6\frac{1}{2}''$. From S. America.

*R. cærulescens.* The Blue-necked Rail. $9\frac{1}{2}''$. From S. Africa.

*R. madagascariensis.* $12''$.

Also there are ten species of extinct Rails from France and Germany. (B.M. Cat., xxiii. 227.)

Also the genus *Limnopardalus*, with indication of a small frontal shield, the nostril placed about centre of the bill, and mid toe and claw varying from 1·2″ to 2·45″. Three species, all from S. America.

*L. maculatus*, $10\frac{1}{2}''$; *L. eytirhynchus*, $10\frac{1}{2}''$; and two subspecies, $12\frac{1}{2}''$ and $15\frac{1}{2}''$; and *L. nigricans*, $12''$. (B.M. Cat., xxiii. 8–32.)

## Genus **HYPOTÆNIDIA.**

Bill is shorter than tarsus, but in Indian representatives it equals the tarsus. With white bars or spots on the back. Mid toe and claw varying from $1\frac{3}{4}''$ to $2\frac{1}{3}''$. Widely distributed in Oriental and Australian regions.

*Throat white.*

### 91. Hypotænidia striata. The Blue-breasted Banded Rail.

**Wade-kodi** (Telugu); **Yay-gyet,** *Burma.*

♂ $9\frac{3}{5}''$ to $11\frac{1}{2}''$; $3\frac{1}{2}$ to 5 oz. Legs dingy pink. Bill $1\frac{1}{2}''$, reddish. Chin and mid-throat white. Above olive, with narrow white bars edged black. Vent and under-tail dull, with white bands. Face, neck, and breast blue-grey. White banding on wings. S.E. Asia, Malay Archipelago, Philippines, and Celebes. Resident in India, Ceylon, and Burma. Five to seven eggs (1·35 × 1·02), stone colour, spotted brown. (J. 913. B. 1389.)

**92. Hypotænidia obscurior.** THE ANDAMANESE BANDED RAIL.

♂ 11½″ to 12¾″. Legs slaty green. Bill 1¾″, Indian red. Resembles *H. striata.* Face, sides of neck, and breast lead-grey. Forehead and crown dark maroon. Above dark brown, banded white. The Andaman Islands. Four to six eggs (1·43 × 1). (H. & M. ii. 253.)

Also *H. brachypus*, 7½″, from W. and S. Australia and Tasmania; and *H. muelleri*, from Auckland Islands; and one subspecies (extinct), *H. pacifica*, from Tahiti.

*H. philippinensis*, 11½″, from Philippines to Celebes, the Moluccas, Australia, New Zealand, and Pacific Islands; and one subspecies, 10½″, from Macquarie Islands.

*Throat black, or black, barred white.*

*H. torquata.* 11″. From Philippines.

*H. celebensis.* 13½″. From Celebes.

*H. jentinki.* 11″. From Sula Islands.

*H. saturata.* 13″. From New Guinea.

*H. sulcirostris.* 10½″. From Sulu Islands.

*H. insignis.* 12″. From New Britain.

Also the genus *Cabalus*, with genys distinctly decurved at tip. Mid toe and claw 2″. Three species—*C. dieffenbachi*, 7″, and *C. modestus*, 7″, from Chatham Islands; and *C. sylvestris*, 12″, from Lord Howe Island.

*Tarsus longer than mid toe and claw.*

Also the genus *Eulabeornis*, with no bare patch behind eye. Mid toe and claw from 2·2″ to 2·7″. Three species—*E. castaneiventris*, 17″, from N. Australia and Aru Islands; *E. pœciloptcrus*, 13″, from Fiji Islands; and *E. woodfordi*, 14½″, from Solomon Islands.

Also the genus *Tricholimnas*, plumage soft and hair-like. Mid toe and claw 2½″. One species—*T. lafresnayanus*, 17″, from New Caledonia.

Also the genus *Gymnocrex*, with bare patch behind eye. Two species—*G. rosenbergi*, 7″, from Celebes; and *G. plumbeiventris*, 13″, from Moluccas, New Guinea, and Solomon Islands.

Also the genus *Aramidopsis.* One species—*A. plateni*, 11½″, from Celebes.

Also the genus *Aramides*, with tail somewhat shortened. Mid toe and claw from 2·05″ to 3·4″. Eight species and three subspecies, from 10½″ to 16½″, all confined to Neotropical region.

Also the genus *Megacrex*, with frontal shield distinct and tail decomposed. Incapable of flight. One species—*M. inepta*, from 17″ to 21½″, from S. New Guinea.

Also the genus *Habroptila*, small frontal shield, plumage black. Mid toe and claw 2·85″. One species—*H. wallacei*, 15″, from the Moluccas. (B.M. Cat., xxiii. 37–63.)

(ii.) *Culmen shorter than mid toe and claw.*

## Genus **CREX.**

Bill shorter than head. Forehead feathered. Wing broad, second quill longest. Remiges twenty-six. Plumage striped above. Tail pointed, rectrices narrow.

**93. Crex pratensis.** THE LAND-RAIL or CORNCRAKE.

*Crex* = κρέξ, a Rail, in classical Greek. Cf. κρέκω = I strike so as to sound.

♂ 10″. ♀ 9″. Legs pale brown. Bill 1$\frac{1}{10}$″, pale brown. In winter, crown, hind neck, back, rump, and tail black, margined brown and grey. Wing rufous. Chin, throat, and abdomen whitish. In summer the eye-stripes, cheeks, fore-neck, and breast are grey. Young hatched with black down. Mid toe and claw 1½″. A single species. Migratory. Found in summer throughout Europe and C. Asia, and in winter in Africa and Arabia. Said to occur in N. India. (B. 1391.)

Also the genus *Œnolimnas.* One species, with uniform plumage. Mid toe and claw 2·6″. *Œ. isabellina*, 9″, from Celebes.

Also the genus *Amaurolimnas.* One species, with culmen as long as inner toe. Mid toe and claw 1½″. *A. concolor*, 9½″, from C. America.

Also the genus *Anurolimnas.* Two species, with tail obsolete. Mid toe and claw from 1·55″ to 1·7″. *A. castaneiceps*, 7″, and *A. hauxwelli*, 6½″, from S. America.

*Secondaries not so long as primaries.*

## Genus **PORZANA.**

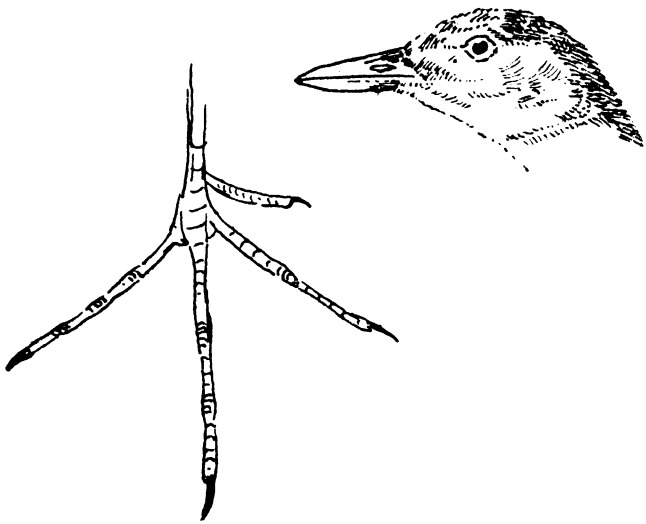
*Porzāna*, the Italian name; also written *Sforzana* (Salvadori) and *Forzane*. Of unknown derivation.

Small, short-billed, long-toed Water-Rails. Bill equals length of head, somewhat narrowed in middle. Wings rounded. Second quill longest, or two and three equal. Tail short, nearly covered by tail-coverts. Toes long, slender, and smooth. Sharp claws. Mid toe and claw from 1·2″ to 1·8″. Cosmopolitan.

*Breast uniform, not spotted white.*

### 94. Porzana parva. The Little Crake.

♂ 8″; 1¾ oz. ♀ 7¾″ to 8″; 1¼ to 1½ oz. Legs yellow-green. Bill yellow-green, red base.—*Male:* Throat and breast ashy, banded white on abdomen. Outer edge of first primary brown. Above dark brown, splotched black. Mid toe and claw 1·6″.—*Female:* Below isabelline buff. Europe, S.W. and C. Asia. Migratory to Africa and N. India in cold weather.



Calcutta, 5.2.88.

### 95. Porzana pusilla. The Eastern Baillon's Crake.

Baillonı, in honour of Louis Antoine François Baillon, of Abbeville, who died about 1855. He first found the species in Picardy, and gave Vieillot details of its habits, etc.

**Jhilli**, *Nepal.*

♂ 6½″ to 7¾″; 1 to 2 oz. Legs yellow-green. Bill ¾″, dark green. Mid toe and claw 1½″. Above yellow-brown, with white irregular spots black-edged. Beneath grey. Under-tail black, with white crossbar. Outer edge of first primary white. Sexes alike. Eastern Asia, India, Ceylon, Burma, Afghanistan, and Baluchistan. In W. Asia and Europe replaced by *P. intermedia*. Six to

eight eggs (1·16 × 0·87), pale olive, thickly freckled. (J. 910. B. 1393. H. & M. ii. 203.)

Also *P. carolina*. 8″. With white breast. From N. and C. America.
*P. fluminea*. 7″. With slate-grey breast. From Australia.
*P. albicollis*. 9½″. With ashy breast. From S. America.
*P. intermedia*. 7″. With grey breast. From C. Europe, Persia, and Africa.
*P. affinis*. 7″. From New Zealand.
*P. palustris*. 6″. With grey breast. From Australia.
*P. spiloptera*. 5½″. With leaden breast. From Buenos Aires.
*P. flaviventris*. 5″. With buff breast. From S. America, Cuba, Jamaica.
*P. tabuensis*, 6½″, with slate breast, from Oceania; and one subspecies—*P. tahitiensis*.
*P. gœlapagoensis*. 5½″. With grey breast. From the Galapagos. (B.M. Cat., xxiii. 97–113.)

*Breast spotted with white.*

### 96. Porzana maruetta. The Spotted Crake.

*Maruetta*, Latinised from the French *la Marouette*. The word is probably not Italian, as it is not mentioned by Salvadori.

**Khairi**, *Bengal*; **Venna-mudi-kodi** (Telugu).

♂ 8½″ to 9″; 3 to 4 oz. Legs bright green. Mid toe and claw 1·7″. Bill orange and yellow.—*Male*: Above olive-brown, blotched. All feathers spotted and streaked white. Nape black and white. Chin and throat dark grey. Breast grey, spotted white. Flanks barred white. Abdomen white. Female marked like the male, but chin is white, and breast light brown with white spots. Found in summer in Europe and W. and C. Asia, and migrating in winter to N. Africa and India. (J. 909. B. 1394. H. & M. ii. 213.)

Also the genus *Pennula*. Two species from Sandwich Islands, with tail-feathers entirely hidden. Mid toe and claw from 1·35″ to 1·5″. *P. ecaudata*, 5½″; and *P. sandwichiensis*, 5½″.

Also the genus *Aphanolimnas*. One species—*A. monasa*, with tail hidden, from Kushai.

Also the genus *Corethrura*. Eight species and one subspecies. From 4⅓″ to 6½″. With nostrils pervious. From Africa and Madagascar. Mid toe and claw from 0·85″ to 1·3″.

Also the genus *Rallicula*. Three species. From 8″ to 8⅓″. With nostrils closed. Mid toe and claw 1½″. From New Guinea.

Also the genus *Thyrorhina*. One species. 5″. With nostrils closed. Mid toe and claw 0·8″. From S. America.

Also the genus *Ortygops*. Four species, with white secondary quills. Mid toe and claw from 0·9″ to 1·25″. *O. novaboracensis*, 5½″, from N. America; *O. exquisita*, 5½″, from E. Siberia and Japan to N.E. China; *O. notata*, 5⅓″, from S. America; and *O. ayresi*, 5½″, from S.E. Africa.

Also the genus *Poliolimnas*. One species, with variegated plumage, and wing fully developed. *P. cinereus*, 7½″, from the Malayan Islands, Australia, and the Pacific Islands. Mid toe and claw 2·1″.

Also the genus *Porzanula*. One species—*P. palmeri*, 5″, with variegated plumage, and wing feeble, from N. Pacific Island, Laysan. Mid toe and claw 1·2″.

Also the genus *Creciscus*. With variegated plumage, and wing fully developed. Mid toe and claw from 1″ to 1·55″. Thirteen species and four subspecies. 4½″ to 6⅔″. From the greater part of the New World.

Also the genus *Limnocorax*. One species. Mid toe and claw 1·8″. *L. niger*, with black plumage, from Africa. (B.M. Cat., xxiii. 114–150.)

## Genus **RALLINA.**

Culmen less than inner toe and claw. Wing rounded. Third quill longest. Mid toe and claw from 1¾″ to 2″. Secondaries shorter than or as long as primaries.

**97. Rallina superciliaris.** The Banded Crake.

♂ 9¾″ to 10¾″. Legs leaden brown. Bill 1⅛″, green.—*Male:* Crown, nape, and back of neck rich chestnut. Back and wings olive. Chin and upper throat white. Below, including wing-lining and lower tail-coverts, barred white and dusky black. Old females resemble males, but without bars on wing-coverts. India, Ceylon, Burma, and Malayan Peninsula. A winter visitor. Summer quarters and breeding haunts unknown. (J. 912. B. 1395. H. & M. ii. 237.)

**98. Rallina fasciata.** The Malayan Banded Crake.

♂ 8½″ to 9¾″; 2¾ to 4¾ oz. Legs coral-red. Bill slaty. Orbital ring, gape, and skin of chin vermilion. Chin and throat whitish. Sides of neck and breast chestnut. Above chestnut. Back and wings rufous. Abdomen heavily banded black and white. From Burma, through Indo-Malayan region, to Celebes and the Moluccas. (B. 1396. H. & M. ii. 235.)

Also *R. euryzonoides*, 8½″, from the Philippines; and one subspecies, *R. separia*, from Liu-Kiu Islands.

*R. minahasa*. 10½″. From Celebes and Sulu Islands. Mid toe and claw 1¾″.

*R. tricolor*. 11½″. From N.E. Australia, New Guinea, and Aru Islands.

Also the genus *Ocydromus*, with wing-coverts lengthened. Three species from New Zealand—*O. australis*, 19″, the Weka Rail; *O. eagli*, 17½″; and *O. brachypterus*, 17½″; and one species—*O. insignis* (extinct), from Chatham Islands. The Ocydrome, or Swift Runner, has a skeleton like the Dodo. The Maoris say that this bird interbreeds freely with common poultry.

Also the genus *Aphanapteryx*, flightless and long billed (now extinct).

*A. broccki*, from Mauritius; *A. hawkinsi*, from Chatham Islands; and *A. leguati*, from Rodriguez.

Also the genus *Himatornis*, with tarsus longer than mid toe and claw. One species—*H. hæmatopus*, 15″, from W. Africa.

Also the genus *Dryolimnas*, with nostrils longitudinal and very narrow. One species—*D. cuvieri*, 9½″, from Madagascar and Mauritius; and one subspecies—*D. aldabranus*, 10½″, from Aldabra Island.

Also the genus *Canirallus*, with nostrils large, oval, and pervious. Mid toe and claw 0·85″. Two species—*C. oculeus*, 13″, from W. Africa; and *C. kioloides*, 10½″, from Madagascar. (B.M. Cat., xxiii. 64–73.)

*Secondaries as long as the primaries.*

**99. Rallina canningi.** The Andamanese Banded Crake.

♂ 13″ to 14½″. Legs olive-green. Bill 1⅛″, pale green. Head, neck, and above chestnut. Below black, banded white. Andaman Islands. Six eggs (1·4 × 1·09), pinkish, streaked and blotched chestnut. (B. 1397. H. & M. ii. 241.)

Also the genus *Stictolimnas*, with second and third quills equal and longest. One species—*S. sharpii*, 9″, from S. America.

Also the genus *Crecopsis*. One species—*C. egregia*, 9″, from tropical Africa.

## Genus **AMAURORNIS.**

Bill much shorter than mid toe and claw. Wing rounded, third quill longest; second quill as long as fifth or sixth. Secondaries shorter than primaries. Plumage more nearly uniform. Culmen sometimes swollen at base. Mid toe and claw from 2½″ to 2⅘″.

*Bill not swollen at base.*

**100. Amaurornis fuscus.** The Ruddy Crake.

**Chota Boder,** *Nepal;* **Yay-gyet,** *Pegu.*

♂ 7⅔″ to 8¾″. Legs red. Bill red, tip green. Above olive-brown. Vent and under-tail barred white. Head and breast deep red. Chin and throat whitish. India, Ceylon, and Burma to Java, Borneo, the Philippines, China, and Japan. Breeds in Bengal, July to September. Five eggs (1·2 × 0·84), white with inky spots. (J. 911. B. 1398. H. & M. ii. 217.)

**101. Amaurornis bicolor.** Elwes's Crake.

♂ 8″ to 9″. Legs dull red. Bill greenish. Head, neck, and breast ashy. Back and wings chestnut. Tail black. From Nepal to Assam and Manipur. Eggs (1·4 × 1·0) white, spotted sepia. (B. 1399. H. and M. ii. 217.)

**102. Amaurornis akool.** The Brown Crake.

♂ 10½″ to 12″; 4 to 6 oz. ♀ 10″ to 11½″; 3½ to 5 oz. Legs dull lake-red. Bill green.—*Male:* Head black. Above olive-brown. Wings and tail dusky. Under-tail deep brown.—*Female:* The same, but without the black on head and the chin clearly white. Rather a Moorhen than a Rail. Resident in N. India, and met with throughout India generally, the N. Khasi Hills, and in China. Breeds twice in the monsoon. Four to eight eggs (1·49 × 1·1), pinkish with red-brown spots. (J. 908. B. 1400. H. & M. ii. 217.)

Also the genus *Limnobœnus.* Three species—*L. phœopygus,* from Liu-Kiu Archipelago; *L. paykulli,* 8½″, from E. Siberia, China, Malay Peninsula, Java, and Borneo; and *L. marginalis,* 9″, from W. Africa.

*Bill swollen at base.*

**103. Amaurornis phœnicurus.** The White-breasted Water-hen.

φοινίκουρος = a bird.

**Dawak,** *India;* **Kureyn,** *Gondwarra;* **Kurayi,** *Sind;* **Kinati,** *Oudh;* **Bolikadi** (Telugu); **Tannin-koli,** *Ceylon;* **Kálu-gwet,** *Burma.*

♂ 12¾″. Legs green. Mid toe 2·7″. Bill 1″, green, ridge orange. Forehead, sides of face, chin, throat, foreneck, and breast white. Above black, with green reflections. Under tail-coverts chestnut. Quills brown. Outer margin of first primary and edge of wing white. India, Ceylon, Burma, to Celebes and Formosa. Breeds from May to September. Four to eight eggs (1·57 × 1·18), buff, spotted and blotched purple. (J. 907. B. 1401.)

**104. Amaurornis insularis.** The Andamanese Water-Hen.

♂ 12″. ♀ 12″. Legs yellow. Bill pale green. Similar to *A. phœnicurus,* but the white of the forehead is extended to the crown, and on the breast is restricted to a narrow strip. Andaman Islands and Nicobars.

Also *A. olivaceus.* 11½″. From the Philippines.

*A. moluccana.* 10⅝″. From the Moluccas to New Guinea and New Britain and N.E. Australia.

Also the genus *Rougetius.* One species—*R. rougeti,* 11″, with long and slender bill, from N.E. Africa.

Also the genus *Neocrex.* One species—*N. erythrops,* 7″, with stout bill, and nasal groove indistinct, from S. America. Mid toe and claw 1·3″.

## Subfamily GALLINULINÆ.

With frontal shield. Toes narrowly bordered or lobed. More aquatic than Rails, and plumage generally uniform in colour.

## Genus **GALLICREX.**

Posterior caruncle on frontal shield pointed. Toes without lateral membrane. Third quill usually longest, or second, third, and fourth quills subequal. Sexes differ.

### 105. Gallicrex cinerea. THE WATER-COCK.

**Kora, Khora,** *India;* **Kettala,** *Ceylon;* **Boun-dote,** *Burma.*

♂ 16″ to 17″; ♀ 14″. Legs, ♂ dull red; ♀ dull green. Mid toe 3·6″. Bill red, tip yellow.—*In summer:* Male dull black, edged brown. Edge of wing white, and white on outer web of first primary. In autumn male moults into the female garb.—*Female:* Brown, edged fulvous. Beneath buff, barred brown. India, Ceylon, Burma, China, Japan, Philippines, Java, Sumatra, and Borneo. Breeds in July and August. Eggs (1·7 × 1·27) light brown, spotted purple. (J. 904. B. 1403.)

Also the genus *Psammocrex*. One species. 17″. Mid toe without claw 1·85″. *P. petiti*, from the Lower Congo (said to be identical with *H. hæmatopus*).

Also the genus *Porphyriola*. Three species. 9½″ to 11″. With mid toe and claw from 2·6″ to 3″, and no posterior caruncle to frontal shield. From S. Europe, Africa, and America.

Also the genus *Parendiastes*. One species—*P. pacificus*, 9″, with mid toe and claw 1·6″, large frontal shield, nostrils linear, not pervious, from the Samoa Islands.

Also the genus *Microtribonyx*. One species—*M. ventralis*, 10½″, with mid toe and claw 3·1″; the culmen dilated at base, nostrils oval, large, and pervious, from Australia.

Also the genus *Tribonyx*. One species—*T. mortieri*, 14″, with mid toe and claw 2½″, the culmen dilated at base, secondaries as long as primaries, wing feeble, from S. Australia and Tasmania; and the extinct species, *T. effluxus*, from Queensland. (B.M. Cat., xxiii. 164–166.)

## Genus **GALLINULA.**

*Gallĭnŭla*=a chicken; diminutive of *gallĭna*=a hen.

Bill bent up at base, forming a small fore shield, rounded behind. Nostrils elongate. Wings very long. Second quill longest, or second and third equal. Secondaries less than primaries. Toes varying in length from 2·3″ to 3·6″, and narrowly fringed. Remiges twenty-three. Found over the greater portion of Old and New Worlds.

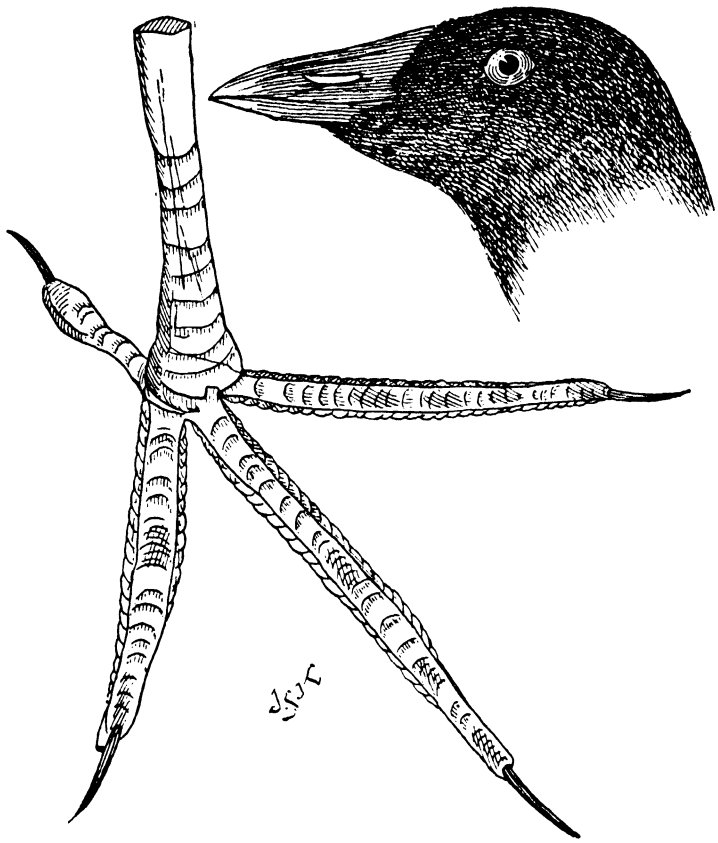
### 106. Gallinula chloropus. THE MOORHEN.

*Chlōrŏpus*=green-footed, from χλωρός + πούς.

**Godhan,** *Behar;* **Jumbu Kodi** (Telugu); **Jal murghi,** *Bengal.*

♂ 13″. ♀ 12″. Legs green, with orange garter. Mid toe and claw 2·95″. Bill red, tip yellow. Head grey. Above olive. Beneath grey. Chin and abdomen speckled white. Flanks streaked white. Under-tail white, with black feathers superposed. Edge of bastard wing white. Outer web of first primary white. Found throughout the greater part of Europe, Africa, and Asia, including

India, Ceylon, and Burma. Five to nine eggs (1·62 × 1·21), drab, spotted red. Young leave the nest as soon as hatched. (J. 905. B. 1402.)



Mandalay, 15.2.89.

Also *G. lepida.* Species undetermined.

*G. tenebrosa.* 14½″. From E. and S. Australia and S. New Guinea.

*G. frontata.* 14″. From Australia, New Guinea, Moluccas, Celebes, and Borneo.

*G. galeata,* 14″, from greater part of New World; and one subspecies from Sandwich Islands.

*G. angulata,* 9″, from Africa; and two extinct Gallinules from Queensland.

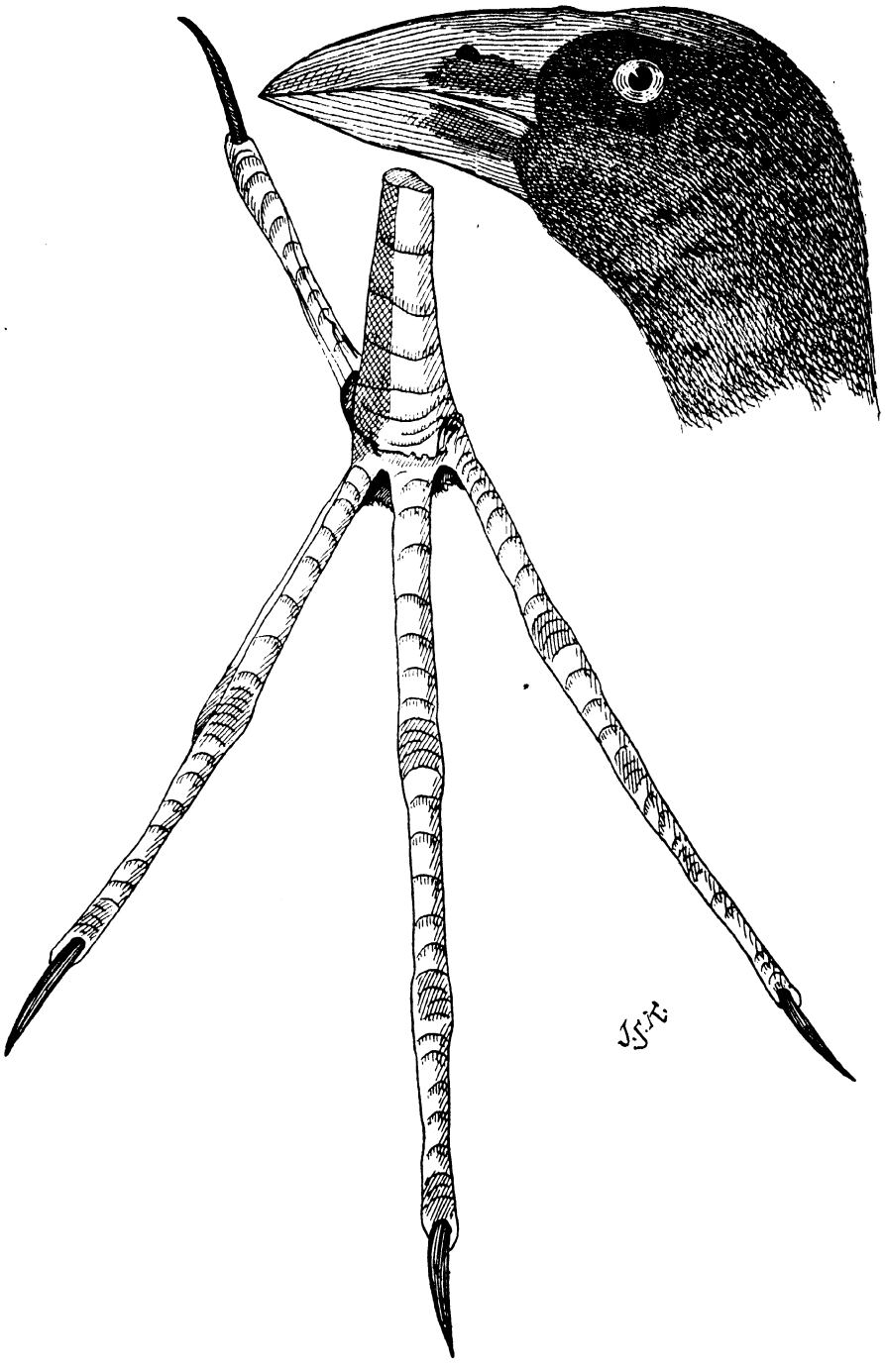
Also the genus *Porphyriornis.* Two species, with fringe to toes nearly obsolete, and wing feeble. *P. nesiotis,* 10″, from Tristan d'Acunha; and *P. comori,* 11″, from Gough Island. Mid toe and claw 2·7″.

Also the genus *Porphyriops.* One species, with frontal shield pointed posteriorly. Mid toe and claw 2·4″. *P. melanops,* 9″, from S. America (B. M. Cat., xxiii. 166–182).

## Genus **PORPHYRIO.**

*Porphyrio* = πορφυρίων = a red-coloured water-bird known to the Greeks: from πορφύρα = purple.

Base of bill prolonged to top of head and squarely truncated behind. Wings rounded; second, third, and fourth quills subequal. Toes very long, from 3·8″ to 4·9″. Plumage blue. Sexes alike. Africa, India, Burma, S. China, Malayan Archipelago, Australia, New Zealand, and South Sea Islands.



107. Mandalay, 15.2.89.

### 107. Porphyrio poliocephalus. The Purple Moorhen.

**Keim, Kharim,** *India;* **Kem,** *Bengal;* **Nila bolakodi** (Telugu); **Sannary,** *Ceylon.*

♂ 18″ to 19″. Legs brick-red, joints darkened. Bill red, with spot. Mid toe and claw 4·65″. Wing-coverts pale blue. Breast pure blue. Under-tail white. Caucasus to Mesopotamia, Afghanistan, India, Ceylon, Burma. Six to eight eggs (1·93 × 1·39), pale pink, spotted red and purple. (J. 902. B. 1404.) See illustration, p. 131.

Also *P. palliatus.* Range unknown.

*P. cærulescens.* Formerly in Réunion.

*P. mackintoshi.* Extinct species from New Zealand.

*P. cæruleus.* 16″. Mid toe and claw 4·9″. From Mediterranean countries.

*P. porphyrio.* 16″. Mid toe and claw 4·6″. From Africa.

*P. bemmeleni.* From Sumatra.

*P. calvus.* 15½″. Mid toe and claw 3·8″. Java to S. Celebes.

*P. edwardsi.* 18″. Mid toe and claw 4·35″. Cochin China to Malay Peninsula.

*P. ellioti.* 15½″. Mid toe and claw 4″. From Admiralty Islands.

*P. bellus.* 17½″. Mid toe and claw 4·6″. From W. Australia.

*P. chathamensis.* 17″. Mid toe and claw 3·8″. From Chatham Islands.

*P. smaragdinus.* 15″. Mid toe and claw 3·8″. N. Celebes to Fiji and Friendly Islands.

*P. samoensis.* 13½″. Mid toe and claw 3·7″. Samoan Islands.

*P. melanonotus,* 16″, mid toe and claw 4·5″, from Australia and Tasmania, New Zealand and New Guinea; with one subspecies—*P. pelewensis,* 15″, mid toe and claw 4·1″, from Pelew Islands.

*P. pulverulentus.* 15″. Mid toe and claw 4·2″. From the Philippines.

Also the genus *Notornis.* One species. Without power of flight. Wing-coverts elongated. *N. mantelli,* 20″, mid toe and claw 3·7″; and one species, *N. alba,* now extinct, from Norfolk Island.

Also the genus *Aptornis,* now extinct, from New Zealand. Two species—*A. otidiformis* from North Island and *A. defossor* from South Island.

## Genus **FULICA.**

*Fulică* = a Coot, in classical Latin; akin to φαλ-ακρός = bald-headed.

Bill with shield on forehead. Toes lobed and clear to base. Tarsus with membranous fringe behind. Second and third quills longest. Remiges twenty-five. Secondaries as long as primaries. Plumage dark grey or blackish. Sexes alike.

### 108. Fulica atra. The Coot.

*Atra* = black.

**Dasari,** *India;* **Bara godhan,** *Purneah;* **Boli kodi** (Telugu).

♂ 14½″ to 16″. Legs with three garters. Mid toe and claw 3·85″. Bill white. Head, neck, and under tail-coverts deep black. Above blackish, tinged blue. Under parts ashy.—*In Young:* Under parts grey, with white tips to secondaries. Europe, Asia, Japan, and the Philippines, India (not observed in Ceylon), Burma, and the Malayan Archipelago as far as Java. Seven to twelve eggs (1·98 × 1·4), grey, speckled with black. (J. 903. B. 1405.) See illustration, p. 133.

Also *F. cristata.* 16″. Mid toe and claw 4·2″. Outer secondaries without white tips. Frontal shield corrugated. Africa.

*F. australis.* 14″. Mid toe and claw 3·4″. With frontal shield smooth. From Australia and Tasmania.

*Secondaries with white tips. Under tail-coverts white.*

Five species from S. America.

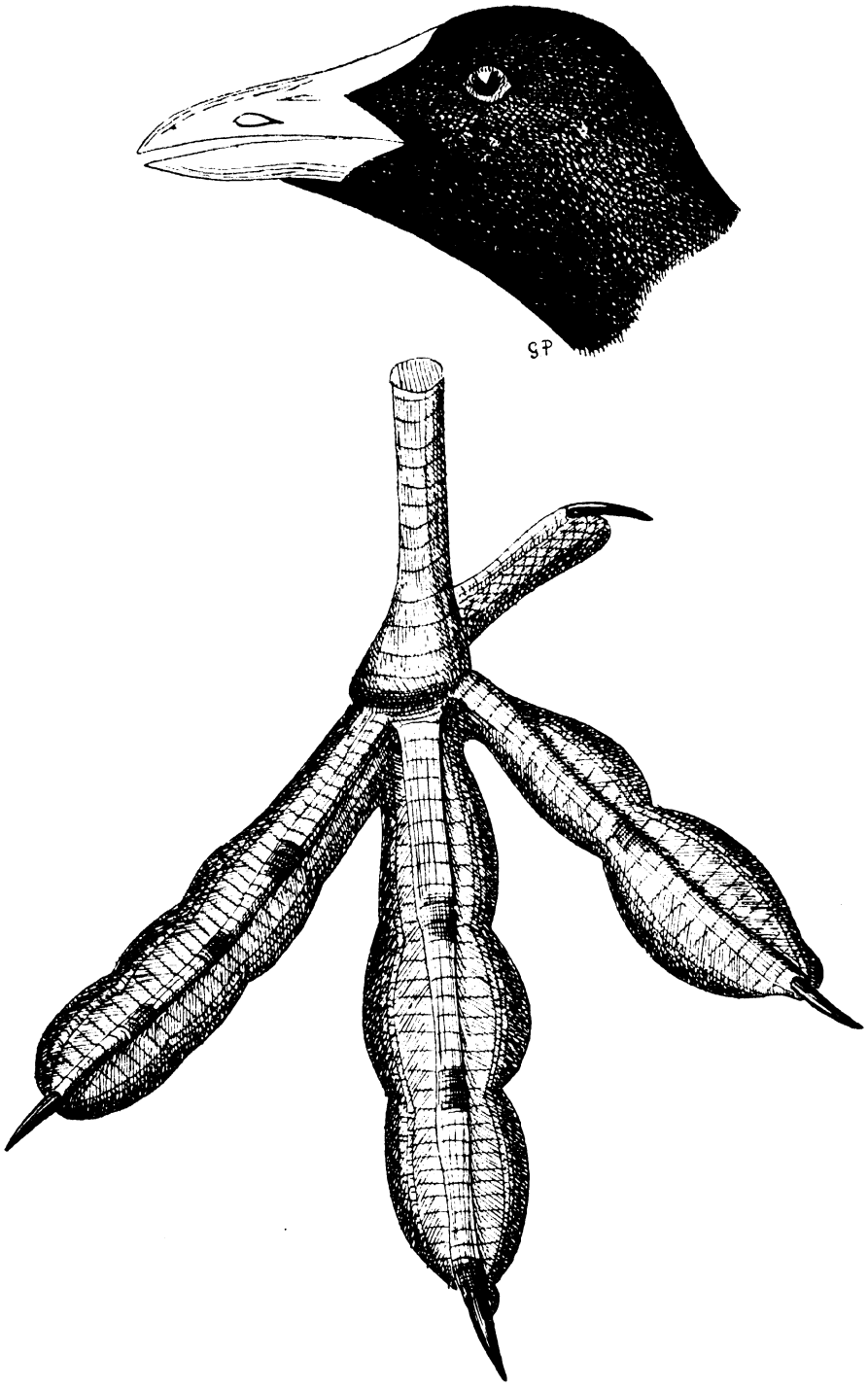
*F. cornuta.* 19″. Frontal shield with caruncles.

*F. ardesiaca.* 16″. Mid toe and claw 4″. Frontal shield plain and rounded.

*F. armillata.* 18″. Mid toe and claw 4″. Frontal shield pointed.

*F. leucopyga.* 14″. Mid toe and claw 3·4″. First primary plain.

*F. gigantea.* 20″. Mid toe and claw 5½″. Toes dark red.



108. *Fulica atra*, 22.10.75.

*Outer secondaries with broad white tips.*

*F. americana.* 14″. Mid toe and claw 3·1″. Bill dusky. From N. and C. America.
*F. caribæa.* 13½″. Mid toe and claw 3·1″. From the Lesser Antilles.
*F. leucoptera.* 11″. Mid toe and claw 3·1. Bill yellow. From S. America.
*F. alai.* 11½″. Mid toe and claw 3·2″. Bill yellow. From Sandwich Islands.
*F. novæ zealandiæ.* Not identified.

Also the extinct species—*F. newtoni*, from Mauritius; *F. minor*, from Oregon; *F. desjardini* and *F. prior*, from Queensland.

Also the extinct genus *Leguatra*. One species—*L. gigantea*, from Mauritius.

Also five fossil genera of *Rallidæ—Gypsornis*, one species, from France; *Telmatornis*, two species, from New Jersey; *Orthocnemus*, four species, from S. France; *Elaphrocnemus*, three species, from S. France; and *Tapinopus*, one species, from S. France.

Also the family MESITIDÆ, akin to the *Rallidæ*, but with hind toe on same level as others. Rectrices sixteen. Primaries ten. Breast-bone with deep notch on each side. Five pairs of powder-down patches (two dorsal, two ventral, and one lateral). Bill shorter than head. Nostrils linear, upturned, more than half length of beak, and covered above. One genus—*Mesites*. One species—*M. variegata*, 10½″, mid toe and claw 1·05″, from Madagascar.

## Family HELIORNITHIDÆ.

Externally like, but larger than Rails. Toes with scalloped lateral webs. No after-shaft. Fifth secondary present (wanting in *Heliornis*). Tail of eighteen feathers. Young hatched naked and helpless.

### Genus **HELIOPAIS.**

No frontal shield. Toes webbed only at base, lobed as in Coots and broadly fringed. Wing round. Second quill longest or second and third equal. Tail of eighteen feathers, about half the length of the wing, short and rounded, soft and broad. Sexes differ slightly.

**109. Heliopais personata.** THE MASKED FINFOOT.

♂ 22″. ♀ 20½″. Legs light green. Bill orange. Mid toe and claw 3·1″. Hind toe has no lobe or web. Tail of eighteen feathers, much rounded.—*Male:* Crown and hind neck bluish grey. Forehead, face, chin, and throat black. Sides drab. Breast, abdomen, lower tail-coverts white. Back and scapulars dark brown. *Female:* Chin, throat, and foreneck white, with black border. From Assam to Sumatra. (B. 1406.)

Also the genus *Heliornis*. One species—*H. fulica*, 12″, with toes webbed for nearly two-thirds of length, from S. and C. America.

Also the genus *Podica*. Two species, from Africa, with tail-feathers narrow and pointed, long, stiff, and ribbed. *P. senegalensis*, 21″, mid toe and claw 3·1″; and *P. petersi*, 23″, mid toe and claw 3·4″. (B.M. Cat., xxiii. 229-235.)

## Suborder GRUES.

No notches on posterior margin of breast-bone (*Eurypygidæ* excepted). Oil-gland tufted. Hind toe present. Young hatched clad in down and run at once. Includes Cranes, Limpkins or Courlans (*Aramidæ*),* Sun Bitterns,* Kagus,* and Trumpeters.*

* Not represented in India.

## Family GRUIDÆ. True Cranes.

Bill equal to or longer than head, stout, straight, and slightly cleft. Nostril shut in by large posterior membrane. Lower mandible slightly grooved. Mid claw smooth. Hind toe small and raised. Large size. Plumage grey or white. Long neck and legs. Rectrices twelve, primaries eleven. Sternum with no notches behind, but perforated in front. No powder-down patches. Inner secondaries longer than primaries, and generally composed of drooping plumes with dissociated webs. Fifth secondary wanting. Small after-shaft.

Inhabit the Palæarctic region, migrating to India and N. Africa in winter. A rare straggler to portion of the United Kingdom, probably from Scandinavia. Migratory and gregarious. Breed on the ground. Two eggs. Appear to pair for life. Young hatched clad in down and run at once. Externally allied to Bustards; while internal anatomy is more that of Plovers.

### Genus **GRUS**.

*Grus* = a Crane, in classical Latin; akin to γέρᾶνος, *gallus*, *garrio* = I chatter, etc.

Base of bill, orbits, and sometimes whole head nude. Wings long, third quill usually longest. Remiges thirty-three. Tertiaries lengthened and overhanging. Tail short. Sexes alike. The greater part of Europe and N. Asia, N.E. Africa, India, China, and N. America.

*Without straw-like bristles on the nape. Nostrils linear.*

#### 110. **Grus communis**. The Common Crane.

**Kooroonch, Koorch,** *N. W. P.*; **Kul-lung,** *Upper India*; **Kunj,** *Sind*; **Kallam,** *Deccan*; **Kulungi** (Telugu); **Wainu,** *Manipur*.

♂ 43″ to 48″; 9½ to 13 lbs. Legs dull black. Mid toe and claw 4·2″. Bill green, tip white. Slate-coloured patch between gape and eye. Forehead nude, with black hairs. Crown nude, blackish, with occipital red band. White bands from eyes, which continue and meet down back of neck. Five or six beautifully curled lavender feathers with black tips at elbow of wing. Plumage ashy blue. Inner secondaries with drooping plumes of decomposed feathers.—*Young* birds want the naked patch. Migratory. N. Europe and N. Asia, wintering in S. Europe, N. Africa, S.W. Asia, N. India, and China. Arrives in India in August and leaves in March. Two or three eggs (3·9 × 2·4), grey, blotched and spotted red-brown. (J. 865. B. 1407. H. & M. iii. 21.) See illustration, p. 136.

Also *G. lilfordi*. The same species as *G. communis*, but catalogued as distinct.

*G. mexicana*. 40″. Mid toe and claw 4″. From U.S. America.

*G. canadensis*. 35″. Mid toe and claw 3·3″. The Brown Crane from N. America.

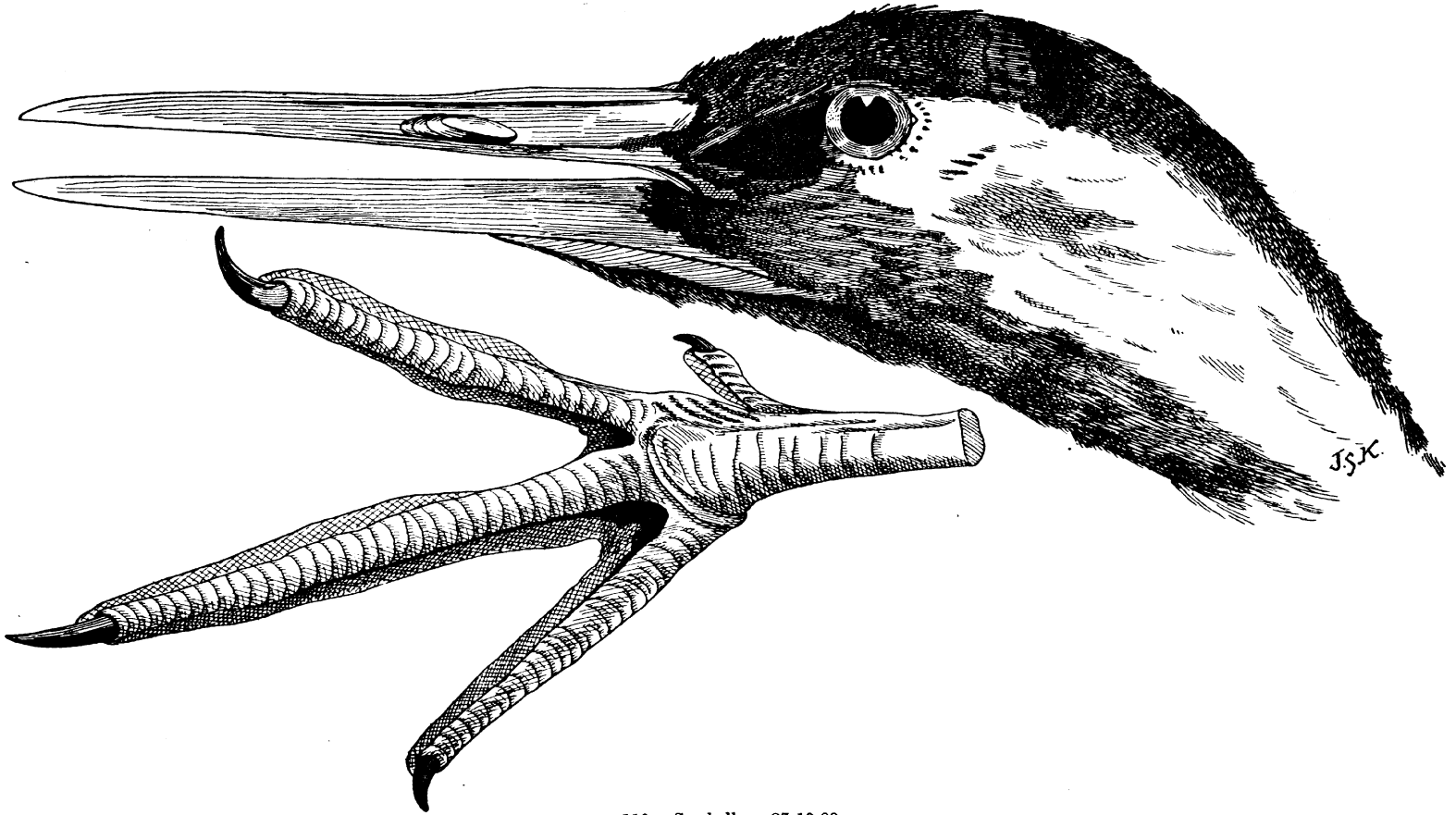
*G. monachus*. 36″. Mid toe and claw 4·1″. Breeds in Siberia, winters in China.

*G. nigricollis*. 48″. From Kokonor.

*G. japonensis*. 50″. Mid toe and claw 5·2″. From E. Siberia and Japan, and wintering in China.

Also ten fossil species (three from Italy, one Malta, one Greece, two France, one Hampshire, one New Jersey, and one Nebraska).

Also the genus *Limnogeranus*, with crown and cheeks bare. One species—*L. americanus*, 48″, mid toe and claw 4·4″. The Hooping Crane, from N. America. (B.M. Cat., xxiii. 253–260.)




110. Sambalkar, 27.10.89.

### 111. **Grus antigone.** The Sarus Crane.

**Sirhaus** (Hindi); **Khur-sang,** *Assam;* **Sarus, Gyogya,** *Aracan.*

♂ 56″ to 60″; 16 to 20 lbs. ♀ 53″ to 55″; 15 to 17½ lbs. Legs rose-red. Mid toe and claw 5″. Bill green, tip brown. Head and neck nude, crimson, with few black hairs. White neck-ring.—*In summer:* Collar pure white. Resident in N. India. Usually seen in pairs and often with one or two young birds. Pair for life. Two or three eggs (3·96 × 2·56), white, blotched pale brown. (J. 863. B. 1409. H. & M. iii. 1.)

### 112. **Grus sharpii.** The Burmese Sarus Crane.

**Gyo-gya,** *Burma.*

Similar to *G. antigone*, but the neck grey and not white. ♂ 40″. Mid toe and claw 5·4″. ♀ 40″. Burma, Siam, and Cochin China.

Also *G.* (*antigone*) *australasiana.* 42″. Mid toe and claw 3·6″. From E. Australia.

Also the genus *Pseudogeranus.* One species—*P. leucauchen*, 40″, mid toe and claw 4½″, from E. Siberia, Japan, and China.

Also the genus *Bugeronus.* One species—*B. carunculatus*, 54″, mid toe and claw 6·8″, the wattled Heron of S. Africa.

Also the genus *Tetrapteryx.* One species—*T. paradisea*, 40″, mid toe and claw 4·3″, from S. Africa.

### 113. **Grus leucogeranus.** The Large White, or Snow-wreath, or Siberian Crane.

**Karekhur,** *N.W.P.;* **Tunhi,** *Oudh;* **Chini Kalung,** *Hansi;* **Syakbal,** *Cabul.*

♂ 52″ to 56″; 16 to 19 lbs. ♀ 48″ to 53″; 12½ to 16 lbs. Legs red. Bill umber. Quills black. Face naked, red. Plumage white. Rare visitor to N.W. India. Breeds in Siberia. (J. 864. B. 1408. H. & M. iii. 11.)

## Genus **ANTHROPOIDES.**

ἀνθρωποειδής = in the shape of a man.

Head and neck densely feathered, with white plumes behind ear-coverts. Neck and breast-feathers lanceolate and hackled.

### 114. **Anthropoides virgo.** The Demoiselle Crane.

*Virgo* = a maiden, from the bird's elegant appearance and dancing propensity.

**Karkarra,** *N.W.P.;* **Ghanto,** *Nepal;* **Kurkurchi,** *Sattara;* **Parouthakee,** *Mysore;* **Wadakoraka** (Telugu); **Shuck duruck,** *Cabul.*

♂ 31″ to 36″; 5 to 6¾ lbs. Legs black. Bill green, tip pink. Face, neck, and breast-plumes black. Eye-tuft of white decomposed feathers.—*Young* birds have no black and want ear-tuft. Migratory. Breeds in S. & E. Europe, S. Siberia, C. & W. Asia. Winters in N.E. Africa, India and China. One was shot at Deerness, Orkney, in 1863, and one (female) at Brancaster, Norfolk, in 1899, feeding in a cornfield. (J. 866. B. 1411. H. & M. iii. 31.)

Also the genus *Balearica*, with tuft of straw-like bristles on nape, and nostrils oblique. Three species from Africa—*B. pavonina*, 37″, the Crowned Crane; *B. chrysopelargus*, 34″, mid toe and claw 4·4″; and *B. abbericeps*, 37″, mid toe and claw 4·1″.

Also the fossil genera *Geranopsis*, two species (one from Hampshire, one from S. France); and *Aletornis*, five species (from Wyoming).

Also the following families of Wading Birds, with hind toe raised:—

(i.) ARAMIDÆ. The family of Limpkins, or Courlans, intermediate between Rails and Cranes. Rectrices twelve. Sternum as in Cranes, with no posterior notches. Bill longer than head, curved, and Rail-like. Nostrils in deep groove. Secondaries as long as primaries. First primary sickle-shaped, and spatulate at tip. Four bare tracts on body, extending up neck. Ten to twelve eggs, large as a Turkey's, white, blotched purple, having a powdered appearance. One genus, *Aramus*, with two species—*A. scolopaceus*, 22″, mid toe and claw 3·8″, from S. America; and *A. pictus*, 27″, mid toe and claw 4·2″, from Florida to Panama.

(ii.) EURYPYGIDÆ. Sun Bitterns. Rectrices twelve. Primaries ten. Sternum with posterior notches on each side. Bare tracts on body, not extending beyond base of neck. Bill Rail-like, longer than head. Nostrils horizontal. Inner secondaries nearly reaching tips of primaries. Young fed by parents for some weeks. One genus, *Eurypyga*, with two species—*E. helias*, 18″, mid toe and claw 1·75″, the Sun-Bittern of S. America; and *E. major*, 17″, mid toe and claw 1·9″, from C. America to Ecuador.

(iii.) RHINOCHETIDÆ. Kagus. Rectrices twelve. Primaries ten. Sternum with no posterior notch. After-shaft. One pair of powder-down patches on side of rump. Four bare body tracts, extending up neck. Bill as long as head. Nostril basal, in broad depression, entirely hidden. No lateral groove in mandible. Inner secondaries longer than primaries. One genus, *Rhinochetus*, one species—*R. jubata*, the Kagu, with large drooping crest, 22″, mid toe and claw 2·3″, from New Caledonia.

(iv.) PSOPHIIDÆ. Trumpeters. Rectrices ten. Sternum with no notch on posterior margin. No after-shaft. Long tract on the neck bare. Plumage soft. Under tail-coverts long and lax. Bill shorter than head. Nostrils ovate and pervious with posterior membrane. Nest on the ground. Two eggs, light ash colour. One genus, *Psophia*, five species, confined to S. America—*P. crepitans*, 21″, mid toe and claw 2·8″, the Gold-breasted Trumpeter; *P. napensis*, 19″, mid toe and claw 2·5″; *P. leucoptera*, 20″, mid toe and claw 2·8″; *P. ochroptera*, 19″, mid toe and claw 2·8″; *P. viridis*, 17″, mid toe and claw 2·5″. (B. M. Cat., xxiii. 236–281.)

## Suborder OTIDES.

Two small notches on each side of posterior margin of breast-bone. No oil-gland. No hind toe. Young hatched covered with down, and run almost at once.

### Family OTIDIDÆ. BUSTARDS and FLORIKINS.

Bill flattened and obtuse. Three short toes, with connecting membrane. Plumage mottled and game-like. Rectrices sixteen to twenty. Primaries eleven. Secondaries nearly as long as primaries. Fifth secondary wanting. After-shaft. A gular pouch in some species. No lateral bare tract on side of neck. Tarsi covered with reticulate scales. No hind toe. Europe, Asia, Africa, and Australia.

### Genus **OTIS.**

ὠτίς = a kind of Bustard with long ear-feathers, known to the Greeks; from οὖς, genit. ὠτός, an ear.

Short and stout limbs and bill. Long white moustachial tuft. Third quill longest. No crest or ruff. Palæarctic.

#### 115. **Otis tarda.** THE GREAT OR EUROPEAN BUSTARD.

*Tarda*, the Spanish name, according to Pliny (*Hist. Nat.*, x. p. 29). A Celtic or Basque word. *Tarda* and *Bistarda* are always used as substantives, like the French *Outarde* (from *avis tarda*, through the Provençal *Austarde*, as *avis struthio* became *Autruche* in French and Ostrich in English) and our *Bus-tard*.

♂ 45″; 20 to 30 lbs. ♀ 33″; 8½ lbs. Legs blackish. Bill brown.—*Male:* Head and upper neck light grey. Chin, with long narrow feathers on each side of throat, white. Breast pale orange. Back orange, barred black. Below pure

white.—*Female:* No rufous gorget, and without chin-plume till third or fourth year.—*Young* born buff colour, barred black. S. and C. Europe, N. Africa, C. Asia, China. Eggs (3·0 × 2·3) olive, clouded light brown. (B. 1412. H. & M. i. 1.)

Also *O. dybrowski*, 34″, similar to *O. tarda*, from E. Siberia, Japan, and China; and *O. rhaad*, from Africa.

### 116. Otis tetrax. The Little or Butterfly Bustard.

*Tětrax* = τέτραξ, a bird known to the ancient Greeks.

**Chota-tilaor**, *India.*

♂ 17″ to 19″; 1½ to 2 lbs. Legs yellow. Bill brown.—*Male:* In summer, neck and upper breast black, with white necklet and white gorget. In winter, chin and throat white; sides of head, neck, and foreneck streaked and mixed black and buff. Breast white. Back chestnut, streaked black irregularly. Tail of eighteen feathers.—*Female:* Head and neck chestnut, mottled black. Breast with short black bars. S. Europe, N. Africa, C. Asia, including Afghanistan and Yarkand. Eggs (2·0 × 1·5) glossy green, more or less blotched brown. (B. 1413. H. & M. i. 3.)

Also *O. affinis*, an extinct species from Bavaria.

Also the genus *Lophotis*. Two species—*L. ruficristata*, 16″, from S. Africa; and *L. gindiana*, 16″, from E. Africa.

Also the genus *Compsotis*. Two species—*C. afra*, 19″, from S. Africa; and *C. leucoptera*, 19″, from S.E. Africa.

Also the genus *Heterotetrax*. Three species—*H. vigorsi*, 20″, from S. Africa; *H. ruppelli*, 20″, from S. Africa; and *H. humilis*, 16″, from Somaliland.

Also the genus *Neotis*. Five species—*N. ludwigi*, 36″, from S. Africa; *N. burchelli*, 30″, from N.E. Africa; *N. caffra*, 30″, from S. Africa; *N. denhami*, 38″, from W. Africa; and *N. henglini*, 25″, from Somaliland.

Also the genus *Lissotis*. Four species—*L. maculipennis*, from E. Africa; *L. nuba*, 25″, from N.E. Africa; *L. melanogaster*, 22″, from tropical Africa; and *L. hautlaubi*, 27″, from N.E. Africa.

Also the genus *Trachelotis*. Four species—*T. cærulescens*, 16″, from S. Africa; *T. canicollis*, 22″, from E. Africa; *T. senegalensis*, 18″, from E. Africa; and *T. barrovii*, 17″, from S. Africa.

## Genus **EUPODOTIS.**

εὖ = well; ποδοτής = footed.

Long strong legs. Male with pouch. Occipital crest black in both sexes. Neck white. Feathers of throat and foreneck lengthened. Of very large size. Africa, Arabia, India, and Australia.

### 117. Eupodotis edwardsi. The Indian Bustard.

**Toogder**, *Punjab;* **Hoom**, *C. P.;* **Kara-dhonk**, *Deccan:* **Gurahna**, *Sind;* **Herihakki**, *Mysore.*

♂ 45″ to 50″; 17 to 22 lbs. ♀ 36″ to 38″; 8 to 10 lbs. Legs dingy yellow. Bill dusky and yellow. Sexes differ. Forehead, crown, and occipital crest black. Plumage above pale brown, variegated with minute black lines. Greater coverts grey, tipped white. Primaries slaty, tipped white. Beneath white with black breast-band. Large gular pouch.—*Female:* Breast-band incomplete.—*Young* resemble females. India. Polygamous. One or two eggs (3·11 × 2·24), drab, mottled brown. (J. 836. B. 1414. H. & M. i. 7.)

Also *E. arabs*. 36″. The Arabian Bustard from N. and N.E. Africa to Arabia.

*E. kori*. 52″. S. and E. Africa.

*E. australis*. 48″. Australia.

## Genus **HOUBARA.**

The Asiatic name for a Bustard.

Legs rather short. Black ruff and white crest, with black tip. Feathers of foreneck lengthened. Of moderate size. Sexes alike. Mediterranean countries and W. Asia, visiting N.W. India in winter.

### 118. **Houbara macqueeni.** The Houbara Bustard.

In honour of the sender of the specimens described by J. E. Gray.

**Houbara, Tilaor,** *Punjab;* **Taloor,** *Sind.*

♂ 28″ to 30″; 4 to 5¼ lbs. ♀ 25″ to 27½″; 3 to 3¾ lbs. Legs green-yellow. Bill slate. Sexes alike. Beautifully crested. Plumage pale buff, pencilled black. Tail with bluish bands and lateral feathers, tipped cream-white. Primaries white base, black end. Chin, throat, and below white. A cold-weather visitor to N.W. India. In 1877 the first bird of the season was shot at Joongshae, in Sind, on 11th August. Breeds in Afghanistan and Persia. Eggs (2·4 × 1·82) olive, blurred brown. (J. 837. B. 1415. H. & M. i. 17.) See illustration, p. 141.

Also *H. undulata*, similar to *macqueeni*, 30″, Armenia, Mediterranean countries, and Canary Isles.

## Genus **SYPHEOTIS.**

*συφεός*=a hogsty; *ὠτίς*=a kind of Bustard.

No ruff.—*Male* with white wing and black plumage. Highly crested, or with cheek side plumes. Primary quills notched on inner webs, and attenuated towards ends.—*Females* bigger than males. India.

### 119. **Sypheotis bengalensis.** The Bengal Florikin.

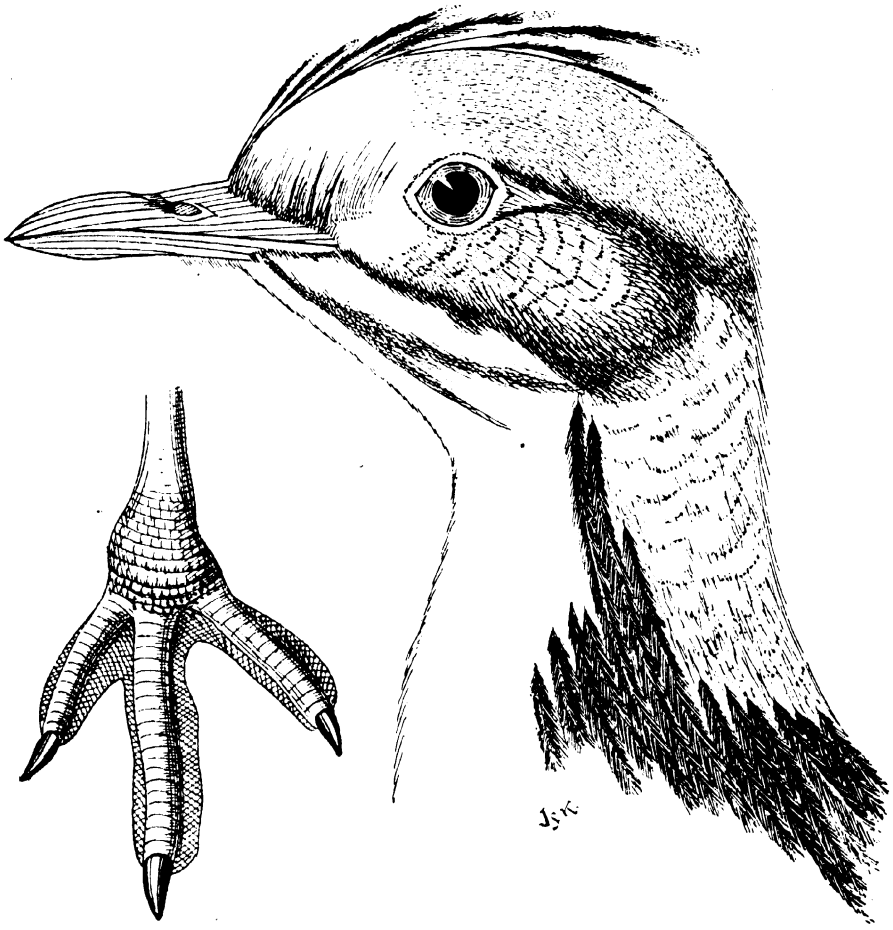
**Charas,** *N. W.P.;* **Dabar,** *Nepal;* **Ooloo Moora,** *Assam.*

♂ 26″ to 27″; 3½ to 4¼ lbs. ♀ 28″ to 29″; 4 to 5 lbs. Legs pale yellow. Bill dusky and yellow. Crested. Full breast-tuft. Above blue-buff, minutely mottled with black. Below deep glossy black.—*Female* fulvous, with black and brown mottlings. Neck with dark lines. India. Two eggs (2·6 × 1·76), green, blotched dull brown. (J. 838. B. 1417. H. & M. i. 23.)

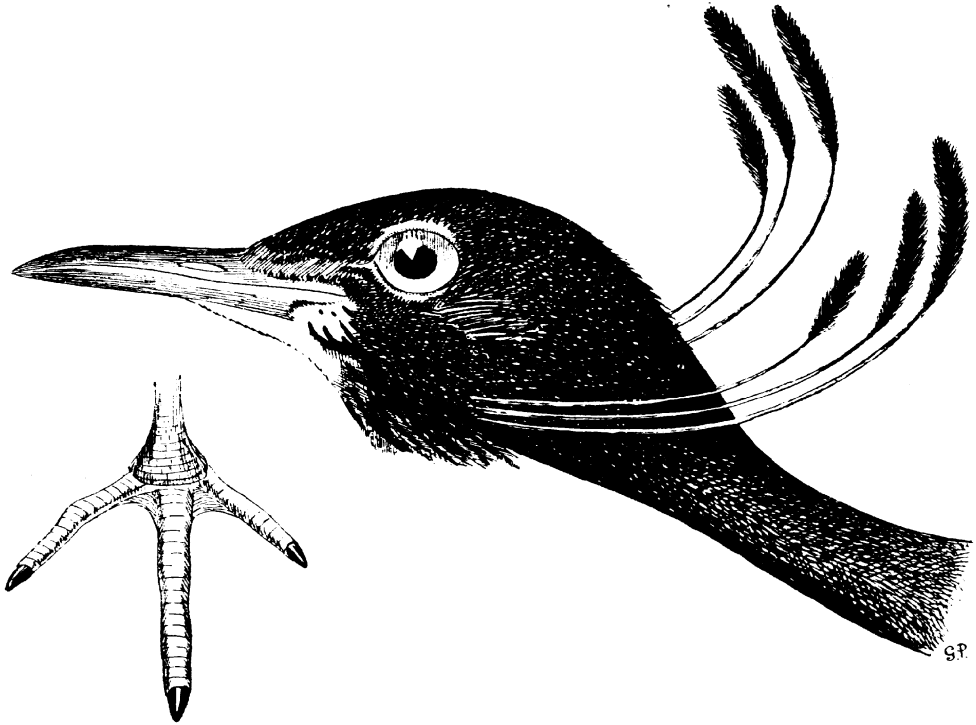
### 120. **Sypheotis auritus.** The Likh or Lesser Florikin.

**Kurmor,** *Guzerat;* **Tun-mor,** *Deccan;* **Chini-mor,** *Belgaom;* **Likh,** *N. W.P.;* **Charas,** *S. India;* **Kannoul** (Canarese).

♂ 17¼″ to 19″; 14 to 20 oz. ♀ 18″ to 21″; 18 to 24 oz. Legs whitish yellow. Bill dusky and yellow. Elongate plumes from each side of face. Chin white. Primaries sharp-pointed. Base of feathers rose colour.—*Female* clouded and barred deep brown. India. Three to four eggs (1·88 × 1·6), olive, mottled brown. (J. 839. B. 1416. H. & M. i. 33.) See illustration, p. 142.



118. Mayting, 4.1.73.



120. Mulock, Sapoora, 9.8.75.

## Order **LIMICOLÆ** (Part).

Usually two notches on posterior margin of breast-bone (several species have only one pair). Tibia (with but few exceptions) is bare for some distance above tibio-tarsal joint. Schizognathous. Hind toe present or wanting. Nostril in a groove or depression. Oil-gland tufted. After-shaft. Eleven primaries. Fifth secondary wanting. Eggs double-spotted. Young hatched covered with down.

| | | |
|---|---|---|
| No hind toe | Œdicnemus | Stone-Curlews. |
| | Esacus | Stone-Plovers. |
| Hind toe raised | Dromas | Crab-Plovers. |
| No hind toe | Cursorius, Rhinoptilus | Courier Plovers. |
| With hind toe | Glareola | Swallow Plovers. |
| Four toes with long claws | Hydrophasianus, Metopidius | Jaçanás. |
| With no wing-spur and no facial wattle. Hind toe | Strepsilas | Turnstones. |
| | Vanellus, Chettusia | Lapwings. |
| | Sœvatarola | Grey Plovers. |
| With no wing-spur and no facial wattle. No hind toe. | Charadrius | Golden Plovers. |
| | Ægialitis | Sand-Plovers. |
| | | Dotterels. |
| | | Ringed Plovers. |
| With no wing-spur and with facial wattle | Sarcogrammus, Microsarcops, Sarciophorus | Wattled Lapwings. |
| With wing-spur and no wattle. | Hoplopterus | Spur-winged Plovers. |
| Plumage black or pied | Hæmatopus | Oyster-Catchers. |
| | Himantopus | Stilts. |
| | Recurvirostra | Avocets. |
| | Ibidorhynchus | Ibis-bills. |
| Plumage white | Chionididæ* | Sheath-bills. |
| Plumage game | Thinocorythidæ* | Seed Snipes. |

## Order **LIMICOLÆ**.

Hind toe present or wanting. Toes only partially webbed or not webbed at all. Sternum has two notches usually on each side of posterior margin, but several species have only one on each side. Tibia with but few exceptions bare for some distance above tibio-tarsal joint. Schizognathous, or birds with vomer narrow behind, pointed in front; maxillo palatines free. Nostrils in a groove or depression. Oil-gland tufted. Primaries eleven. Fifth secondary wanting. After-shaft. Young are hatched covered with down. Eggs double-spotted.

### Family ŒDICNEMIDÆ. Stone-Curlews or Stone-Plovers.

Resemble Bustards in habits, but are more nearly allied to Oyster-Catchers. No hind toe, the three anterior toes united by a membrane at the base. Mid claw not pectinated, but dilated on inner side. Tarsus reticulated all round. Remiges twenty-nine.

* Not represented in India.

## Genus **ŒDICNEMUS.**

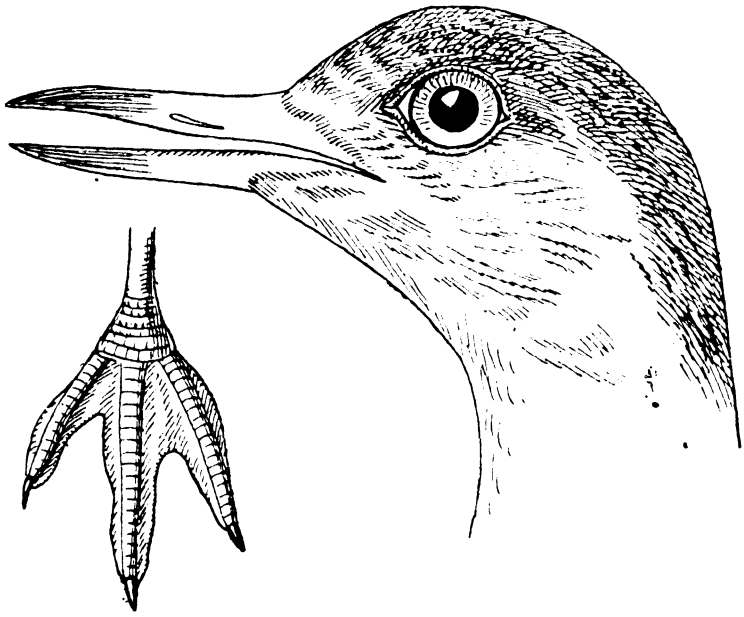
οἰδος = a swelling; κνήμη = a leg.

Plumage brown and striated. Eye large. Bill not longer than the head and not compressed. Nostrils in long, shallow groove. Wings pointed. Second quill usually longest. Tail of twelve feathers. Migratory, inhabiting all parts, except N. America. Frequents dry, open, stony country.

### 121. Œdicnemus indicus. The Goggle-eye or Bastard Florikin, or Stone-Curlew, or Thick Knee.

**Karwanak, Barsiri, Lambi,** *India;* **Kharma,** *Bengal;* **Kalleydu** (Telugu); **Kana mosal** (Tamil).

♂ 16″ to 17″; ¾ lb. Legs yellow. Bill yellow, black tip. Upper feathers



Laughton, Loharilung, 29.8.75.

red-ashy, with black shaft stripe. Breast reddish, with dark brown shaft stripes. Quills blackish, with white patch on first two or three quills. Tail brown, tipped black (except mid pair) with subterminal white bar. C. and S. Europe, N. Africa, C. and S.W. Asia, India, Ceylon, and Burma. Two to three eggs (1·9 × 1·39), buff, blotched black. (J. 859. B. 1418.)

Also *Œ. senegalensis.* 14″. From W. Africa.
*Œ. vermiculatus.* 14″. From S. Africa.
*Œ. bistriatus.* 15½″. From C. America.
*Œ. dominicensis.* 14½″. From San Domingo.
*Œ. superciliaris.* 15″. From S. America.
*Œ. capensis.* 16″. From S. Africa.
*Œ. affinis.* 16″. From N. and Equatorial Africa.
Also the genus *Burhinus.* One species—*B. grallarius,* 20½″, the Australian Thick Knee.

### Genus **ESACUS.**

Bill much longer than the head. Edges of bill notched towards tip. Nail of mid toe hollowed beneath. Found in India, Indian Archipelago, and Australia. Frequents margins of rivers and seaboard.

**122. Esacus recurvirostris.** THE GREAT STONE-PLOVER.

**Abi, Bara Karwanak,** *India;* **Talur,** *Sind;* **Gang-titai,** *Bengal.*

♂ 19″ to 21″; 1¾ lbs. Legs yellow. Bill yellow, tip black. Culmen almost straight. Eyebrow, ear-coverts, and moustache blackish. Plumage above grey, with dark shaft stripes. Below white. Sixth primary brown. Resident in India, Burma, and Ceylon. Usually alone or in pairs, on banks of larger rivers. Two eggs (2·15 × 1·6), drab, with dark blotches. (J. 858. B. 1419.)

**123. Esacus magnirostris.** THE AUSTRALIAN STONE-PLOVER.

♂ 22½″. Legs yellow. Bill greenish. Culmen curved, convex. Band round eye extending back over ear-coverts. Chin and throat pure white. Nape, back, and scapulars earth-brown. First five primaries umber-brown. Sixth primary white. Australia and Malay Archipelago, Borneo, the Andamans, and Cocos Islands. Eggs 2·6 × 1·75. A bird of the seashore. (B. 1420. S.F. ii. 290.)

## Family DROMADIDÆ.

Bill long, arching towards tip; strongly angulated below. Nostril perforated in the bill itself. Hind toe raised. First quill longest. Shores of the Indian Ocean. Single white egg.

### Genus **DROMAS.**

δρομάς = a street-walker, a runner.

Bill strong, longer than the head. Culmen regularly curved. Angle of lower mandible prominent. First quill longest. Feet much webbed. Mid claw notched. A remarkable genus.

**124. Dromas ardeola.** THE CRAB-PLOVER.

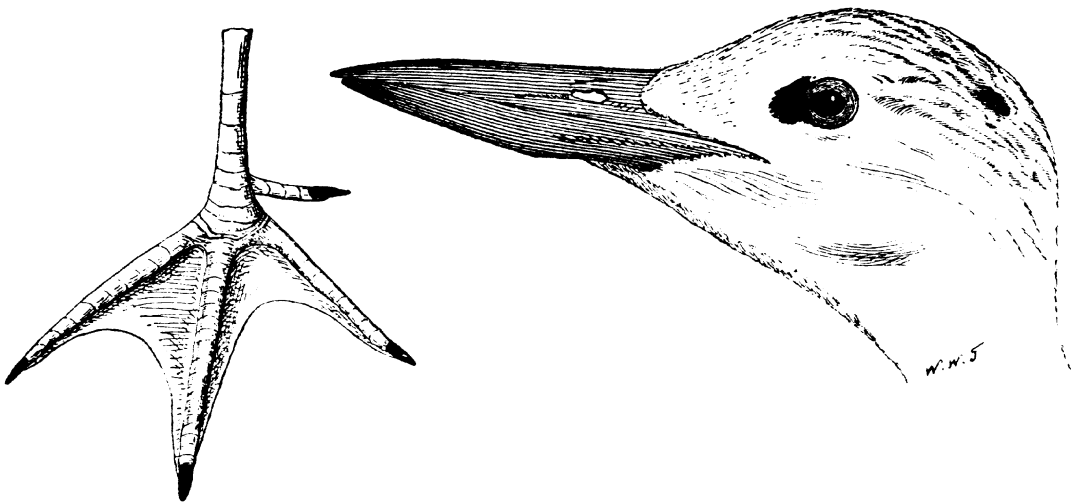
♂ 15″. Legs plumbeous. Bill black. Head, neck, and below white. Mantle and wing-coverts black. Small patch in front of eye, and another at back of head, black. Asiatic and African shores of the Indian Ocean, west of the Malay Peninsula, including Persian Gulf and Red Sea. Single egg (2·54 × 1·77), white, laid in a hole about 4 feet long, dug obliquely in the sand. (J. 861. B. 1421.) See illustration, p. 146.

## Family GLAREOLIDÆ. COURIER PLOVERS or COURSERS, and SWALLOW PLOVERS or PRATINCOLES.

Bill short and arched. Nostrils in a depression, not in a groove. Fourth and third toe united by web. Mid claw pectinated. Tarsus transversely scaled in front and behind. With or without a hind toe. Confined to the Eastern Hemisphere. Young hatched covered with down, and able to run in a few hours.

### Subfamily CURSORIINÆ.

No hind toe.



124. *Dromas ardeola*. Babur Island, 22.10.75.

## Genus **CURSORIUS.**

*Cursōrius* = pertaining to a race-course; *cursor* = a runner, from *curro* = I run.

Bill slightly curved. Three toes only. Plumage brown and rufous. Breast without band. Tail short, of twelve feathers. First and second quills subequal, first generally longest. Mid claw slightly pectinated. About the size of a Lapwing. Resemble Bustards both in structure and habits, but they are of small size and do not change plumage at breeding season. S. Europe, Africa, S.W. Asia, India, and Ceylon.

### 125. **Cursorius coromandelicus.** The Indian Courier Plover.

**Nukri** (Hindi); **Yerra Chitawa** (Telugu).

♂ 9″ to 10″. Legs cream-white. Bill black. Irides brown. White supercilia meeting at nape, bordered below with black and surmounting a rufous collar. Above sandy, axillaries sandy. Abdomen chestnut, with black patch. Crown bright red, the long occipital feathers concealing a nuchal spot. India and Ceylon. Two or three eggs (1·19 × 0·97), drab, blotched with black. (J. 840. B. 1422.)

### 126. **Cursorius gallicus.** The Cream-coloured or European Courier Plover.

*Gallĭcus* = of the Gauls, *Galli*. Gmelin seems to have thought it only occurred in France.

♂ 10″. Legs cream. Bill brown, tip black. Irides pale grey.—*Male:* Forehead pale buff. Crown pale orange, hinder part shading into grey, below which is a triangular black spot. Wing-coverts cream-yellow. Abdomen white. Axillaries black.

Inhabits desert plains of N. Africa and S.W. Asia, including Baluchistan, Afghanistan, and N.W. India. An occasional visitor to S. Europe, and a rare straggler to England in late autumn. Eggs (1·3 × 1·0) pale olive, speckled brown and grey. Doubtful if this bird breeds in India. (B. 1423.)

Also *C. somalensis.* 7½″. With axillaries ashy grey. From Somaliland.

*C. rufus.* 7½″. With axillaries light brown, tipped white. From S. Africa.

*C. temmincki.* 6·6″. Similar to *C. coromandelicus.* From tropical Africa.

Also the genus *Ortyxelus.* One species—*O. meiffreni*, the Little Courser from W. Africa, 4·8″, with plumage variegated like a Quail.

Also the genus *Pluvianus.* One species—*P. ægyptius*, the Black-headed Plover, from W., N., and E. Africa, occurring as a straggler in Mediterranean countries.

## Genus **RHINOPTILUS.**

ῥὶν = a nose.

Adopted by Jerdon as a mountain form of *Cursorius.* The form combines large eye and somewhat the colour of some of the true Plovers, with legs and general structure of Couriers. The genus is almost Ethiopian, but a single species of great rarity occurs in C. India.

Bill straight. Second and third primaries subequal and longest. Outer toe joined by web. No hind toe. Mid claw slightly pectinated.

*With one black band across the foreneck.*

### 127. **Rhinoptilus bitorquatus.** The Double-banded Courier Plover.

**Adavi-wula-titti** (Telugu).

♂ 9″ to 10″. Legs pale flesh-yellow. Bill black, yellow at base. Throat white, with red band. Broad brown gorget and second white collar. First and

second quills obliquely marked. Crown black, with buff median band. Primaries with a white band. First primary white. (J. 841. B. 1424.)

Also *R. chalcopterus.* 9·7″. From Africa.
*R. albofasciatus.* 10″. From S. Africa.

*With two bands across the foreneck.*

*R. bicinctus.* 8″. From S. Africa.
*R. bisignatus.* 7·2″. From E. Africa to S.W. Africa.
*R. hartingi.* 6·8″. From Somaliland.
*R. cinctus.* 9″. From Upper White Nile.
*R. seebohmi.* 9″. From S.W. Africa.

Also the genus *Stiltia.* One species—*S. isabella*, 9″, from Australia, Celebes, and Moluccas, as far as Java and Borneo. (B.M. Cat., xxiv. 43–52.)

## Subfamily GLAREOLINÆ.

With a hind toe.

## Genus **GLAREOLA.**

*Glārĕŏla*=a diminutive from *glārĕa*=gravel, from its haunting gravelly places.

Culmen much arched. Wings narrow, long, and pointed. First primary longest. Nostrils basal, oblique, semi-tubular. Hind toe well developed. Mid claw pectinated. Gape wide. Resemble Swallows both in detail of structure and flight. Linnæus placed them with Swallows, and Blyth approximates them to Nightjars. Called "Sea-Partridges" by the French. S. Europe, Africa, C. Asia, India, Burma, China, to Australia.

(i.) *Tail forked.*

### 128. Glareola orientalis. THE LARGE SWALLOW PLOVER.

♂ 10″. Legs dusky black. Bill black. Chin and throat rufous, bounded by black line from gape. Secondaries not tipped white. Exterior tail-feathers project 1″ beyond central ones.—*Young* pale fulvous, with blackish ends and buff terminal spots. No gorget. India, Ceylon, Burma, Pegu, to N. Australia. Breeding in E. Siberia and migrating through W. China. Two to four eggs (1·18 × 0·93), drab, blotched brown.

### 129. Glareola pratincola. THE COLLARED OR AUSTRIAN PRATINCOLE.

*Prātincŏla*, from *prātum*=a meadow; *incŏla*=an inhabitant. From its frequenting the open meadows in Austria.

♂ 8⅘″ to 9½″. Legs brownish. Bill black. White tipping to short secondaries conspicuous. Exterior tail-feathers project 2″ to 2½″ beyond central ones. (S.F. ii. 284.)

Migratory, occurring in summer in C. and S. Europe, W. and C. Asia; breeding in Sind and wintering in Africa. (B. 1426.) See illustration, p. 149.

Also *G. melanoptera.* 9½″. From S.E. Europe. Wintering in Africa.

(ii.) *Short and even tail.*

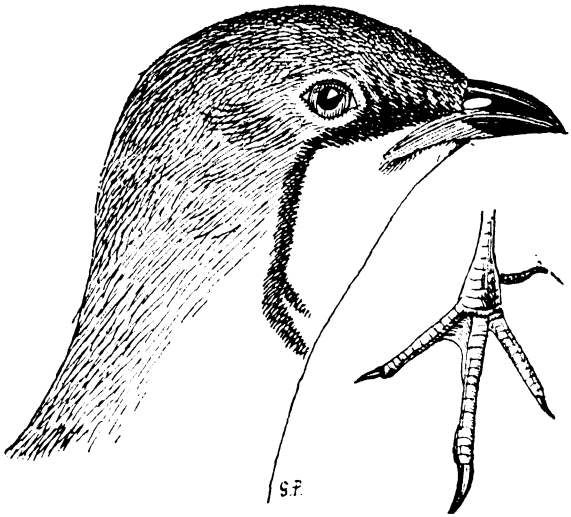
### 130. Glareola lactea. THE SMALL INDIAN SWALLOW PLOVER.

Utteran, *Sind.*

♂ 6½″. Legs dusky green. Bill black and red. No collar on hind neck. Primaries brown, with first four white-shafted. Wing-lining and axillaries black. Kashmir, India, Ceylon, and Burma. Two to four eggs (1·05 × 0·82),

buff, speckled brown. The Swallow Plovers with short and even tail are placed by many in a distinct genus—*Galactochrysea*. (J. 843. B. 1427.)

Also *G. ocularis*. 9″. From E. Africa and Madagascar. With black legs.
*G. liberiæ*. 6·3″. From W. Africa. With feet coral-red, and hind neck with rufous collar.
*G. emini*. 8″. From Equatorial Africa. Hind neck with white collar.
*G. nuchalis*. 5·7″. From Upper White Nile. With outer base of secondaries white.
*G. cinerea*. 6½″. From W. Africa. With axillaries. (B.M. Cat., xxiv. 62-65.)



129. *Glareola pratincola*. Mandi Hissar, 21.4.79.

## Family PARRIDÆ. JAÇANÁS.

*Para*=a bird of ill-omen; supposed to be the Wheatear.

Size moderate. General aspect that of a Rail, but more plump in form. Four toes, all greatly lengthened, with long straight claws, that of hind toe longest. Wings spurred.

Jaçanás, as called in America, are found in the warmer parts of Asia, Africa, and America. They walk or run easily over the plants that float on the water. Not distantly removed from Ostriches and Cassowaries, they also resemble *Megapodius*. Sexes alike, but the fact of females being much larger than males militates against their association with Plovers. The genus *Jaçaná* is restricted to America.

*With no frontal shield or lappet. Primaries attenuated.*

### Genus **HYDROPHASIANUS.**

ὕδωρ=water; φασιανός=Pheasant.

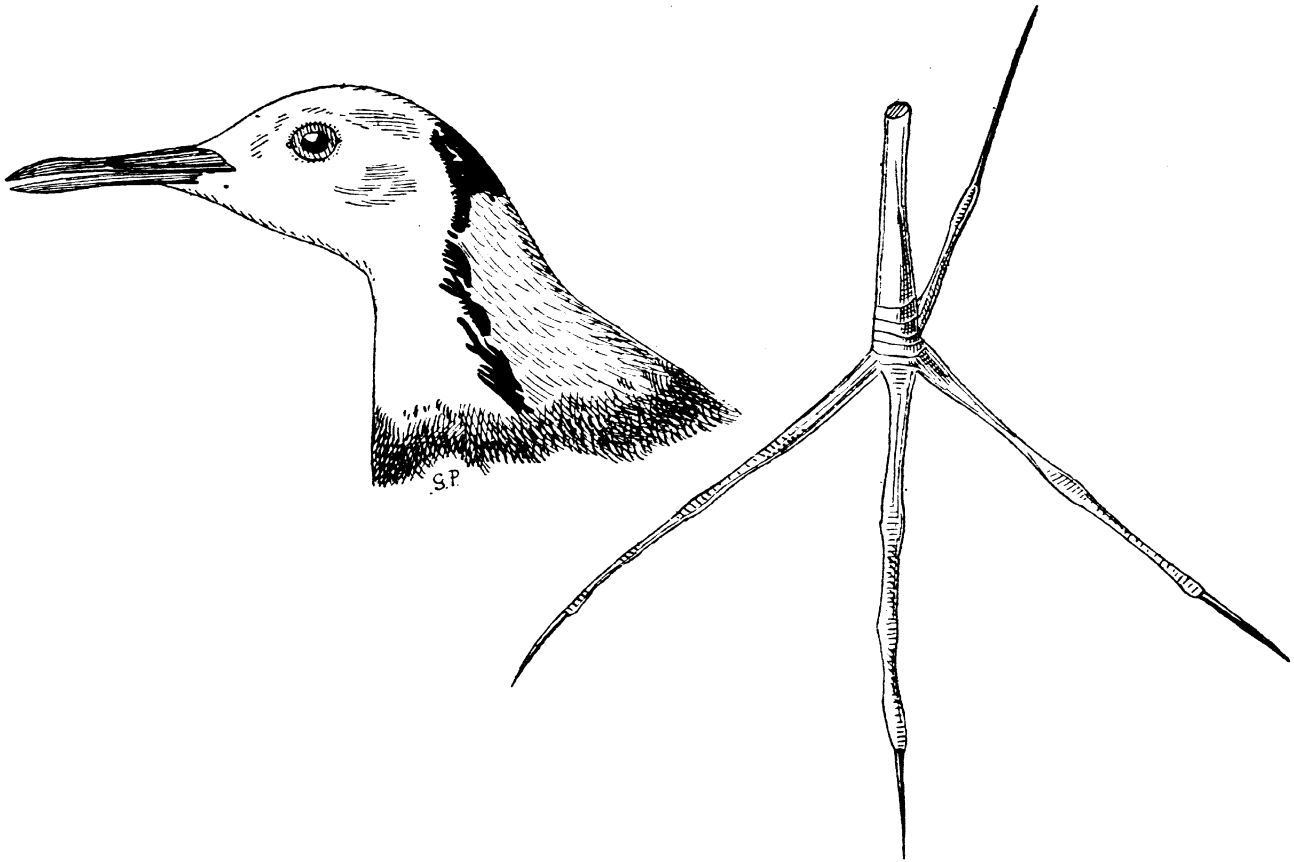
No frontal lappet. Tail very long. Small sharp wing-spur. Four primaries produced and attenuated. Breeding plumage is assumed by a change of colour without any moult, central tail-feathers being elongated.

**131. Hydrophasianus chirurgus.** THE PHEASANT-TAILED JAÇANÁ.

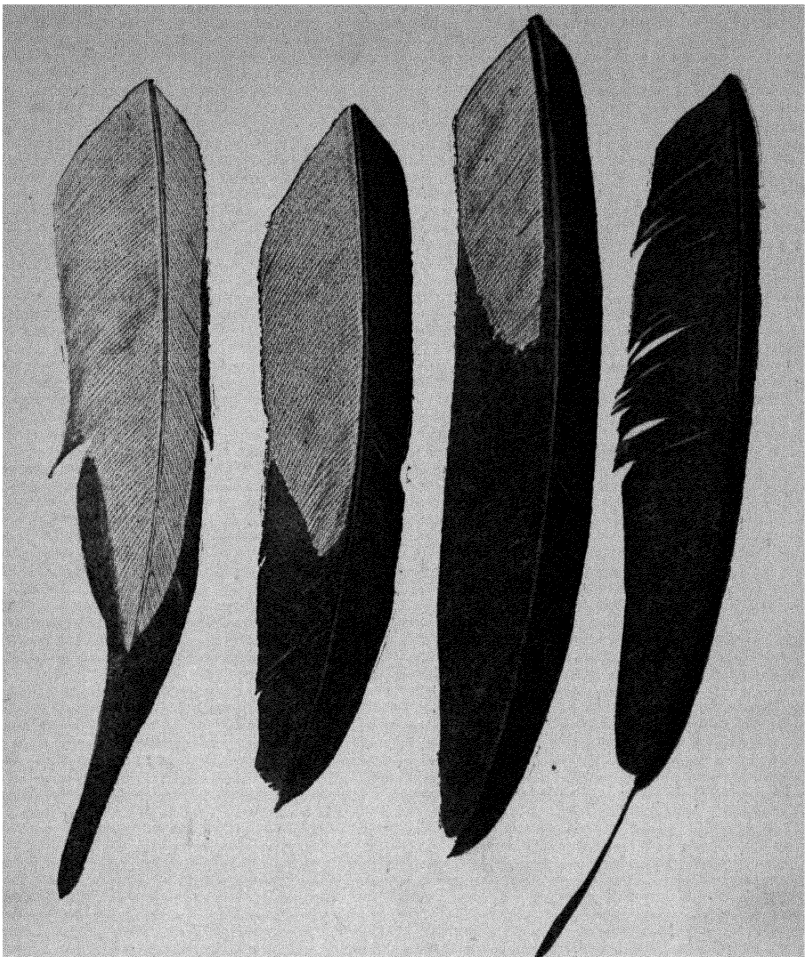
χειρουργός=a surgeon.

**Piho**, *India*; **Dalkukra**, *Bengal*; **Newiya**, *Ceylon*.

♂ 18″. ♀ 20″. Legs green. Bill blue, tip green.—*In winter*: Above hair brown, barred white. Golden eye-line. First primary with an appendage; second




131. *Hydrophasianus chirurgus.* S. Doig, E. Narra, 22.8.75.



4th. 3rd. 2nd. 1st.

and third barbed; fourth attenuated and prolonged.—*In summer:* Head white, with black mark on crown. Above olive. Tail black. First primary black; second nearly so; third black on outer web, and a broad tip; fourth white, edged and tipped black. Kashmir, India, Ceylon, Burma, S. China, Philippines, and Java. Four eggs (1·46 × 1·12), bronze, without spots. (J. 901. B. 1429.)

*With frontal shield rounded or truncated posteriorly. Primaries not produced at the ends.*

## Genus **METOPIDIUS.**

μετωπίδιος = on the forehead.

With frontal lappet. Short tail. First and second quills longest. Primaries not produced. Wing-spur obtuse and feeble. No distinct breeding plumage, and no sign of a winter plumage; the change from the young plumage to that of the adult is effected by a direct moult, without any change in the pattern of the feather.

**132. Metopidius indicus.** THE BRONZED-WING JAÇANÁ.

**Dal-pipi,** *Bengal;* **Kattoi,** *Purneah.*

♂ 10″. ♀ 12″. Legs green. Mid toe and claw 3·6″. Bill yellow. Frontal shield large. Head, neck, breast, and wing-lining black, glossed green. Back, rump, upper tail-coverts, tail, and under tail-coverts chestnut. India, Burma, Siam, Malay Peninsula, Sumatra, Java, and Celebes. Wanting in Ceylon and Kashmir. Four eggs (1·47 × 1·03), glossy buff, with dark brown lines. (J. 900. B. 1428.)

Also the genus *Phyllopezus*. With frontal shield very small, and wing-spur nearly obsolete. Two species—*P. africanus*, 10″, mid toe and claw 3½″, from Africa; and *P. albinucha*, 10½″, mid toe and claw 3·3″, from Madagascar.

Also the genus *Hydralector*. With frontal lappet and erect central crest. Two species—*H. gallinaceus*, 9″, mid toe and claw 3·6″, from Australia, Celebes, and S. Borneo; and *H. novæ-guineæ*, 7·8″, mid toe and claw 3·1″, from New Guinea.

Also the genus *Jaçaná*. With single median indentation in frontal lappet, and pendent lappets at angles of mouth. Wing-spur very sharp. Three species—*J. jaçaná*, 7·8″, mid toe and claw 2·9″, from S. America; *J. melanopygia*, 8½″, mid toe and claw 2·9″, from C. and S. America; and *J. nigra*, 7½″, mid toe and claw 2·9″, from C. and S. America.

Also the genus *Asarcia*. With double indentation in frontal lappet, and no mouth lappets Wing-spur long and sharp. One species—*A. variabilis*, 7½″, mid toe and claw 2·8″, from Texas, C. America, Cuba, etc.

Also the genus *Microparra*. With forehead feathered. One species—*M. capensis*, 6″, mid toe and claw 2·1″, from S. Africa.

## Family CHARADRIIDÆ. PLOVERS, LAPWINGS, SANDPIPERS, and SNIPES.

Bill short, basal half soft. Long nasal groove. Wings long and pointed. Gape small. Hind toe short or wanting. Toes webbed or unwebbed. Tarsus usually reticulated, but sometimes scutellated. Cosmopolitan. Four eggs, pear-shaped. Young hatched covered with thick down, and able to run in a few hours.

### Subfamily CHARADRIINÆ. PLOVERS and LAPWINGS.

Bill short, slightly enlarged on top at tip, resembling that of a Pigeon (*Strepsilas* excepted). Nasal groove not extending beyond half the length of upper mandible. Toes scarcely webbed or connected. Tarsus always reticulated behind, but, in front, sometimes reticulated and sometimes scutellated. First quill usually longest. The difficulties in recognition may be partially overcome if the species are examined in the following groups, viz.—

With neither wing-spur nor facial wattle (133–148).

Without wing-spur, and with a facial wattle (149–152).

With wing-spur, and without a facial wattle (153).

With both wing-spur and a facial wattle (not represented in India).

(i.) *With no wing-spur, and no facial wattle.*

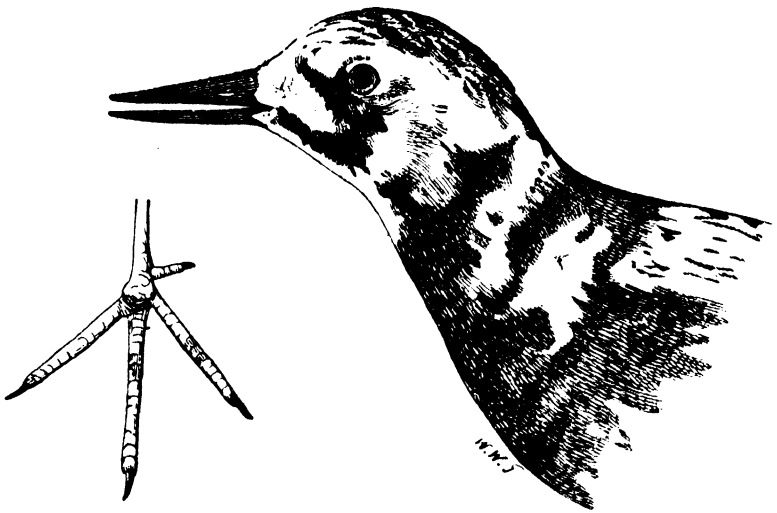
### Genus **STREPSILAS.**

*Strepsĭlas*, from στρέφω = I turn, and λᾶας, contracted in Attic to λᾶς = a stone.

Top of bill compressed and truncated. Nostril in a groove which extends nearly half-way down bill. Remiges twenty-five. First primary longest. Tarsus transversely scaled in front, reticulated behind. Hind toe well developed. Toes without webs. Cosmopolitan.

**133. Strepsilas interpres.** THE TURNSTONE or SEA-DOTTEREL.

*Interprĕs* = an agent between two parties, an explainer; from *inter* = between, and the root of the Sanskrit *prath* = unfold (whence πλατύς = broad); perhaps in allusion to its warning note.



Karachi, 21.6.75.

♂ 8″ to 8½″. ♀ 8½″ to 9½″. 3½ to 4 oz. Legs orange-yellow. Bill black. Remiges twenty-five. Sexes alike. *In summer:* Crown white, with black stripes. Black stripe from eye meets another from mouth behind eye. Incomplete collar with gorget, and a second incomplete band towards wing-shoulder. Mantle, scapulars, and wing-coverts mostly chestnut, with black pattern. Axillaries white.—*In winter:* Below pure white. Head and back hair-brown. Gape line mottled.

Found in most parts of the world. A winter visitor to India, but met with at other seasons, notably at Karachi in June and August; in Ceylon in June. At the Laccadives, Hume found Turnstones swimming in the sea like Phalaropes. Eggs (1·6 × 1·1) buff, spotted brown. (J. 860. B. 1430.)

Also *S. melanocephæla.* 8″. With throat and breast blackish. From W.N. America.

## Genus **VANELLUS.**

Formerly often spelt *Vannellus*, diminutive of *vannus* = a fan, whence the French name *Vanneau.*

Head crested. Second and third quills longest. No white on wing outside. Nostril in groove extending more than half length of bill. Tarsus reticulated all round. Two toes cleft to base, two united to nearly first joint. Small hind toe. Europe and N. Asia, wintering in Mediterranean countries; N.W. India and China. Accidental in N. America.

**134. Vanellus vulgaris.** THE PEEWIT or CRESTED LAPWING or GREEN PLOVER.

*Vulgāris* = common, from *vulgus* = the multitude.

♂ 12″. Legs orange-brown. Bill black. Black slender crest.—*In summer:* Above green, glossed purple. Abdomen white. Under-tail chestnut. Axillaries white.—*In winter:* Chin and throat white. Winter visitor to N.W. India.

Gregarious. Breeds in Punjab. Four or five eggs (1·8 × 1·3), pyriform, olive, blotched brown. (J. 851. B. 1436.)

Also the genus *Erythrogonys*. One species with white on wing—*E. cinctus*, 7½", from Australia.

Also the genus *Defillipia*. Two species with white on wing—*D. crassirostris*, 11½", from N.E. Africa; and *D. leucoptera*, 11½", from S.E. Africa.

Also the genus *Oreophilus*. One species with no hind toe—*O. ruficollis*, 9½", with scarcely any connecting membrane between the toes, from S. America.

## Genus **CHETTUSIA**.

Head not crested. Plumage ashy. White on wings inside and out. Small hind toe. Second or third primary longest. S.E. Europe to Turkistan, N.E. Africa, and India.

### 135. **Chettusia gregaria**. The Sociable Lapwing.

♂ 13". Legs dull black. Bill black. Crown black. Broad white supercilium. Abdomen deep black, bordered chestnut. Tail white with broad subterminal black band on median rectrices, narrowing and disappearing before it reaches the outermost pair. *In winter:* Crown olive. No abdominal patch. Migratory, breeding in E. Europe and C. Asia, and wintering in N.E. Africa and N.W. India.

### 136. **Chettusia leucura**. The White-tailed Lapwing.

λευκός = white.

♂ 11". Legs bright yellow. Bill black. No supercilium. Crown and back light brown. Belly and flanks tinged rosy. Tail white. Breast slate-grey, margined white. Breeds in Persia and Turkistan, and winters in N.E. Africa and N. India. (J. 853. B. 1438.)

## Genus **SQUATAROLA**.

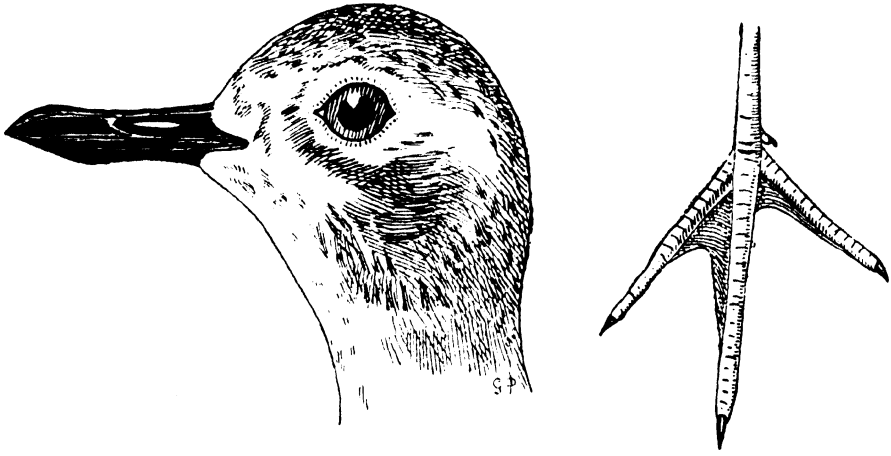
*Squatărŏla* = the Italian name; of uncertain origin.

Minute hind toe, with rudimentary claw. Otherwise it agrees with *Charadrius* in colour and structure, undergoing similar changes of plumage.

### 137. **Squatarola helvetica**. The Grey Plover.

Swiss, from *Helvetii* = the inhabitants of Switzerland, whence M. de Réaumur first received specimens.

**Bara-battan**, *India*.



Karachi, 10.10.74.

♂ 10½″ to 11″. ♀ 11″ to 12″. Legs black-grey. Bill black.—*In winter:* Forehead and chin white. Below white, with brown spots. Above brown, tipped white. Tail white, broadly barred black and brown. Axillaries black.—*In summer:* Lower surface deep black, edged white. Back barred black and white. Almost world wide. Breeds in the far north and visits the south of both hemispheres in winter. Eggs (2 × 1·4) pyriform, greenish, spotted brown. (J. 844. B. 1441.)

Also the genus *Aphriza*. One species—*A. virgata*, 9½″, with hind toe, from W.N. America.
Also the genus *Zonibyx*. One species—*Z. modesta*, 7″, with hind toe, from S. America.
Also the genus *Stephanibyx*. Three species, without hind toe, from Africa—*S. coronatus*, 12½″; *S. melanopterus*, 10″; and *S. inornatus*, 8½″.

## Genus **CHARADRIUS.**

*Charădrĭus* = χαραδριός, in classical Greek, a bird dwelling in clefts or river-valleys, χαράδραι. The sight of it was held to be a cure for jaundice.

Nasal groove extends about two-thirds length of bill. First quill longest. Secondaries short. Tertiaries lengthened and pointed. Tail rounded. No hind toe. Plumage brown, spotted yellow. Tarsus reticulated throughout. Outer and mid toe nearly half-webbed.

### 138. **Charadrius pluvialis.** The Golden Plover.

*Pluvĭālis* = rainy; from *plŭvĭa* = rain. Charleton says because it frequents places damp from rain and marshes. Littré derives the French *pluvier* from the fact of the birds only reaching France in the rainy season.

♂ 10″ to 11¼″. Legs blue-grey. Bill black.—*In winter:* Above black, mottled golden. Throat, lower breast, and abdomen pure white. Axillaries pure white.—*In summer:* Above black, mottled golden and white. Throat, breast, and belly black. Reigns in the W. Palæarctic, from Europe generally to W. Siberia, and migrating south in winter to N. Africa and Sind. Male helps in incubation. Four pyriform eggs (2·1 × 1·4), light brown, spotted purple.

H.M.S. *Caroline* in Pacific reported that during a gale on May 14th twelve Golden Plover were seen round the ship migrating from the Sandwich Islands for the north. The ship was 1,200 miles from nearest land, and it was computed that the time of flight would be 80 hours (at 30 miles an hour) to complete the distance between Hawaii and the mainland. (B. 1440. S.F. vii. 186.)

### 139. **Charadrius fulvus.** The Eastern Golden Plover.

*Fulvus* = tawny.

**Chota battan,** *India.*

♂ 9″ to 10″. ♀ 9½″. Legs plumbeous green. Bill black.—*In winter:* Above dull grey, with triangular spots. Breast white, spotted yellow. Primaries black. Axillaries smoky grey.—*In summer:* Above darker, and spots smaller. Beneath deep black, edged white. Reigns in the Nearctic region. Breeds in E. Siberia, and has a wide range in Asia and Australia, but it rarely reaches Europe. Visits India between September and May. Said to breed in India. Four pyriform eggs (1·9 × 1·3), buff, blotched brown. (B. 1439.)

## Genus **ÆGIALITIS.** Sand-Plovers, Dotterels, and Ringed Plovers.

αἰγιαλῖτις = of the shore, αἰγιαλός.

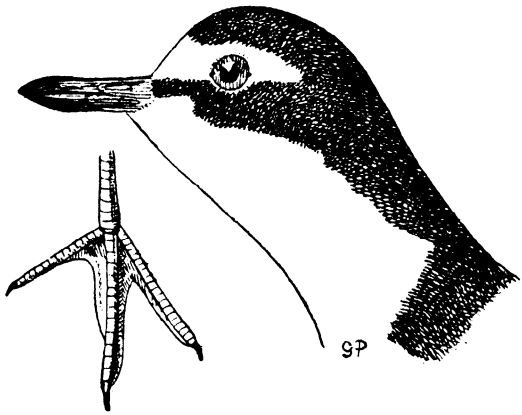
No hind toe. Tarsi reticulated. Of small size. Often with black collar. Sexes alike. First quill longest. Upper plumage unspotted brown; below chiefly white in breeding season, the amount of black not exceeding a pectoral band. Almost cosmopolitan.

(i.) *No white ring round the neck.*

**140. Ægialitis geoffroyi.** The Large Sand-Plover.

♂ 8½″ to 9¼″; 2½ to 3 oz. Legs grey-green. Bill black.—*In winter:* Grey-brown. Eye-streak and above bill white. Below white. Secondaries partly white on outer web. Shafts of all primaries partly white. Axillaries white. —*In summer:* White mark on each side of black forehead. No supercilia. Breast rufous. Throat white. Migratory, breeding in Japan, Formosa, and Hainan, and wintering on the shores of the Indian Ocean from S. Africa to Australia. (J. 846. B. 1442.)

**141. Ægialitis mongolica.** The Lesser Sand-Plover.



♂ 7½″. ♀ 7″. Legs plumbeous. Bill black. Similar to, but smaller than, *Æ. geoffroyi.* Summers in C. and N. Asia, Japan, and Alaska. In winter visits the shores of the Indian Ocean from S. Africa to Queensland. Has been found breeding in Upper Indus Valley and Tibet. Sharpe has also added *Æ. pyrrothorax*, similar to above, as wintering in India. (J. 847. B. 1443.)

**142. Ægialitis asiatica.** The Caspian Sand-Plover.

♂ 7½″. Legs horn. Bill black.—*In winter:* Crown, nape, and above hair brown. Broad rufous breast-band. Axillaries white. Shaft of first primary and subterminal portion of second white. Shaft of third primary dark throughout. *In summer:* Above pale brown. No breast-band, but patch dusky grey on each side of breast. Breeds on Caspian and Aral Seas and in C. Asia. Winters in Africa. Found in Persian Gulf and occasionally in India. (B. 1444. S.F. vii. 438.)

**143. Ægialitis vereda.** The Eastern Dotterel.

♂ 8¼″ to 9½″. Legs yellowish. Bill black.—*In winter:* Crown and neck brown, more or less buffy below. Under-tail white. Shafts of first and second primaries white, of the third dark throughout. Axillaries dark grey.—*In summer:* Crown and above white. Forehead, eyelids, and chin white. Collar buff. Broad rufous breast-band. Breeds in N. China and Mongolia, and winters in Malay Peninsula and Australia. (B. 1445. S.F. i. 83.)

(ii.) *A white ring round the neck.*

**144. Ægialitis (cantiana) alexandrina.** THE KENTISH RINGED PLOVER.

*Cantiāna* = Kentish, because specimens were first sent to Latham by Dr. Boys from Sandwich, in Kent.

♂ 6½″ to 6¾″; 1¼ to 1½ oz. Legs dusky grey. Bill black.—*In winter:* Crown brown. Large patch black on each side of breast. Central tail ashy. Shaft of first primary white throughout. *In summer:* Crown pale rusty. Europe, Africa, and the greater part of Asia and Australia. A winter visitor to India. Has been found breeding in S. India and Ceylon, Guzerat, Karachi, and Jashk. Eggs (1·2 × 0·9) pale olive, spotted brown.

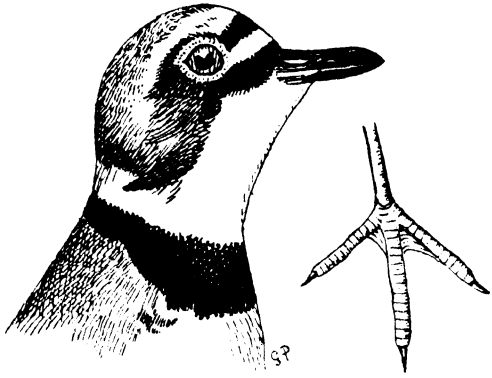
The Kentish Plover has its breeding place in Britain limited to the pebbly beach between Sandwich and Hastings. In other parts of the British Isles it only occurs as a chance straggler, yet this bird has as wide a range elsewhere as almost any that could be named, breeding not only abundantly along the greater part of the coasts of the temperate and warmer portions of the Old World north of the equator, but also occasionally in the interior, as at the base of the Caucasus and in the plains of N. Africa. During its migration it wanders to the Malay Archipelago and S. Africa. Moreover, it appears to be specifically identical with *Æ. nivosa*, which is found on the W. coast of America. (J. 848. B. 1446.)

**145. Ægialitis hiaticula.** THE RINGED PLOVER.

**Zinea,** *India;* **Bytu-ulanka** (Telugu).

♂ 7¼″ to 7½″. Legs yellow. Bill black, base yellow. Frontal zone yellow. Band from top of head, through eye and ear-coverts, black. White collar, with black border narrowing behind. Shafts of all primaries, basal half brown and distal half white, except near the tip. Throughout Europe, W. and C. Asia, wintering chiefly in Africa. Migratory, and a rare visitor to N.W. India. (J. 849. B. 1448.)

**146. Ægialitis dubia.** THE LITTLE RINGED PLOVER.



Mandi Hissar, 22.4.79.

♂ 6½″. Legs yellow. Bill black, base yellow. Shaft of first primary almost white throughout. Similar to *Æ. hiaticula*, but smaller. All Europe and Asia, with N. Africa. Migrants, breeding in India from December to May. Four eggs (1·14 × 0·84). (J. 850. B. 1447.)

### 147. Ægialitis placida. The Long-billed Ringed Plover.

♂ 8″ to 8¾″. Legs yellow. Bill black, base yellow. Greyish fuscous. Quills fuscous black. Front, throat, collar, below and margins of wing-coverts white. Black and grey breast-band. Shafts of all primaries brown. E. Asia, Manchuria, Japan, China, and N.E. India. Migratory, visiting India in cold season. (B. 1440.)

### 148. Ægialitis melanops. The Australian Ringed Plover.

♂ 6″. ♀ 5·8″. Legs orange-yellow. Bill yellow, tip black. Forehead, streak on either side extending through eye and ear and meeting behind, dark brown. Breast-band brown-black. Wing-coverts ashy. Scapulars maroon. Described by Jerdon as *C. russatus*. Not included by Blanford among Indian Birds.

Also the following with no hind toe :—

*Æ. peroni.* ♂ 6″. ♀ 5½″. With shafts of all quills white. From Malayan Archipelago. Java to Philippines, Borneo, and Celebes.

*Æ. marginata.* ♂ 6·8″. ♀ 6·5″. With inner secondaries white. From S. Africa.

*Æ. pallida.* 6″. With inner secondaries brown. From Madagascar and E. Africa.

*Æ. venusta.* 5·3″. From E. Africa.

*Æ. ruficapilla.* 6″. With neck and mantle rufous. From S. New Guinea, Australia, and Tasmania. Accidental in New Zealand.

*Æ. collaris.* ♂ 6·3″. ♀ 6″. With black collar on foreneck. From S. America and Mexico.

*Æ. nivosa.* Similar to *Æ. alexandrina*. From W. coast of America.

*Æ. meloda.* With white collar on hind neck. N. America, wintering in S. America, Bermuda, etc.

*Æ. occidentalis.* ♂ 6·5″. ♀ 6·8″. With feet and toes black. From Chili.

*Æ. falklandica.* 7″. With double black band across foreneck and chest. From S. America.

*Æ. pecuaria.* ♂ 6½″. ♀ 6″. Primaries excepting third with white shafts. From Africa.

*Æ. thoraciæ.* From Madagascar.

*Æ. sanctæ helenæ.* 7½″. First primary only with white shaft. From St. Helena.

*Æ. cucullata.* ♂ 8·3″. ♀ 8″. Throat black. From Australia and Tasmania.

*Æ. obscurus.* 10″. Below rufous. No bands. From New Zealand.

*Æ. bicinctus.* 7½″. Triple breast-band black, white, and chestnut. From Australia and Tasmania.

*Æ. wilsoni.* 6·3″. With single band across foreneck. From America.

*Æ. pyrrothorax.* Shown by Sharpe as additional to *Æ. mongolica*, and as wintering in India.

Also the genus *Eudromias*. One species—*E. morinellus*, 8½″, the Dotterel, shaft and outer web of first primary white, from N. Europe and Siberia, wintering in Mediterranean countries and N.E. Africa.

Also the genus *Podasocys*. One species—*P. montanus*, 8½″, from W.N. America.

Also the genus *Oxyechus*. Four species—*O. vociferus*, ♂ 9″, ♀ 10″, from N. America, migratory to S. America ; *O. tricollaris*, ♂ 7·2″, ♀ 6½″, from S. Africa ; *O. bifrontatus*, from Madagascar ; and *O. forbesi*, 8·4″, from W. Africa.

Also the genus *Ægialeus*. One species—*Æ. semipalmatus*, 6½″, from N. America, wintering in C. and S. America.

Also the genus *Pluvianellus*. One species—*P. sociabilis*, 7½″, from Patagonia.

Also the genus *Thinornis*. Two species—*T. novæ zealandiæ*, 7″, from New Zealand and Chatham Island ; and *T. rossi*, 7½″, from Auckland Islands.

Also the genus *Anarhynchus*. One species—*A. frontalis*, ♂ 7″, ♀ 7½″, from New Zealand.

Also the genus *Peltohyas*. One species—*P. australis*, 8″, with tarsus transversely scaled both in front and behind, from Australia.

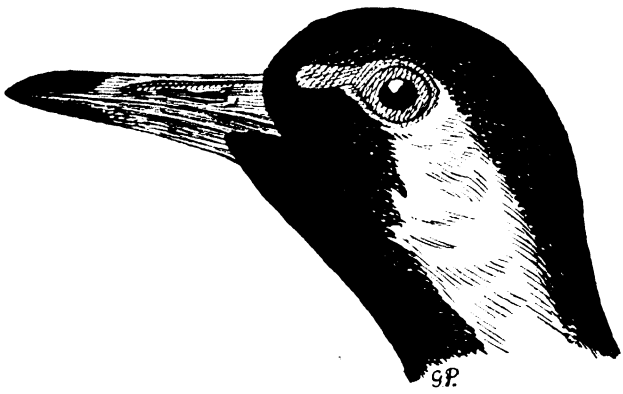
(ii.) *With no wing-spur and with a facial wattle.*

## Genus **SARCOGRAMMUS.**

Small hind toe. Nasal groove extending beyond middle of bill. Fleshy wattles in front of the eyes. Wing with tubercle developed into a short spur in breeding season. Tarsus reticulated throughout.

**149. Sarcogrammus indicus.** The Red-wattled Lapwing.

**Titai, Titiri,** *India;* **Yennapa, Chittawa** (Telugu); **Alkati** (Tamil); **Kiralla,** *Ceylon.*



♂ 13½″. ♀ 13″. Legs bright yellow. Bill red, tip black. Eyelid and wattle lake. Head and breast black. Side of nape and round nape white. White wing-bar. Tail white with broad black subterminal band. From Prussia, Mesopotamia, N Arabia to Afghanistan, Kashmir, India, Assam, and Ceylon. Four eggs (1·64 × 1·2), yellow, blotched brown. "Did you do it" of Anglo-Indians. (J. 855. B. 1431.)

**150. Sarcogrammus atrinuchalis.** The Burmese Red-wattled Lapwing.

**Titidu,** *Burma.*

♂ 12½″. ♀ 13″. Similar to *S. indicus*, but the neck is black all round, and the white eye-patch does not extend beyond the ear-coverts. Also a white bar bordering the black of upper back. Burma and Cochin China to the Malayan Peninsula and Sumatra.

Also the genus *Tylibyx*. One species—*T. melanocephalus*, 11½″, from N.E. Africa.

## Genus **MICROSARCOPS.**

Small hind toe. Tarsi transversely shielded in front.

**151. Microsarcops cinereus.** The Grey-headed Wattled Lapwing.

**Chappour,** *India.*

♂ 14″. ♀ 14½″. Legs bright yellow. Bill yellow, terminal third black, basal two-thirds yellow. Head, neck, and breast light grey, passing into black. Lower plumage white. Small frontal lobes yellow. Winter visitor to Bengal, Assam, and Burma, breeding in Mongolia, N. China, and Japan. (J. 854. B. 1434.)

## Genus **SARCIOPHORUS.**

*σαρκιόν*=a little bit of flesh; *φορέω*=I carry.

No hind toe. Head more or less crested. Wattles in front of the eyes. Second quill longest. Tarsus with transverse shields in front.

### 152. **Sarciophorus malabaricus.** The Yellow-wattled Lapwing.

**Zirdo,** *India;* **Chitawa** (Telugu); **Jithiri,** *N. W. P.*; **Alkati** (Tamil).

♂ 9½". ♀ 10½". Legs yellow. Bill yellow, black tip. Crown, chin, and nape black. Sides of head, neck, upper breast, back, scapulars, tertiaries, and wing-coverts pale ashy. Below from breast white. Resident throughout India and Ceylon. Four eggs (1·45 × 1·07), buff, blotched brown. (J. 856. B. 1433.)

Also with no hind toe:—

*S. tectus.* 10". With crimson bill and feet. From Africa.

*S. latifrons.* Similar to *S. tectus.* From E. Africa.

Also the genus *Zonifer.* One species—*Z. tricolor*, 10½", from Australia and Tasmania.

Also the genus *Anomalophrys.* One species—*A. superciliosus*, 10½", from W. Africa.

(iii.) *With wing-spur and no facial wattle.*

## Genus **HOPLOPTERUS.**

Head crested. No hind toe. Wing with horny black spur. Second quill longest. Tarsus reticulated throughout. Found in S.E. Europe, Africa, India, Burma, to Cochin China and Hainan.

### 153. **Hoplopterus ventralis.** The Indian Spur-winged Plover.

*Ventrālis*, adj. =a belly-band.

♂ 11½". ♀ 12½". Legs red-black. Bill black. Head, crest, and broad band down throat black. Abdomen white, with broken black band. Central Provinces, Bengal, and Orissa, Assam, Burma, to S. China. Four eggs (1·45 × 1·07), yellow, blotched brown. (J. 857. B. 1435.)

Also without hind toe:—

*H. spinosus.* 12". From S.E. Europe, Palestine, and Africa.

*H. speciosus.* 11". From Africa.

Also the genus *Belonopterus.* Two species from S. America—*B. cayennensis*, 13½"; and *B. chilensis*, ♂ 14½", ♀ 15½".

Also the genus *Hoploxypterus.* One species—*H. cayanus*, ♂ 8", ♀ 9½", from C. and S. America.

Also the genus *Ptiloscelis.* One species—*P. resplendens*, 13", from S. America.

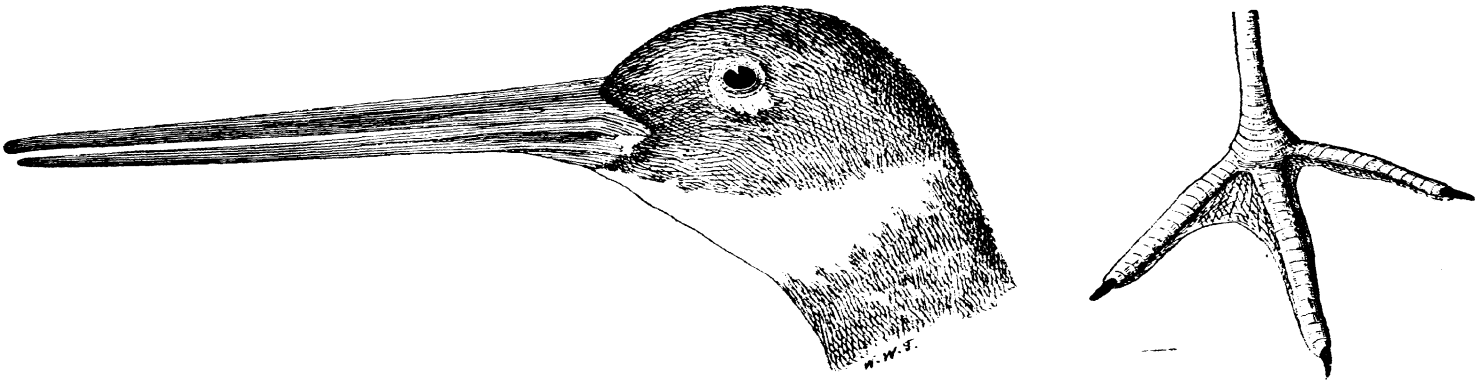
(iv.) *With wing-spur and facial wattle.*

The genus *Lobivanellus.* Four species—*L. lobatus*, 14", from Australia; *L. miles*, 12½", from Australia, New Guinea, and Papua; *L. senegalus*, 12", from W. Africa; and *L. lateralis*, 12", from S.E. Africa.

The genus *Xiphiodopterus.* Two species—*X. albiceps*, 11", from W. Africa; and *X. cucullatus*, 11", from Java, Sumatra, and Timor.

## Subfamily Hæmatopodinæ. Oyster-Catchers, Stilts, Avocets, and Ibis-bills.

Bill long. Plumage black or pied. Tarsus reticulated. No distinct summer plumage. No hind toe (*Recurvirostra* excepted).



151. *Hæmatopus ostralegus.* Chinnee Creek, 23.10.75.

## Genus **HÆMATOPUS.**

*Hæmătŏpus* = with blood-coloured feet; from αἷμα = blood; πούς = a foot.

Bill straight. Nasal groove extends more than half length of bill. Remiges twenty-nine. First quill longest. Bony toes. Slightly edged between second and third toes. Third and fourth nearly one-third webbed. No hind toe. Sexes alike. Found in most parts. Several species in America.

**154. Hæmatopus ostralegus.** THE OYSTER-CATCHER, SEA-PIE or OLIVE.

*Ostrĕa* = an oyster; *lĕgo* = I bring together, collect.

**Darya gajpaon,** *India;* **Yerri kali ulanka** (Telugu).

♂ 16″. ♀ 17″. Legs pink-red. Bill 3¼″, orange-yellow. Head, neck, back, wings, and tail black; rest white. Broad wing-band.—*Young* birds less black; feathers pale-edged. Europe generally, wintering in Egypt, C. Asia, and N.W. India. Two to four eggs (2·2 × 1·5), buff, streaked brown. (J. 862. B. 1450.) See illustration, p. 161.

Also with belly and quill-lining white :—

*H. osculans.* 18″. Probably intermediate between *H. ostralegus* and *H. longirostris.* From E. Siberia south to China.

Also with belly white and quill-lining blackish :—

*H. longirostris.* 17″. From Australia, New Zealand, Papuan and Moluccan Islands.
*H. leucopus.* 16″. From Falkland Islands.
*H. palliatus.* ♂ 15½″. ♀ 17″. America and W. Indies.
*H. frazari.* 17″. From California.
*H. galapagensis.* 15″. From Galapagos Islands.
*H. durnfordi.* 16″. From Patagonia.

Also with belly black or blackish :—

*H. unicolor.* ♂ 18″. ♀ 17″. From Australia and New Zealand.
*H. moquini.* 20″. From Africa, Canaries, and Madeira.
*H. niger.* 17½″. From N.W. America.
*H. ater.* 16″. From Falkland Islands. (B.M. Cat., xxiv. 105–121.)

## Genus **HIMANTOPUS.**

*Himantŏpus* = a kind of water-bird, in Oppian (*circ.* A.D. 180); from ἱμάς = a thong, and πούς = a foot.

Bill twice as long as head. Nasal groove extends half-way to tip of bill. Plumage black and white. First quill longest. Remiges twenty-nine. Long thin legs, tarsi reticulated throughout. No hind toe, fourth joined to third by broad web, third to second by narrow web. Found in most parts of the globe. Breed in north region of N. Africa. Rarely if ever swim. When flying have peculiar Tern-like call.

### 155. Himantopus candidus. The Black-winged Stilt.

*Candĭdus*=of a glistening white.

**Gaj-paon,** *India;* **Lalgori, Lamgora,** *Bengal.*

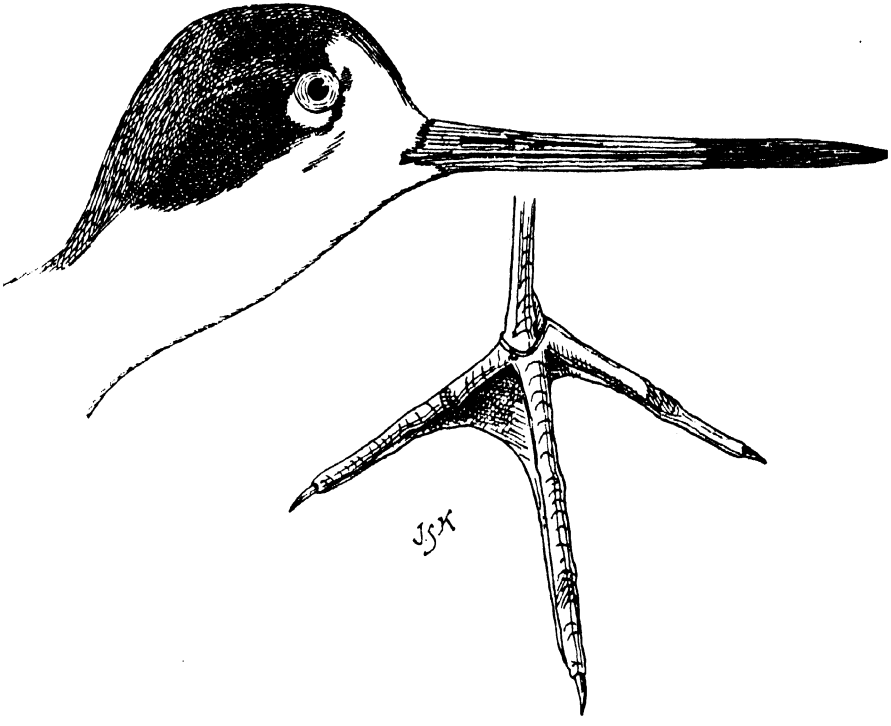
♂ 15½″. Legs lake-red. Bill 2¾″, red, tip black. Back, neck, and tail grey. Wing, back of head black, glossed green. Rest white. The adult male in breeding plumage has head, neck, upper mantle, and entire under surface pure white. S. Europe, Africa, C. and S. Asia. Cold-season visitor to India, Ceylon, and Burma. Three or four eggs (1·64 × 1·21), drab, blotched black. (J. 898. B. 1451).

Also with under surface white :—

*H. melanurus.* 14″. Similar to *H. mexicanus.* From Brazil and Chili.
*H. leucocephalus.* ♂ 14½″. ♀ 14″. From Australia, New Guinea, and the Moluccas.
*H. picatus.* 14½″. A subspecies. From New Zealand.
*H. mexicanus.* ♂ 11½″. ♀ 12½″. America and W. Indies.
*H. knudseni.* 14½″. From Sandwich Islands.

Also with under surface black :—

*H. melas.* 12″. From New Zealand.
Also the genus *Cladorhynchus.* One species—*C. leucocephalus,* 13½″, from Australia.



Mandalay, 15.2.89.

## Genus **RECURVIROSTRA.**

*Recurvirostra*, from *rĕcurvus* = turned back, and *rostrum* = the beak.

Bill long and flexible, turned up, channelled above and below. Remiges twenty-nine. First quill longest. Tarsus reticulated. Hind toe small. Anterior toes deeply webbed, webs notched in middle. Swim well. Avocets, from their strongly webbed feet, were classed by Temminck and others near the Flamingo. Nearly cosmopolitan.

### 156. **Recurvirostra avocetta.** The Avocet.

The Italian name; said to be connected with *avis* = a bird.

**Kusya-chaha**, *Behar.*

♂ 16½″. ♀ 17″. Legs pale grey. Bill 3½″, black. Crown, nape, lesser coverts, and quills black; the rest white. Europe, Asia, and Africa. A winter visitor to Ceylon. Shot one, in hot weather of 1861, on E. Narra, Sind. Eggs (2·0 × 1·4) buff, blotched brown. (J. 899. B. 1452.)

Also with greater wing-coverts and secondaries white :—

*R. americana.* ♂ 16″. ♀ 15″. From temperate N. America.

*R. novæ hollandiæ.* 15½″. From Australia and New Zealand.

Also with greater coverts and secondaries dark brown :—

*R. andina.* 17″. From Chili.

## Genus **IBIDORHYNCHUS.**

ἶβις = Ibis; ῥύγχος = a bill.

A peculiar species. Bill curved downwards. Nasal groove extends to more than half length of the bill. First, second, and third quills subequal. Tarsi reticulated throughout. No hind toe. Third and fourth toes connected by web, hardly any web between second and third toe.

### 157. **Ibidorhynchus struthersi.** The Ibis-bill.

♂ 16″; 10 oz. Legs blood-red. Bill 3¾″, crimson. Head black, mixed grey and margined white. Plumage olive.

Hodgson says it has the short legs and feet of a Plover. Gould remarks that its legs and feet are those of an Oyster-Catcher, and its bill that of an Ibis. Masson, in December, 1880, shot eight in the Great Ranjit River. Excellent for the table. From W. Turkistan to N. China. Inhabits the Himalayas from the Afridi country to Assam. (J. 879. B. 1453.)

## Order **LIMICOLÆ** (Continued).

| | | |
|---|---|---|
| Anterior toes partially webbed at base | Numenius | Curlews. Whimbrels. |
| | Limosa | Godwits. |
| | Macrorhamphus | Godwits. |
| | Terekia | Avocet Sandpipers. |
| | Totanus | Yellow-shanks. Green-shanks. Sandpipers. Red-shanks. Wood-Sandpipers. |
| | Pavoncella | Ruffs. |
| Anterior toes divided to base. Tarsus and culmen equal | Calidris | Sanderlings. |
| | Eurinorhynchus | Stints. |
| | Tringa | Pectoral Sandpipers. Knots. Curlew Stints. Dunlins. Broad-billed Stints. |
| Anterior toes lobed | Phalaropus | Phalaropes. |
| Anterior toes free and cleft to base. Tarsus scutellated | Scolopax | Woodcocks. |
| | Gallinago | Snipes. |
| | Rostratula | Painted Snipes. |
| Plumage white | Chionis, Chionarchus | Sheath-bills.* |
| Plumage game | Attagis, Thinocorus | Seed-Snipes.* |

### Subfamily Totaninæ. Curlews, Godwits, Sandpipers, Stints, and Phalaropes.

Bill lengthened. Fourth and second toes joined by webs to third. (In *Phalaropus* toes have scalloped webs.) Tarsus transversely shielded both in front and behind (*Numenius* excepted). Summer and winter garb distinct. Sexes alike (*Pavoncella* excepted). With hind toe (*Calidris* excepted).

Migratory birds scattered in both hemispheres. Winter visitants to India, breeding in N. and C. Europe and Asia. They pick up small crustacea and molluscs from the surface, and do not insert their bills deeply like Snipes. Several are solitary in their habits.

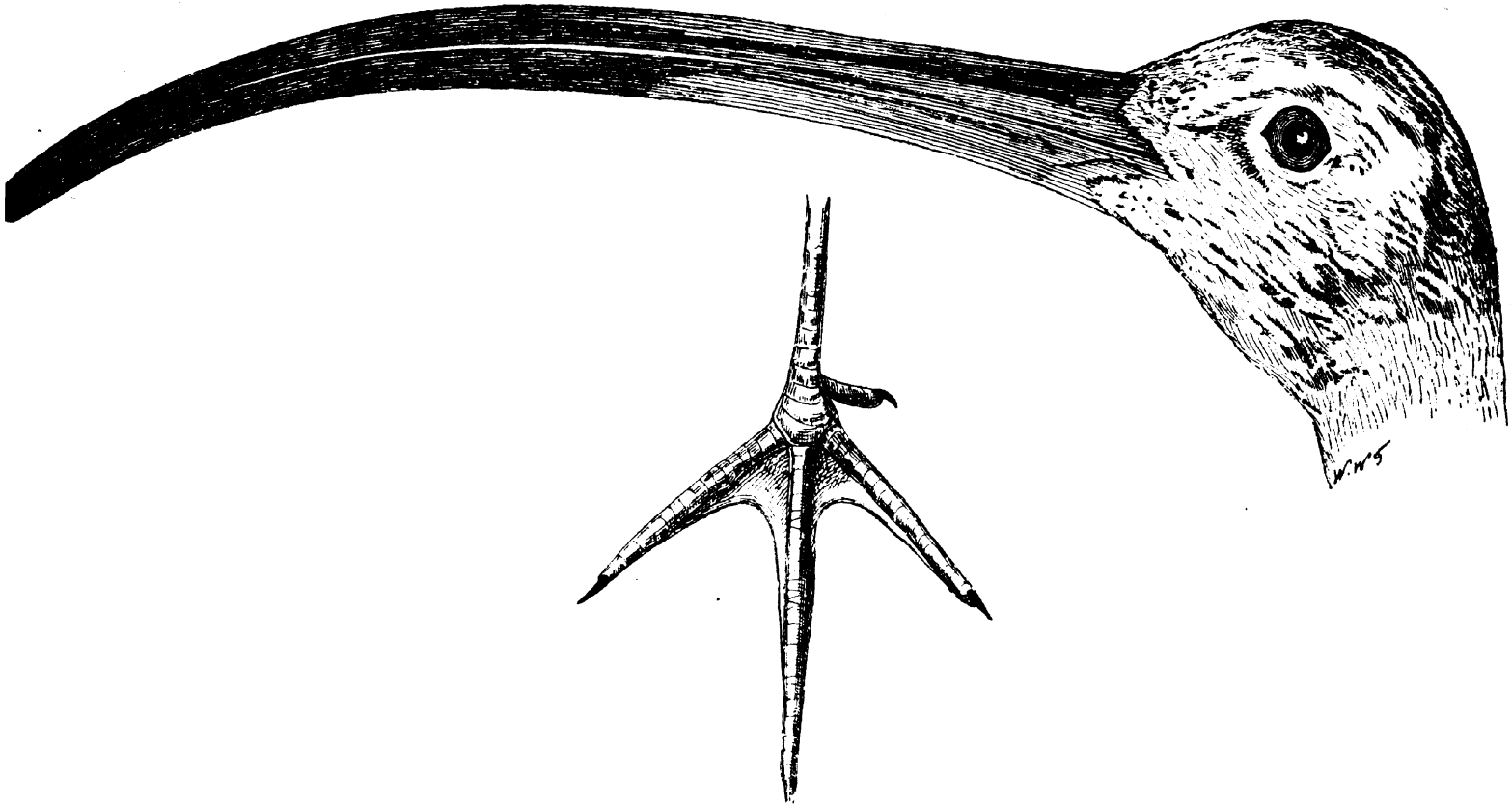
#### (i.) *Anterior toes partially webbed at base.*

### Genus **NUMENIUS.**

*Numēnius* = νουμήνιος, a kind of Curlew in Diogenes Laërtius (about A.D. 200); from νέος = new, and μήνη = the moon, from its "crescent" beak.

Hind toe with nail short. Bill very long, curved downwards. Nasal groove for three-quarters length of bill. Anterior toes webbed at base. Tarsi transversely scaled in front and reticulated behind. Differ from Godwits and Stints in beak

* Not represented in India.



158. *Numenius arquata.*

and plumage. Remiges thirty. First quill longest. Primaries barred whitish or rufous on inner web (*N. borealis* excepted).

Migratory and found all over the world. Said to perch on trees occasionally in N. Europe.

*Colour of crown same as back, and without central longitudinal pale band.*

**158. Numenius arquatus.** THE CURLEW.

The mediæval name. It is generally said to be derived from the bird's bill being bent like a bow, *arcus;* but it more likely refers to *arquatus morbus*=the jaundice ("when the skin turns to the yellow colour of the rainbow"), in allusion to the legend about *Charadrius, Galbula, Icterus*, etc.

**Goar, Goungh,** *India;* **Choppa, Sada Kastachura,** *Bengal.*

♂ 21″; 27 oz. ♀ 26″; 30 oz. Legs grey. Bill 4″ to 7¼″, brown. Tongue rather short. Above brown, edged rufous. Lower back and rump white, with blackish shaft streaks ending in dusky spots. Abdomen white, with dark shaft lines on breast and flanks. In summer the male becomes darker, with broader shaft lines. In winter the female resembles male in being nearly white below. Nearly cosmopolitan, breeding in temperate Europe and Asia, wintering in Africa and S. Asia. Winter visitor to India, Ceylon, and Burma. Accidental in N. America. Eggs (2·6 × 1·8) olive, blotched grey. Its note is the wild scream of "cur-lew." (J. 877. B. 1454.) See illustration, p. 166.

Also *N. tenuirostris*. 16″. Similar to *N. arquatus*. From C. Europe.
*N. cyanopus*. ♂ 21″. ♀ 24″. Breeding in E. Siberia and wintering as far south as Australia.
*N. longirostris*. ♂ 18½″. ♀ 21″. From America.

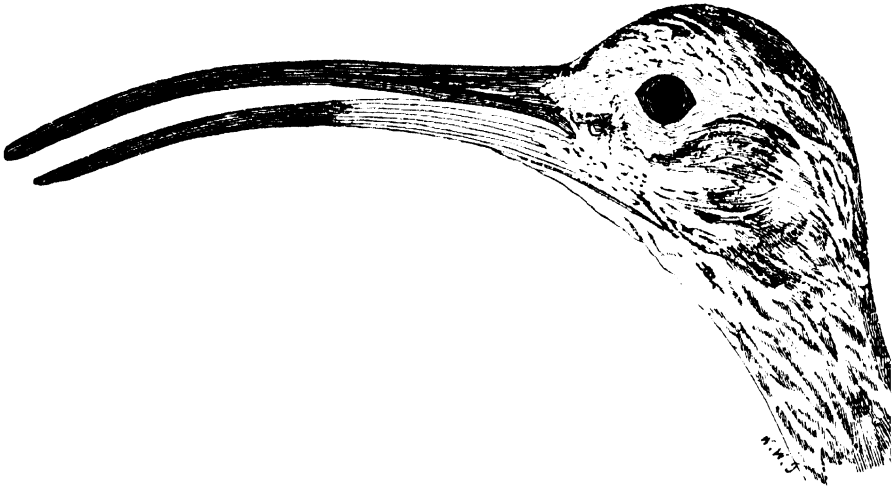
*Crown with central longitudinal pale band.*

**159. Numenius phæopus.** THE WHIMBREL, WHAUP, OR SEVEN WHISTLER.

The mediæval name; from φαιός=dusky, and πούς=a foot.

**Chota-Goungh,** *India.*

♂ 16″. ♀ 18″. Legs bluish. Bill 3″ to 3½″, dusky. Crown brown, with median white band. Pale broad eye-streak. Above brown with whitish spots. Flanks and axillaries barred. Lower back and rump unstreaked white. Europe



159. *Numenius phæopus.* 10.10.75.

and N. Asia in summer; Africa, S. Asia, Malay Archipelago, and Australia in winter. Winter visitor to India, Ceylon, and Burma. Eggs (2·3 × 1·7) olive, spotted brown. Its note is a whistling "titterel" repeated seven times. T. H. Thornley, of Birkenhead, reported that on 4.10.94, in lat. 12° 33′ N., long. 26° 38′ W., a Whimbrel, *N. phæopus*, came on board the homeward bound R.M.S.S. *Thames*, and being exhausted and starved, was easily caught. The nearest land would be Cape Verd Islands, lying about 200 miles to the north.

Also *N. variegatus*, 15″, which replaces *N. phæopus* in E. Siberia and Japan, extending in winter to the Malay Archipelago and Australia.

*N. hudsonicus*. ♂ 14″. ♀ 17″. Similar to *N. phæopus*. From N. America, wintering in S. America.

*N. tahitiensis*. ♂ 18½″. ♀ 17″. From N. America, visiting the Pacific Isles, where it is believed to breed.

*N. borealis*. ♂ 13½″. ♀ 14″. The Eskimo Curlew. With quills uniformly coloured, and without bars on inner webs.

Also the genus *Mesoscolopax*. One genus—*M. minutus*, 13″, with tarsus transversely scutellated both in front and behind, from E. Siberia, passing through Japan and China on its migrations to the Moluccas and Australia.

## Genus **LIMOSA.**

*Limōsus* = muddy, from *limus* = mud.

Bill lengthened, straight or bent upwards, cylindrical at base, obtuse at tip; both mandibles grooved at side. Plain plumage, in winter grey-brown, in summer rufous in both sexes. Males smaller than females. Remiges twenty-eight. First quill longest. Tail even. Tarsus transversely shielded in parts both in front and behind. Hind toe well developed. Second, third, and fourth toes fringed on both sides. Mid claw curved and often pectinated. Like SNIPES in bill, and like STINTS in plumage. Scattered nearly all over the world.

*Axillaries white, with or without dusky bars.*

### 160. **Limosa belgica.** THE BLACK-TAILED GODWIT.

The Linnean form of αἰγοκέφαλος, a bird mentioned by Aristotle; from αἴξ = a goat, and κεφαλή = the head.

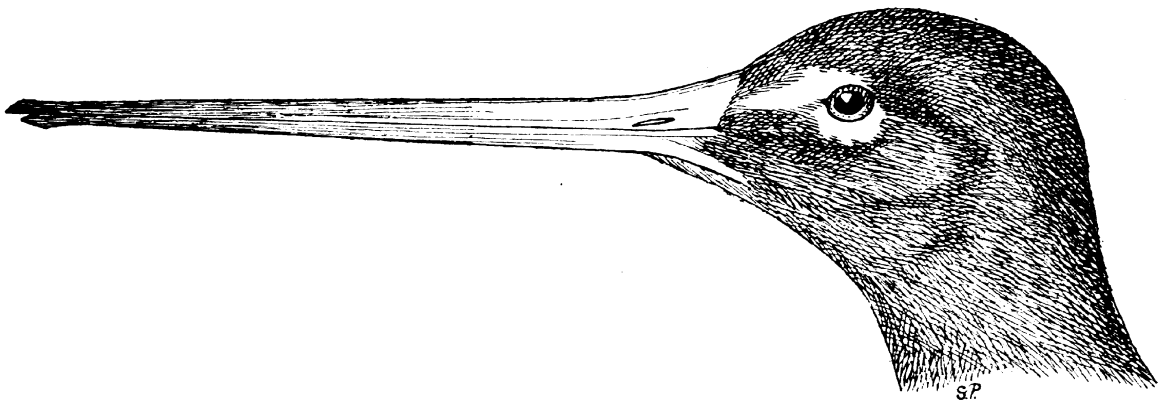
**Goodera, Gairiya,** *N.W.P.*; **Malgujha,** *Nepal*; **Jaurali,** *Bengal*; **Susling,** *Sind*; **Tonda ulanka** (Telugu).

♂ 16″ to 18″; 8 to 12 oz. ♀ 18″ to 21″; 9 to 15 oz. Legs dusky. Bill 3½″ to 5″, fleshy.—*In winter:* Above ash-brown. Short supercilia and spot under each eye white. Below grey-white. Tail, basal one-third white, terminal two-thirds black.—*In summer:* Back black, tipped rufous. Breast rufous. Abdomen white. Migratory, breeding in Europe and Asia, and wintering in S. Europe, N. Africa, S. Asia, Malay Archipelago, and Australia. Common in N. India from October to March. Eggs (2·1 × 1·5) olive, spotted brown. (J. 875. B. 1456.) See illustration, p. 169.

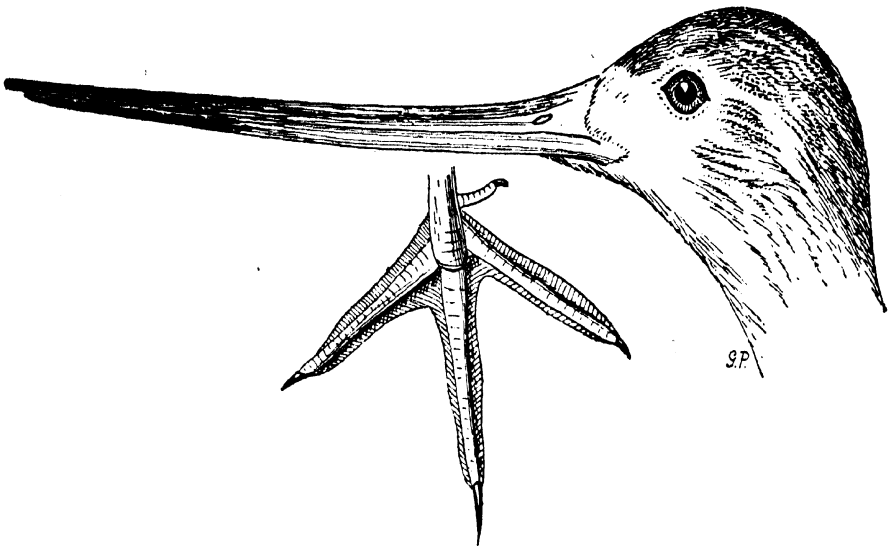
### 161. **Limosa lapponica.** THE BAR-TAILED GODWIT.

*Lappōnĭca* = of Lapland.

♂ 13½″ to 14¾″; 7½ to 10 oz. ♀ 15¾″; 9 to 11½ oz. Legs black. Bill 3″ to 3½″, pink and black.—*In winter:* Above earthy, and dark central shaft. Lower back and rump white, with heart-shaped brown spots. Upper tail-coverts white, with irregular brown bars. Mid-tail ashy, tipped white, and barred white and brown towards base. Outer rectrices barred throughout. Below white.



160. *Limosa ægocephala.* Khairodera, 12.10.7.



161. Karachi, 29.10.76.

Axillaries white, with brown bars on inner web.—*In summer:* Crown black, edged rufous. Below pale red. Above black-brown, marbled grey. Tail barred white and brown throughout. Breeds in N. Europe and N.W. Asia, and migrates south in winter, but does not cross the equator. Accidental in Canary Islands. In India hitherto only found at Karachi (see illustration). Eggs (2·2 × 1·45) olive, spotted grey. (B. 1457. S.F. i. 295.)

Also *L. novæ zealandiæ.* ♂ 14½″. ♀ 16″. From Alaska, Siberia, Japan, China, to Malay Archipelago, Oceania, Australia, and New Zealand.

*L. hudsonica.* 14″. With axillaries slatish. From N. and S. America.

*L. fedoa.* ♂ 16″. ♀ 14½″. With axillaries cinnamon. Tail banded brown and rufous. From N. and C. America.

## Genus **MACRORHAMPHUS.**

With a long beak; from μακρός + ῥάμφος.

Bill more high than wide, both mandibles broader toward the tip and pitted. First quill longest, second subequal. Tarsus with lower part shielded in front or behind. Hind toe well developed. Anterior toes webbed near base. Remiges twenty. Plumage plain; in summer rufous and in winter grey. Breeds in Arctic regions and migrates to C. and S. America, Europe, Japan, China, India, and Burma.

### 162. **Macrorhamphus semipalmatus.** The Snipe-billed Godwit.

♂ 12½″ to 13″; 4 oz. ♀ 13″ to 13½″. Legs green. Bill 2⅞″ to 3¼″, dusky. —*In winter:* Ash-brown, edged white. Broad white supercilia. Rump and upper tail-coverts white, with arrow-shaped marks of brown. Tail barred brown and white. Axillaries, flanks, and under tail-coverts spotted and barred brown. Lower part of tarsus transversely shielded in front.—*In summer:* Rufous. Wing brown, edged white. Tail banded black and white. Rare visitor to India and

Burma. Breeds in Siberia, and migrates to China, Japan, Burma, and India. (J. 874. B. 1458.)

Also *M. griseus*. ♂ 10″. ♀ 11″. With tarsus shielded behind, wintering in C. and S. America.

Also the genus *Micropalama*. One species—*M. himantopus*. ♂ 8″. ♀ 8½″. With bill widened at tip and pitted. Breeding in Canada and migrating to S. America and W. Indies.

## Genus **TEREKIA.**

In some respects intermediate between *Limosa* and *Totanus*. Bill slender, curved upwards. Upper mandible bent slightly downwards at tip. First quill longest. Tail nearly even. Second and fourth toes united to third by distinct membrane. Tarsus scutellated. Mid claw dilated, not pectinated.

### 163. Terekia cinerea. The Avocet Sandpiper.

♂ 9″. ♀ 10½″. Legs pale orange. Bill 1⅘″, orange.—*In winter:* Forehead and supercilia white. Ashy blue, with dark shaft stripes. Shoulder-edge of wing and quills brown. Breast ashy, with streaks of red. Axillaries white.—*In summer:* Scapulars black, edged with brown. Head, neck, and breast streaked with brown. Breeds in northern parts of the Palæarctic region, and winters in Africa, India, and Australia. (B. 1459.)

## Genus **TOTANUS.**

*Totănus*, Latinised from the Italian *Tótano*. Derivation unknown.

Bill straight or slightly curved upwards. Both mandibles grooved on each side. Tip of upper mandible hard and bent down. First quill longest. Tarsus always scutellated in front and behind. Hind toe present. Anterior toes united by webs, which sometimes are rudimentary between second and third toe.

(i.) *Bill with upward curve.*

### 164. Totanus guttifer. Armstrong's Yellow-shanks.

♂ 12″ to 13″; 3⅓ oz. ♀ 13″. Legs ochreous. Bill 2·4″, plumbeous. Broad stripe from forehead. Chin, neck, breast, abdomen, and wing-lining white. Crown, neck, secondaries, and tertiaries pale ashy. N.E. Asia, ranging in winter to Burma and Bengal. (B. 1467.)

### 165. Totanus glottis. The Common Green-shanks.

γλῶττις = mouth of the windpipe.

**Tim timma**, *India;* **Gotra**, *Bengal;* **Peria-kotan** (Tamil); **Maha-oliya**, *Ceylon.*

♂ 13″ to 15″. Legs greenish. Bill 2″ to 2⅕″, dusky. *In winter* and *summer* the same. Tail cross-barred and laterals white, with narrow streak on outer web. Head white, with brown streaks. Back brown, edged yellow. Breeds in N. Europe and N. Asia, and winters in China, S. Asia, and Australia. Four eggs (2·0 × 1·35), light brown, spotted brown. (J. 894. B. 1466.)

(ii.) *Bill straight and not curved upwards.*

### 166. Totanus stagnatilis. The Marsh-Sandpiper, or Lesser Green-shanks.

*Stāgnātilis* = pertaining to ponds.

**Chota gotra**, *Bengal.*

♂ 10½″. Legs pale green. Bill 1⅝″, dusky.—*In winter:* Ash-brown. Quills brown, shafts white. Cheeks, neck, breast, and flanks spotted brown. Lower

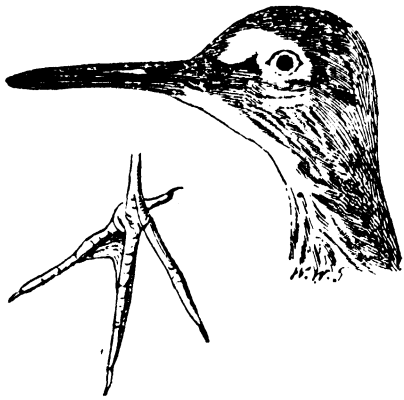
back white.—*In summer:* Beneath small, round, black spots. Breeds in S.E. France, S. Russia, C. Asia, and S. Siberia, and ranges in winter to Africa, S. Asia, Malay Archipelago, and Australia, India, Burma, and Ceylon. (J. 895. B. 1463.)

**167. Totanus hypoleucos.** THE COMMON SANDPIPER, or SUMMER SNIPE.

*Hypoleucos* = ὑπόλευκος, which generally = whitish (pale from the ordinary sense of ὑπό in composition, "somewhat"), but here plainly = white underneath. It was the bird's common mediæval name.

**Potti ulanka** (Telugu); **Kotan,** *Ceylon.*

♂ 7¾″ to 8¼″. Legs pale green. Bill 1″, dusky. *In winter* and *summer* the same. Above and four central tail-feathers glossed green. No white on rump. Lateral tail tipped and barred white. Remiges twenty-four. Quills, except first, with spot on inner web. The greater part of the Old World, and migrating in winter to S. Africa, S. Asia, and Australia. Common throughout India, Burma, and Ceylon in cold season. Four eggs (1·41 × 1·06), buff, with black specks. (J. 893. B. 1460.)



167. *Totanus hypoleucos.* 21.8.75.

**168. Totanus ochropus.** THE GREEN SANDPIPER.

*Ochropus,* from ὠχρός = pale yellow, and ποῦς = a foot.

**Nella ulanka** (Telugu).

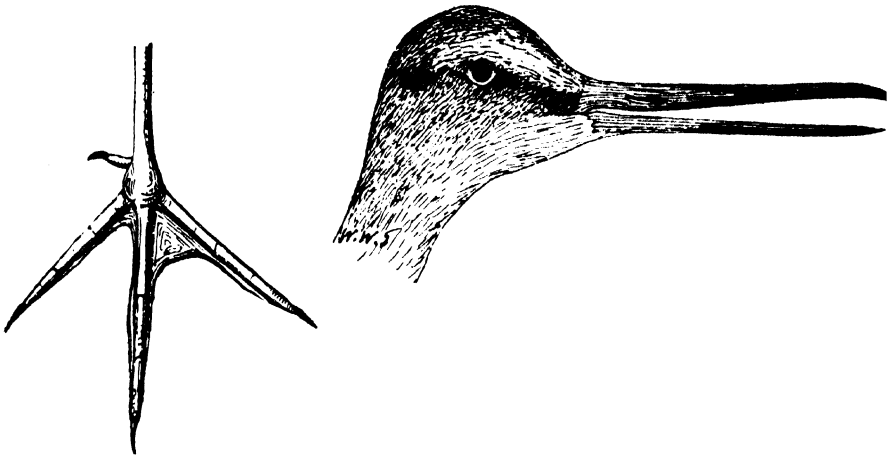
♂ 9¾″ to 10¼″. Legs green. Bill 1½″, green, tip black.—*In winter:* Above ashy, tinged green, with edging of small white spots. Lower back brown. Upper tail-coverts white. Tail, basal third white, rest white, barred brown. Axillaries white, with brown bars. Remiges, twenty-nine.—*In summer:* Darker, greener, and more spotted. Breeds in the north, and winters in Africa, S. Asia, and Malay Archipelago. Common throughout N. India in cold weather. Four eggs (1·5 × 1·1), buffish green, spotted brown. (J. 892. B. 1462.)

**169. Totanus calidris.** THE COMMON RED-SHANKS.

κάλιδρις or σκάλιδρις = a speckled water-bird, in Aristotle.

**Chota battan,** *India.*

♂ 10½″ to 11½″; 6 oz. Legs pale red. Bill 1⅞″, red, tip dusky. Supercilia from the bill white. Above brown. Inner margin of primaries mottled white. Lower back white. Secondaries white. Known in flight by white on wing.



Karachi, 30.10.76.

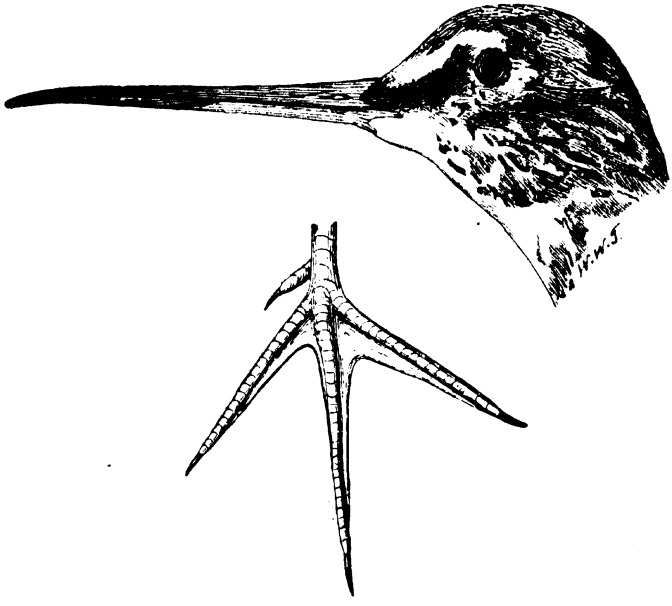
Breeds from Asia Minor to S.E. Siberia, and migrates in winter to Africa, S. Asia, and Malayan Archipelago. Common in cold season in India, Ceylon, and Burma. Four eggs (1·8 × 1·25), buff, spotted dark brown. (J. 897. B. 1464.)

**170. Totanus fuscus.** The Spotted Red-shanks.

*Fuscus*=dusky.

**Batan,** *India;* **Yerra Kal ulanka** (Telugu).

♂ 13″; 7¼ to 9 oz. Legs orange-red. Bill 2⅓″, orange, tip black.—*In winter:* Black patch near eye. Supercilia from base of bill white. Sides of neck and upper breast indistinctly spotted and mottled with brown. Secondaries barred brown and white. Upper tail-coverts barred black and white. Central tail ash-



170. *Totanus fuscus.* Buckree, 10.10.72.

grey; outer tail vandyked white.—*In summer:* Head, neck, and below sooty grey. Vent and lower tail barred white and brown. Back black, with white spots. Breeds in Finland, and migrates south to Mediterranean countries and S. Asia. Common in cold season in N. India. Eggs (1·8 × 1·25) buff, spotted dark brown. (J. 896. B. 1465.)

**171. Totanus glareola.** THE WOOD-SANDPIPER.

*Glārĕŏla*, a diminutive from *glārĕa* = gravel, from its haunting gravelly places.

**Chupka, Chobaha,** *India;* **Chinna ulanka** (Telugu).

♂ 8½″ to 9″. Legs green. Bill 1⅕″, green, tip black.—*In winter:* Forehead and above deep brown, with grey spots. White supercilia from the bill. Tail barred black and white; laterals white-spotted. Remiges twenty-six. Axillaries barred brown.—*In summer:* Feathers of back brown, with white markings on both webs. Europe and N. Asia, winters in Africa, India, Malay Archipelago, and Australia. Eggs (1·5 × 1·1) olive, blotched red and brown. (J. 891. B. 1461.)

Also *T. macularius.* 6½″. Similar to *T. hypoleucos.* From N. America. Migratory to C. and S. America and W. Indies.

*T. solitarius.* ♂ 7″. ♀ 7½″. Similar to *T. ochropus.* From N. to S. America.

*T. cinnamomeus.* Similar to *T. solitarius.*

*T. melanoleucus.* ♂ 11″. ♀ 12·8″. Similar to *T. glottis.* From N. America. Migratory to S. America.

*T. flavipes.* ♂ 9″. ♀ 9½″. N. America. Migratory to S. America.

Also the genus *Symphœnia.* One species—*M. semipalmata,* ♂ 12″, ♀ 13″, from N. America to C. and S. America in winter.

Also the genus *Heteractitis.* Two species—*H. brevipes,* ♂ 8·8″, ♀ 9″, from E. Siberia through Japan and China to Malayan Archipelago and Australia; *H. incanus,* 10″, from Alaska and Mexico throughout Oceania to N.E. Australia.

## Genus **PAVONCELLA.**

Males much larger than females. Web only between fourth and third toes. Bill almost straight. Both mandibles grooved. First quill longest. Tail graduated. Tarsus transversely shielded in front and behind. Hind toe moderate. At breeding season male assumes a distinct plumage, with a ruff of long feathers. Scarcely two ruffs in full plumage are alike in colour. Polygamous. Almost the whole of the Old World.

**172. Pavoncella pugnax.** THE RUFF and REEVE.

*Pugnax* = fond of fighting; from *pugna* = a fight.

**Gehwala,** *India.*

♂ 12″ to 13″. ♀ 10″. 6 oz. Legs yellow. Bill 1½″ to 1½″, brown.—*In winter: Male* has upper plumage brown, with black spots. Breast reddish. Axillaries white. Lower parts white. *Female,* known as the Reeve, is smaller, ashy plumage throughout, and has no ruff or occipital tufts.—*In summer: Male:* Plumage black, deep rufous, and ashy. After spring moulting the face-feathers are replaced by hard pimples and the ruff is developed. The two sexes are alike for part of the year, but differ in the pairing season. Among young males and females there is no difference in plumage during their first autumn, the only marked difference being the larger size of the male. Similarly size alone distinguishes adult males and females in winter. In the breeding plumage (May and June) the only alteration in the female from the winter state is a darker

feathers about the head and neck, constituting the "ruff." In addition to this peculiarity is another which is rare amongst animals in a wild condition (though so common among domesticated races), that of striking diversity of colour in different individuals. The range of variation appears to be restricted within certain limits, and the colour of each individual bird always continues the same throughout successive seasons. The pugnacity of the males at this time of the year is proverbial (N.H.M.). Breeds in N. Europe and Asia and migrates to Africa and S. Asia. Visitor in cold season to N. India. Four eggs (1·75 × 1·2), olive, spotted red and brown. (J. 880. B. 1468.)

Also the genus *Bartramia*. One species—*B. longicauda*, 11″, a Sandpiper, with graduated tail, from N. to S. America.

Also the genus *Ereunetes*. One species—*E. pusillus*, 5½″, a Sandpiper, from N.E. Siberia and Arctic America to Brazil and Peru.

Also *with tarsus longer than the culmen*:—

The genus *Tringites*. One species—*T. subruficollis*, ♂ 8″, ♀ 7½″, with central tail-feathers produced beyond the others, a buff-breasted Sandpiper, nesting in N. America and migrating to S. America.

The genus *Æchinorhynchus*. One species—*Æ. cancellatus*, a barred Sandpiper with small hind toe and central tail not produced, confined to Oceania.

The genus *Prosobonia*. One species—*P. leucoptera*, 6·7″, a white-winged Sandpiper, with long hind toe and central tail not produced, from the Society Islands.

(ii.) *With anterior toes divided to base. With tarsus and culmen practically equal in length.*

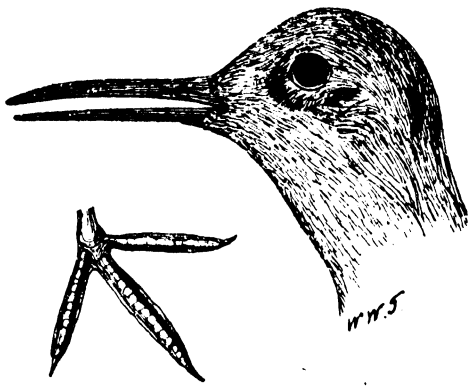
## Genus **CALIDRIS**.

κάλιδρις or σκάλιδρις = a speckled water-bird in Aristotle. Derivation unknown.

No hind toe, otherwise as in *Tringa*. Web at base of toes very small.

### 173. Calidris arenaria. The Sanderling.

*Arenārĭa* = pertaining to sand, *arēna*.



Manora, 27.10.75.

♂ 7½″ to 8″. 1¾ oz. Legs black. Bill 1″, black.—*In winter:* Upper plumage ashy. Shafts brown. Head, edge of wing, and tail deep grey.—*In summer:* Head and cheeks black. Back, neck, and breast reddish, with black spots. Tail-feathers doubly notched. Breeds in Arctic regions and migrates south. Common in cold season in Sind and Baluchistan. Eggs (1·4 × 0·95) olive, spotted brown and red. (J. 888. B. 1469.)

## Genus **EURINORHYNCHUS.**

εὖ = well; ῥῖν = nose; ῥύγχος = a bill.

Bill with tip expanded, otherwise as in *Tringa*. Toes well cleft. Small web between fourth and third toes. Hind toe present.

### 174. **Eurinorhynchus pygmæus.** The Spoon-billed Stint.

♂ 6½″. Legs black. Bill 1″, black. Forehead, supercilia, cheeks, and axillaries white. Tail-coverts dark brown, margined white. Shafts white, tipped black. Lower parts snow-white. A very rare bird, visiting N.E. Siberia in summer, and found in winter in China, Burma, and Bengal. (J. 887. B. 1470.)

## Genus **TRINGA.**

The late Latin form of Aristotle's τρύγγας. Derivation unknown.

Bill flexible, straight, or slightly curved downwards. Both mandibles grooved. First quill longest. Tail even and without bars. Median rectrices pointed, and sometimes projecting. Tarsus scutellated. Hind toe present. Anterior toes free or barely united by a web. Migratory, breeding in N. Asia.

Stints have shorter bills and legs than Godwits, and shorter and softer bills than Sandpipers. Change of plumage in summer darker above and rufous beneath. Frequent marine marshes and seashore. Retire north in summer.

It is on the shore, after recess of the tide, in company with other species, that these birds are seen collecting their food from the refuse of the ocean, or quietly and intently probing the moist sand for worms and small shell-fish, running before the advancing surf, and profiting by what is left behind.

(i.) *Bill straight. Shafts of primaries mostly white.*

### 175. **Tringa minuta.** The Little Stint.

**Chota pan-loha,** *India.*

♂ 6″. Legs black. Bill $\frac{7}{10}$″, black.—*In winter:* Above and sides ash-brown, with broad black shaft stripes. Below white. Six outer tail-feathers brownish grey.—*In summer:* Head, above, and central tail black, edged rufous. Breast reddish. Middle toe ⅔″. Nesting in N. Europe and Siberia; wintering in Africa, India, and Ceylon. Eggs (1·1 × 0·8) grey, spotted brown. (J. 884. B. 1471.)

### 176. **Tringa ruficollis.** The Eastern Little Stint.

♂ 5½″ to 6¼″. ♀ 5″. Resembles *T. minuta*. Legs blackish. Bill black. Forehead white. Primary shafts white about centre, sullied near base. Breast white. From E. Siberia, China, and Japan, to Burma, Malay Archipelago, and Australia. (B. 1472.)

*Shafts of first primary white, of others brown.*

### 177. **Tringa subminuta.** The Long-toed Stint.

♂ 6″. Legs pale brown. Bill olive. Above dark brown, edged lighter. Shafts of primaries, with exception of first, are brown. Middle toe and claw 1″. All tail-feathers brown. Ranges from E. Siberia in summer to Australia in winter. Common during cold season in Burma, Bengal, and Ceylon. (S.F. i. 244. B. 1473.)

### 178. Tringa temminckii. The White-tailed Stint.

In honour of Coenraad Jacob Temminck, Keeper of the Leyden Museum, b. 1778, d. 1858.

♂ 6″ to 6¼″. Bill $\frac{7}{10}$″, black. Legs greenish.—*In winter:* Above brown, with dusky streaks. Four central tail-feathers ash-brown, six outer tail-feathers white. Laterals, throat, belly, and under-tail pure white.—*In summer:* Breast sandy, with small dark spots. Shaft of first primary white, of others brown. Mid toe and claw ¾″. N. Europe and Asia, migrating south. Common in N. India from August till May. Eggs (1·15 × 0·85) green, spotted red and brown. (J. 885. B. 1474.)

Also *T. minutilla.* Similar to *T. minuta.* 5⅛″. From N. to S. America.

### 179. Tringa acuminata. The Asiatic Pectoral Sandpiper.

♂ 7″ to 8½″. Bill $1\frac{1}{10}$″, black. Legs yellow. Tail-feathers lanceolate and pointed.—*In summer:* Crown and above broadly margined bright rufous. Upper throat unspotted.—*In winter:* All tail-feathers with white edges. Chin, throat, and abdomen white. N.E. Siberia and Alaska, migrating to China, Japan, Malayan Archipelago, Australia, and New Zealand. A single specimen was shot at Gilgit on 1st August. (B. 1475. S.F. v. 344.)

Also *T. maculata.* 8″. The American Pectoral Sandpiper.

*T. bairdi.* 6½″. From N. to S. America.

*T. fuscicollis.* 7″ to 9½″. Buonaparte's Sandpiper. From E.N. America and W. Indies to S. America.

### 180. Tringa crassirostris. The Eastern Knot.

♂ 11½″ to 12″. ♀ 11½″ to 12″. Legs dusky. Bill 1½″ to 2″, black.—*In winter:* Breast mottled, brown spots heart-shaped. Above ashy, tipped white.—*In summer:* Breast-feathers black, with white cross-band. From Siberia migrating by China and Japan to the Malayan Archipelago and Australia, wandering to W. India and the Laccadives. (B. 1476. S.F. i. 240.)

Also *T. canutus.* 10″. The Knot, really the Knut, from the king whose courtiers forgot the double tide in Southampton Water; the Latinisation of his name gives the specific Canutus. Flight strong and straight, and always alights head to wind. Back black, with chestnut spots. Upper tail-coverts white, with black bands. Axillaries white, with brown bars.

(ii.) *Bill curved downwards near the tip.*

### 181. Tringa subarquata. The Curlew Stint.

*Subarquāta* = a little like a Curlew, *Arquāta.*

♂ 8″ to 8¾″. Legs grey. Bill 1½″, black.—*In winter:* Face, throat, and beneath white. Brown streak from gape to eye. Above ashy brown, with dark shaft stripes. Upper tail-coverts chiefly white. White ring barred with black round base of tail.—*In summer:* Crown, neck, back, and scapulars rufous, with black shaft stripes. Upper and lower tail-coverts with black spots. Below chestnut. Nesting in Arctic regions and wintering in Africa, India, and Australia. Accidental in N. America and W. Indies. (J. 882. B. 1477.)

Also the genus *Arquatella.* One species—*A. maritima,* 7½″, the Black Sandpiper, breeding in Arctic Europe and N.E. America, and ranging south in winter on coasts of temperate Europe and America. Also two subspecies—*A. couesi,* 7½″, replacing *A. maritima* in W.N. America; and *A. ptilocnemis,* 9½″, from Pribylov Islands.

**182. Tringa alpina.** THE DUNLIN, or PURRE.

♂ 7½". Bill 1¾", black. Legs black.—*In winter:* Ash-brown, shafts darker. Central tail projecting, dark brown. Laterals ashy, edged white. Upper tail-coverts dark brown. Abdomen white.—*In summer:* Head and abdomen black. Breast spotted white. Axillaries white. Breeds in N. Europe and Asia, and migrates in winter to S. Europe, N. Africa, and S.W. Asia. Common in N. India in the cold season, but not in S. India, Ceylon, or east of Bay of Bengal. Eggs (1·3 × 0.95) buff, with brown marks. (J. 883. B. 1478.)

Also *T. americana.* 7¾". From N. America, E. Siberia, south to China.

**183. Tringa platyrhyncha.** THE BROAD-BILLED STINT.

πλατύς = broad; ῥύγχος = a bill.

♂ 6¼" to 7". Legs dusky. Bill 1" to 1⅛", black. Sexes same size. Bill flat, wide in the middle, and slightly bent.—*In winter:* Above, tail, breast, and under-tail tinged rufous. Mid-tail not projecting.—*In summer:* Above black, edged rufous. Black breast-spots. Upper tail-coverts blackish brown. N. Europe and Siberia, migrating in winter to Mediterranean countries, Red Sea, India, Ceylon, China, and Malay Archipelago. (J. 885. B. 1479.)

(iii.) *Anterior toes lobed.*

Genus **PHALAROPUS.** PHALAROPES or LOBEFOOTS.

*Phalărŏpus*, from φαλᾰρίς = a Coot, in classical Greek, which is from φάλᾰρος = having a patch of white (on its forehead); πούς = a foot.

Feet lobed and partly webbed, the web between third and fourth toes extending to first joint. Tarsus scutellated in front and with small reticulated fringe behind. Remiges twenty-five. In other respects agrees with *Tringa.* Modified Sandpipers, but unlike those birds, they are found swimming in the sea. Inhabit north regions. Appearance in India occasional and accidental. Of dense plumage. Said to swim and dive well. Yarrell classes them with Coots. Males alone incubate, females forsaking nest and leading a wandering life. Males inferior in size to the females.

(i.) *Bill thin and pointed.*

**184. Phalaropus hyperboreus.** THE RED-NECKED PHALAROPE.

*Hyperbŏrĕus* = northern; ὑπερβόρεος = beyond Boreas, "at the back of the north wind"; from ὑπέρ = above, and βορέας = the north wind, the north.

♂ 6⅘". ♀ 7½". Legs green. Bill ⅘", dusky.—*In winter:* Crown brown. Forehead white. Back and tail brown, edged red. Broad white bar on the wing.—*In summer:* Above black, edged red. Neck red. Breeds in N. Europe, Asia, and America, and winters in Arabia, Baluchistan, and Sind. Four eggs (1·15 × 0·86), olive, spotted red. (J. 890. B. 1480.)

(ii.) *Bill flat and broad.*

**185. Phalaropus fulicarius.** THE GREY PHALAROPE.

*Fŭlicārĭus* = like a Coot, *fŭlica.*

♂ 7½". ♀ 8". Legs green. Bill 1", yellow, tip brown.—*In winter:* Forehead, supercilia, cheeks, and crown white. Grey nape streak. White bar on

wing. Beneath white. Mid-tail projecting.—*In summer:* The females have the crown and nape black, with a white patch on the sides of the head. Back, scapulars, and tertiaries black, edged buff. Breeds in Arctic regions and ranges south in winter to Chili and New Zealand. Four eggs (1·2 × 0·9), olive, marbled brown. (J. 889. B. 1481.)

Also the genus *Steganopus*. One species—*S. tricolor*, ♂ 8½″, ♀ 9½″, from N. America, migrating to S. America.

## Subfamily SCOLOPACINÆ. WOODCOCKS and SNIPES.

Bill long, slender, rather soft, swollen and bent over at tip. Eyes set far back, with hinder margin, just above orifice of ear. Wings long. Inner secondaries less than primaries. Tail of twelve to twenty-eight feathers. Toes free and cleft to base. Hind toe present (*Phegornis* excepted). Tarsus scutellated in front. Plumage rich, often streaked black and yellow. No distinct summer and winter plumage.

### Genus **SCOLOPAX.**

*Scŏlŏpax* = σκολόπαξ, a kind of Snipe mentioned by Aristotle; probably from σκόλοψ = a thing pointed, a stake, and akin to σκάλλω = I stir up, probe, etc.

Tibia plumed to joint. Tail of twelve uniform feathers. Remiges twenty-six. Head and neck transversely marked with black. First quill longest. Two notches in posterior margin of breast-bone. Females as a rule larger than males. Scattered throughout the world.

#### 186. **Scolopax rusticola.** THE WOODCOCK.

*Rustĭcŏla* = a little Heath-Cock in Pliny; *rustĭcŭlus* = a little countryman in Cicero. Diminutive of *rustĭcus* = of or belonging to the country, *rus*.

**Sim-titar**, *India;* **Kumattu, Chinjarol**, *Chamba;* **Kangtruk**, *Manipur;* **Wilate-chaha**, *Chittagong;* **Murgh-i-zerak**, *Persia.*

♂ 13″ to 15″; 9 to 15 oz. ♀ 16″. Legs livid. Bill 3″, flesh-grey. Forehead ash-grey. Chin white. Four cross-bars on head. Plumage variegated brown, yellow, and grey, with rufous bars and black spots. Breast and abdomen buff, barred black. Remiges twenty-six. Nine primaries, blackish, with rufous notches on both webs; in old birds the notches on outer webs of first two primaries disappear; in females first primary is plain. Tail black, tipped grey above and silvery white below. Breeds in N. Europe and Asia, the Azores, Canaries, and Madeira. Also in Himalayas above 10,000 feet, and migrates in winter to the lower valleys, also to S. India and Burma. Rare in Ceylon. Four eggs (1·65 × 1·4), drab, spotted brown. Nestlings are believed to be carried between the thighs of the old bird and held there by the bill of the parent as it flies. Rises with a whirr and flies with bent wings and beak pointed down. Arrives in Darjeeling in October and leaves about the middle of March. Masson says they breed "in the hills close to the snows, for many a time, while out shooting in July and August near the snows at dusk, I have seen Woodcock flying in various directions." (J. 867. B. 1482. H. & M. iii. 309.)

Also *S. saturata*. 10½″. With bill 3¼″. Abdomen white, with dusky bars. Forehead rufous, barred black. Primaries almost uniform black. From Java and N.W. New Guinea.

Also the genus *Neoscolopax*. One species—*N. rochusseni*, 15″, with bill 3⅝″; a mountain Woodcock confined to the Moluccas.

Also the genus *Philohela*. One species—*P. minor*, 9″, with bill 2½″, and three outer primaries attenuated; from N. America.

## Genus **GALLINAGO.**

From *gallīna*=a hen, feminine of an obsolete adjective *gallīnus*, from *gallus*=a cock. The termination is adjectival, as if from *gallinax*, like *virago* from *virax*.

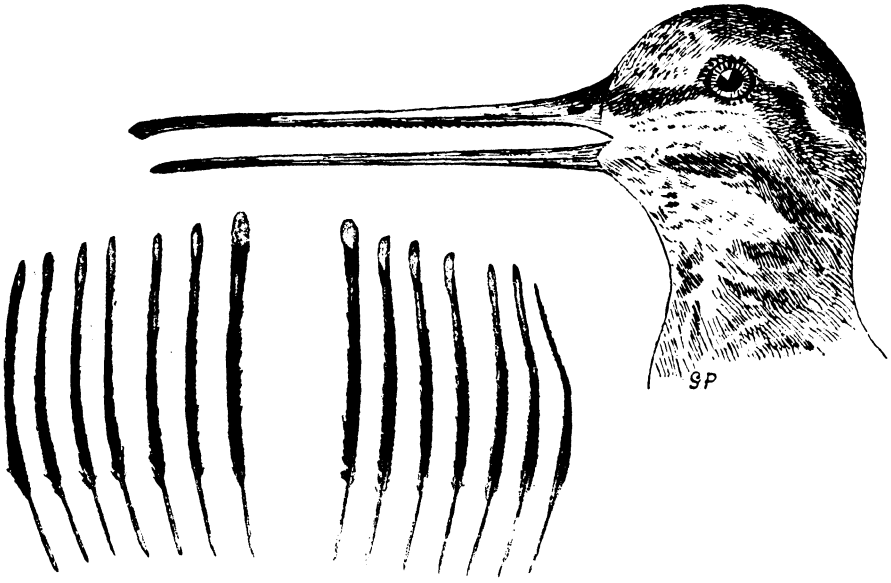
Tibia bare for small space. Tail of twelve to twenty-eight feathers. Pale bands on head and scapular longitudinal. Two notches in posterior margin of breast-bone. Inner secondaries as long as primaries.

Scattered all over the world, and breed in northern parts of Europe and Asia. Females larger than males.

(i.) *With broad red subterminal tail-band. Lower breast and abdomen white and not transversely barred. Pale median band on crown.*

### 187. Gallinago stenura. The Pintail Snipe.

**Chaha**, *N.W.P.*; **Bharka**, *Nepal*; **Chegga**, *Lower Bengal*; **Cherayga**, *Assam*; **Cheklonbi**, *Manipur*; **Tibud**, *Ratnagiri*; **Oolan**, *S. India*; **Birku**, *Malaya*; **Kaswatua**, *Ceylon*.




Maddur, 5.11.80.

♂ 9¾″ to 10″; 4 oz. ♀ 10″ to 11¼″; 4½ oz. Legs grey-green. Bill 2½″, red-brown. Like *G. cœlestis*, in colour, but duller. No transverse marks on outer primaries. Outer web of first primary brown. Outer tail stiffened (see illustration, p. 9). Normally twenty-six tail-feathers (ten soft and broad in centre and eight narrow, stiff ones on each side). The side pin feathers vary from six to nine on each side and are slightly curved, from 1½″ to 1¾″ long, of a dusky colour, with yellow tips, and less than ⅛″ wide (see illustration.) Under wing-coverts and axillaries richly barred dusky and white.

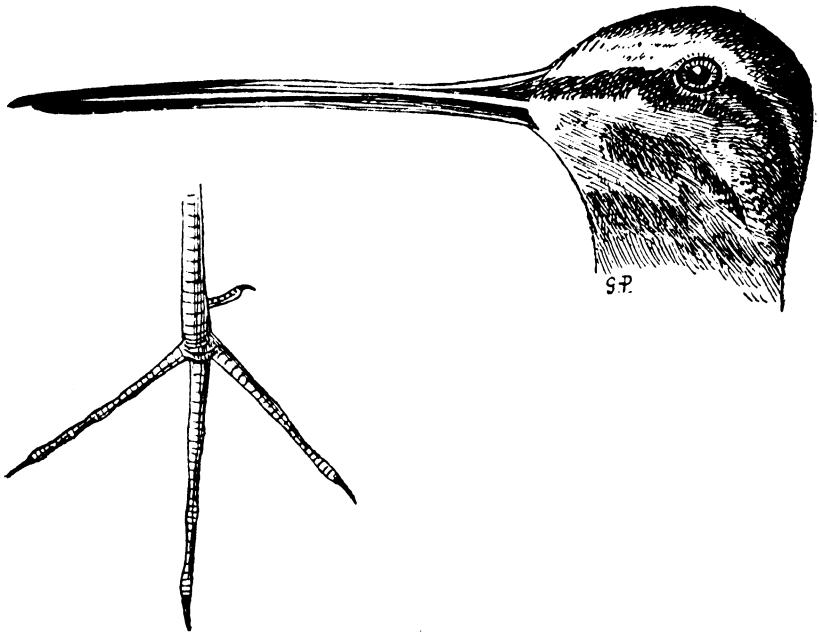
Breeds far north in E. Siberia, and migrates in winter to S.E. Asia and the Malay Archipelago. Arrives in India and leaves later than *G. cœlestis*. In 1889 first bird was reported on 17th August. Common in S. India, Ceylon, and Burma. (J. 870. B. 1485. H. & M. iii. 339.)

Also *G. megala*. ♂ 9½″. ♀ 10½″. With central tail of six feathers and seven outer ones on each side attenuated and less than ½″ in width. From E. Siberia, migrating south by Japan and China to the Philippines and the Moluccas.

### 188. Gallinago cælestis. The Fantail or Common Snipe.

*Cœlestis* = pertaining to or coming from heaven, *cœlum*. The Snipe was called by the older authors *Capella cœlestis*, from its imitating the voice of a goat (*capella*) in its curious "drumming" sound during the breeding season, as he swoops down with tail outspread.

**Chaha**, *N. W.P.*; **Bharka**, *Nepal*; **Chegga**, *Lower Bengal*; **Cheryga**, *Assam*; **Chek lonbli**, *Manipur*; **Tibud**, *Ratnagiri*; **Oolan**, *S. India*; **Kadakecho**, *Orissa*; **Ketbatta**, *Ceylon*; **Pashalek**, *Afghanistan*; **Mahalamche**, *Yarkand*.



188. *Gallinago cælestis*.

♂ 9″ to 11⅓″; 3¾ to 5 oz. ♀ 9″ to 12½″; 3 to 5½ oz. Legs green-drab. Bill 2¾″, red-brown. Back velvet-black, crossed chestnut with streaks of yellow. Lower wing-coverts faintly barred. Tail of fourteen feathers of same width. Three outer tail-feathers white, tinged rufous, with dusky spots and bars. Outer web of first primary white. Axillaries often pure white. Eminently gregarious. Calls "chiswick" on rising as he zigzags up, preparatory to getting straight away. Known formerly as the "Jill" Snipe. Breeds in Europe, C. and N. Asia, and winters in S. Europe, N. Africa, and S. Asia. Found in Calcutta markets in August. Four eggs (1·6 × 1·1), greenish, double-spotted red-brown. (J. 871. B. 1484. H. & M. iii. 359.)

Also with tail of sixteen feathers:—

*G. major*. 11½″. With three outer tail-feathers white, without spots or bars. Wing-coverts with white tips. Remiges twenty-five. The Great Snipe. From Europe and N. Asia, wintering in Mediterranean countries and Africa.

*G. nigripennis*. 11″. Similar to *G. major*, but three outer tail-feathers have obsolete spots. Confined to Africa.

Also with tail of sixteen feathers and axillaries regularly barred:—

*G. delicata*. 10¾″. Wilson's Snipe. Similar to *G. cælestis*, but with outer tail-feather less than ⅛″ in breadth and outer secondaries slightly extended beyond primaries. From N. America, and wintering in Bermudas, W. Indies, and S. America.

*G. frenata*. 10″. Resembling *G. delicata*, but outer tail-feather is less than ⅛″ in breadth, and the outer secondaries are strongly extended beyond primaries. Confined to S. America.

*G. andina.* 7½″ to 8½″. Similar to *G. frenata.* From Peru.

*G. nobilis.* 11½″. Of same group as *G. delicata,* but with larger feet and toes and a bill 3¾″ long. From N. of S. America.

*G. macrodactyla.* 13″. Of same group as *G. cœlestis* and *G. delicata.* Bill 3$\frac{7}{16}$″. From Madagascar and Mauritius.

*G. paraguayæ.* 10½″. Similar to *G. delicata,* but with outer tail-feathers narrower and having five distinct bars. Outer secondaries not exceeding the longest primary coverts in length. From S. America.

*G. australis.* 11½″. Similar to *G. cœlestis,* but with tail of eighteen feathers, the two outer ones attenuated. Breeding in Japan, and wintering in Australia and Tasmania.

### 189. Gallinago solitaria. The Himalayan Solitary Snipe.

**Bharka,** *Nepal.*

♂ 12″ to 13″; 5 to 8 oz. ♀ 13″; 9 oz. Legs green. Bill 2¾″, red-brown. Pale buff stripe along scapular and inner edge of wing. Chin and throat white. Breast olive, dashed white. Outer primary mottled. Outer margins of first three primaries white. Abdomen, vent, and lower tail-coverts unbarred. Margins of scapulars white. Tail of from sixteen to twenty-four feathers (eight central and from four to eight laterals on each side). Median tail black, with rufous subterminal band, then a black bar and whitish at the tip. Outer tail-feathers irregularly cross-barred, with black at base and white towards tip. Calls as it rises, a harsh imitation of the note of the common Snipe. From 9,000 to 15,000 feet throughout the Himalayas, from Afghanistan to Assam, Japan and N.E. Siberia, wintering in the lower valleys and China. (J. 869. B. 1486. H. & M. iii. 333.)

### 190. Gallinago nemoricola. The Wood-Snipe.

**Ban-chaha,** *Nepal.*

♂ 11½″ to 12½″; 5 to 6 oz. ♀ 13″; 7 oz. Legs green. Bill 2⅔″, red-brown. Top of head and back black, marked rufous-grey. Breast ashy. Margins of scapulars rufous. Outer margin of first three primaries nearly uniform with rest of feathers. Abdomen, vent, and lower tail-coverts closely barred. Tail of eighteen feathers (six central broad, the next two on each side intermediate, and the outer four on each side very narrow). Silent as it rises. Home in the Himalayas from Dalhousie to Sikkim, also Assam and Burma hills. A winter visitor to hills of S. India. Four eggs (1·7 × 1·25), green, spotted red. (J. 868. B. 1483. H. & M. iii. 325.)

Also *with no rufous terminal tail-band. Abdomen and breast distinctly barred all over. Pale median crown-band:—*

*G. gigantea.* 19″. The largest of the Snipes. Bill 4½″ to 5½″. Primaries and secondaries barred on both webs. Back with pale margins to scapulars and secondaries, imparting broadly streaked appearance above. From Brazil and Paraguay.

*G. undulata.* 14″. Of the same group as *G. gigantea.* Bill 3⅔″ to 4⅓″. Apparently confined to Guiana.

Also *with primaries of uniform colour:—*

*G. stricklandi.* 13½″. Bill 3⅓″. Black markings on upper surface in bars. Wing-coverts thickly barred. Centre of breast and abdomen sandy, without bars. Axillaries sandy. From S. of S. America.

*G. jamesoni.* 12″. Bill 3⅓″. Centre of breast barred. Below and axillaries dull white. From N.W. of S. America.

*G. aucklandica,* 8½″, bill 2¼″, black markings above as subterminal spots, from Auckland Islands; and the two subspecies—*G. huegeli,* 9″, from Snares Island; and *G. pusilla,* 7½″, from Chatham Islands.

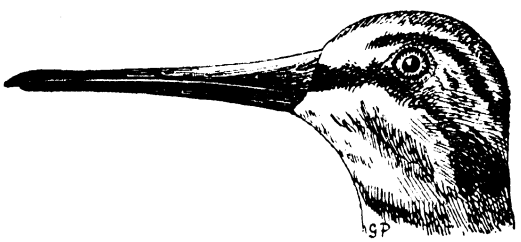
*G. imperialis.* 11″. Bill 3½″. With entire upper surface barred rufous and black. Breast and abdomen white, barred black. From Colombia. (B.M. Cat., xxiv. 658–665.)

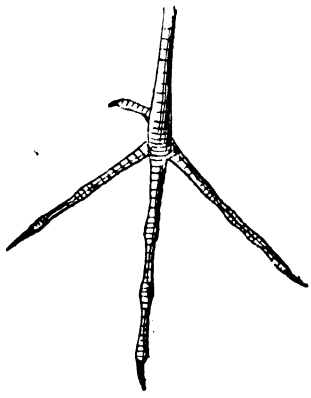
*No median pale band on the crown.*

**191. Gallinago gallinula.** THE JACK SNIPE.

*Gallĭnŭla*=a chicken; diminutive of *gallīna*=a hen.

**Chota bharka,** *Nepal;* **Oolan,** *Madras;* **Tibud,** *Ratnagiri.*





♂ 7¾″ to 9″; 1½ to 2½ oz. ♀ 8½″. Legs green-grey. Bill 1½″ to 1¾″, blackish. Back black, glossed green. Two yellow bands from shoulder to tail. Four notches on posterior margin of breast-bone. Tail of twelve feathers of uniform width, dark brown, bordered buff. Remiges twenty-four. Axillaries white. Flight straight and rapid, beginning in silence, with a few zigzags. Formerly considered as the male of *G. cœlestis.* Occur in Asia Minor, Palestine, N. Africa, Mediterranean, and Europe, excluding Atlantic isles, Faroes, and Iceland. A winter visitant to India, summering and breeding north of 60° N. lat. to far within Arctic circle. Four eggs (1·5 × 1·1), olive, spotted red-brown, remarkable for their large size, each weighing more than 1½ oz., while the bird itself weighs but 2½ oz. (J. 872. B. 1487. H. & M. iii. 373.)

## Genus **ROSTRATULA.**

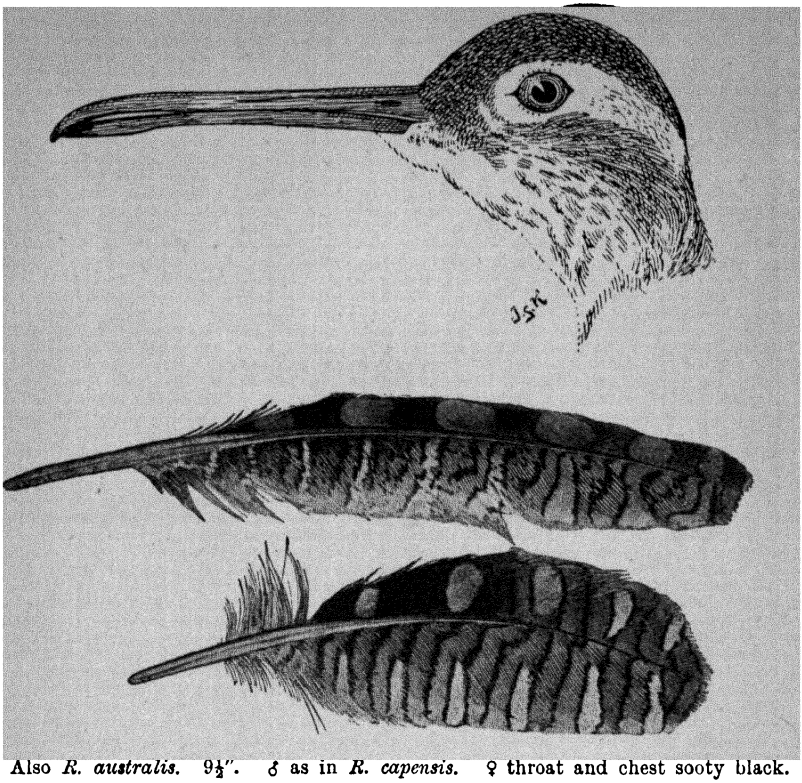
An aberrant form of *Scolopacinæ.* Tibia much denuded. Bill curved slightly down at tip, and not pitted. Tail of fourteen to sixteen feathers. First and second quills subequal and longest. Sexes differ. Non-migratory. Ethiopian, Indian, Australian, and S. Neotropical regions.

**192. Rostratula capensis.** THE PAINTED SNIPE.

**Ohari,** *Nepal;* **Kone,** *Singbhoom;* **Tibud,** *Ratnagiri;* **Mail-ulan,** *Madras;* **Baggerjee,** *Lower Bengal.*

♂ 9¼″ to 10″; 3½ to 5 oz. ♀ 9¾″ to 11″; 4½ to 6½ oz. Legs green. Bill 1⅞″, red-brown. Throat white. Above olive-brown, with narrow white bars broadly fringed dark green. Line on head and one from eye to nape buff. Quills blue-grey, with fine wavy black lines, and with oval buff spots on outer webs. Tail of fourteen feathers blue-grey, with black bars.—*Female:* Darker face. Neck chestnut. A tuft of white lanceolate feathers beneath the scapulars. E. and C. Africa, Egypt, India, Ceylon, China, and Japan, extending to Sumatra, Java, Borneo, and Philippines. Swims well. Four eggs (1·39 × 1·0), drab, irregularly blotched brown. Nest found in Calcutta on 7.8.88. Three young just hatched.

Eggs obtained at Tongloo in September. Breeds two or three times a year. (J. 873. B. 1488. H. & M. iii. 381.)



Also *R. australis*. 9½". ♂ as in *R. capensis*. ♀ throat and chest sooty black. From Australia.

*R. semicollaris*. 7½". Wing-coverts uniform blackish, with white spots. Throat sooty black. From S. America.

Also the genus *Phegornis*. 6½". With no hind toe. One species—*P. mitchelli*, from W.S. America.

Also the family CHIONIDIDÆ. SHEATHBILLS.*

Apparently connect the Jaçanás, Snipes, Turnstones, etc., with the Gulls.

The size of a Pigeon, with rather the appearance of a Fowl. White plumage, light pink legs, small spurs on inner side of wings, and a black bill. Bill complex. Hind toe present. Feet not webbed, only a membrane between third and fourth toes at base. Tarsus reticulated in front and behind. Nest in holes or behind rocks. One to three eggs, similar to those of the Oyster-Catcher, but blotched purple. Nestling covered with grey down. Two genera, viz.—

*Chionis*, with face bare and caruncles near base of bill; bare space below eye. One species—*C. alba*, 15", the Kelp Pigeon, confined to S. of S. America and adjacent islands.

*Chionarchus*, with face bare in front of the eye; no caruncles at base of the bill. Two species—*C. minor*, ♂ 16", ♀ 15½", feet yellow, and sheath with rounded Petrel-like opening above the nostrils, from islands of S. Atlantic; and *C. crozettensis*, 14", feet dark red, and sheath with no perceptible rounded opening in front, from Crozette Islands.

Also the family THINOCORYTHIDÆ. SEED-SNIPES* (Latreille's).

Seed-Snipes or Quail Snipes are small, short-billed birds, with general habits and appear-
of the Quails. According to Darwin, these birds partake both of the character of Snipe
·ail. Their character and mode of flight show them to be modified *Grallæ*. Blyth
ey approach *Pteroclidæ* in appearance and habit. Called "Shore Larks" by some
· the term is here omitted to save confusion with *Otocorys alpestris*, which belongs

* Not represented in India.

to *Alaudinæ*, one of the subfamilies of *Passeridæ*. Vomer broad and rounded in front similar to that of *Ægithognathæ*. Bill like that of game birds, without any sheath. Feet not webbed, with scarcely perceptible membrane between fourth and third toes. Hind toe present. Tarsus reticulated in front and behind. Plumage like the game birds, in flight like the Plovers. Eggs drab, thickly speckled chocolate. Nestling covered with light and dark down.

Not represented in India. Two genera—one, *Attagis*, in Falkland Isles and on lofty mountains of southern portion of S. America, within the boundary of Alpine plants, or even in places entirely destitute of vegetation; the second, *Thinocorus*, inhabiting the desolate valleys of southern parts of S. America.

The genus *Attagis*, with tail rounded. Three species, viz.—*A. grayi*, 11½", with breast and abdomen cinnamon, from Chili and Peru; *A. chimborazensis*, 11", from Ecuador, and *A. maloninus*, 11", with breast and abdomen white, from the Falkland Islands.

The genus *Thinocorus*, with tail more wedge-shaped. Two species—*T. orbignianus*, 9", throat white, with black border, from Chili and Peru; *T. rumicivorus*, 6½", foreneck with black mesial line, from S. America.

## Order **HERODIONES.**

Toes long. Hind toe free, well developed, and on same plane as others (except in Storks). Tibia partially bare (except in a few Herons). Desmognathous. Oil-gland tufted. Fifth secondary wanting. After-shaft generally present (wanting in some Storks). Eggs greenish white. Young remain in nest for a time.

| | | |
|---|---|---|
| Two notches on each side of posterior margin of breast-bone. Hind toe on same plane as others | Ibis | Ibises. |
| | Inocotis | |
| | Plegadis | |
| | Platalea | Spoonbills. |
| One notch on each side of posterior margin of breast-bone. Hind toe raised, position variable | Ciconia | |
| | Anastomus | Storks. |
| | Xenorhynchus | Open Bills. |
| | Dissura | Adjutants. |
| | Leptoptilus | Painted Storks. |
| | Pseudotantalus | |
| One notch on each side of posterior margin of breast-bone. Hind toe on same plane as others | Ardea | |
| | Mesophoyx | Herons. |
| | Herodias | Egrets. |
| | Lepterodius | Reef-Herons. |
| | Demiegretta | |
| | Nycticorax | Night Herons. |
| | Cancroma* | Boatbills. |
| | Gorsachius | Malay Bitterns. |
| | Butorides | Green Herons. |
| | Ardeola | Pond-Herons. |
| | Bubulcus | Cattle Egrets. |
| | Ardetta | |
| | Dupetor | Bitterns. |
| | Botaurus | |
| Hind toe on same plane as others | Balænicipittidæ* | Shoebills. |
| | Scopidæ* | Hammerheads. |

* Not represented in India.

## Order **HERODIONES.** Ibises, Spoonbills, Storks, and Herons.

Marsh birds, resembling Rails, Cranes, and Plovers in their long bills, necks, and legs, but differing from them in anatomy and their young being helpless when hatched. They are more nearly allied to the Steganopodes (Cormorants, Gannets, Frigate-Birds, Pelicans, etc.) and the Acciptrine birds. Desmognathous, or birds with vomer abortive or small, when existent always slender, narrow behind and tapers in front. Maxillo-palatines united. Oil-gland tufted. Sternum has two notches or one notch on each side of posterior margin. Fifth secondary wanting. After-shaft generally present (wanting in some Storks). Tibia (except in a few Herons) partially bare. Toes long, hind toe free, well developed, and on same plane as the other toes (except in Storks). Nest generally in trees, and young are fed in the nest for a time by the parents. Eggs greenish white, with or without spots.

### Suborder PLATALEÆ.

Vomer pointed in front. Two notches on each side of the posterior margin of breast-bone. Comprising the Ibises and Spoonbills.

### Family IBIDIDÆ.

Bill long, slender, and decurved. Nostril pierced in base of nasal groove which extends nearly to tip of bill. Twenty-seven remiges.

#### Genus **IBIS.**

Ἶβις = the Ibis, an Egyptian bird to which divine honours were paid.

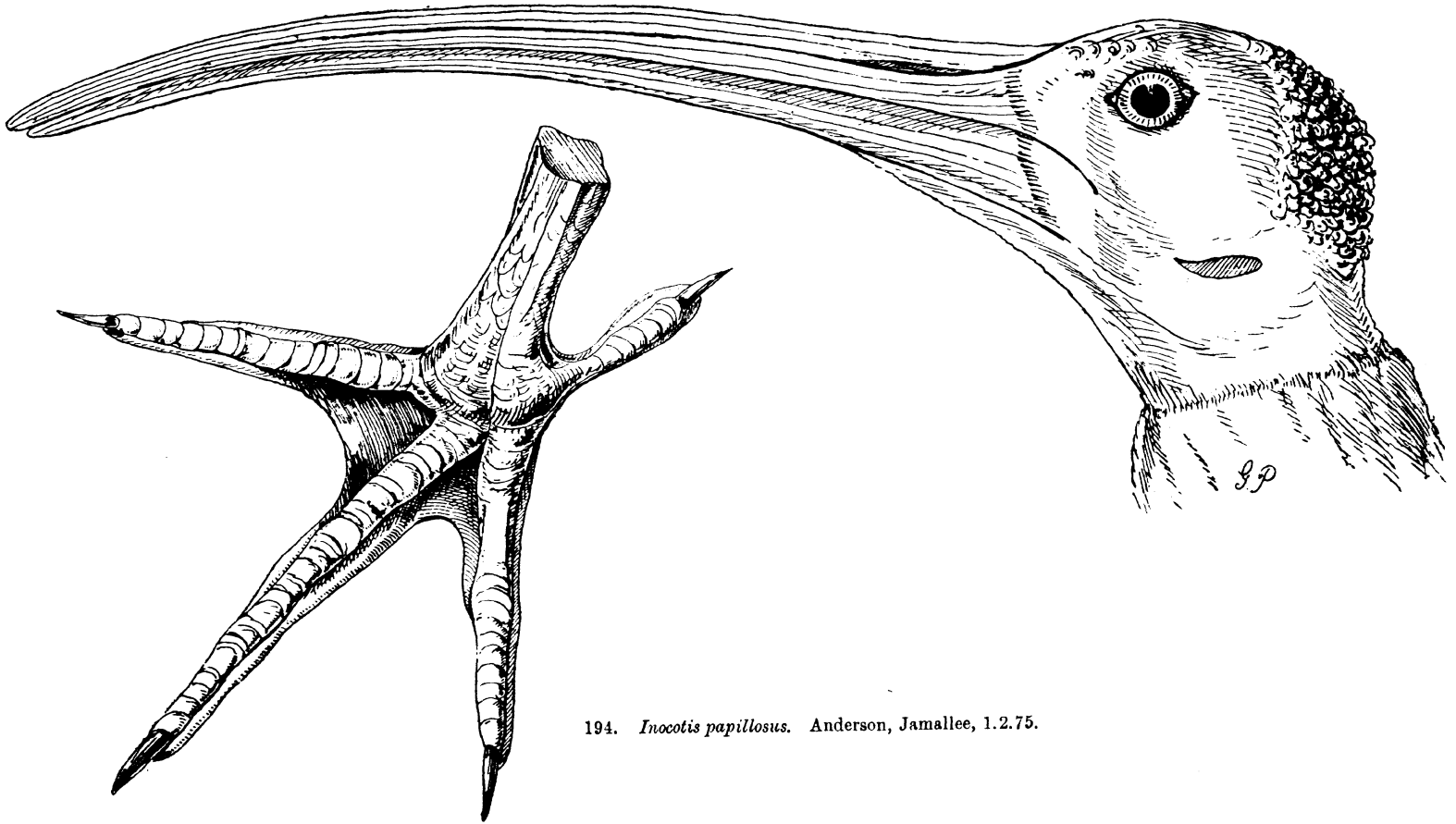
Head and neck nude and black. Plumage white. Tarsus reticulated with hexagonal scales. Second, third, and fourth toes joined by a web at base. Tail of twelve feathers. Tertiaries in breeding season with elongate plumules forming ornamental plumes. Young have head and neck feathered and streaked black and white. Ranges from Africa through India to Australia.

(i.) *Tarsus reticulated with hexagonal scales.*

**193. Ibis melanocephala.** The White Ibis.

**Munda,** *India;* **Kacha-tor,** *Purneah;* **Sabut-buza,** *Bengal;* **Tatu-Kota,** *Ceylon;* **Kayusoti,** *Burma.*

♂ 29″. Legs black. Bill 6½″, black.—*In summer:* Plumage white, similar to *I. æthiopica*, but quills are white with no black tips, the ends of tertiaries are grey with open barbs, and with a neck ruff with long plumes on foreneck.—*In winter:* No plumes on foreneck. Quills grey, with ordinary barbs. India, Ceylon, Burma, and S. Japan. Resident in India, replacing the Sacred Ibis (*I. æthiopica*) of Egypt. Two to four eggs (2·54 × 1·7), greenish white, occasionally spotted light brown. (J. 941. B. 1541.)



194. *Inocotis papillosus.* Anderson, Jamallee, 1.2.75.

Also *I. æthiopica*. 25″. The Sacred Ibis. With no plumes on foreneck. All quills tipped greenish black. Ornamental plumes with purple gloss. Iris brown. From Africa to Persian Gulf.

*I. bernieri*. 21″. With no plumes on foreneck. Quills white. Iris white. From Madagascar.

*I. abboti*. Similar to *I. bernieri*, but lower neck naked and minutely papillose. Iris light blue.

*I. molucca*. 30″. With plumes on foreneck. Primaries broadly tipped blue-black. Ornamental plumes black. From Australia and New Guinea.

Also the genus *Carphibis*. One species—*C. spinicollis*, 29″, with long yellow shafts on foreneck, no papillæ on crown, from Australia.

## Genus **INOCOTIS**.

Head and throat bare. Hind neck feathered. No nuchal crest or ruff. Crown covered more or less with papillæ or coral-like granulations.

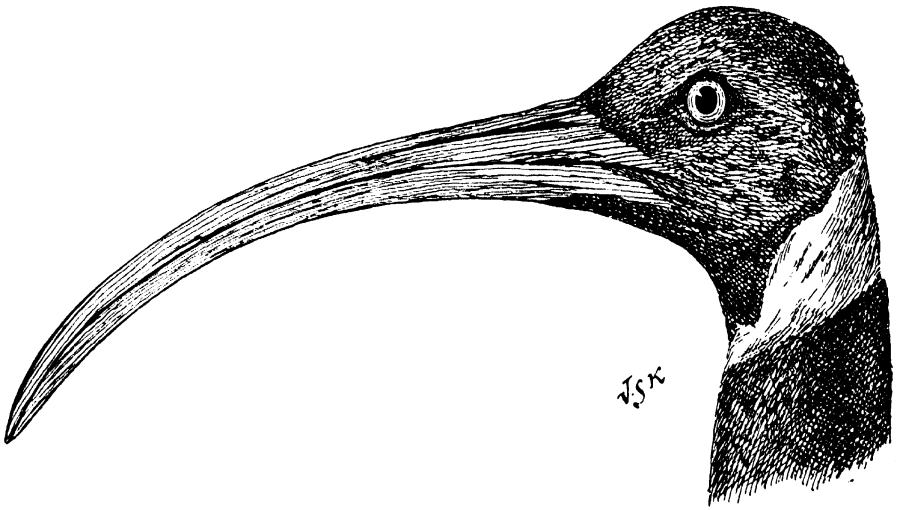
### 194. Inocotis papillosus. The King Curlew or Black Ibis.

**Buza**, *India;* **Nella kankanum** (Telugu).

♂ 25″ to 30″; 3¼ lbs. Legs brick-red. Bill 6$\frac{1}{10}$″, leaden. Plumage dark olive-brown. Red warts on back of black head. Wings and tail black, glossed purple and green. Large white patch on wing-coverts. Sexes alike. India, Assam, Aracan, and Borneo. Three or four eggs (2·43 × 1·7), sea-green, generally unspotted. (J. 942. B. 1542.) See illustration, p. 187.

### 195. Inocotis davisoni. Davison's Black Ibis.

♂ 32″ to 32½″; 3½ to 4 lbs. Legs coral-red. Bill 7″, plumbeous. Head black, with but few papillæ behind. Broad white necklet, tinged blue at the



"Drawn from memory. Killed at Shnaygheen in 1866. In all respects like the King Curlew, except the head. I saw one pair only; both had the white band."
H. Elton, Mandalay, 23.2.89.

nape. Burma, Pegu, Tenasserim, Cochin China, and Siam. Two eggs (2·55 × 1·8), pale blue. (B. 1543. S.F. iii. 300.)

Also the genus *Thaumatibis*. One species—*T. gigantea*, from Cochin China.

Also *with crest or ruff of elongated feathers on the nape*:—

The genus *Nipponia*. One species—*N. nippon*, 29″, with long crest and throat feathered to chin, general colour white, from E. Siberia, Japan, and China.

Also *with entire throat bare*:—

The genus *Comatibis*. One species—*C. comata*, 30″, with long and narrow nuchal crest, head bare, general colour above black, from Asia Minor, Red Sea, Abyssinia, and N.E. Africa.

The genus *Geronticus*. One species—*G. calvus*, 26″, general colour dark metallic green, with nuchal crest of soft plumes, confined to S. Africa.

Also *with head feathered*:—

The genus *Bostrychia*. One species—*B. carunculata*, 28″, general colour blackish, with nape strongly crested, and a fleshy wattle in centre of throat, from N.E. Africa.

The genus *Hagedashia*. One species—*H. hagedash*, 23″, general colour above dark olive-green, chin feathered like the throat, and some warty papillæ on lores, confined to Africa.

Also *with chin bare and forehead feathered*:—

The genus *Theristicus*. Two species—*T. melanopis*, 26″, general colour silver-grey, lores with warts, region of eye bare, no crest on nape, from S. America; and *T. caudatus*, 26″, from British Guiana.

The genus *Molybdophanes*. One species—*M. cærulescens*, 30″, general colour grey, mottled brown, large nuchal lanceolate crest, region of eye feathered, from S. America.

The genus *Harpiprion*. One species—*H. cayennensis*, 22″, general colour dark grass-green, lores bare, with no papillæ, small nuchal, metallic crest, from C. and S. America.

The genus *Phimosus*. One species—*P. infuscatus*, 20½″, general colour black, glossed green, forehead and lores bare, with warty papillæ, no nuchal crest, from S. America. (B.M. Cat., xxvi. 11–26.)

(ii.) *Tarsus plated with transverse scales.*

## Genus **PLEGADIS.**

Head feathered. Chin, lores, and area in front of eye bare. Tail short. Toes strong, claws sharp and pointed, that of mid toe nearly straight.

### 196. Plegadis igneus. The Glossy Ibis.

**Kowari**, *India*; **Kala Kachiatora**, *Bengal*; **Kankaram** (Telugu); **Kotan**, *Ceylon*.

♂ 22″ to 25″. Legs with blue garter. Bill 5¼″, blackish.—*In summer*: Head, breast, and below chestnut; rest dark green, glossed purple.—*In winter*: Head and neck brown, streaked with white.—*Young*: Ash-brown, with white markings. Widely spread throughout the warmer parts of the world. Seems to be the Black Curlew of East Anglia. Found in India, Ceylon, and Burma. Breeds in Sind on E. Nára, also in Ceylon. Generally three eggs (2·01 × 1·40), blue. (J. 943. B. 1544.)

Also *P. guarauna*. 21″. With white band across forehead. From United States, America, C. and S. America, St. Domingo, and Sandwich Isles.

*P. ridgwayi*. 22″. With under surface purplish black. From Peru and Bolivia.

Also *with short tail*:—

The genus *Lampribis*. One species—*L. olivacea*, 19″, general colour above dark grass-green, toes weak, claws small and curved, from W. Africa.

The genus *Eudocimus*. Two species—*E. albus*, 25″, pure white, from S. United States, America; and *E. ruber*, 19″, general colour brilliant scarlet, from S. United States, America, and British Guiana.

Also *with tail very long*:—

The genus *Cercibis*. One species—*C. oxycerca*, 34″, general colour black, and moderate crest, from N. of S. America.

Also the genus *Lophotibis*. One species—*L. cristata*, 28″, general colour chestnut, head fully crested, chin feathered, from Madagascar.

## Family PLATALEIDÆ.

Bill straight, broad, flat, and dilated at end. Head partially or entirely bare. Nostrils in a groove extending to the front of the bill. Remiges thirty. Plumage white.

### Genus **PLATALEA.**

*Plătălĕa* = the Spoonbill, in Cicero, N.D., ii. 49, 124. *Plătĕa*, in Pliny, H.N., x. 40, 56, probably from πλατύς = broad.

Bill like a spatula. Second quill longest. Region in front of eye naked. Legs long. Tibia half naked. Tarsus reticulated throughout. Four toes, three united to the second joint. Cosmopolitan.

#### 197. Platalea leucorodia. The Spoonbill.

*Leucŏrōdia* = the late Latin form of λευκερωδιός; from λευκός = white, ἐρωδιός = a Heron.

**Chamach buza,** *India;* **Chinta,** *Bengal;* **Gentu muku konga** (Telugu); **Chapy Chundun,** *Ceylon.*

♂ 31″ to 38″. Legs black. Bill 8″, black, tip yellow.—*In summer:* Rose-white. Long nuchal crest of pointed and drooping plumes. Breast-patch buff-yellow, extending towards back.—*In winter:* Crest-plumes wanting.—*Female* smaller. C. and S. Europe, E. Africa, S.W. Asia, Afghanistan, Baluchistan, and C. Asia, to China and India. Resident in India. Breeds in the Deccan, Sind, N.W.P., and Ceylon. Four eggs (2·7 × 1·81), chalky, spotted brown. (J. 939. B. 1545.)

Also *P. regia.* 34″. With orange mark over each eye. From Australia.

*P. alba.* 28″. With forehead and chin yellow. From Africa and Madagascar.

*P. minor.* 27″. With forehead black, and yellow spot in front of eye. From Japan and China.

Also the genus *Platibis.* With no crest. With ornamental plumes on neck, and tertiaries decomposed as in an Ibis. One species—*P. flavipes*, 38″, with dense tuft of long yellow feathers on foreneck, confined to Australia.

Also the genus *Ajaja.* With head entirely bare, and earholes exposed. No ornamental plumes on neck. One species—*A. ajaja*, 25″, tinged rosy, confined to America.

## Suborder CICONIÆ.

One notch on each side of posterior margin of breast-bone. Hind toe elevated, though to a very variable extent; in some it is scarcely raised at all, while in the White Stork, and especially in the Black Stork, the elevation is considerable. Toes webbed at base, third and fourth especially. No pectination on mid claw. No powder-down patches. No voice, but make sounds by snapping their bills.

### Family CICONIIDÆ. Storks.

Bill large, long, straight, and without any grooves. All anterior toes joined at base. Of large size. Legs long. Tibia half naked. Tarsus reticulated with hexagonal scales. Over thirty remiges. Genys recurved, except in *Tantalidæ.* Inhabit India and its Archipelago, Africa, and America. Flight powerful. A few migratory and gregarious. Breed in lofty trees or on high buildings. Giants of the Bird Kingdom.

(i.) *Under tail-coverts ordinary, not stiffened and not longer than tail.*

### Genus **CICONIA.**

*Cĭcōnĭa* = a Stork, in classical Latin. Cognate with *căno* = I sing, κύκνος = a Swan, καναχή = a sharp sound, κόναβος = a din.

Bill convex above; genys inclining upwards. Crown and cheeks feathered. Orbits naked. Toes strongly webbed. Claws short, broad, and depressed. Third and fourth quills longest. Partially aquatic. Palæarctic, Ethiopian, and Indian regions, but not reaching Australian region.

### 198. Ciconia alba. The White Stork.

**Haji-Laglag,** *India;* **Dhak,** *N.W.P.;* **Wadume konga** (Telugu).

♂ 42″. Legs red. Bill 8½″, blood-red. Greater coverts and quills black, rest white. Orbital skin black. Europe and C. Asia, wintering in Africa and N. India. Three to five eggs (3·2 × 1·5), white. (J. 919. B. 1546.)

Also *C. boyciana.* 56″. Bill 9½″, black. Resembles *C. alba.* From E. Siberia, Corea, and Japan.

### 199. Ciconia nigra. The Black Stork.

**Surmai,** *India.*

♂ 40″ to 44″; 9 lbs. ♀ 39½″; 7½ lbs. Legs dark red. Bill 8″, blood-red. Orbital skin red. Breast and abdomen white; rest blackish, with purple reflections. Europe and Asia, winters in Africa and India. Not observed in S. India, Ceylon, or Burma. (J. 918. B. 1547.)

## Genus **ANASTOMUS.**

Ανα = up and down; στόμα = a mouth.

Second and third quills unequal. Bill thick, coarse, and gaping in the middle. Upper mandible edged with lamellæ. Genys strongly curved upwards.

### 200. Anastomus oscitans. The Open-bill Stork.

♂ 29″ to 32″. Legs fleshy. Bill 6″, green. Plumage ash-grey. Wing and tail black. Some nearly white, supposed to be adults. India, Ceylon, and east to Cochin China. Two to five eggs (2·24 × 1·6), white. (J. 940. B. 1553.)

Also *A. lamelligerus.* 28″. General plumage black, with horny elongations to shafts of breast-feathers. From Africa and Madagascar.

## Genus **XENORHYNCHUS.**

Bill large, solid, with no "saddle." Tip ascending. Head and neck completely feathered.

### 201. Xenorhynchus asiaticus. The Black-necked Stork.

♂ 52″ to 56″. Legs red. Bill 12″, black. Under plumage white, rest glossy green. Iris in male dark brown; in female yellow. India, Ceylon, Burma, and through Malaya to Australia. Four eggs (2·91 × 2·12), white. (J. 917. B. 1549.)

Also the genus *Ephippiorhynchus.* With "saddle" across bill. Lores and eye region bare. One species—*E. senegalensis,* 65″, confined to Africa.

Also the genus *Mycteria.* Head and neck bare, with few downy feathers on occiput. One species—*M. americana,* 50″, from C. and S. America.

(ii.) *Under tail-coverts lengthened and stiffened, equal to or longer than tail.*

## Genus **DISSURA.**

Crown feathered, forehead and cheeks naked. Tail deeply forked. Under tail-coverts longer than tail. Legs very short.

### 202. Dissura episcopus. The White-necked Stork.

**Manikjor, Kali, Laglag,** *India;* **Kandesur** (Mahratta); **Sanku-budi-konga** (Telugu); **Padre koku,** *Ceylon;* **Chi-gyin-sut,** *Burma.*

♂ 36″ to 37″. Legs dull red. Bill 6½″, dusky. Neck, abdomen, under tail-coverts, and tail white; rest black-glossed. Forehead and eye-patch nude. The

Beefsteak Bird. Ethiopian region, India, Ceylon, Burma, Cochin China, Indo-Malayan Islands, and Celebes. Four eggs (2·5 × 1·83), bluish white. (J. 920. B. 1548.)

Also the genus *Euxenura*. With tail deeply forked, sides of face and centre of throat feathered. One species—*E. maguari*, 45″, general colour white, confined to S. America.

Also the genus *Abdimia*. With tail slightly forked, and under tail-coverts as long as the tail, sides of face and centre of throat feathered. One species—*A. abdimii*, 30″, general colour black, glossed green, from tropical Africa and S. Arabia.

(iii.) *With under tail-coverts of soft downy plumes.*

## Genus **LEPTOPTILUS.**

λεπτός = thin; πτίλον = a wing.

Bill enormous. Head and neck more or less nude, with fluffy down or a few hair-like feathers. Pendent neck-pouch. Under-tail somewhat decomposed, and called Marabou feathers. Adjutants as scavengers are in many places protected by law. Africa and India, extending to the Indo-Malayan subregion.

### 203. **Leptoptilus dubius.** The Gigantic or Adjutant Stork.

**Hargila, Dusta,** *India;* **Chaniari-dauk,** *Bengal;* **Garur,** *N.W.P.;* **Pini-gala-konga** (Telugu); **Don-zat,** *Burma.*

♂ 60″. ♀ 55″. Legs grey-white. Bill 12″ to 13″, greenish. Head bare, with long neck-pouch. White neck ruff. Above, wings and tail dark slaty, glossed green. Wing-band silver-grey, very conspicuous. Under-tail white, with grey-black streaks near tips.—*In winter:* No wing-band, and pouch yellowish. C. and N. India, Burma, Malay Peninsula, Siam, Cochin China, Sumatra, Java, and Borneo. Three eggs (3 × 2·28), white. (J. 915. B. 1550.)

The bones of the forelimb or wing of the Adjutant are thin-walled and hollow, the interior being filled, not with marrow as in Mammals, but with air, which gains access by apertures connected with the general system of air cavities extending through the body, which apertures occur at the ends of the humerus, radius, and ulna. This hollow or "pneumatic" condition of the bones, which diminishes the specific gravity of the body, and must therefore be advantageous to the bird when on the wing, though very general, is not found in all birds, or in any birds when very young, the interior of the bones being then filled with marrow. It must also be noticed that the amount of pneumaticity of the bones by no means follows the development of the power of flight. In the Ostrich, for example, the bones are far more extensively pneumatic than in the Gull.

On 21.12.72 Dillon, of the 66th Regiment, sent me a young bird shot near Ghizree. Top of the head bald; no hair-like feathers on occiput or face; and no distinctive mane or tuft. Ruff moderate. Upper plumage white, tinged rosy; sides greenish black, edged white. Rest as described in Jerdon. Bill dirty yellow. Bare head yellowish red. Face nude. Hair-like feathers on neck tinged red. Legs dusky black, with hexagonal scales. Bar on wing similar to that of the Gigantic Stork, but not quite complete, and tinged rosy. A few of the upper coverts tinged crimson. Length 48″. Wing 19″. Tail 7½″. Tarsus 8½″. Mid toe 4⅛″. Bill 8¾″, curved towards tip.—A. Le M.

**204. Leptoptilus javanicus.** THE HAIR-CRESTED OR SMALL ADJUTANT STORK.

**Madan-chur,** *Bengal;* **Chinjura,** *India;* **Bang-gor,** *Purneah;* **Dodal-konga** (Telugu); **Mána,** *Ceylon;* **Don-mi-gwet,** *Burma.*

♂ 54″. Legs dirty black. Bill 10″ to 12″, dirty. Bald, bare neck. No gular pouch. Thin mane. White neck-ruff. Above gloss-green, faintly barred. Under-tail pure white. C. and S. India, Ceylon, and eastward through Burma to China, and southward to Malacca, Java, Sumatra, and Borneo. Eggs 2·84 × 2·09. (J. 916. B. 1551.)

Also *L. crumeniferus.* 40″. Similar to *L. javanicus,* but with white edges to all the greater coverts and secondaries. From Africa.

## Genus **PSEUDO TANTALUS.**

*Tantălus,* King of Phrygia, ancestor of the Pelopidæ (akin to τάλαντον, ταλάνταω, ταντάλοω), probably in relation to the mythological story of his *hanging balanced* over water.

Bill very large, thick, rounded, and smooth. Tip of bill bent down, emarginated. Crown, throat, and face bare, but not the neck. Under tail-coverts extend beyond tail.

**205. Pseudotantalus leucocephalus.** THE PAINTED STORK.

♂ 40″ to 42″. Legs fleshy. Bill 10″, deep yellow. Plumage white. Primaries, secondaries, and tail black, glossed green. Tertiaries rosy, with dark band and tipped white. Broad breast-band black. India, extending to Burma and China. Four eggs (2·77 × 1·88), white. (J. 938. B. 1552.)

Also *P. cinereus.* 38″. Pure white. Bastard wing, primary coverts, quills and tail black. From Malay Peninsula to Java and Sumatra.

*P. ibis.* 40″. White, tinged rosy. Wing-coverts with crimson bar. From Africa and Madagascar.

Also the genus *Tantalus.* With crown, throat, and neck bare. The neck covered with scurvy scales. One species—*T. loculator,* 42″, confined to America.

# Suborder ARDEÆ.

## HERONS, SHOEBILLS, and HAMMERHEADS.

One notch on each side of posterior margin of breast-bone. Hind toe on same plane as other toes.

## Family ARDEIDÆ. HERONS.

Bill straight, grooved on each side, notched, but with no hook at end. Hind toe well developed. Slight web between third and fourth toes, that between second and third obsolete. Mid claw pectinated. Powder-down patches present. In Herons, plumulæ of a peculiar kind (the summits of which break off into a fine dust as fast as they are formed) are developed upon certain portions of the integument which are termed "powder-down patches." Tail of ten or twelve feathers. (206–221.)

(i.) *Tail of twelve feathers.*

(a.) *Bare portion of tibio-tarsus equal to or longer than second toe and claw. Edge of mandibles serrated.*

*Plumage grey or white.*

## Genus **ARDEA**.

*Ardĕa*=a Heron, in Virgil, Georg. i. 364. Cognate with the classical Greek ἐρωδιός, of which the supposed primitive form, ῥωδιός, occurs in Hipponax (about 546 B.C.). Old Norse *arta*=a Teal.

Head crested, nape-feathers elongated and ornamented. Foreneck plumes long, not disintegrated. Bill with groove from nostrils towards tip. Fourth toe joined to third by web. Second, third, and fourth quills subequal and longest. Tarsus long, scutellate in front. Tibia half naked. Six powder-down patches. No dorsal train. Plumage grey or white. Nearly cosmopolitan.

### 206. Ardea manillensis. The Eastern Purple Heron.

**Nari**, *India;* **Khyra**, *Behar;* **Lal-kank**, *Bengal;* **Pamula narigadu** (Telugu); **Karawal-koka**, *Ceylon;* **Nga-hit**, *Burma.*

♂ 38″. Legs red-brown. Bill 6″, yellow. Three narrow, black cheek-bands. Crown and crest black. Fore throat and neck uniform rufous and not streaked. Back, rump, wings, and tail slaty grey. Scapulars with long pointed rufous ends. Breast, abdomen, and under tail-coverts slaty black. Throughout the Oriental region. Common in India, Ceylon, and Burma. Four or five eggs (2·17 × 1·56), bluish green. (J. 924. B. 1554.)

### 207. Ardea cinerea. The Common Heron.

*Cinerea*=ash-coloured, from *cinis*=ashes.

**Kabud**, *India;* **Anjan, Sada-kanka**, *Bengal;* **Saa**, *Sind;* **Khyra**, *Behar;* **Narraina pachi** (Telugu); **Narrayan** (Tamil); **Induru-koka**, *Ceylon.*

♂ 39″. Legs brown. Bill 6″, dark yellow, with tip of upper mandible brown. Crown white, narrow crest of black. Head and neck white. Long grey scapulars. Neck-feathers spotted black, form pectoral plume. Black patch of lengthened plumes on each side of breast. The greater part of the Old World. Resident in India. Abundant in Kashmir. Three eggs (2·27 × 1·66), bluish green. (J. 923. B. 1555.) See illustration, p. 195.

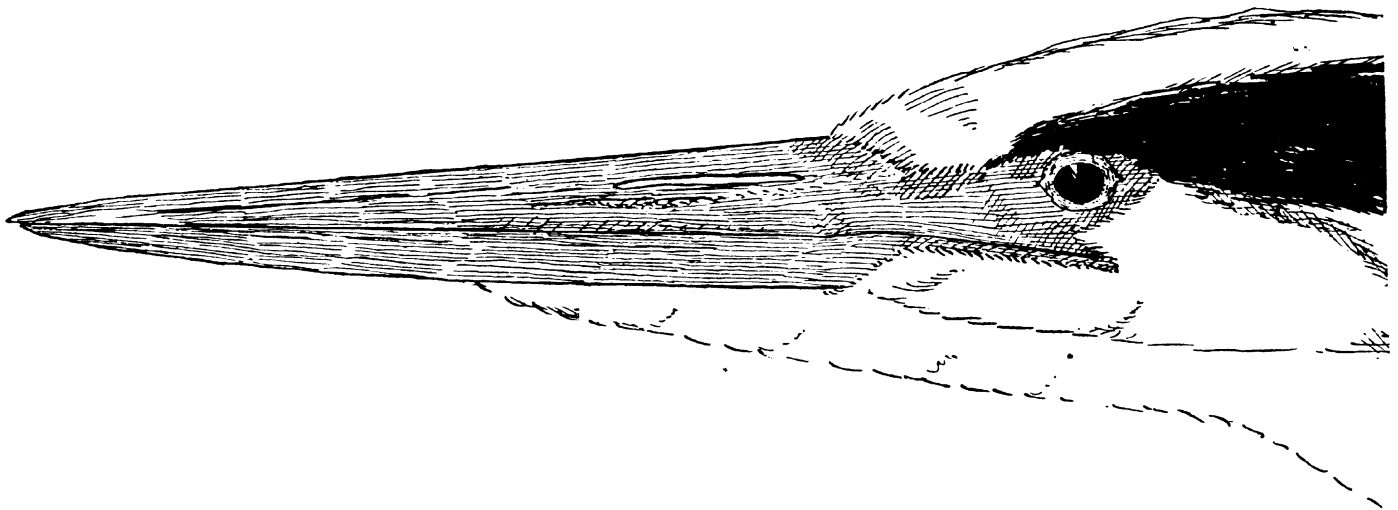
### 208. Ardea sumatrana. The Dusky Grey Heron.

♂ 50″. Legs black. Bill 7½″, black, lower mandible yellow. Crown and crest grey. Occipital crest sometimes 9″ long, pearly white. Breast, abdomen, lower tail-coverts, wing-lining, axillaries, and lower back dirty ash. Broad bare space above and below the eye dirty green. Above slaty. A sea-coast bird. Aracan, S. Tenasserim, throughout Malaya to Australia. (B. 1556. S.F. vi. 469.)

### 209. Ardea insignis. The Great White-bellied Heron.

**Anjan**, *Bengal;* **San barado**, *Sind.*

♂ 40″ to 46″. Similar to *A. sumatrana.* Narrow crest as long as 8″. Breast-plumes and long scapulars silver-grey, with white shaft streaks and tips. Breast, abdomen, unde tail-coverts, axillaries, and wing-lining white. Nepal, Sikkim, and Bhutan. (B. 1557.)



Lalpur, Kashmir, 29.11.92.

**210. Ardea goliath.** THE GIANT HERON.

**Darya anjan,** *Bengal.*

♂ 56″ to 60″. Legs black. Bill 9½″, dusky, tip green. Crown and crest cinnamon. Stands nearly four feet. Upper plumage grey. Below chestnut-brown.—*Young* have dense crest. Africa. Two were shot in Ceylon—one in 1878 and another in 1879—and a third was seen in 1880. (J. 921. B. 1558.)

Also *A. purpurea.* 30″ to 34″. Crown and crest black. Fore part of throat and neck streaked with black. The Purple Heron of Europe, Africa, and S.W. Asia.

*A. wurdemanni.* 50″. Head white, forehead streaked blackish. From Florida.

*A. wardi.* 48″ to 54″. Occiput and sides of crown black. Forehead and mid-crown white. From Florida.

*A. occidentalis.* 58″. General colour pure white. From S. Florida.

*A. humbloti.* 37″. Crown black. From Madagascar.

*A. melanocephala.* 30″ to 36″. Crown black. From Africa and S. Europe.

*A. cocoi.* 35″ to 40″. Crown and crest black. From S. America.

*A. herodias.* 40″. Crown white. From N.C. and S. America, West Indies, and Galapagos Islands. (B.M. Cat., xxvi. 72-84.)

## Genus **MESOPHOYX.**

Head crested. No ornamental nape-plumes. Foreneck plumes disintegrated. Immense dorsal train. Plumage white.

**211. Mesophoyx intermedia.** THE SMALLER WHITE HERON OR EGRET.

**Patokha bagla,** *India;* **Puru-wallai-koku,** *Ceylon.*

♂ 27″ to 28″. Legs black. Bill 2¾″ to 3″; yellow in winter, black in summer.—*In summer:* Head crested, but no drooping plumes. Pectoral plume of long decomposed feathers. Dorsal train extending about 7″ beyond tail. *In winter:* Pure white and without dorsal train. India, Ceylon, N. Burma, Andamans, Malay Peninsula and Islands to Java and the Philippines, China, and Japan. Four eggs (1·9 × 1·44), bluish green. Included by Jerdon and Blanford under *Herodias*, but here separated, as the edges of the mandibles are serrated. (J. 926. B. 1560.)

Also *M. brachyrhyncha.* 25″. Similar to *M. intermedia*, but bill and legs are yellow. From S. and N.E. Africa.

*M. plumifera.* 25″. Similar to *M. brachyrhyncha*, but with distinct loral black patches. From Australia, New Guinea, and Moluccas.

*Edge of mandibles not serrated, but with distinct subterminal notch in upper mandible. Plumage white or black.*

*Bill not longer than mid toe and claw.*

## Genus **HERODIAS.**

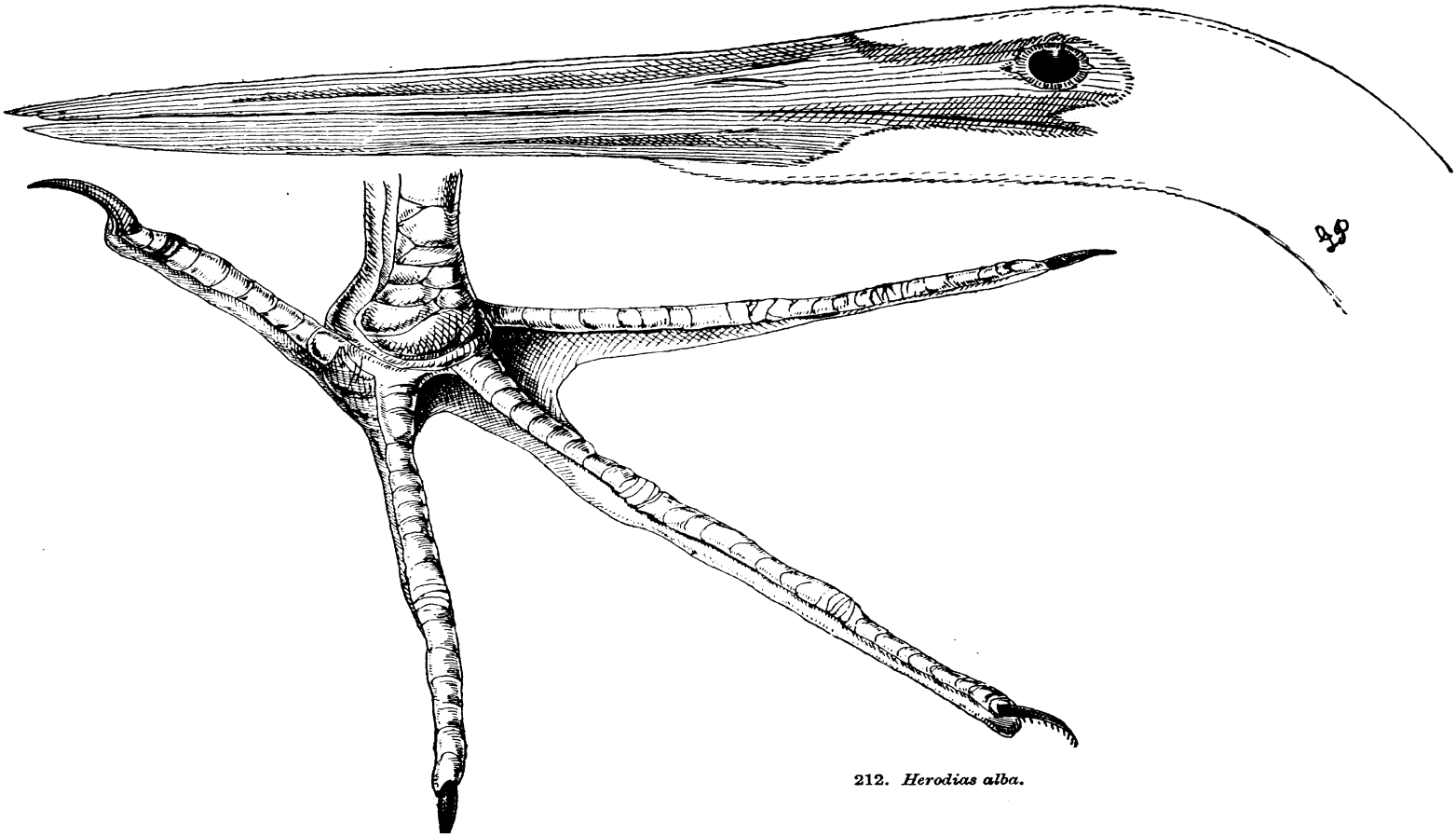
*ἐρωδιός* = a Crane.

No crest or breast-plumes. Well-developed dorsal train. Plumage white.

**212. Herodias alba.** THE GREAT WHITE HERON OR EGRET.

**Bara-bagla,** *India;* **Pedda-tella-konga** (Telugu); **Vella-koku,** *Ceylon.*

♂ 36″. Legs black. Bill 3¾″ to 5½″, yellow in winter, black in summer.—*In summer:* No crest, no pectoral plumes. Dorsal train extends about 5″ beyond tail. Orbital skin pea-green. S. Europe to C. Asia, Africa, India, Ceylon, Burma. Four eggs (2·11 × 1·55), bluish green. (J. 925. B. 1559.)



212. *Herodias alba.*

Also *H. egretta*. 38″. Similar to *H. alba*, but bill always yellow. From N. and S. America.

*H. timoriensis*. 30″. Similar to *H. egretta*. From China and Japan, from Malay Peninsula to Australia. Probably will have to be united to *H. alba*.

Also the genus *Florida*. One species—*F. cærulea*, 22″, with blackish margins at tips of quills, from N. America, W. Indies, C. and S. America.

Also the genus *Melanophoyx*. Of black plumage. Two species—*M. ardeviaca*, 17½″, with throat dark slaty, from tropical Africa; and *M. vinaceigula*, 16½″, with throat rufous, from Transvaal.

*Bill longer than mid toe and claw.*

**213. Herodias garzetta.** The Little White Heron or Egret.

**Kilchia**, *India;* **Nella muka konga** (Telugu); **Sudu-koka**, *Ceylon.*

♂ 24″ to 25″. Legs black. Toes yellow. Bill 3″ to 4″, black.—*In summer:* Crest on head of two or three feathers 5″ to 6″ long. Dorsal train dense, entirely decomposed, curving up, scarcely extending beyond tail. Pectoral plume of narrow ordinary feathers.—*In winter:* Pure white, without crest. Pectoral plume or train. S. Europe, Africa, S. Asia to China and Japan, India, Ceylon, Burma, and the Malay Archipelago. Five or six eggs (1·73 × 1·32), bluish green. *H. eulophotes*, from Amherst, near Moulmein, referred to by Hume (S.F. vi. 480), is probably an abnormally small species of *H. garzetta*. (J. 927. B. 1561.)

Also *H. nigripes*. 22″. Similar to *H. garzetta*, but toes black. From Java to Australia.

Also the genus *Leucophoyx*. One species—*L. candidissima*, 20½″, with crest decomposed, no nape-plumes, breast-plumes decomposed, not lanceolated, and dense dorsal train. From N. and S. America.

Also the genus *Hydranassa*. With nape crested and continued into neck-frill. Feathers of nape and forehead broad. Two species—*H. ruficollis*, 24″, plumage grey, from N. and C. America and W. Indies; and *H. tricolor*, similar to *H. ruficollis*, but much smaller, from N. of S. America.

## Genus **LEPTERODIUS**.

Dorsal train short, of lanceolate feathers. Breast-plumes lanceolate throughout the year. Two elongated nape-plumes. Plumage ashy. Coasts of Africa, India, and Ceylon.

**214. Lepterodius asha.** The Indian Reef-Heron.

**Kala-bagla**, *India.*

♂ 24″ to 27½″. Legs black. Bill 4½″ red-yellow. Crest moderate, two long, narrow feathers of the crest grey. Chin and throat white. Short dorsal train. Breast-plumes grey, narrow, and pointed. Scapulars and upper breast grey. From Persian Gulf to Ceylon and the Laccadives. Three to five eggs (1·85 × 1·35), sea-green. (J. 928. B. 1563.)

Also *L. gularis*. 22″. Darker than *L. asha*, but with crest of several short plumes. From tropical Africa and Madagascar.

Also the genus *Notophoyx*. Similar to *Lepterodius*, with lanceolate dorsal train and breast plumes, but with full crest and no elongated nape-plumes. Four species—*N. novæ hollandiæ*, 26″, with black bill and no white streaks on breast and abdomen, from Australia, Celebes, Moluccas, and New Zealand; *N. pacifica*, with black bill, above glossy olive-green, and long white streaks on breast and abdomen, from Australia; *N. flavirostris*, 19″, with bill yellow, crown and crest black, above slaty black, from N. Australia; *N. aruensis*, 18½″, with yellow bill, head, neck, and below white, from Australia and Celebes.

Also the genus *Dichromanassa*. With nuchal crest and neck-frill of long lanceolate feathers and long dorsal train. One species—*D. rufa*, 26″, from N. and C. America, Jamaica, and

(b) *Bare part of tibio-tarsus less than inner toe and claw.*

*Bill without serrations, but with distinct notch in upper mandible.*

*Culmen longer than tarsus.*

## Genus **DEMIEGRETTA.**

Ornamental plumes fully developed. Full nuchal crest. Dorsal train lanceolate, slightly disintegrated. Tarsus longer than mid toe. Adults dark. Young birds white.

### 215. Demiegretta sacra. The Eastern Reef-Heron.

♂ 21″ to 24″. Legs green. Bill yellowish.—*In summer:* Above slate. Head almost black. Pectoral and dorsal plumes lanceolate, slate-grey. Tufted crest about 1″. Burma, Andamans, Nicobars, Malay Peninsula, to China, Japan, Australia, and Pacific Isles. Three eggs (1·7 × 1·3), pale sea-green. (B. 1564. S.F. ii. 305.)

Also the genus *Agamia*. One species—*A. agami*, 32″, bill 5¾″, above glossy dark green, from Mexico, C. and S. America.

*Culmen equal to the tarsus.*

## Genus **NYCTICORAX.**

νυκτικόραξ = a Nightjar in Aristotle, a Screech-Owl in the *Anthology* (xi. 186); but strictly a "Night-Raven," from νύξ + κόραξ.

Bill short, stout, with culmen curved. Head crested, with two or three ornamental nape-plumes. Wing rounded. Third quill longest. Tarsus reticulated in front with large hexagonal scales. Tail broad and even. Six powder-down patches. Nearly cosmopolitan.

### 216. Nycticorax griseus. The Night Heron.

**Wák**, *India*; **Gadri**, *Sind*; **Sannari**, *Ceylon*; **Lin-wet**, *Burma*.

♂ 21″ to 24″. Legs greenish. Bill black. Eye-streak white. Crown, nape, back, and scapulars black, glossed green. Crest of narrow feathers fitting into each other. Cheeks, chin, throat, and abdomen white. C. and S. Europe, Asia, Africa, N. America, W. Indies, India, Ceylon, and Burma. Four or five eggs (1·92 × 1·35), pale sea-green. (J. 937. B. 1568.)

Also *N. tayazuguira*. 24″. Similar to *N. griseus*, but beneath pale grey. From S. America.

*N. cyanocephalus*. 24″. Beneath dark slaty. From south of S. America.

*N. leuconotus*. 20″. Black above, with white patch on back. From Africa.

*N. caledonicus*. 19½″. Tail chestnut, eyebrow white. From Australia.

*N. crassirostris*. 22″. Similar to *N. caledonicus*. From Bonin Islands.

*N. mandibularis*. With white throat and no white eyebrow. From Solomon Islands.

*N. manillensis*. 25″. Similar to *N. caledonicus*, but no white eyebrow. From the Philippines and Borneo.

Also the genus *Nyctinassa*. With crest of nuchal plumes, dorsal plumes greatly developed, plumage slaty blue. Two species—*N. violacea*, 22″, crown white, from N. and S. America; and *N. pauper*, 16″, crown black, from the Galapagos.

Also the genus *Cancrema*. With bill flattened, broader than high. Two species—*C. cochlearia*, 16″, the Boatbill, with throat and chest white, from S. America; and *C. zeledoni*, 18″, with throat and chest tawny, from C. America.

*Culmen not so long as tarsus.*

## Genus **GORSACHIUS.**

Bill short and stout. Large deep groove on upper mandible. Head crested. Short thick neck, densely feathered. Middle toe and claw shorter than the tarsus. Tarsus reticulated in front.

### 217. Gorsachius melanolophus. The Malay Bittern.

♀ 17″ to 19″; ¾ lb. Legs greenish. Bill 2½″, black. Crown and nuchal crest black. Mantle dull chestnut, finely barred black-brown. Rump and upper tail-coverts slate. First three primaries blackish, broadly tipped white; others tipped chestnut. Wing-lining, axillaries, flanks, and under tail-coverts barred black and white. A rare bird in W. India and Ceylon, but found in Assam, Burma, Pegu, Nicobars, Malay Peninsula, the Philippines, and Borneo. Breeds on Malabar coast. (B. 1569. S.F. ii. 312.)

Also *G. goisachi*. 18″. Similar to *G. melanolophus*, but head is chestnut. From Japan, wintering in Formosa and the Philippines.

Also the genus *Syrigma*. With tarsus plated in front. One species—*S. sibilatrix*, 23″, ashy grey, confined to S. America.

*Bill with distinct serrations near tip, sometimes only on upper mandible, subterminal notch obsolete.*

*Bill longer than mid toe and claw.*

*Throat entirely feathered.*

*Tarsus reticulated in front with hexagonal scales.*

## Genus **BUTORIDES.**

Head crested. Plumage dull blue, streaked or spotted. Feathers of back and scapulars elongate and lanceolate. Inner toe short. Neck thick and short. No separate nuptial plumage. Nearly cosmopolitan.

### 218. Butorides javanica. The Green Heron.

**Koncha-bagla**, *India;* **Dosi-honga** (Telugu).

♂ 16″ to 18″. Legs greenish. Bill 3″, black and yellow. Forehead, crown, and long occipital crest black. Black line from beneath orbit. Back green. Central line to ashy breast white. Chin and throat white. Abdomen chocolate. India, Ceylon, Burma, and rest of the oriental region, Mascarene Islands. Three to five eggs (1·62 × 1·21), pale sea-green. Includes Sharpe's subspecies—*B. spodiogaster*, from Andamans and Nicobars. (J. 931. B. 1567.)

Also *B. atricapilla*. 16″. Similar to *B. javanica*, but throat streaked light rufous. From tropical Africa and Madagascar.

*B. brevipes*. 16½″. Similar to *B. atricapilla*, but throat is grey. From E. Arabia.

*B. striata*. 14½″. Similar to *B. atricapilla*, but throat is streaked dark tawny. From S. America.

*B. robinsoni*. Allied to *B. striata*. From Margarita Island.

*B. amurensis*. 16½″. Similar to *B. javanica*. From Amoorland, Japan, China to Philippines, Java, and Borneo.

*B. stagnatilis*. 17″. Similar to *B. javanica*. From N. and E. Australia, New Guinea, Moluccas, and Pacific Isles.

*B. sundevalli*. 18″. With wing-coverts uniform. From Galapagos.

*B. virescens.* 12½″. Above green. Sides of face chestnut. From N. and C. America.

*B. anthonyi.* Similar to *B. virescens.* From Colorado.

Also the genus *Pilerodius.* With four long white nape-plumes. One species—*P. pileatus,* 25″, white, entirely confined to S. America.

Also the genus *Tigrornis,* with fore cheek bare. No dorsal plumes, and plumage barred. One species—*T. leucolopha,* 28″, above greenish black, from W. Africa.

Also *with tarsus transversely scaled:*—

The genus *Zonerodius.* With crest-plumes full and rounded. One species—*Z. heliosylus,* 21″, above black, barred sandy, from New Guinea.

Also the genus *Heterocnus.* With throat feathered in centre and bare at sides. One species—*H. cabanisi,* 27″, above brown, with black shaft lines, from C. America.

Also the genus *Tigrisoma.* With throat bare. Five species—*T. lineatum,* 20″, olive-brown, barred and streaked black, axillaries black, broadly banded white, from British Guiana and C. America; *T. marmoratum,* 28″, similar to *T. lineatum,* but axillaries slaty, finely barred white, from S. America; *T. bahiæ,* 24″, similar to *T. lineatum,* but breast and abdomen barred brown, from E. Brazil; *T. fasciatum,* 28″, with head and neck black, from S.E. Brazil; *T. salmoni,* 27″, colour brown, and axillaries uniform without bars, from N. of S. America.

*Bill as long as mid toe and claw.*

## Genus **ARDEOLA.**

*Ardeŏla,* diminutive of *Ardĕa. Ardĕa, æ,* f. = ἐρωδιός = a Heron (Virgil, *Georg.*. i. 364).

Head, neck, and back always coloured, but colour changes completely at breeding season. Wings, body, and tail white. Long ornamental nape-plumes. Tibia feathered to the knee nearly. Dorsal train well developed. Confined to the Old World.

### 219. Ardeola grayi. The Paddy-Bird or Pond-Heron.

**Bagla,** *India;* **Gudi-konga** (Telugu); **Kana-koka,** *Ceylon;* **Hbyein-ouk,** *Burma.*

♂ 18½″. Legs dull green. Bill 3″, blue, yellow, and black.—*In summer:* Long pointed occipital crest white. Head and neck yellow. Back maroon.—*In winter:* Head, breast, and thigh fulvous. Persia, India, China, Burma, Andamans, Nicobars, and Laccadives. Six eggs (1·48 × 1·17), greenish blue. (J. 930. B. 1565.)

### 220. Ardeola bacchus. The Chinese Pond-Heron.

♂ 21″; 11 oz. Legs bright orange. Bill 3$\frac{1}{10}$″, black, yellow, and pale blue.—*In summer:* Chin and neck-stripe white. Head and back of neck chestnut. Nuchal crest of long pointed chestnut feathers; longest 4″. Breast and side feathers disintegrated. Back black; rest of bird white.—*In winter:* Similar to *A. grayi.* E. Siberia, Japan, China, Burma, Malay Peninsula, Borneo, and Andamans. (B. 1567. S.F. ii. 481.)

Also similar to *A. grayi,* with back and dorsal train rufous:—

*A. ralloides.* 21″. Head streaked black. From Africa, summering in Mediterranean countries, S. Russia, and Caspian.

*A. idæ.* 18″. Head streaked black. From Madagascar.

Also similar to *A. bacchus,* with back and dorsal train black:—

*A. speciosa.* 15″. Head and neck tawny. From Java, Sumatra, Borneo, to Celebes.

Also the genus *Erythrocnus.* With neck-frill full, but without long ornamental plumes. No dorsal train. One species—*E. rufiventris,* 17½″, black above, confined to Africa.

*Bill shorter than mid toe and claw.*

## Genus **BUBULCUS.**

Bill stout and slightly curved. Wings, body, and tail white, with the addition in the breeding season of hair-like plumes on head, neck, and back. The least aquatic of all the Herons.

### 221. **Bubulcus coromandus.** The Cattle Egret.

**Doria bagla, Gai bagla,** *Bengal;* **Samti konga** (Telugu); **Huni-koku,** *Ceylon.*

♂ 21″. Legs greenish. Bill 3″, yellow in winter, orange in summer.—*In summer:* Head, crest, breast, and dorsal plumes golden buff.—*In winter:* Plumage white. India, Ceylon, Burma, S.E. Asia, Corea, Philippines, and Moluccas. Three to five eggs (1·71 × 1·32), pale green. (J. 929. B. 1562.)

Also *B. lucidus.* 19″. White, with crest-plumes and dorsal plumes vinous sienna. From S. Europe, Africa, and C. Asia.

(ii.) *Tail of ten feathers* (222–226).

*Bill serrated.*

*Mid toe and claw as long as tarsus.*

*Tibio-tarsus feathered to heel.*

## Genus **ARDETTA.**

*Ardetta*, diminutive of *Ardea*=a Heron, on the analogy of the Italian *Garzetta*, etc. In Pliny the diminutive is *Ardeŏla.*

A remarkable genus, of small size, with wing not longer than 6″. Toes long, and claws strong. May be said to be Bitterns with Egret bills. Head with short pointed crest. No neck-frill. Space behind eye feathered. Feathers of upper breast lengthened and concealing lower breast, but not forming ornamental plumes. Four powder-down patches. Nearly cosmopolitan.

*Back and scapulars in males uniform, in females generally mottled or streaked. Greater coverts never chestnut.*

### 222. **Ardetta minuta.** The Little Bittern.

*Mĭnŭta*=small, from *mĭnŭo*=I diminish.

♂ 14″. Legs greenish. Bill 2½″, purplish yellow. Head, back, scapulars, and tail black. Long feathers of upper breast buff. Flanks with narrow brown shaft lines. In females back and scapulars are brown, edged buff. Europe, south of lat. 60°, Mediterranean countries, C. Asia, N.W. India to 80° E. long. Winter in Africa. Common in Kashmir and in Himalayas as far east as Nepal. Four or five eggs (1·34 × 1·0), white. (J. 935. B. 1570.)

### 223. **Ardetta sinensis.** The Yellow Bittern.

**Jan-bagla,** *India;* **Mannal Nari,** *Ceylon.*

♂ 14″ to 15″. ♀ 6 oz. Legs pale green. Bill 2¾″, pale yellow. Top of head, quills, and tail black. Back, scapulars, and tertiaries grey-brown. In females the back and scapulars are brown, edged buff. S.E. Asia, Malay Peninsula to Japan, New Guinea, and N. Australia. Also in the Seychelles, India,

Ceylon, Burma. Breeds in Sind. Three to five eggs (1·3 × 0·95), greenish white. (J. 934. B. 1571.)

Also *A. podicipes*. 12″. Similar to *A. minuta*. With wing-coverts orange, neck-frill red. From Africa and Madagascar, and probably Aden.

Also *with greater coverts mostly or entirely chestnut:—*

*A. exilis*. 12″. Coverts entirely chestnut. In females back and scapulars chocolate. From N. and C. America.

*A. neoxena*. 11″. Coverts entirely chestnut. From E. Canada to Florida.

*A. erythromelas*. 11″. Similar to *A. exilis*, but primary coverts and secondary quills barely tipped chestnut. In females back and scapulars chocolate. From S. America.

*A. pusilla*. 10″. With no rufous tips to primary coverts or quills. From Australia and New Zealand.

### 224. Ardetta cinnamomea. The Chestnut Bittern.

**Lal-bagla**, *India;* **Kuruttu-koku**, *Ceylon.*

♂ 16″. Legs greenish. Bill yellow. Crown and back cinnamon. Pectoral gorget dark brown, with buff edges. Wings and tail chestnut.—*Young birds:* Feathers brown, with yellow edges. China as far as the Amur, but not Japan, thence to Sind, the Philippines, and Celebes. Breeds in Bengal, Pegu, and Ceylon. Five or six eggs (1·28 × 1·0), light blue. (B. 1572.)

Also *with back and scapulars mottled or streaked:—*

*A. involucris*. 11½″. Crown ashy, with central line black. Primary quills black. From S. America.

Also the genus *Zebrilus*. With large crest and plumage waved. One species—*Z. pumilus*, 9½″, above slaty black, with wavy buff cross lines, from S. America.

*Tibio-tarsus bare above heel.*

*Culmen longer than tarsus and mid toe together.*

## Genus **DUPETOR.**

Bill longer than in *Ardetta*. Back of neck less conspicuously nude. Throat-feathers spotted.

### 225. Dupetor flavicollis. The Black Bittern.

**Kala-bagla**, *India;* **Ay-jan**, *Assam;* **Karu-Nari**, *Ceylon.*

♂ 20″ to 24″. Legs pale brown. Bill 4″, red-brown.—*In summer:* Crown and upper parts, with wings and tail, dark ashy. Golden stripe on sides of neck. Neck-feathers mixed white, brown, and black.—*In winter* the dark slaty colour changes to black. From S. and C. China, through Burma, Malay Peninsula, Sumatra, Java, the Philippines, and Celebes. Occurs in Sind, W. India, and Ceylon. Common in E. Bengal, Assam, and Burma. Breeds in Sind and Pegu. Four eggs (1·66 × 1·26), pale green. (J. 932. B. 1573.)

Also *D. gouldi*. 24″. With black spots down centre of throat. Abdomen brown. From Australia.

*D. nesophilus*. 22″. With black spots down centre of throat. Abdomen grey. From New Britain.

*D. melas*. 21″. With black spots down centre of throat. Abdomen black. From the Moluccas.

*Tibio-tarsus bare for some portion above heel.*

*Tarsus shorter than mid toe and claw.*

## Genus **BOTAURUS**.

*Botaurus*=a Bittern, in late Latin; probably akin to our "Bittern." French *butor*, etc. Certainly not derived from *bos*+*taurus*, though perhaps confused therewith in popular etymology.

Bill short, stout, with broad nasal groove. Long lax plumage, beautifully mottled yellow and black. Four powder-down patches. Mid toe and claw longer than tarsus and longer than bill. Hind claw very long. Sexes alike. Cosmopolitan.

### 226. **Botaurus stellaris**. The Bittern.

**Baz**, *India*.

♂ 26″ to 30″. Legs greenish. Bill 3″ to 3½″, yellow and brown. Crown uniform black, not barred. Moustache black. Neck yellow, with brown spots. Quills irregularly barred black and rufous. Temperate portion of Palæarctic region, visiting N. Africa, N.W. India, Burma, and China. Not observed in S. India, Ceylon, or Tenasserim. Three to five eggs (2·0 × 1·5), sandy green. (J. 936. B. 1574.)

Also *B. capensis*. 25″. Similar to *B. stellaris*, but quills not so distinctly barred. From S. Africa.

*B. pœciloptilus*. 24″. With primary coverts uniform brown. From Australia and New Zealand.

*B. lentiginosus*. 28″. With primary coverts uniform slaty, with rufous tips. From N. and C. America and occasionally in Europe.

*B. pinnatus*. 30″. With crown of head barred. Primary coverts blackish brown, with rufous tips. From north of S. America.

Also *with tarsus as long as mid toe and claw*:—

The genus *Nannocnus*. One species—*N. curythmus*, 12″, above chestnut, secondaries shorter than primaries, from E. Siberia to Japan, China to Borneo and Celebes.

The genus *Ardeirœllus*. One species—*A. sturmi*, 12½″, above slaty grey, secondaries equal to or longer than primaries, from Africa, extending occasionally to Canaries and Pyrenees.

Also *with tarsus much longer than mid toe and claw*:—

The genus *Erythrophoyx*. Two species—*E. woodfordi*, 18″, with under tail-coverts sandy, from Solomon Islands; and *E. prætermissa*, 19″, with under tail-coverts dark grey, from Molucca Islands.

Also like the family of *Ardeidæ*, with hind toe on same plane as the other toes; the family of *Balænicipitidæ*, with culmen flattened and grooved; a distinct hook toward the tip, no webs at base of toes, two powder-down patches, and loral space bare. One species—*Balæniceps rex*, 46″, bill 8″, slightly crested, the Shoebill, from the Upper White Nile.

Also the family of *Scopidæ*. With culmen narrow and ridged. A distinct dertral hook at the tip. No powder-down patches. Lores feathered, and distinct webs at base of toes. One species—*S. umbretta*, 20″, bill 3½″, head strongly crested, the Umbrette, or Hammerhead, from Africa, Arabia, and Madagascar. (B.M. Cat., xxvi. 242–290.)

# NATATORES. *WATER BIRDS.*

## Swimmers.

So variously organised that few generalisations can be made. The connections of this order are not very apparent. Some imagine that it is related on one side through the Geese with the *Rasores*, others through the Grebes with the Coots. Again, the Frigate Birds show a decided tendency towards *Raptores*.

FEET MORE OR LESS FULLY WEBBED. Legs placed far back. Plumage thick, close, with quantity of down. Hind toe small or wanting.

## Order **GAVIÆ.**

Nearly related to the *Limicolæ*. Front toes entirely connected by webs. Fifth secondary wanting. Primaries eleven (terminal one minute and concealed). After-shaft. Spinal feather tract. Rectrices twelve. Oil-gland tufted. Young hatched covered with down, but fed by parents for some days. Eggs double-spotted.

| | | | |
|---|---|---|---|
| Bill without a cere | LARUS | | GULLS. |
| | HYDROCHELIDON | | MARSH-TERNS. |
| | HYDROPROGNE | | MARSH-TERNS. |
| | STERNA | | SEA-TERNS. |
| | | | RIVER-TERNS. |
| | | | TERNLETS. |
| | | | OCEAN-TERNS. |
| | ANOUS | | NODDIES. |
| | GYGIS | | NODDIES. |
| | RHYNCHOPS | | SKIMMERS. |
| Bill with horny cere | STERCORARIUS | | SKUAS. |

## Order **GAVIÆ.** GULLS, TERNS, NODDIES, SKIMMERS, and SKUAS.

Closely related to the *Limicolæ*, and the resemblance is shown in nearly every detail of their anatomy. The eggs of Gulls and Terns are double-spotted (like those of Plovers). Schizognathous. Front toes entirely connected by webs. Fifth secondary wanting. Primaries eleven (terminal one minute and concealed). After-shaft. Spinal feather tract. Rectrices twelve. Oil-gland tufted. Young when hatched covered with down, able to run, but fed by parents for some days. Eggs seldom exceeding three, spotted or scrolled with dark colours on white, buff, or olive ground.

## Family LARIDÆ. Gulls, Terns, and Skimmers.

Bill without a cere. Hind toe generally present. Toes partially or fully webbed. Claws moderately curved, not sharp. Breast-bone with two notches on each side of posterior margin. Plumage grey and white or black and brown.

The family *Laridæ* may be divided into three classes, viz.—

(i.) *With three toes united as far as the claws.*

*Rissa*, the Kittiwake. Wings long. Remiges thirty-one. Tail not wedge-shaped.

(ii.) *With four toes (three united, one webbed to tarsus).*

*Pagophila*, the Ivory Gull. Wings long. Bill decurved.

(iii.) *With four toes (three united as far as the claws, hind toe free). Bill neither lamellate nor toothed, and without a nail. Fourth toe rudimentary.*

*Larus.* Tail square.

*Rhodostethea.* Breast white and rose. Tail wedge-shaped.

*Hydrochelidon.* Bill as long as head. Tail slightly forked. Legs short. Webs incised.

*Sterna.* Bill longer than head. Tail forked.

*Anous.* Whole body blackish brown. Tail graduated.

*Xema.* Bill shorter than head. Tail forked. Legs long.

*Stercorarius.* Bill strong, cutting, compressed, and with a cere. Remiges twenty-six or twenty-eight. Tail rounded.

### Subfamily Larinæ.

Bill stout, curved at tip, upper mandible longer than the lower. Nostrils oblong, at some distance from base of mandible. Tarsus scutellated in front. Anterior toes fully webbed. Hind toe small, free, and raised (webbed to tarsus in *Leucophæus* and *Pagophila;* rudimentary or obsolete in *Rissa*). Tail square, or nearly so (forked in *Xema;* cuneate and mid pair produced in *Rhodostethia*).

(i.) *Tail square, or very nearly so.*

*Hind toe free.*

### Genus **LARUS.**

λάρος = a ravenous sea-bird, in classical Greek. Akin to Old Norse *ítri* = a Tern.

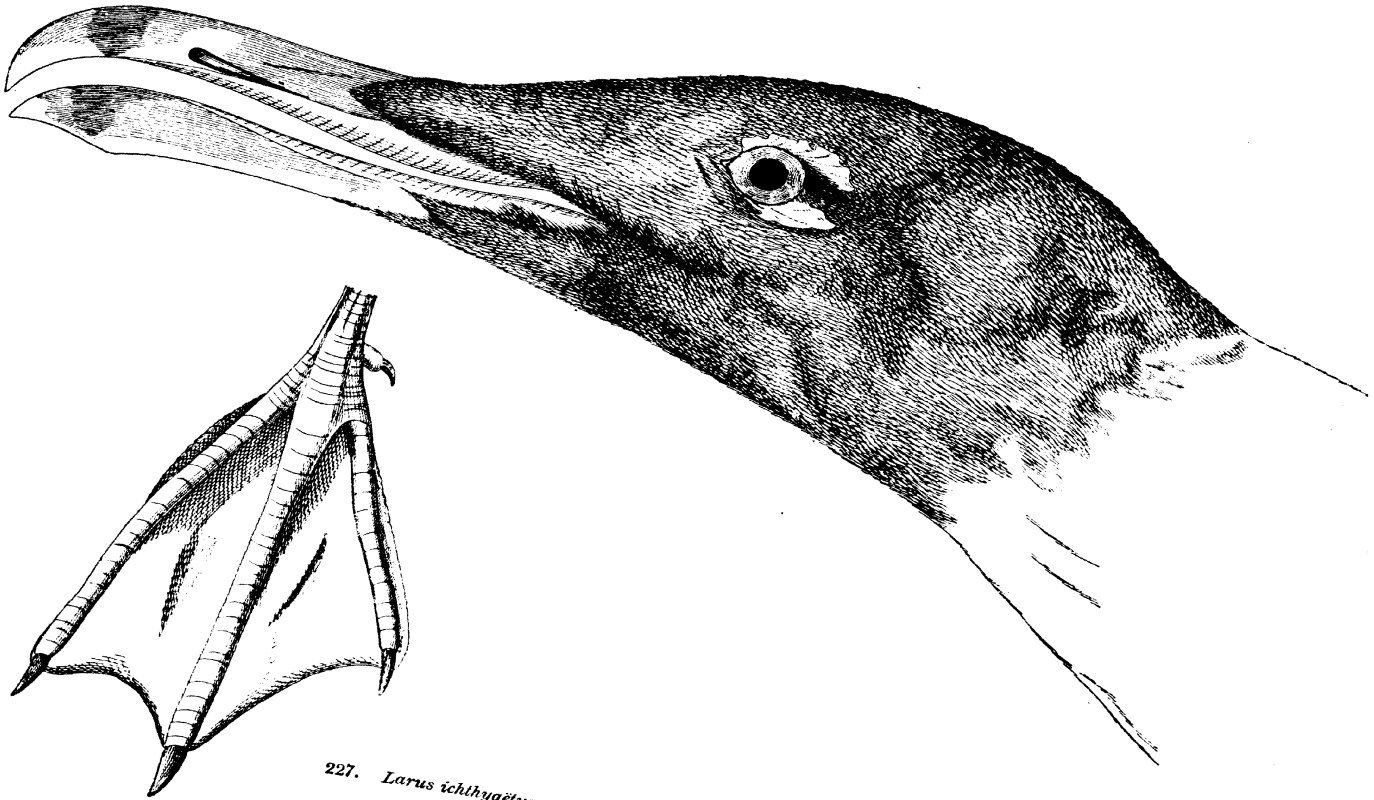
Bill strong, and always more than twice and usually about three times as long as it is deep. Wings long, exceeding tail. First primary longest. Some species in summer have the head darker than the neck.—*In winter:* Head and neck are white, or streaked with brown. For purposes of distinction these birds are here given in three groups, viz.—

A. Head with hood darker than neck in summer (227–231).

B. Head without hood and tail white (232–235).

C. Head without hood and tail with subterminal black band.

(Cosmopolitan with exception of Polynesia and the Central Pacific.)



227. *Larus ichthyaëtus.* Bishop, Pusnee, Mekran coast, 7.2.75. Weight 3⅜ lbs.

*A. Head with defined hood darker than the neck in summer. Hood black. Mantle grey.*

**227. Larus ichthyaëtus.** THE GREAT BLACK-HEADED GULL.

Fish-eyed, from *ἰχθύς* + *ἀετός*.

♂ 26″ to 29¼″. Weight 2 lbs. to 3¾ lbs. Legs dull red. Bill red, black bar. Small crescentic white patches above and below the eye. Back and wings blue-grey. Rump, tail, and below white. Five primaries white, with black band. First quill, outer and half inner web, black.—*In winter:* Head white, streaked dark brown. Breeds in C. Asia and migrates in winter to S. Asia and N.E. Africa. Not further east than Burma, India, and Ceylon. Eggs (3·0 × 2·1) buff, streaked purple and brown. (J. 979. B. 1489.) See illustration, p. 211.

**228. Larus minutus.** THE LITTLE GULL.

♂ 11″. Legs vermilion. Bill lake. Below white, tinged pink. Primaries grey, broadly tipped white, without black bars. Quills black below. Remiges twenty-eight.—*In winter:* Forehead white and hood grey. Temperate Europe and Asia, but not in Mongolia or China. One specimen shot by Colonel Irby, in 1859, near Jehangirabad, Oudh. Eggs (1·6 × 1·2) buff, spotted brown.

Also *L. serranus*. 19″. Legs and bill red. Small white spot behind eye. First and second quills tipped black. Third tipped white.—*In winter:* Head white, streaked grey. Andean lakes and west coast of S. America.

*L. melanocephalus*. 15½″ to 17″. The Mediterranean Black-headed Gull. Legs red. Bill red, with dark band in front of angle. Primaries white, tinged grey on outer webs.

*L. saundersi*. 12½″. Legs red. Bill black. Narrow white eye-ring. First quill white, with narrow black edges. Second quill, outer web white and black patch on inner web near tip. Third quill, tip white, with black patch across both webs.—*In winter:* Head white, streaked grey. China, Mongolia, and E. Siberia.

*L. philadelphia*. 15″. Bonaparte's Gull. Legs orange. Bill black. White eye-ring. First and second quills white, with outer webs, tips, and part of inner webs black. Third quill white, tip and part of outer web black.—*In winter:* Head white, mottled grey. N. America and occasionally in United Kingdom.

*L. franklini*. 14″. Legs livid. Bill red, with dark subterminal band. White patches above and below eye. First, second, and third quills grey, tipped white, with subterminal black bars.—*In winter:* Head white, spotted black above. N. America.

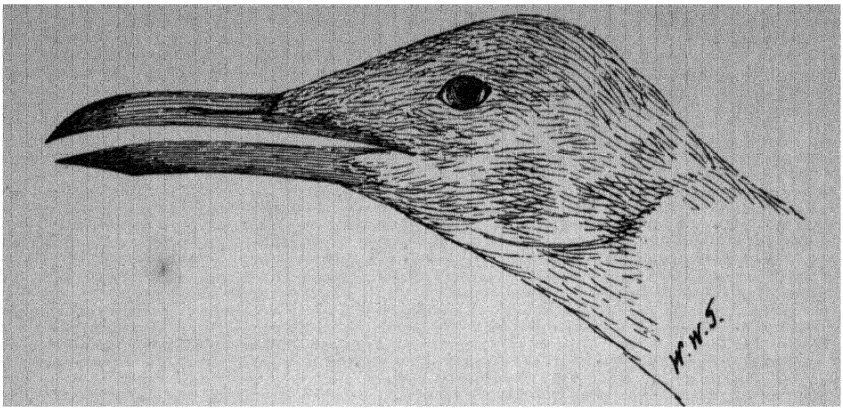
*L. atricilla*. 16½″. Legs and bill red. White patch above and below eye. First quill black; second and third nearly so, and tipped white.—*In winter:* Head white, streaked grey. Bill and legs nearly black. N. and S. America.

*Hood dark brown. Mantle French grey.*

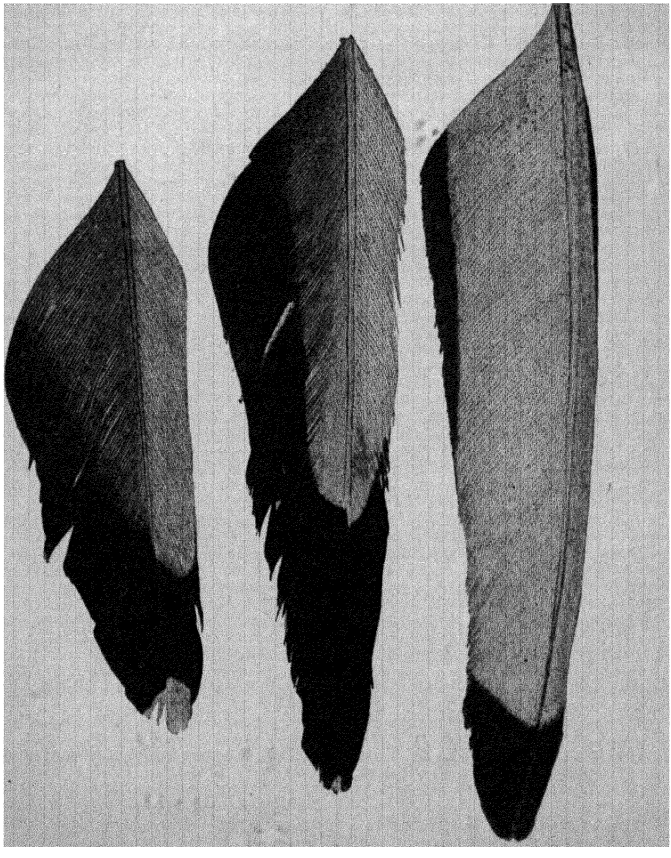
**229. Larus ridibundus.** THE LAUGHING GULL.

*Rīdĭbundus* = full of laughter; from *rīdĕo* = I laugh.

♂ 15″ to 16″. Legs deep red. Bill deep red. Head and neck red-brown. Remiges thirty. Shafts of first, second, and third quills white. First quill white, with narrow black margins and tip. Second and third similar, but with more black. Fourth quill more black, and with grey centre to inner web, and a minute white tip. Sixth quill, both webs and tip grey, the black forming a subterminal bar.—*In winter:* Head grey, or white, with grey patches round the eye and on ear-coverts. Breeds in temperate Europe and Asia; winters in Africa and S. Asia. Kashmir and India (not observed in Burma). Two to three eggs (2·0 × 1·4), olive-green, blotched brown and grey. (J. 981. B. 1490.)




229. *Larus ridibundus.* Manora, 14.3.75.



6th. 4th. 1st.

Karachi, 14.3.75.

### 230. Larus brunneicephalus. The Brown-headed Gull.

**Dhorura,** *India.*

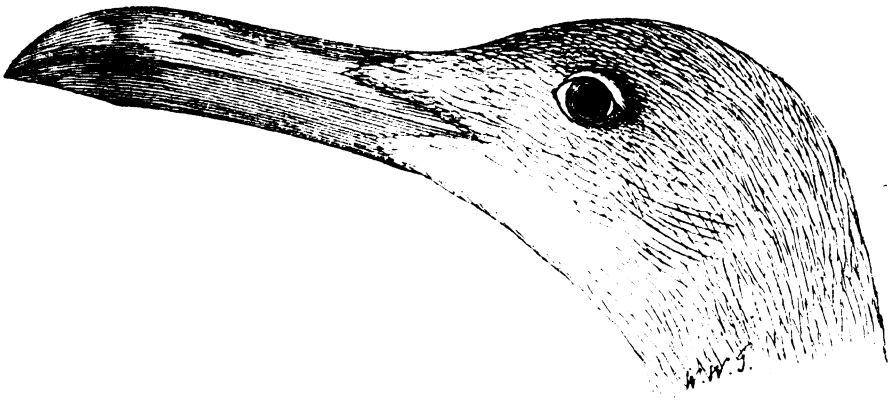
♂ 16″ to 17″. Legs red. Bill red, tip dark. Head brown, paler on forehead, and darker towards neck. First quill black, white at base, white subterminal mirror, and faint white tip. Second quill similar, but no light tip. Third quill black, with more white at base and small white subterminal spot. Fourth and fifth quills with basal white increasing on both webs. Seventh quill tip white, white on outer web, and grey on inner web, with a black spot. Eighth, ninth, and tenth grey.—*In winter:* Head dusky grey. Breeds in C. Asia, and ranges south in winter, from Aden, through India, to Assam, Manipur, and Burma. (J. 980. B. 1491.). See illustration, p. 215.

Also *L. maculipennis.* 15″. Legs red. Bill crimson. Eyelid and patch behind eye white. First quill black, terminal 3″ white. Second quill white outer web. Subterminal bar black, inner web with black clear of white shaft. Third quill similar, but with more subterminal black.—*In winter:* No hood for short time, and not rosy beneath. East of S. America.

*L. glaucodes.* 14″. Like *L. maculipennis*, but primaries without the black subterminal bars. S. America.

*Hood black or brown. Mantle sooty.*

### 231. Larus hemprichi. The Sooty Gull.



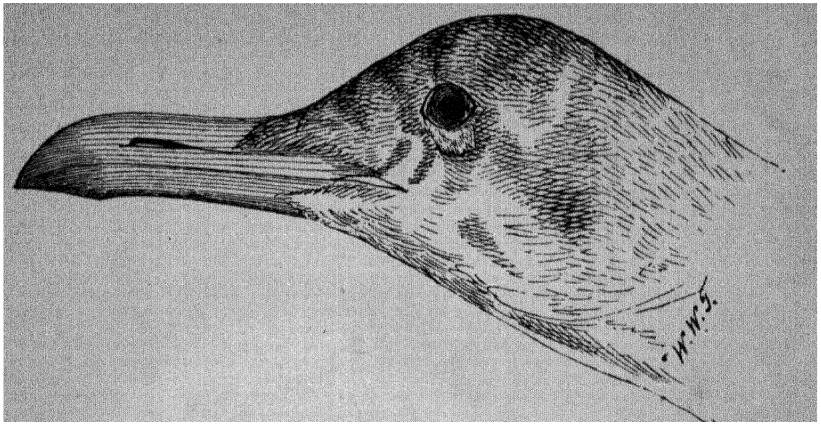
♂ 18¾″ to 19¼″; 14 to 18 oz. ♀ 13 to 14 oz. Legs greenish. Bill green, tip red, with intervening black bar. Head dark brown. Narrow white collar on back and sides of neck. First, second, third, and fourth quills blackish, with white tip and spot. Wing-lining sooty.—*In winter:* Head pale brown, mottled whitish. Chin white. Throat and foreneck mottled white and brown; white collar wanting. Lower Red Sea, E. Africa, S. Arabia, Baluchistan, and Sind. Eggs (2·27 × 1·58) buff, spotted brown and lilac. (B. 1492. S.F. i. 279.)

Also *L. leucopthalmus.* 15½″. Legs yellow. Bill orange. Head black. Mantle deep slate. Eyelids and hind neck white. Primaries chiefly sooty black, tipped white. Red Sea, Lower Egypt, Greek Archipelago, and Sicily.

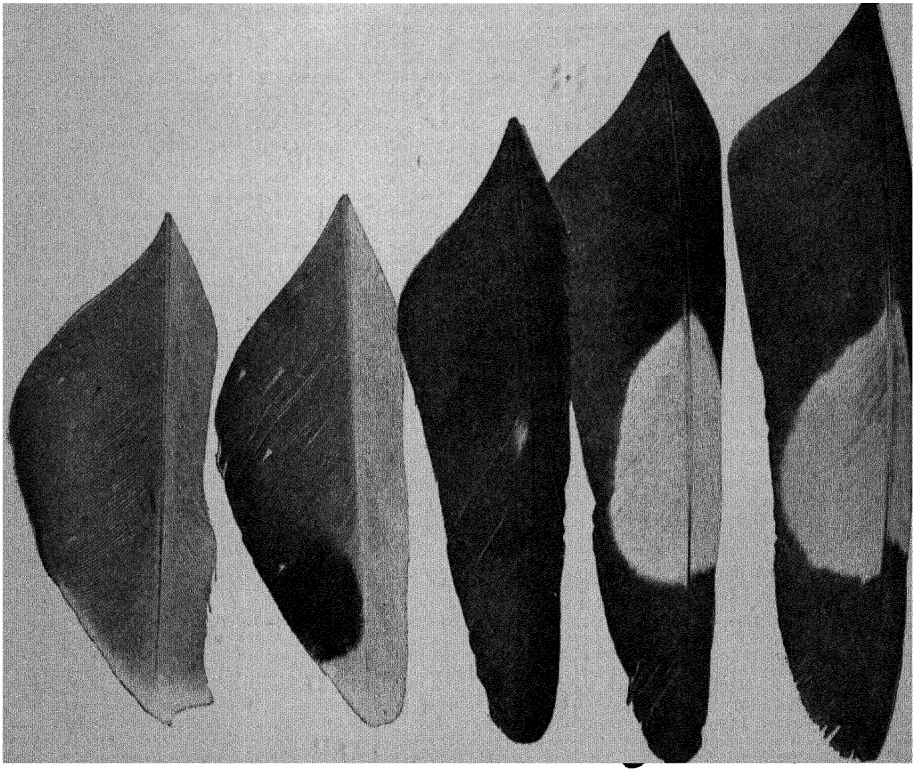
*L. fuliginosus.* ♂ 17″. ♀ 15″. Legs black. Bill red. Head black. Eyelids white. Primaries chiefly black, tipped grey. Galapagos.

*Hood grey. Mantle grey.*

*L. cirrhocephalus.* 16″. Legs and bill red. Eyelids white. First and second quills black, with white subterminal mirrors. Third quill with smaller white mirror.—*In winter:* Head white. Brazil and Africa.



230. *Larus brunneicephalus.* Manora, 3.3.75.



8th. 7th. 3rd. 2nd. 1st.

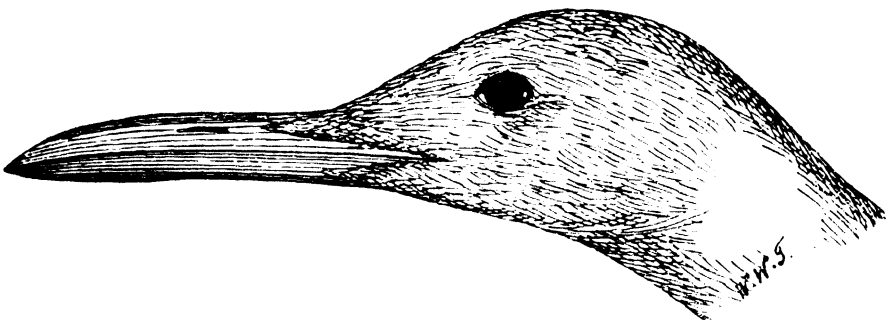
B. *Head without a hood. Tail white.*

*Quills mostly white, margined black.*

*Bill red.*

**232. Larus gelastes.** THE SLENDER-BILLED GULL.

♂ 17½″ to 18¼″; 12 to 14 oz. ♀ 16¾″ to 17¼″; 10 to 11 oz. Legs deep red. Bill deep red. Breast rosy. Mantle French grey. First quill white, tip black, and black margins on outer and inner webs. Second and third quills similar, but black on inner margins increasing. Mediterranean, Black, Caspian, and Red Seas, W. Coast of Africa, and in winter Persian Gulf and Sind. Three eggs (2·18 × 1·52), dull white, spotted and blotched dark brown and grey. (B. 1493. S.F. i. 274.)



232. *Larus gelastes.*

Also *L. novæ hollandiæ*. 15″. Legs and bill red. Head, neck, tail, and below white. First and second quill black, with long white mirror. Third quill tip white, followed by black bar, and then an irregular white mirror joining basal patch of white. Australia and Tasmania.

*L. scopulinus*. 14½″. Legs and bill crimson. Similar to *L. novæ hollandiæ*, but first and second quills are tipped white, and the mirrors are angularly edged, with no mirror on third quill. Chatham and Auckland Islands, N.Z.

*L. hartlaubi*. 14″. Similar to *L. scopulinus*, but mirrors on first and second quills are smaller. South coast of Africa and Madagascar.

*Bill black.*

*L. bulleri*. 14½″. Legs and bill black. Head, neck, and below white. Mantle pearl-grey. First quill white, with black margins to the webs. Second and third quills similar, but with black subterminal bar. New Zealand.

*Head without hood. Tail white.*

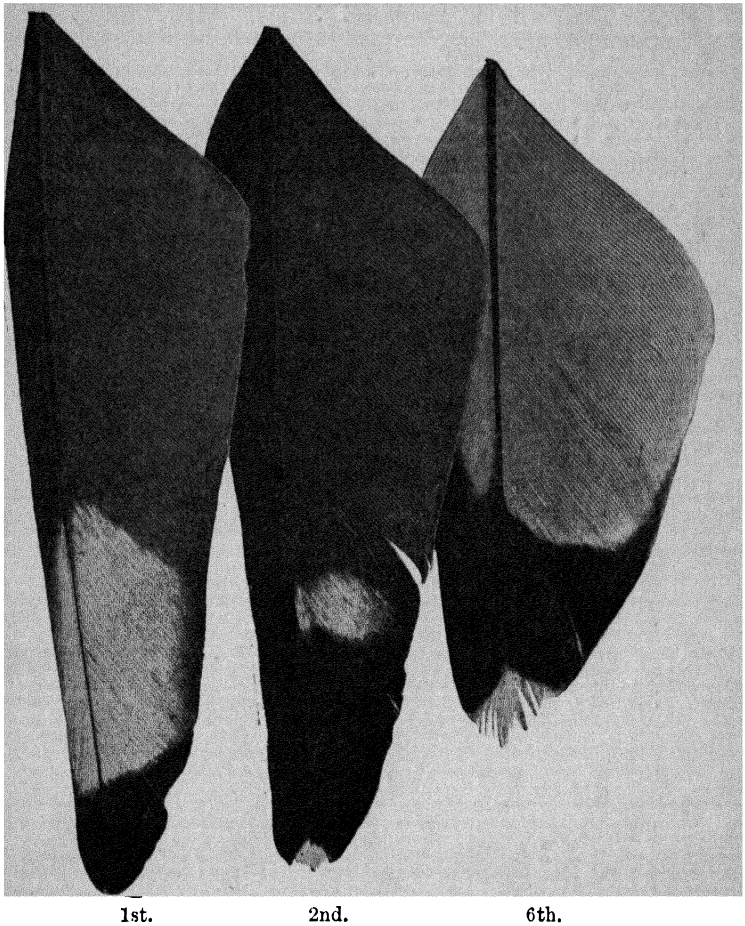
*Quills mostly black. Mantle dark slate.*

**233. Larus affinis.** THE DARK-BACKED HERRING-GULL.

♂ 24″ to 24½″; 2 to 2¾ lbs. ♀ 22″ to 23½″; 2 lbs. Legs pale yellow. Bill yellow, patch red. Mantle and both webs of primaries at base slate-grey. First quill with grey wedge on inner web, then a broad white band, and then a subterminal black bar and white tip. On second quill grey wedge is larger, rest black and tip white. In other quills there is more grey on both webs, till the black finally disappears.—*In winter:* Head and neck flecked with brown. Breeds in N.E. Europe and Siberia, visiting in winter E. Africa, S. Arabia, Baluchistan, and W. India. (B. 1494. S.F. i. 273.)

**234. Larus fuscus.** THE LESSER BLACK-BACKED GULL.

♂ 22″. Legs yellow. Bill yellow, angle red. Head, neck, tail, and below white. First quill with white mirror; second with smaller white mirror. Bases of quills lead colour, tips white. On third quill grey wedge becomes visible, and increases to the seventh. The other quills lead colour with white tips.—*In winter:* Head and neck streaked dusky brown. N. Europe and Mediterranean, ranging south in winter to Canaries, Egypt, Red Sea, and Persian Gulf. (J. 978.)



1st. 2nd. 6th.

*L. occidentalis.* 21″ to 22″. Legs yellow. Bill yellow, angle red. Head, neck, tail, and below white. Mantle darker than in *L. affinis.* All primaries tipped white. First, second, and third quills chiefly black, with white mirror on first, and a white spot on the second. No grey on inner webs of outer quills. Pacific coast of N. America.

*L. schistisagus.* 24″ to 25″. Legs grey. Bill yellow, with red spot at angle. Head, neck, tail, and below white. Mantle darker than in *L. affinis.* All primaries with white tips. The first quill for more than 2″ crossed by narrow dark bar; the second with white subterminal spot on outer web, and a patch of white on inner; third quill transversely barred blackish brown. Inner webs of outer quills grey. Behring Sea to N. Japan.

*Mantle deep sooty black.*

*L. marinus.* 28″ to 30″. The Great Black-backed Gull. Legs flesh colour. Bill yellow. angle red. Remiges thirty-four. All quills broadly tipped white. First quill white for nearly 3″; second quill with large mirror and with black spot on inner web.—*In winter:* Crown and

nape with grey streaks. N. Europe down to about 50° N., ranging in winter to Canaries, Mediterranean and Egyptian coast, Greenland, N. America, and Bermuda.

*L. dominicanus.* 23″. Legs olive. Bill yellow, red at angle. Resembles *L. marinus*, but first quill is white for 2″, and second quill has small white mirror of irregular shape. S. America to S. Africa and New Zealand.

*Quills mostly black. Mantle blue-grey.*

**235. Larus cachinnans.** THE YELLOW-LEGGED HERRING-GULL.

♂ 23″ to 25¾″; 1¾ to 2 lbs. 6 oz. Legs bright yellow. Bill yellow, red below. Eye-ring vermilion. Head, neck, tail, and below white. Mantle, secondaries, and tertiaries grey. Paler than in *L. affinis*, and merely a climatic race of *L. argentatus*. S. Europe, N. Africa, and S.W. Asia, ranging in winter as far east as Bay of Bengal. (B. 1495. S.F. i. 270.) See illustration, p. 219.

Also *L. argentatus.* 24″. The Herring-Gull. Legs flesh colour. Bill yellow, red angle. Orbital ring pale yellow. Remiges thirty-four. All primaries tipped white. First quill white tip 2½″, which is divided by a narrow black bar into "tip" and "mirror." Second quill blackish for nearly ½″ on both sides of shaft, with black subterminal bar, a white mirror, and on inner web a broad grey wedge. Fourth quill with grey on both webs above the bar. Sixth quill grey without a bar. The remaining quills grey, with white tips.—*In winter:* Head and neck streaked brown and grey. N. Europe, Greenland, and N. America, southwards in winter to Bermudas, California, Mediterranean, Black and Caspian Seas.

*L. vegæ.* 24″. Resembles *L. cachinnans*, but legs are pale flesh colour. Arctic coast of Siberia, southwards in winter to China, Japan, and Formosa.

*L. audouini.* 20″. Legs olive. Bill red, banded black, tip yellow. First quill black, with small white spot on inner web. Third quill, black, with grey wedge on inner web. W. Mediterranean.

*L. delawarensis.* 18½″. Legs greenish. Bill greenish, with black zone and yellow tip. Mantle pearl-grey. First quill with long white mirror on both webs, then a black bar and tip white. Second quill with smaller white mirror and grey wedge on inner web. Third quill without mirror, more white at tip and grey on greater part of both webs. N. America.

*L. californicus.* 20″. Legs greenish. Bill yellow, with red spot near tip. Eye-ring vermilion. First quill black, with shaft and end white. Second quill with black shaft and white mirror, black subterminal bar and white tip. W.N. America.

*L. canus.* 17″ to 18½″. The Common Gull. Legs greenish. Bill greenish, with yellow tip. Orbital ring vermilion. Remiges thirty-one. First quill black, with white subterminal mirror 2″ long. Second quill black, with grey basal wedge and smaller white mirror. Third quill black, with grey at base on both webs and sometimes a small subterminal white spot. Fourth, fifth, and sixth quills chiefly grey, with black bars and broad white tips.—*In winter:* Head and upper neck streaked and mottled ash-brown. N. Europe and Asia, southwards in winter to Mediterranean, Nile Valley, and Persian Gulf. From Kamschatka to China and Japan.

*L. brachyrhynchus.* 17″. Legs olive. Bill olive, tip yellow. Orbital ring vermilion. First quill with long white mirror on both webs, followed by subterminal black bar. Second quill with mirror and white bar. Western portion of Arctic and sub-Arctic America.

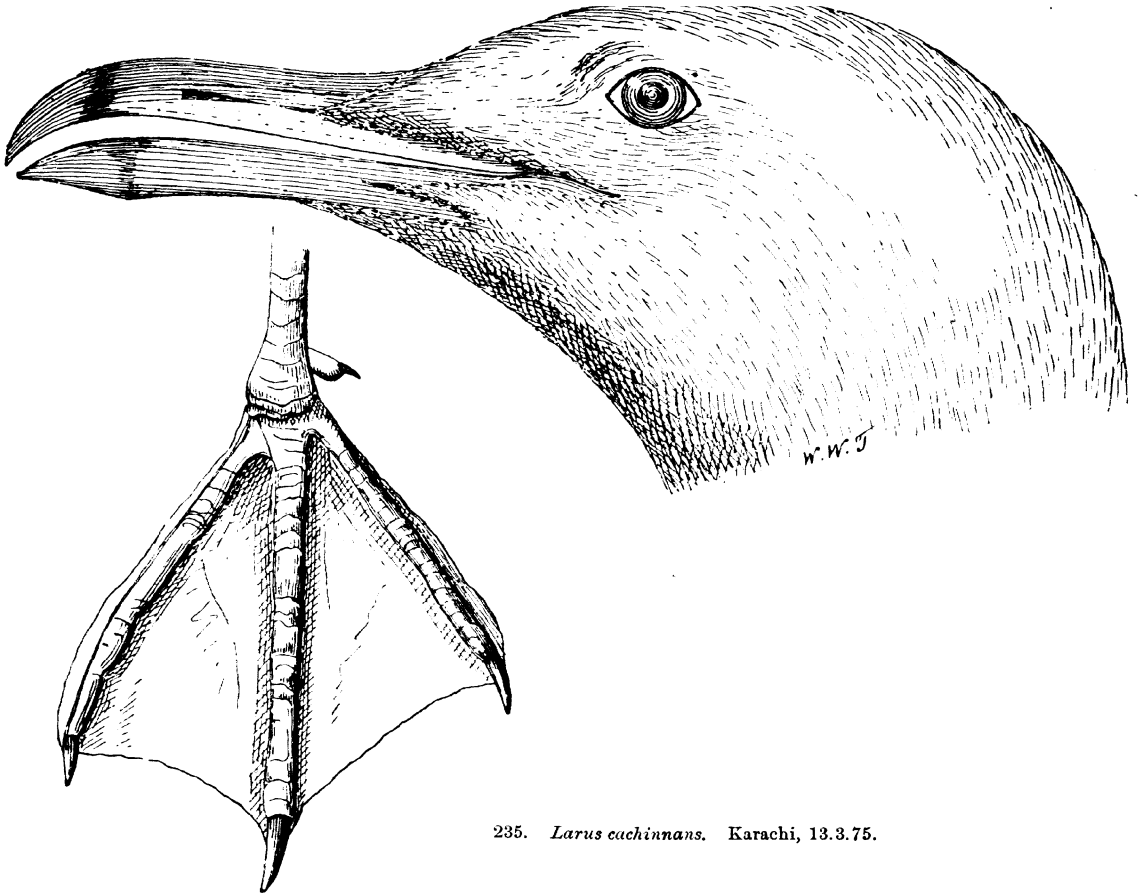
*Quills devoid of black; mostly pale grey or white.*

*L. glaucescens.* 25″ to 26″. Legs flesh-colour. Bill yellow, angle red. First quill white at tip for 2″. Second quill with white subterminal spot on each web and white tip. Third quill without distinct spots and with white tip. Behring Sea, Kamschatka, and in winter south to California and N. Japan.

*L. nelsoni.* 23″. Legs yellow. Bill yellow, with red spot. First quill ash-grey on outer web, with pale stripe ⅛″ wide next shaft. 3″ of tip white. Alaska and N.W. America.

*L. kumlieni.* 19½″. Legs yellow. Bill yellow, angle red. Third and fourth quills with defined subterminal bar across both webs. Baffin's Land.

*L. glaucus.* 29″. The Glaucous Gull. Legs pink. Bill yellow, angle red. Eye-ring orange. Head, neck, tail, and below white. Mantle pale grey. Primaries pearl-grey basally and tipped white on outer webs.—*In winter:* Head and neck mottled pale brown. Circum-



235. *Larus cachinnans.* Karachi, 13.3.75.

polar, ranging south in winter to Mediterranean, Black and Caspian Seas, Japan, California, Texas, and Bermuda.

*C. leucopterus.* 22″. Resembles *L. glaucus.* All white. Legs and wings very long. Greenland, and in winter to Iceland, the Baltic, the British Isles, N.W. Europe, and N. America.

C. *Head without a hood. Tail with a subterminal black band.*

*L. modestus.* 18″. Legs and bill black, tinged red. Crown and throat grey. Forehead and chin white. Mantle lead colour. First, second, third, and fourth quills chiefly sooty, tipped grey. Tail grey, with subterminal black band. Beneath smoky. Peru and Chili.

*L. heermanni.* 17″. Legs black. Bill red, often tipped black. Head and neck white. Mantle deep slate. First to fifth primaries nearly black, with white tips. Tail black, with broad white tips. Pacific coasts of N. America.

*L. belcheri.* 20″. Legs and bill yellow. Head, neck, and below white. Mantle sooty. First to fifth primaries sooty black, tipped greyish white. Tail chiefly black, tipped with white, outer webs of outermost pair white. Coasts of Chili and Peru.

*L. crassirostris.* 19″. Legs yellow. Bill yellow, angle and tip red, with intervening black zone. Mantle slate-grey. First to fifth primaries blackish, with white tips. Tail white, tinged pale grey on basal half, followed by a black band about 2″ wide. Coast of E. Asia, through Japan and China to about 22° N. lat.

Also the genus *Gabianus.* With bill barely twice its depth. Nostrils very small and ovate. One species—*G. pacificus,* 25″, legs greenish, bill orange, head, neck, and below white, mantle deep black, primaries black, tipped white, tail white, broadly banded black, Australia and Tasmania.

Also the genus *Leucophæus.* With hind toe joined to second by a rugose membrane. Webs of anterior toes coarsely indented. One species—*L. scoresbii,* 18″, legs vermilion, bill cherry, orbital ring white, head, neck, and below lavender, mantle black, primaries chiefly black, second quill with minute white tip, fifth quill with white spot on inner web. South of S. America.

Also the genus *Pagophila.* With hind toe joined to second by a strong serrated membrane. All nails curved. Tibia feathered nearly to joint. One species—*P. eburnea,* 18″, the Ivory Gull, legs black, bill greenish, with yellow tip, orbital ring brick-red, all white. Circumpolar, southwards in winter to north of France.

Also the genus *Rissa.* Hind toe obsolete or rudimentary. Two species—*R. tridactyla,* 15½″, the Kittiwake, legs blackish, bill yellow, mantle grey, rest white, quills chiefly grey, outer web of first quill black, grey in others, first, second, and third quills terminally black, fourth quill tip white, surmounted by a black bar, wing-lining white. Circumpolar, and in winter south to Mediterranean and Caspian Seas, coasts of America to about 35° N. lat.; *R. brevirostris,* 15″, legs vermilion, bill yellow, under wing-coverts grey. Lower part of Behring Sea.

Also the genus *Xema.* Hind toe very small and free. Two species—*X. sabinii,* 13″, legs blackish, bill black, tip yellow, orbital ring vermilion, beneath which is a minute white speck, head deep slate-grey, terminating in a dark black collar, first to fifth quills white, rest black with white tips and broad white margins on inner webs; *X. furcata,* 20″, legs red, bill black, tip horny, white band at base of the bill, head sooty black, with no terminal collar, first to fourth quills black, with white on inner webs, fifth and sixth tipped white, Arctic regions, and down to 14° S. lat. on the American side of the Pacific.

Also the genus *Rhodostethia.* With tail cuneate, and central pair of rectrices produced. One species—*R. rosea,* 13½″, legs red, bill black, orbital ring vermilion, head and below white, narrow black collar, mantle and quills pearl-grey, outer web of first quill black.—*In winter:* No black collar. Circumpolar, exceptionally to about 54° N. lat. in winter. (B.M. Cat., xxv. 161–312.)

## Subfamily STERNINÆ. TERNS and NODDIES.

**Tehari,** *India;* **Ramadasu** (Telugu); **Liniya,** *Ceylon;* **Myit-hway,** *Burma.*

Bill almost straight; both mandibles of about equal length, with acute tips. Nostrils linear. Hind toe small, raised, and free. Web usually scalloped. Tail forked (rounded or slightly pointed in *Hydrochelidon* and *Phaëthusia*). Long pointed wing. More lightly built than Gulls, and have a different flight. Feed on fishes. Rarely settle on the water.

(i.) *Tail-feathers rounded or slightly pointed* (236, 237).

## Genus **HYDROCHELIDON.**

ὕδωρ = water; χελιδών = a Swallow.

Bill long and slender. Tail short, less than half length of wing. Webs deeply marginate.

### 236. **Hydrochelidon leucoptera.** The White-winged Black Marsh-Tern.

*Leucoptĕra* = λευκόπτερος, white-winged; from λευκός + πτερόν.

♂ 9″ to 10″. Legs red. Bill livid red in summer, blackish in winter. Head, neck, mantle, below, and wing-lining black. Upper tail-coverts and tail white.—*In winter:* Parti-coloured and below white. Temperate Europe and Asia south of 55° N. lat. in summer. Africa to Australia in winter. Often met with in Ceylon, but not identified in India west of Tipperah. Eggs (1·3 × 0·9) chocolate, blotched grey and brown. (B. 1497.)

### 237. **Hydrochelidon hybrida.** The Whiskered Marsh-Tern.

*Hybrĭda* = a mongrel, hybrid; because Pallas thought it like a hybrid between *H. nigra* and *Sterna fluviatilis.*

♂ 10″ to 11″. Legs dull red. Bill lake. Forehead, crown, and nape black. White eye-line. Chin, cheeks, throat, vent, under tail-coverts and wing-lining white. Abdomen dull black. Upper tail-coverts and tail grey.—*In winter:* Front and round bill white. Beneath white. S.W., C., and S. Europe, Africa, Asia, to China and Australia. Three eggs (1·51 × 1·09), olive, spotted purple and brown. Breeds along the Danube and in the Orange River Colony, forming a curious but not the only instance of a bird nesting both north and south of equator. (J. 984. B. 1496.)

Also *H. nigra.* 9½″ to 10″. The Black Tern. Legs red-brown. Bill black. Head and neck black. Mantle and wings slate. Breast and abdomen dark lead colour.—*In winter:* Forehead white, crown and nape mottled. Europe south of 60° N. lat., Africa. Not traceable in Asia beyond W. Turkistan.

*H. surinamensis.* 9½″. Similar to *H. nigra*, but abdomen deep black. Temperate N. America to S. America in winter.

Also the genus *Phaëthusia*, with webs slightly indented. One species—*P. magnirostris*, 14¾″. Legs olive, webs yellow. Bill yellow. Head and nape black, with narrow white line at base of bill. Mantle and tail slate-grey. Primaries dark brown, with whitish wedges on inner webs. Below white. S. America.

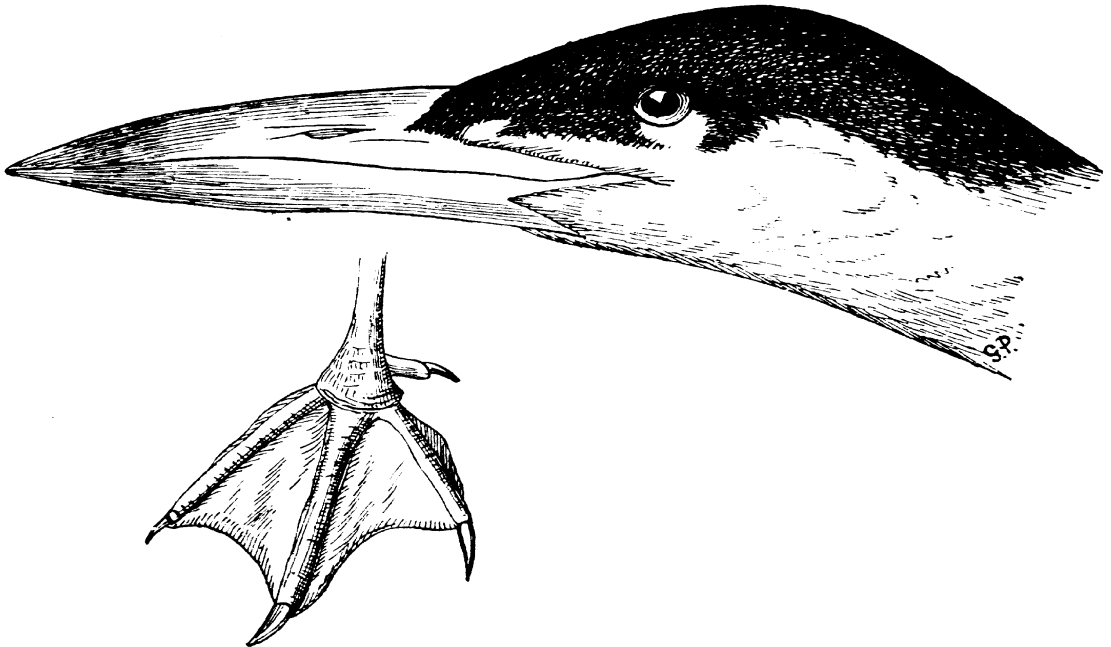
(ii.) *Outer tail-feathers longest, pointed.* (238–254.)

## Genus **HYDROPROGNE.**

Bill stout and deep. Tail emarginate, short, rather more than one-third length of wing. Webs fully developed.

### 238. **Hydroprogne caspia.** The Caspian Marsh-Tern.

♂ 18″ to 20″. Legs black. Bill coral-red. Head and nape black. Above pearl-grey. Back, neck, and below white. Some primaries edged and tipped.—*In winter:* Head white, with black streaks. (J. 982. B. 1498.) See illustration, p. 222.



238. *Hydroprogne caspia*, 3.4.75.

## Genus **STERNA.**

The Latinised form of the name. Cf. Frisian *Stirn*, German *Tänner*, Swedish *Fisk-tärna*, Norwegian *Makrel-tern*, our *Tern* or *Tarney*. Derivation unknown.

Bill slender, lengthened. Tail much forked, with outer rectrices prolonged and generally more than half length of wing (*S. anglica* less than half, *S. seena* more than three-quarters). Webs well developed.

*Crown black in summer.*

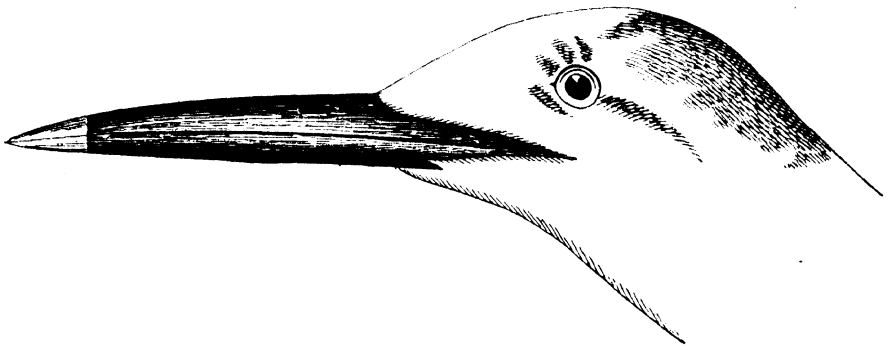
*Wing from* 11¼″ *to* 15″.

### 239. Sterna anglica. The Gull-billed Marsh-Tern.

♂ 14″ to 16″. Legs black. Bill black. Front, crown, and nape black. Sides of head white. Five primaries tipped on inner webs. Below white.—*In winter:* Head white, streaked grey and black. Temperate and warm regions of Old World (except S. Africa), America, but almost unknown on the Pacific side. Common in India and Ceylon. Eggs intermediate in character between those of Terns and Gulls (2·0 × 1·46). (J. 983. B. 1499.)

### 240. Sterna cantiaca. The Sandwich Sea-Tern.

♂ 17″ to 18″; 14 oz. ♀ 16″ to 17″; 12 oz. Legs black. Bill black, tip yellow. Feathers of nape prolonged and pointed. Lower parts rosy.—*In*



*winter:* Black crescent in front of eye. No rosy hue. Coasts of N. Atlantic, Mediterranean, Black and Caspian Seas in summer.—*In winter:* S. Africa, Red Sea, Persian Gulf, and Sind. Eggs (2·1 × 1·4) buff, marked brown. (B. 1500.)

### 241. Sterna media. The Smaller Crested Sea-Tern.

♂ 15″ to 17″. Legs black. Bill yellow. Crest black. Cheeks, neck, and below white. Mantle grey. Quills dark grey, with white on inside of inner webs.—*In winter:* Crown black and white, and a black band from nape to the

front of the eye. Coasts of Indian Ocean, with Persian Gulf, Red Sea, and Mediterranean. (J. 990. B. 1501.)

Also *S. maxima*. 21″. Legs black. Bill orange-red. Neck and tail white. Mantle pearl-grey, with conspicuous white line. Outer webs of primaries grey. America to W. Africa in winter.

*S. elegans*. 16½″ Similar to *S. maxima*, but bill is longer and more slender. Pacific coast of America.

*S. eurygnatha*. 17½″. Similar to *S. elegans*, but bill is yellow. East side of America.

### 242. Sterna bergii. The Large Crested Sea-Tern.

♂ 19½″ to 21″; 14 oz. to 1 lb. ♀ 14 oz. to 1 lb. Legs black. Bill pale yellow. Resembles *S. media*, but has a white frontal band and broader white lores. Mantle grey, tinged lilac. Long black crest. Face, nape, and below silky white. Tips of secondaries white.—*In winter:* Crown mottled white, and some of the nuchal feathers with white tips. Indian Ocean and Polynesia, also west coast of S. Africa, the Red Sea, and China Sea up to Japan, Australia, but not New Zealand. Common throughout India and Ceylon. One to three eggs (2·45 × 1·71), greenish, blotched and spotted brown and purple. (J. 989. B. 1502.) See illustration, p. 225.

Also *S. bernsteini*. 17″. Legs black. Bill olive, tip yellow. Forehead and lores white. Crest-feathers black and white. Mantle pale grey. Rump white. The Moluccas, Chagos Archipelago, Seychelles, Rodrigues, and Mascarene Islands.

*S. frontalis*. 16″ to 17″. Legs red-brown. Bill black. Forehead and lores white. Crest-feathers filamentous and not acuminate. Mantle pale grey. Outer web of first primary black nearly to the tip. Below white, tinged pink. Australia and New Zealand.

### 243. Sterna dougalli. The Roseate Sea-Tern.

In honour of Dr. MacDougall, of Glasgow, who first sent a specimen and description to Montagu in 1812.

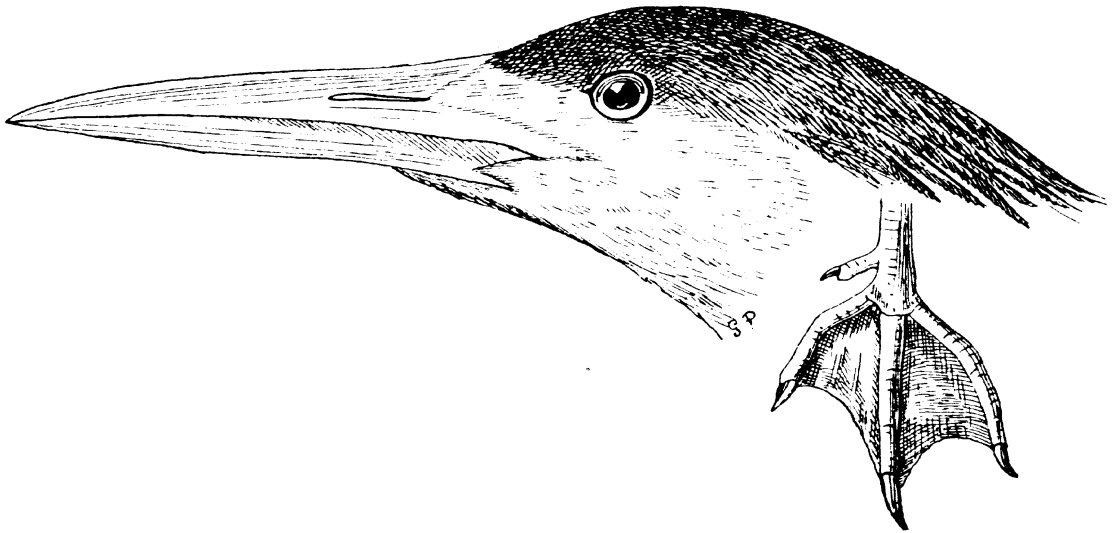
♂ 15⅘″. Legs coral. Bill black. Black head, and long, pointed, velvet-black crest. Beneath rose. Mantle pale grey. White collar round hind neck. Inner webs of primaries white to the tips.—*In winter:* Forehead spotted white, and below nearly white. Coasts of temperate and tropical Atlantic, and of the Indian Ocean. One or two eggs (1·58 × 1·12), greenish, spotted and blotched brown and purple. (B. 1508. S.F. iii. 376.)

### 244. Sterna albigena. The White-cheeked Sea-Tern.

♂ 14½″. Legs Indian red. Bill blackish. Patch in front of eye. Back, scapulars, wings, and tail French grey. First primary with large portion of inner web white to margin. Below dark vinaceous grey. Wing-lining pale grey.—*In winter:* Crown mixed black and white. Wing-lining white. From Red Sea to Laccadives. (B. 1505.)

### 245. Sterna longipennis. Nordmann's Sea-Tern.

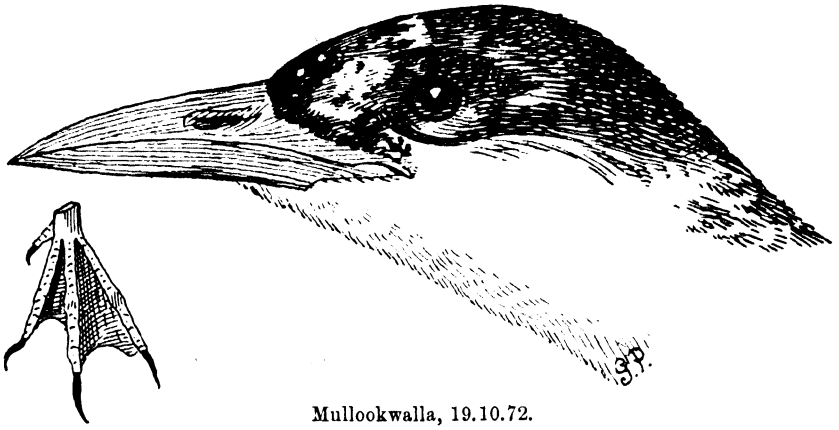
♂ 14½″. Legs black. Bill black. Similar to *S. fluviatilis*. From Kamschatka to New Guinea, Malay Peninsula, and Ceylon. (B. 1507.)



242. *Sterna bergii.*

*Wing* 9″ to 11″ (*S. hirundinacea*, 11¼″, *excepted*).

**246. Sterna seena.** The Indian River-Tern.



Mullookwalla, 19.10.72.

♂ 15″ to 17″. Legs red. Bill deep yellow. Mantle and tail-coverts dark grey. Tail pearl-grey. Lateral tail white. Flanks ashy.—*In winter:* Head with white streaks. India to Malacca. Three or four eggs (1·65 × 1·25), grey, spotted and blotched brown and purple. (J. 985. B. 1503.)

**247. Sterna melanogaster.** The Black-bellied River-Tern.

♂ 12″ to 13″. Legs vermilion. Bill orange. Breast pearl-grey. Tail pale grey, outer rectrices white. Abdomen brown-black. Wing-lining white.—*In winter:* Head dusky. Abdomen grey. From S. Afghanistan to Bhutan, throughout India, but not authenticated in Ceylon. Eggs 1·25 × 0·95. (J. 987. B. 1504.)

**248. Sterna fluviatilis.** The Common River-Tern.

♂ 12½″ to 14¼″. Legs red. Bill deep red. Black markings on bill near tip. Wings reaching beyond tail. Remiges twenty-nine. Tail-feathers grey, with white on inner webs. Abdomen greyish. First primary, outer web black, and a broad streak of dark grey next the white shaft on inner web. Rest of inner web white, and tip ash-grey.—*In winter:* Crown streaked and mottled with white. Temperate regions of Asia, Europe, and N. America, ranging into Ladak and higher Himalayan valleys. In winter visiting India and Ceylon. Eggs (1·75 × 1·2) olive, blotched brown and grey. (J. 986. B. 1506.)

Also *S. macrura*. 14″ to 15″. The Arctic Tern. Legs red. Bill red. White streak from base of bill to side of neck. Mantle pearl-grey. Outer web of first primary blackish. Shaft white, and narrow line of grey on inner web, which is white, with ashy tip. Tail-coverts white. Abdomen French grey.—*In winter:* Forehead and crown mottled white. Circumpolar and in winter southwards to coasts of America and Africa and to 66° S. lat. in Southern Ocean.

*S. hirundinacea*. 16½″. Bill and legs red. Rump and tail white. Below nearly white. S. America.

*S. vittata*. 16″. Bill and feet cherry-red. White moustachial streak prolonged to the nape. Below grey. S. Atlantic.

*S. virgata.* 13″. Bill and feet red. Mantle and under parts dark smoky grey. Kerguelen Island and the Crozettes.

*S. albistriata.* 12″. Legs and bill yellow. Broad streak of white passes under the eye to the nape. Mantle dark grey. Breast and abdomen pale grey.—*In winter:* Head grey. New Zealand.

*S. fosteri.* 14″ to 15″. Legs and bill orange. Forehead, crown, and nape sooty black. Abdomen white. Outer web of long tail-feathers white. Inner web dark grey. N. America.

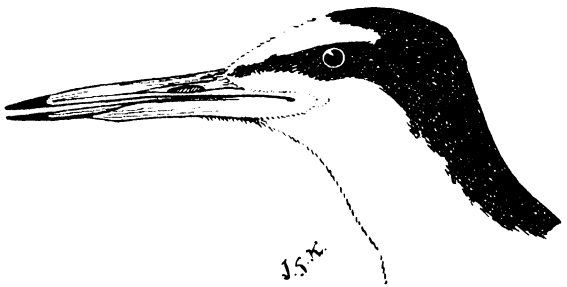
*Wing* 6½″ *to* 7½″.

**249. Sterna sinensis.** The White-shafted Ternlet.

♂ 10″. Legs orange. Bill yellow, tip black. Broad arrow-shaped white patch on forehead. Forehead white and lores black. Shafts of outer primaries white. Rump, tail-coverts, and tail white. Ceylon, Burma, through S.E. Asia, to Japan and Australia. Two or three eggs (1·24 × 0·94), drab, broadly spotted and streaked. (B. 1509. S.F. v. 325.)

**250. Sterna minuta.** The Little River-Tern.

♂ 8″ to 9½″. Legs orange. Bill yellow, black tip. Rump, upper tail-coverts, and tail white. Shafts of outer primaries dark. Crown, eye-line, nape, and hind neck black. Remiges twenty-six. Resembles *S. sinensis.* Europe, and in winter Africa, W. and C. Asia, N. India as far as the Godavari, Burma, and Java. Eggs (1·2 × 1·0) buff, marked brown and grey. (J. 988. B. 1510.)



Chinnee Creek, 1875.

**251. Sterna saundersi.** The Black-shafted Ternlet.

♂ 9$\frac{1}{10}$″. Legs yellowish olive. Bill yellow, tip dusky. First three primaries black, with black shafts and broad white margins to inner webs. Rump, tail-coverts, and tail grey. Back grey. Triangular frontal patch. Crown velvet-black. Closely allied to *S. minuta* and *S. sinensis.* Coasts of Indian Ocean, from S. Africa to Burma and Lower Pegu, Red Sea, and Persian Gulf.

Also *S. antillarum.* 8½″. Legs orange. Bill yellow, tip black. Mantle, rump, and tail grey. First and second primaries black. N. and C. America, visiting W. Coast of Africa.

*S. superciliaris.* 9″. Legs dull yellow. Bill greenish. First, second, third, and fourth quills dusky, with narrow white margins on inner webs of first and second. S. America.

*S. lorata.* 9½″. Legs brownish. Bill greenish, tip dusky. Web between second and third toes considerably indented. Mantle and tail slate-grey. Belly grey. Primaries with white shafts. Coast of Peru.

*S. nereis.* 10″. Legs yellow. Bill yellow, tip dusky. A black spot in front of the eye, and a narrow black ring round the eye. Shafts of outer primaries grey. Forehead and lores white. Below white. Australia and New Zealand.

*S. balœnarum.* 9″. Legs yellow. Bill black. Forehead black to the base of the bill. Shafts of primaries white. Tail grey. Outer rectrices white. S. and W. Africa.

*Crown always white.*

**252. Sterna melanauchen.** THE BLACK-NAPED OCEAN-TERN.

♂ 12″ to 13½″. Legs black. Bill black, red tip. Head white, nape, orbits, and ear-coverts black. Eye-line widening to nape black. Mantle pale grey. Wing almost white. First quill dark grey on outer web; shafts of all primaries white. Outer rectrices white. Chiefly insular throughout tropical parts of Indian Ocean, the Malay Archipelago, and N. Australia, the Loochoo, Friendly, and Navigator groups. Two eggs (1·56 × 1·12), yellowish and double-spotted. (J. 991. B. 1512.)

Also *S. trudeau.* 14″. Legs dull orange. Bill yellow, banded black. Crown and nape white, merely a blackish streak through the eye. Above and below grey. Chin and rump white. S. America.

*Crown and lores black.*

**253. Sterna anæstheta.** THE BROWN-WINGED OCEAN-TERN.

♂ 14″. Legs black. Bill dusky red. Crown and lores black. Front of forehead, eye-stripe, and nape white. Quills blackish. Rump and mantle umber-brown. Tail grey-brown, outer rectrices white on outer webs. Tropical and subtropical seas. One or two eggs (1·72 × 1·2), white, finely spotted. (J. 992. B. 1513.)

**254. Sterna fuliginosa.** THE SOOTY OCEAN-TERN.

♂ 17¾″. ♀ 16″. Legs purplish. Bill purplish. Lores black. Middle claw much curved. Forehead, chin, neck below, axillaries, wing-lining, and lower tail-coverts white. Nape velvet-black. Mantle deep black. Tail sooty, outer feathers dull white, with grey on inner web. Tropical and subtropical seas. Eggs (1·94 × 1·34) whitish, spotted red-brown. (B. 1514.)

Also *S. lunata.* 15″. Legs reddish black. Bill black. Crown, nape, and loral stripe black. Centre of forehead and eye-streak white. Mantle and tail-coverts dark slate-grey. Primaries with brown shafts. Below white. Low Archipelago and Pacific isles.

*S. aleutica.* 13½″. Legs and bill black. Mantle slate-grey. Rump and tail white. Breast and abdomen slate-grey. Shafts of primaries white. Alaska to S.E. Japan.

Also the genus *Nœnia.* With conspicuously prolonged plumes at the gape. Tail slightly forked, with the two outer rectrices equal. One species—*N. inca*, 16″. Legs red. Bill crimson. Forehead and crown dark slate. A white moustache prolonged to the auricles and thence detached in curling feathers about 2″ long. Mantle and tail slate, outer rectrices brown. Coasts of Peru and Chili.

(iii.) *Outer tail-feather shorter than the next one* (255–257).

## Genus **ANOÜS**.

*Anŏüs* = *ἄνοος* (trisyllable), without understanding (*νόος*, *νοῦς*), foolish.

Bill, tip decurved. Nostrils in groove, further from base of bill than in *Sterna*. Tail cuneate. Fourth feather from outside longest (third in *Micranous*). Feet large. Toes fully webbed. Plumage dark. Tropical oceanic birds allied to Terns, but with a slower and heavier flight and very different habits. Live in the open sea and settle on the water to feed. Tropical and subtropical seas. The only Tern's eggs laid in a nest.

**255. Anoüs stolidus.** The Noddy.

♂ 14″ to 16½″. Legs red-brown. Bill black. Forehead, crown, and throat grey. Sooty brown above and below. Quills and tail darker. Tropical and subtropical seas, breeding, as a rule, where found. One egg (2·08 × 1·38), whitish, spotted dark brown and purple. (J. 993. B. 1515.)

**256. Anoüs leucocapillus.** The White-headed Noddy.

♂ 11″ to 13″. Legs black. Bill black. Front and crown white. Lores and chin black. Nape and shoulders nearly blue-black. In tail, third feather from outside the longest. Rest of plumage sooty brown. Tropical seas. (J. 994. B. 1516. S.F. ii. 322.)

Also *A. hawaiiensis*. 13½″. Legs brown. Bill black. Forehead and crown greyish white. Lores black. Cheeks and throat lead-grey. Nape, shoulders, mantle, and tail dull lavender-grey. Third tail-feather from outside longest. Below sooty black. Sandwich Islands.

*A. tenuirostris*. 12″. Legs brown. Bill black. A small black circlet above the eye, followed by minute white eyelid streak and then a small black spot. Cheeks grey. Lores lavender. Third tail-feather from outside longest. From Seychelles and Madagascar to Australia.

Also the genus *Procelsterna*. With second feather from outside of tail longest. Foot very long. General colour grey. Two species—*P. cærulea*, 9¾″, legs brown, bill blackish, dark grey above, pale grey below, shafts of primaries black, Central Polynesia; and *P. cinerea*, 11″, legs reddish black, bill black, pale grey above, white below, shafts of primaries brown, Australian and New Zealand seas.

## Genus **GYGIS**.

Bill stout at the base, pointed. Culmen almost straight or slightly upcurved. Toes slender. Mid toe abnormally long, webs deeply indented. Plumage pure white.

**257. Gygis candida.** The White Noddy.

♂ 12″ to 13″. Legs dark brown. Bill black. Irides blue. Narrow black ring round the eye. Second feather from outside of tail longest. Shafts brownish. W. Indies, across Atlantic to Indian Ocean, Malayasia to Australia, Polynesia to the Sandwich Islands. (B. 326. S.F. vii. 447.)

Also *G. microrhyncha*. 10½″. Legs brown. Bill black. Third feather from outside of tail longest. Shafts white. Marquesas Islands.

## Subfamily Rhynchopinæ. Skimmers or Scissors-bills.

Bill much compressed. Upper mandible freely movable, and considerably shorter than the lower (the bill of the young when hatched resembles that of a Tern). Wing long, first primary longest. Tail short, slightly forked. Feet small, webs with concave edges. Temperate and tropical America, Africa, India, to Burma.

## Genus **RHYNCHOPS**.

ῥύγχος = a bill, ὤψ = a face.

Lower mandible knife-like, flexible, truncated at end, and closely marked on side with minute oblique ridges. Nostrils elongate, opening in an irregular hollow.

**258. Rhynchops albicollis.** The Indian Skimmer or Scissors-bill.

♂ 16½″. Legs vermilion. Bill orange. Crown, nape, back, wings, mid-rump, mid tail-coverts, and inner web of median rectrices blackish brown. Forehead, lores, cheeks, neck all round and below white. Sides of rump, tail-coverts, and rest of tail white.—*Young* have bill and feet dusky. Large rivers of India and Burma. Not known in Ceylon. Four eggs (1·63 × 1·18), buff, blotched and streaked brown and purple. (J. 995. B. 1517.)

Also *R. flavirostris*. 17″. Legs vermilion. Bill orange. No white collar. Above umber-brown, beneath white. Africa and Red Sea.

*R. nigra*. 17″. Legs orange. Bill red, tip black. Above black, beneath white. Under wing-coverts white. Tail chiefly white. N. America.

*R. intercedens*. 16½″. Similar to *R. nigra*, but tail chiefly brown, with merely white borders to the outer webs. S. America.

*R. melanura*. 19½″ to 20½″. Similar to *R. intercedens*, but tail dark brown, with whitish margins. Under wing-coverts dusky. S. America.

## Family STERCORARIIDÆ. Skuas.

Bill with a horny cere extending more than half the bill. Hind toe small. Anterior toes long and fully webbed. Claws strong, much curved, and sharp. Wings long and pointed, first quill longest. Tail long and rounded, with central pair projecting. Sternum with one notch on each side of posterior margin. Gull-like birds that live mainly by robbing Gulls, Terns, and Petrels of their food. Plumage dark-coloured. Breed in high latitudes. Two eggs, olive, spotted brown.

### Genus **STERCORARIUS.**

Bill like a Gull's, with upper mandible bent over lower. Tail long and rounded, with central rectrices projecting 3″ or more.

**259. Stercorarius pomatorhinus.** The Pomatorhine Skua.

*Pōmătŏrhīnus*, from πῶμα, genitive πώματος = a lid or cover; ῥίς, genitive ῥῑνός = the nose, nostril, from the nasal operculum. Originally written *pomarinus*.

♂ 20″ to 21″. Legs blackish. Bill horny brown. Forehead, cheeks, and crown sooty black. Acuminate feathers of neck white, edged straw colour. Breast dull white, barred black. Mantle, upper tail-coverts, and rectrices deep brown. Primaries brown, with white shafts. Abdomen, flanks, and under wing umber. Two central tail-feathers 4″ longer than the others, rounded at ends, and twisted upwards. Breeds in Arctic regions north of 70°, and ranges in winter to Africa, Australia, and S. America. A single specimen was once obtained by Colonel Tickell at Moulmein. Eggs (2·3 × 1·65) olive, spotted dark brown. (B. 1519.)

**260. Stercorarius crepidatus.** Richardson's Skua.

♂ 20″. Legs black. Bill brown. Crown, nape, lores, and sides of head dark brown. Cheeks, ear-coverts, narrow collar (sharply defined in front) white. Throat and collar tinged straw colour. Often a pale brown gorget. Mantle, wings (above and below), and tail dark brown. All shafts of primaries white. Median rectrices pointed, and project 3″ beyond the others. Arctic and sub-Arctic regions down to lat. 55°, and in winter to Europe, Africa, Persian Gulf,

Australia, New Zealand, N. Pacific, and Atlantic, as far south as Rio de Janeiro. Eggs (2·4 × 1·6) olive, spotted brown and grey. (B. 1518.)

Also *S. parasiticus*. 22″. The Long-tailed or Buffon's Skua. Legs olive. Bill horny brown. Forehead, lores, crown, and nape brownish black. Mantle ash-brown, tinged grey. Shafts of first and second quills white, of the rest brown. Neck yellowish, and breast white. Abdomen, flanks, and under wing brown. Breeds in the Arctic Circle, and ranges in winter south as far as the Straits of Gibraltar, to 40° N. on Atlantic side of America, and a little further south on Pacific side. Eggs (2·1 × 1·5) olive, clouded brown.

Also the genus *Megalestris*. With short tail, the central pair of feathers projecting more than ½″ beyond the others. Four species—*M. catarrhactes*, 21″, the Great Skua, head and nape umber-brown, acuminate feathers on neck streaked yellowish brown, primaries umber, back streaked and mottled rufous, below tawny, Greenland, Iceland, and Norway, ranging south to Straits of Gibraltar and New England States; *M. chilensis*, 21″, similar to *M. catarrhactes*, but brighter in colour, above boldly spotted chestnut, below rich rufous, S. America; *M. antarctica*, 23″ to 24″, legs black, bill black, above and below sooty brown, back slightly striated, Southern Ocean from S. America to Australia and New Zealand, ranging as far north as Madagascar, and perhaps Ceylon; *M. maccormicki*, 21″, legs and bill black, head and neck clay-brown, neck-feathers tinged golden, abdomen coffee-brown, mantle, wings, and tail umber as in *M. antarctica*, Victoria Land and high Antarctic region. (B.M. Cat., xxv. 314–334.)

## Order **STEGANOPODES.**

Totipalmate, with four toes united by web. Oil-gland tufted. Fifth secondary wanting. After-shaft rudimentary or wanting. Desmognathous, distinctly connected with the Accipitres. Young hatched blind and helpless.

| | | |
|---|---|---|
| Mid-tail greatly produced. | Phaëton | Tropic Birds. |
| Tail rounded or cuneate | Pelecanus | Pelicans. |
| | Phalacrocorax | Cormorants. |
| | Plotus | Darters. |
| | Sula | Boobies. |
| Tail forked | Fregata | Frigate Birds. |

## Order **STEGANOPODES.**

### Tropic Birds, Pelicans, Cormorants and Darters, Gannets or Boobies, and Frigate Birds.

Totipalmate, with four toes united by a web. Hind toe turned inwards. Tongue rudimentary. Oil-gland tufted. Fifth secondary wanting. After-shaft rudimentary or wanting. Plumage of neck continuous. Desmognathous, distinctly connected with the Accipitres. Young hatched blind, either naked or covered with down, undergoing a protracted downy stage, during which they are helpless and fed by parents. Food chiefly fishes, crustacea, or insects.

### Family PHAËTONIDÆ (Flying Fishers). Tropic or Boatswain Birds.

About the size of the smaller Gulls, and combine the structure of Gannets or Cormorants with habits and appearance of Terns. Plumage satin white or salmon colour, with a few black markings. Bill pointed, not hooked. Nostrils narrowly pervious. Palate imperfectly desmognathous. Mid-tail greatly produced and attenuated. Web between toes not emarginate. Intertropical seas. Single egg, pinkish white, mottled and spotted purple.

## Genus **PHAËTON.**

φαετόντις, poetical feminine of φαέθων = shining.

Toes webbed to the tip. Wings very long. First primary longest. Bill pointed, curved on top. Margins of bill finely dentated. Tail of twelve to sixteen feathers.

*Bill red. Back and scapulars transversely barred black.*

**261. Phaëton indicus.** The Short-tailed Tropic Bird.

♂ 18″, and including two long (much prized) central tail-feathers 20½″; 1½ lbs. ♀ 20¾″. Legs white, claws black. Bill from gape 3¼″, dull orange-red. Black crescent in front of eye. Narrow black line from gape to nostrils and from nostrils to culmen, dividing feathers from bill. First five primaries black, narrowly tipped white. Back, scapulars, rump, and upper tail-coverts white, regularly and closely barred black. Tail of twelve feathers. Mid-tail not exceeding 12″. Indian Ocean. From Red Sea to Persian Gulf to the Straits of Malacca. (B. 1533.)

Also *P. æthereus.* 40″. The Tropic Bird. Bill coral red. A conspicuous black band behind eye. Tail of fourteen feathers. Mid-tail about 26″. Tropical portions of Pacific and Atlantic Oceans.

*Bill mostly yellow. Back uniform, not transversely barred black.*

**262. Phaëton flavirostris.** The White Tropic Bird.

♂ 29″. Legs dusky. Bill from gape 2⅘″, yellow. A crescentic black patch in front of eye. White, with black wing-band. Tail of twelve feathers white, stem black. Mid-tail 18″. Intertropical seas except the east coast of N. America. (J. 997. B. 1534.)

Also *P. fulvus.* 32″. As in *P. flavirostris,* but general colour is rich salmon. Tail of twelve feathers. Mid-tail 21″. Christmas Island, Indian Ocean.

*P. americanus.* 30″. Allied to *P. flavirostris,* but more black on primaries, and third quill is black, narrowly tipped white. Tail of twelve feathers. Mid-tail, 16¾″. From Bermuda to W. Indies.

**263. Phaëton rubricauda.** The Red-tailed Tropic Bird.

♂ 24″ to 25″; 1 to 1¼ lb. ♀ 1 lb. 6 oz. Legs red. Bill red. Silky white, with pink gloss. Black band on side of head. Tail of sixteen feathers. Mid-tail 19″, carmine, with black shafts.—*Young* with upper plumage black arrow-marked. Tropical portions of Pacific and Indian Oceans. (J. 996. B. 1535.)

## Family PELECANIDÆ (Swimming Fishers). Pelicans.

Huge bill, long and flattened, with pouch. Tail of twenty to twenty-four feathers, rounded. Of large size. Web between toes not emarginate. Frequent inland lakes and rivers. Tropical and temperate regions of Old and New Worlds.

## Genus **PELECANUS.**

πελέκανος = a Byzantine form of πελεκάν, a bird known to the Greeks, a Woodpecker; from πέλεκυς = an axe.

Nostrils concealed in a groove extending throughout bill. Two bony arches support a huge extensive pouch. Wings long and ample. Second primary

(i.) *Base of lower mandible entirely naked* (264–268).

*Feathers of forehead terminate in a point.*

**264. Pelecanus roseus.** THE EASTERN WHITE PELICAN.

**Penr,** *India;* **Gara-polo,** *Bengal;* **Sekhawet,** *Burma.*

♂ 62″. ♀ 54″. Legs flesh-pink. Bill 13″ to 16″, blue, mottled white, nail red. Plumage white (tinged pink in breeding season). Primaries and primary coverts black. Secondaries black, with white outer borders. Tertiaries whitish, with broad black margins. Pouch gamboge. No true crest in males, but in old females the crest is about 4″ long. Tail-feathers twenty-two. Breast-feathers of some birds golden. E. Asia and Malay Archipelago. Winter visitor to India and Burma. (J. 1003. B. 1520.)

**265. Pelecanus onocrotalus.** THE WHITE OR ROSEATE PELICAN.

*Ŏnŏcrŏtălus* = ὀνοκρόταλος, the Pelican, in Pliny; from ὄνος = an ass, and κρόταλον = a rattle.

♂ 66″ to 73″; 25 lbs. Legs fleshy. Bill 16″, with crimson central line, nail light red. Differs from *P. roseus* in having twenty-four tail-feathers. Primaries and winglet black. Secondaries have outer webs white and inner webs grey. Small crest. Pouch yellow, mixed red and purple. The female has a full crest of narrow pointed feathers directed backward, from 4″ to 5″ long. S. Europe, N. Africa, and S.W. Asia. Those found in N. India during cold season belong apparently to this species, but the greater number are intermediate in size and other characters between *P. onocrotalus* and *P. roseus*. (J. 1001. B. 1521.)

*Feathers of forehead terminate in a transverse concave line.*

*Under parts white.*

**266. Pelecanus crispus.** THE DALMATIAN PELICAN.

♂ 64″ to 72″. Legs plumbeous. Bill from gape 17″, plumbeous, nail orange. Pouch in breeding season orange. Silver-white. Crest full, soft, and recurving. Wings and back, at all seasons, white with black shafts. Tail of twenty-two feathers, white. S.E. Europe, N.W. Africa, and S.W. Asia as far east as India. Winter visitor to N. India and Sind. (B. 1522. S.F. i. 110.)

**267. Pelecanus philippensis.** THE SPOTTED-BILLED PELICAN.

**Woon-bah,** *Burma.*

♂ 51″ to 59″. Legs dark brown. Bill from gape 14″, pinkish yellow, with large blue-black spots, nail orange. Pouch dull purple, blotched blue-black. General plumage white. Back, rump, flanks, vent, and lower tail-coverts vinaceous pink. Slight white crest slightly recurved, and a mane of brownish feathers. Primaries dusky, with black shafts. Lower feathers lanceolate white, with grey margins. Tail twenty-two feathers, ashy brown. Throughout the Oriental region. Breeds in India and Burma. Three eggs (3·0 × 2·15), white greatly soiled. (J. 1004. B. 1523.)

**268. Pelecanus rufescens.** THE RED-BACKED PELICAN.

♂ 58″. Legs yellowish. Bill yellowish, nail orange. Pouch flesh-colour, with transverse parallel yellow lines. Resembles *P. philippensis*, but the sides of upper mandible are without spots. Feathers of head and neck narrow and straight. Lower back and rump vinaceous. Tail of twenty feathers. Africa, south of 16° N. lat., Aden.

Also *with general colour of under parts brown*:—

*P. fuscus.* ♂ 52″. ♀ 49″. With back of neck velvety brown in breeding season and white in winter. Pouch olive-brown. Legs black. Bill grey, irregularly spotted carmine. Tail of twenty-two feathers. Orbital skin blue. From Gulf of Mexico and Caribbean Sea.

*P. californicus.* Resembles *P. fuscus.* Orbital skin brown. From Pacific coast of N. America.

*P. thagus.* 60″. Similar to *P. fuscus.* With straw-coloured occipital crest about 2½″ long. Under parts finely streaked with white. Base of bill and sides of forehead covered with warty carunculations. Bill yellow, sides and tip of both mandibles red. Pouch black, with blue stripes. Legs slate. Tail of twenty-two feathers. Pacific coast of S. America.

(ii.) Also *with base of lower mandible feathered*:—

*P. erythrorhynchus.* 60″. Culmen ornamented with horny excrescences in breeding season. General plumage pure white. Naked skin round eye orange. Bill orange. Pouch pale yellow. Legs orange. Tail of twenty-four feathers. Temperate N. America, and south in winter to C. America.

Also *with ring of feathers surrounding naked orbital space*:—

*P. conspicillatus.* 60″. General colour pure white. Quills and their coverts, scapulars, and rump black. Tail of twenty-two feathers black. Bill yellow. Pouch yellow. Legs yellowish. Australia and Tasmania, ranging north to New Guinea.

## Family PHALACROCORACIDÆ (DIVING FISHERS). CORMORANTS and DARTERS.

Bill hooked at tip with smooth margins, or straight and pointed with toothed margins. Nostrils nearly obsolete. Plumage blackish. Tail of twelve or fourteen stiff feathers. After-shaft wanting. Web between toes not emarginate.

### Subfamily PHALACROCORACINÆ. CORMORANTS.

Bill hooked at tip, margins of commissure smooth. Almost world-wide, but absent from C. Pacific.

### Genus **PHALACROCORAX.**

Bill with narrow groove on each side, tip sharply hooked. Nostrils rudimentary. Under mandible truncated. Cuneate tail of twelve to fourteen stiff feathers. A gular pouch naked anteriorly. Second quill generally longest.

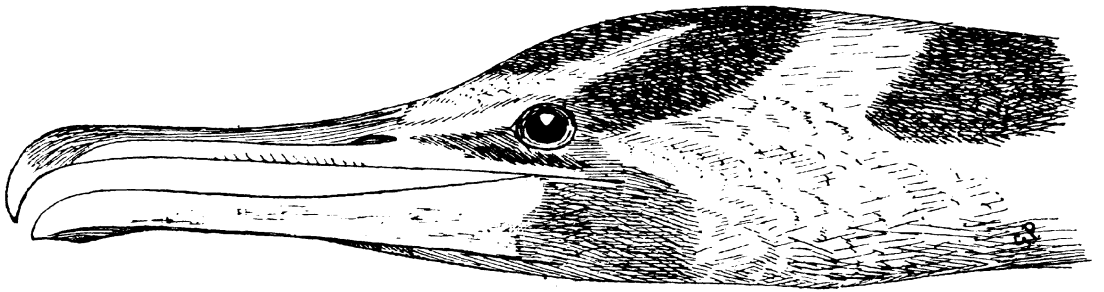
(i.) *Tail of fourteen feathers.*

**269. Phalacrocorax carbo.** THE LARGE CORMORANT.

*Carbo* = a coal; perhaps from the bird's sooty blackness.

**Jal-kowa,** *India*; **Wadda-silli,** *Sind*; **Bonta-kaki** (Telugu); **Tin-gyi,** *Burma.*

♂ 32″ to 36″. Legs black. Bill from gape 3¾″, brownish. Small pointed nuchal crest black. General colour bronze, with black edges.—*In summer:* White spot on thigh-coverts. Head and neck with white and hair-like plumes. In females the plume is larger. Europe, Africa, Asia, India, Ceylon, Burma,



269. *Phalacrocorax carbo.*

Australia, and Atlantic coast of N. America. Four to seven eggs (2·5 × 1·6), white (green when held up to the light). (J. 1005. B. 1526.)

Also *P. filamentosus.* 33″. General colour oil-green. White feathers bordering gular pouch thickly mottled greenish black. Large patch of white on each flank. E. Siberia to S. China and Japan.

*P. lucidus.* 32″. Foreneck and chest white. Flanks with scattered white plumes. Cape Verd Island, Africa, Socotra, and islands off south coast of Africa.

*P. capensis.* 24″. Below black, glossed blue. No white flank-patch. S. Africa.

*P. gaimardi.* 28″. Below smoke-grey. Long white patch on each side of neck. Legs red. Pacific coast of S. America.

(ii.) *Tail of twelve feathers.*

*No crest.*

### 270. Phalacrocorax fuscicollis. The Indian Shag.

**Pan-kowa,** *India;* **Niru-kahi,** (Telugu); **Nir-kakam,** *Ceylon.*

♂ 24″ to 27″. Legs black. Bill brown, red below. Cheeks pale brown. Scapulars and wing-coverts grey, bordered black. Bronze feathers as in *P. carbo.*—*In summer:* White ear-tufts. Chin black. India, Ceylon, and Indo-Burmese countries as far south as Tenasserim. Resident in India. Three to five eggs (2·1 × 1·4), white (emerald-green when held up to light). (J. 1006. B. 1527.)

Also *P. pencillatus.* 30″. Back, wing-coverts, and scapulars oil-green, margined dark green. Feathers bordering naked throat white. Tuft of long white hair-like feathers behind the ear. Pacific coast of N. America.

*P. neglectus.* 28″. Back, wing-coverts, and scapulars ash, margined brown; no white band bordering chin and throat. S. Africa.

*P. sulcirostris.* 25″. Head, neck, and below brownish black, with dull green gloss. Australia and New Zealand, ranging to New Guinea, the Moluccas and Borneo.

*P. vigua.* 30″. Feathers of back, wing, and scapulars lanceolate. White band bordering chin and throat. Atlantic and Pacific coasts of S. and C. America.

*P. mexicanus.* 28″. A subspecies similar to *P. vigua.* Gulf of Mexico.

*P. carunculatus.* 30″. Below pure white. Legs red. Nasal caruncles well developed. New Zealand.

Also *with legs and feet black:*—

*P. varius.* 28″. Scapulars bronze-grey, margined black. Lower back dark green. New Zealand.

*P. gouldi.* 24″. Scapulars bronze-green, narrowly margined steel-blue. Lower back dark green. Australia, Tasmania, and Louisiade Archipelago.

*P. hypoleucus.* 27″. Similar to *P. gouldi*, but feathering on throat not continued on lower mandible. W. Australia.

Also *with semi-erect crest on crown.*

*P. graculus.* 30″. The Shag. Scapulars bronze-green, with narrow dark margins. Legs black. No white in plumage. Said to dive to a depth of 120 feet. Three to five eggs (2·5 × 1·5), white (emerald-green when held up to light). Coasts of Norway, from Norway to Portugal, extending to British Isles and Iceland.

*P. desmaresti.* A subspecies of *P. graculus.* Mediterranean, Black and Caspian Seas.

*P. chalconotus.* 28″. Similar to *P. graculus*, but scapulars are edged pale green. Legs orange. New Zealand.

Also *with single crest well developed. General colour below white:*—

*P. onslowi.* 25″. Foreneck white. Nasal caruncles well developed. Dorsal patch white. From Chatham Island.

*P. stewarti.* 29″. Similar to *P. onslowi*, but no nasal caruncles. Stewart and South Island, New Zealand.

*P. campbelli.* 25″. Similar to *P. colensoi*, but foreneck is entirely black, the white on chin and throat forming an isolated patch. Campbell Island.

*P. bougainvillii.* 30″. Similar to *P. campbelli*, but scapulars and wing-coverts margined greenish blue. Pacific coast of S. America.

*P. magellanicus.* 26″. Throat black, a white patch on the ear-coverts. Southern coasts of S. America.

*P. atriceps.* 29″. Similar to *P. albiventer*, but feathers round the eye white. South-west coast of S. America.

*P. albiventer.* 27″. Feathers round the eye black. Nasal caruncles largely developed. No white dorsal patch. South coast of S. America.

*P. verrucosus.* 27″. Similar to *P. albiventer*, but no trace of white bar on outer scapulars. Kerguelen Land.

Also *with two crests, one on crown and one on nape. Beneath grey:—*

*P. punctatus.* 29″. No white flank-patch. Broad white eyebrow stripe continued down each side of neck to shoulder. New Zealand.

*P. featherstoni.* 25″. Similar to *P. punctatus*, but no white eyebrow stripe. Chatham Islands.

Also *with two crests. Beneath black:—*

*P. perspicillatus.* 38″. Feathers of face and crests purple. Spectacles of thick white skin round the eyes. Weight 12 to 14 lbs. Similar to *P. bicristatus*. Behring Island. Probably extinct.

*P. bicristatus.* 30″. Forehead naked. Wing-coverts and scapulars dark purple. Crests bronze-green. E. Siberia to Alaska.

*P. pelagicus.* 27½″ to 30″. Forehead feathered. Wing-coverts and scapulars violet-bronze with green reflections. Similar to *P. bicristatus*. Kamschatka to S. China, Alaska to W. Mexico.

Also *with two crests, one on each side of crown:—*

*P. auritus.* 31″. Crest-feathers mostly or entirely black. Loral region and gular pouch deep orange. Labrador to Florida, W. Indies, Gulf of Mexico, extending far inland to W. Texas.

*P. cincinnatus.* 32″. Differs from *P. auritus* in having crest-feathers white or mostly white. From Aleutian Islands and Alaska to Lower California and W. Mexico eastwards to Great Salt Lake.

*With culmen less than 1½″ from feathers on forehead to tip.*

### 271. Phalacrocorax javanicus. The Little Cormorant.

**Jograbi,** *India;* **Niru-kahi** (Telugu); **Nir-kakam,** *Ceylon.*

♂ 19″ to 22″. Legs black. Bill brown. Feathers black, edged brown. Scapulars and wing-coverts dark silvery grey. Chin white.—*In summer:* Short crest and white triangle on crown. Chin, throat, and below black. India, Ceylon, Burma, Malay Peninsula, Sumatra, Java, and Borneo. Common in India. Three to five eggs (1·76 × 1·16).

Also *P. africanus.* 22″. Similar to *P. javanicus*, but feathers of back and scapulars ash, with a black spot at tip. Africa south of 29½° N. lat., Madagascar.

*P. melanoleucus.* 23″. Chin, throat, and below white. Australia, ranging to New Zealand, New Guinea, the Moluccas, and Pelew Islands.

*P. brevirostris.* 22″. Chin, throat, and sometimes the foreneck white, rest of under parts black. New Zealand and Chatham Islands.

*P. pygmæus.* 22″. Chin and throat reddish brown, rest of under parts black. C. and S. Europe, N. Africa, S.W. and C. Asia.

## Subfamily Plotinæ. Darters.

Bill long, slender, and acute. Margins finely serrated. Nostrils rudimentary. Tail cuneate. Body nearly uniformly covered with small, rather soft contour feathers and very delicate down feathers. N. Syria, Africa, Mesopotamia to Indo-Chinese countries, through Malay Archipelago to Australia, New Guinea, and New Zealand. Tropical and subtropical America.

## Genus **PLOTUS**.

πλώς = a swimmer.

Bill slender, sharp pointed, both margins toothed near tip. No lateral groove. Wings long. Third quill longest. Tail long, cuneate, of twelve rigid feathers. Mid-tail transversely ribbed. Mid claw pectinate.

### 272. **Plotus melanogaster.** The Indian Darter or Snake Bird.

**Banwa,** *India;* **Sili,** *Sind;* **Goyar,** *Bengal;* **Killaki-pitta** (Telugu); **Pam buttara,** *Ceylon.*

♂ 32″ to 36″. Legs black. Bill dusky and yellow. Long and lanceolate scapulars more than 5″ long, spotted white. Outer webs of secondary coverts mostly silvery white. Foreneck never entirely chestnut. Black at base of foreneck, and chest not divided by buff bands from brown base of hind neck and upper back.—*Female:* Black at base of foreneck, and chest divided on each side from hind neck and upper back by a wide buff band terminating at the shoulder. Throughout the Oriental region, India, Ceylon, and Burma. Three or four eggs (2·13 × 1·37).

Also *P. novæ hollandiæ.* 31″. Scapulars less than 5″ long. Neck and under parts black. Long chestnut patch at base of foreneck.—*Female:* Foreneck and below white. Australia, New Guinea, and New Zealand.

*P. rufus.* 36″. Outer webs of secondary coverts mostly rufous. Entire foreneck from throat downward chestnut. Black at back of foreneck, and chest not divided by chestnut bands from base of hind neck and upper back.—*Female:* Black at base of foreneck, and chest divided on each side from base of hindneck and upper back by a chestnut band terminating at the shoulder. N. Syria, Africa, north of 20° N. lat., and Madagascar.

*P. anhinga.* 36″. Tail tipped white. Foreneck, chest, and below black.—*Female:* Foreneck and chest whitish. Tropical and subtropical America.

## Family SULIDÆ (Plunging Fishers). Gannets and Boobies.

Bill broad at base, pointed, curved, but not hooked, upper mandible with linear groove on each side. Nostrils closed. Plumage black and white, or brown and white. Tail wedge-shaped. Web between toes not emarginate. Smaller than a goose, ungainly and awkward on land, but a perfect swimmer, with great powers of flight.

"It is conjectured that Gannets destroy more than 100,000,000 of herrings yearly. The apparatus by which this bird is furnished for its aerial powers, as well as for aiding its arrowy descent, is very beautiful and instructive. Professor Owen, by inserting a tube into the windpipe, was enabled to inflate the whole body with air, and found that air cells communicating with each other pervaded every part, separating even the muscles from each other, and isolating the very vessels and nerves, and penetrating the bones of the wings. A large air cell was found to be placed in front of the forked bone or clavicle, which was furnished with muscles, whose action was instantaneously to expel the air, and thus in a moment to deprive the bird of that buoyancy so necessary for its flight, but equally detrimental to its swoop" (*The Ocean*, by P. H. Gosse).

Temperate and tropical seas.

## Genus **SULA.**

Latinised from the Norse *Sule*, which is said to mean an awkward fellow, a dolt.

Bill strong and pointed. Upper mandible furrowed, inner margins of both mandibles serrated. Nostrils minute, in long groove (completely closed in adults). Sides of head, chin, and part of throat naked. Tail wedge-shaped, of twelve to eighteen feathers. Third and fourth toes equal. Mid claw pectinated.

(i.) *Feathers on throat ending in a transverse line.*

*Plumage above uniform sooty brown.*

**273. Sula leucogaster.** The Booby.

♂ 26″ to 32″. Legs pale yellow. Bill from gape 4·7″, white, veined blue. Head, neck, and chest dark brown. Under parts white. Tail-feathers fourteen.—*Young* all brown. Tropical and subtropical seas, except Pacific coast of America. (J. 998. B. 1530.)

Also *S. brewsteri.* Similar to *S. leucogaster*, but head and throat are white, shading into grey on neck. Pacific coast of America.

*Plumage above, including head and neck, mostly white.*

**274. Sula piscator.** The Red-legged Booby.

♂ 26″ to 30″. Legs red. Bill red. Upper tail slightly mottled. Tail white, of fourteen or sixteen feathers. Outer webs of flight-feathers grey. Tropical and subtropical seas, except the Pacific coast of America. Common in the Malay Archipelago. (J. 999. B. 1531.)

Also *S. websteri.* Resembles *S. piscator*, but tail is brown-grey. Galapagos and neighbouring seas.

**275. Sula cyanops.** The Masked Booby.

♂ 33″. ♀ 32″. Legs lavender. Bill bluish. Tail, quills, and greater wing-coverts black. Outer webs of flight-feathers brownish black. Tail-feathers sixteen to eighteen. Tropical seas. Christmas Island, Indian Ocean. (B. 1532. S.F. v. 303.)

Also *S. variegata.* 29″. Similar to *S. cyanops*, but bill is red. Coasts of Chili and Peru.

*Plumage above dark brown.*

*S. nebouxi.* 34″. With feathers of head and upper neck narrow and pointed. Tail of sixteen feathers. Pacific coast of America.

(ii.) *Feathers on throat extending forward in two lines.*

*Mostly white. Head and neck buff.*

*Naked band down middle of throat.*

*Tail of twelve feathers.*

*S. bassana.* 36″. The Gannet or Soland Goose. Throat-patch 2″ long. Primaries black. Full adult dress is not obtained till sixth year. Single egg (3·0 × 2·0), pale bluish green. N. Atlantic, extending south in winter to Gulf of Mexico, N. Africa, Madeira, and Canary Islands.

*S. serrator.* 36″. Similar to *S. bassana*, but mid-tail is brown-black. Australia and New Zealand.

*S. capensis.* 31. Similar to *S. bassana*, but throat-patch is 6″ long, and tail is brownish black. S. Africa.

### Family FREGATIDÆ (Pouncing Fishers). Frigate Birds.

Bill long, nostrils in a groove, basal and linear, both mandibles bent downwards. Dark-coloured oceanic birds. Tail forked. Web between toes deeply emarginate. Single egg.

Frigate Birds live by piracy in tropical seas just as the Skuas do in colder latitudes, and use their powerful flight in pursuing Gannets, Gulls, and Terns, in order to rob them of their prey.

### Genus **FREGATA.**

Bill long, strongly hooked at end, and both mandibles bent down. Nostrils basal and linear in deep groove. Long tail forked, of twelve feathers. Large naked gular pouch, capable of great distension. Mid claw pectinated inside. Wings very long and pointed. First quill longest. Intertropical seas.

**276. Fregata aquila.** The Frigate Bird.

(Sometimes called "Sea-Hawk," "Man-of-War Bird," and might also be called a "Gannet-Eagle.")

♂ 37″ to 40″. Legs red. Bill blue-grey. Glossy black throughout. Gular pouch red. Breast and sides black. No white patch on flank. *Young* with head, neck, and abdomen white.—*Female:* breast and sides white. No white collar round back of the neck. Tropical and subtropical seas. Christmas Island, Indian Ocean. (J. 1000. B. 1524.)

**277. Fregata ariel.** The Smaller Frigate Bird.

♂ 30″ to 33″. Legs, ♂ black, ♀ red. Bill grey. Head and above ferruginous brown. Similar to *F. aquila*, but male has a white patch on each flank, and female has a white collar round the back of the neck. Tropical parts of Indian and Pacific Oceans from Madagascar to the Society Islands. (B. 1525. S.F. vii. 447.)

## Order **TUBINARES.**

Nostrils terminating externally in tubes separate or united. Horny covering of bill divided into several pieces by deep grooves. Hind toe small, rudimentary or absent. Anterior toes webbed throughout. Primaries eleven. Fifth secondary wanting. Oil-gland tufted. Special feather tract well developed. Schizognathous. Single egg. Young helpless, clad in down till fully grown. Sexes alike.

| | | |
|---|---|---|
| Nostrils united externally in one tube | Oceanites | Storm Petrels. |
| | Cymodroma | |
| Nostrils united externally with two openings | Puffinus | Shearwaters. |
| | Daption | Fulmars. |
| Nostrils distinct | Pelecanoides | Diving Petrels. |
| Nostrils separate, in horny sheath | Diomedea | Albatrosses.* |
| | Thalassogeron | |
| | Phœbetria | |

* Not represented in India.

## Order **TUBINARES.** Petrels, Shearwaters, Fulmars, Albatrosses.

Resemble Gulls externally, but as nearly allied to the Steganopodes as to any other order. Nostrils terminating externally in tubes separate or united. Horny covering of bill divided into several pieces by deep grooves. Upper mandible generally much hooked at the end. Anterior toes webbed throughout. Hind toe small, rudimentary or absent. Primaries eleven. Fifth secondary wanting. Oil-gland tufted. Spinal feather tract well defined by lateral bare tracts on neck. Schizognathous. Vomer large, broad, depressed, and pointed. Nostrils impervious. Single egg in a burrow without nest, white, or with zone of reddish spots near larger end. Young helpless, and clad with down till fully grown. Sexes alike in colour. Food chiefly fishes, crustacea, or insects. Swift, powerful flyers, passing the greater part of their life far from land, resting on the water at times, and only visiting the shore, as a rule, for breeding purposes.

Land Birds are only at sea by accident. Coast Birds are seen at sea, but near land. Ocean Birds seldom visit shore, except to breed. Land Birds explain wind-currents, while difference between Coast and Ocean Birds is the difference between signs that do and signs that do not prove proximity of land. As a rough distinction, the more a bird lives on land the more he flaps his wings. The Rook flaps continually. The Gull skims and flaps in about equal ratio. The Albatross rarely, if ever, flaps.

### Family PROCELLARIIDÆ.

Bill unserrated, and ending in a nail. Nostrils united externally in one tube above the culmen. Margin of sternum even. Second primary longest. The majority of Petrels on being captured vomit a small quantity of clear oil with a disagreeable smell. The plumage of the Petrels is somewhat close set, and a peculiar musky odour is perceptible in all of the species. The same smell attaches to the eggs, and seems never to evaporate entirely.

#### Subfamily Oceanitinæ.

Fourth toe as long as third. Claws usually flat. Tarsus covered in front with single shield, or with transverse short scutes. Secondaries ten. Keel of sternum with large fenestra.

##### Genus **OCEANITES.** Long-legged Storm Petrels.

Of small size. Slender compressed bill. Orifice of combined nostrils single. Hind toe represented by a minute claw. Second quill longest.

It is from the Stormy Petrel (*Procellaria pelagica*), "Mother Carey's Chicken," that the whole tribe derive their name.

**278. Oceanites oceanicus.** Wilson's Storm Petrel.

♂ 7″ to 7½″. Legs black. Bill black. Pale yellow patch in centre of webs. Tiny spur at base of tarsus. General plumage sooty. Upper and under tail-coverts white, with white bar on upper base of tail, and white spots on the flanks. Southern Ocean, Atlantic Ocean, into the N. Temperate Zone. Eggs (1·3 × 0·9)

white. Recognisable by its long legs. In flight it seems invariably to cross the waves at right angles, leaping from one to the other in the Petrel way, Petrel being Peterel, or Little Peter, from the apostle who tried to walk on the water. (J. 976. B. 1536.)

Also *O. gracilis.* 6″. Similar to *O. oceanicus*, but smaller, and the middle of abdomen is white. West coast of S. America.

Also the genus *Garrodia.* With scutellæ on tarsus distinct. One species—*G. nereis*, 6¾″, legs and bill black, above greyish black, tail grey, broadly tipped with black, breast and below white. Southern Ocean from Kerguelen Land to New Zealand and the Falkland Islands.

Also the genus *Pelagodroma.* Grey Storm Petrels. With claws flattened and wide. First primary much shorter than third. One species—*P. marina*, 8″, the White-bellied or Frigate Petrel, legs and bill black, above slaty brown, edged white. Forehead, eye-stripe, and below white, tail brownish. Seas of southern hemisphere, ranging north to the Canary Islands and the coast of Massachusetts.

Also the genus *Pealea.* With claws flat and wide. First primary longer than third. One species—*P. lineata.* Legs and bill blue-black. Above dark fuliginous. Upper tail-coverts white with dark longitudinal and terminal lines. Upola Island. (B.M. Cat., xxv. 361–364.)

## Genus **CYMODROMA.**

Nearly allied to *Oceanites.* Claws flattened, spade-shaped, and pointed at the end.

### 279. Cymodroma melanogaster. The Dusky-vented Storm Petrel.

♂ 8″. Legs and bill black. Above blackish brown. Tail nearly even, bases of all rectrices except mid pair white. Abdomen in middle sooty black. Southern Ocean, northwards to Bay of Bengal, and in the Atlantic to the Tropic of Cancer. (B. 1537.)

Also *C. grallaria.* 7½″. Legs and bill black. Above sooty black. Back and scapulars grey, edged white. Tail black, bases of lateral rectrices white. Southern seas, north to the coast of Florida.

Also with tail deeply forked :—*C. albigularis.* 8¾″. Legs and bill black. Above sooty black. Throat, abdomen, and a narrow band across the rump white. S. Pacific Ocean. And *C. mæstissima.* 9½″. Legs and bill black. Entire plumage sooty black. Samoa Islands.

## Subfamily Procellariinæ.

Fourth toe shorter than third. Claws sharp and compressed. Tarsus covered in front with hexagonal scutes. Secondaries, thirteen. Keel of sternum entirely ossified.

The genus *Procellaria.* With tail rounded or nearly even. Two species—*P. pelagica*, 6½″, the Storm Petrel, legs and bill black, upper tail-coverts sooty black, rectrices sooty, white at base, shafts black, N. Atlantic southwards to W. Africa and Mediterranean ; and *P. tethys*, 6″, similar to *P. pelagica*, but upper tail-coverts wholly white, tail slightly forked, Galapagos.

Also the genus *Halocypteria.* With tail cuneate. One species—*H. microsoma*, 5½″, legs and bill black, sooty black, forehead and below brown, Lower California to Panama.

Also the genus *Oceanodroma.* With tail distinctly forked. Twelve species :—

*O. leucorrhoa.* 8″. The Fork-tailed Storm Petrel. Legs and bill black. Head and throat grey. Upper tail-coverts more or less white. Bases of lateral rectrices black. Longest upper tail-coverts white, narrowly tipped sooty. Seas of northern hemisphere.

*O. cryptoleucura.* 7″. The Madeira Storm Petrel. Similar to *O. leucorrhoa*, but longer upper tail-coverts, broadly tipped black. Hawaiian and Galapagos Islands. S. Atlantic, and as far north as Madeira.

*O. macrodactyla.* 8½″. Similar to *O. leucorrhoa*, but tail longer and more deeply forked, and upper tail-coverts tipped dusky. Lower California.

*O. socorroensis.* 6¾″. Similar to *O. leucorrhoa*, but upper tail-coverts chiefly greyish white (producing a distinct spot on each side of rump). Coast of Mexico.

*Upper tail-coverts of same colour as back, not white.*

*O. fuliginosa.* 10″. The Sooty Petrel. Legs and bill black. Under parts uniform sooty grey. Japanese seas.

*O. melania.* 9″. Bill and legs black. Uniform sooty above, paler below. California.

*O. markhami.* 9″. Entire head tinged plumbeous. Peru.

*O. tristrami.* 9″. Back, scapulars, and upper rump slate, each feather with one or two indistinct dark bars. Japan.

*O. homochroa.* 7½″. Legs and bill black. Under wing-coverts variegated with dirty white. California.

*O. monorhis.* 7½″. Similar to *O. homochroa*, but under wing-coverts uniform sooty. China and Japan.

*O. hornbyi.* 8½″. Legs and bill black. Under surface white. Breast with sooty collar. N.E. Pacific.

*O. furcata.* 8″. The Fork-tailed Petrel. Plumage generally pale ashy. N. Pacific as far south as Oregon. (B.M. Cat., xxv. 343–357.)

## Family PUFFINIDÆ.

Bill arched and hooked. Nostrils with two openings united externally, or nearly so, above culmen. Margin of sternum uneven. First primary longest, or equal to the second. Hind toe present.

### Subfamily PUFFINIDÆ. PUFFIN PETRELS or SHEARWATERS.

Sides of palate without lamellæ. Tail of twelve feathers (*Priocella* fourteen).

### Genus **PUFFINUS.**

*Puffinus*, the Latinised form of the English "Puffin"; from "to puff" = to blow in an intermittent way, thence "to swell," French "bouffer"; from the swollen bill of *Fratercula artica*. Brisson seems to have applied the name to the Shearwater, from Willoughby calling it the "Puffin of the Isle of Man."

Of moderate size. Bill slender, compressed, much hooked at tip. Tubular nostrils terminate in two distinct openings directed forward and upward. First primary longest. Tarsus compressed, reticulated. Hind claw distinct.

**280. Puffinus chlororhynchus.** THE GREEN-BILLED SHEARWATER.

♂ 17″. Legs fleshy white. Bill greenish. Dark smoke-brown, paler and more grey beneath. Throat ashy. Tail long and cuneate. Indian Ocean, Australian and New Zealand seas, and northwards to the Society Islands. (B. 1538.)

Also *P. leucomelas.* 19″. Upper plumage sooty, edged with white. Under surface white. Japan and Corea, and southwards to Philippines, N. Borneo, the Moluccas, and N. Australia.

*P. cuneatus.* 17″. Upper plumage not edged with white. Back, greater wing-coverts, and primaries entirely sooty. Under surface white. N. Pacific.

*P. bulleri.* 16½″. Upper plumage not edged with white. Back and greater wing-coverts grey. New Zealand.

**281. Puffinus persicus.** THE PERSIAN SHEARWATER.

♂ 12″ to 14″. Legs white. Bill pale lavender. White line round eye. Above blackish brown. Below pure white. Axillaries dark brown. Tail rounded. Lateral lower tail-coverts deep brown. Remiges thirty. Arabian Sea and Persian Gulf. (B. 1539. S.F., i. 5.)

Also *P. obscurus.* 12″. The Dusky Shearwater. Legs black. Bill hazel. Similar to *P. persicus*, but axillaries are white, or slightly mottled near tips. Tropical and subtropical seas.

*P. assimilis.* 10½". Inner webs of primaries edged white. Australia and New Zealand seas, and northwards in Atlantic to Madeira.

*P. elegans.* 11½". S. Atlantic.

*P. gavia.* 12". Legs dusky. Bill dark horn colour. Under tail-coverts pure white. Axillaries sooty. New Zealand and Australian seas.

*P. opisthomelas.* 12". Primaries wholly dark beneath. Under tail-coverts sooty black. Flanks and axillaries dusky. California.

*P. auricularis.* 12½". Similar to *P. opisthomelas*, but flanks and axillaries white. Coast of Mexico.

*P. anglorum.* 15". The Manx Shearwater. Above slaty black. Below white. Lower breast grey. Axillaries white, subterminally black. N. Atlantic Ocean, south to coast of Brazil. One egg (2·4 × 1·7), white.

*P. yelkouanus.* 15". The Levantine Shearwater. Similar to *P. anglorum*, but axillaries, lower flanks, and under tail-coverts mostly pale sooty. Mediterranean Sea, straying northwards to Devonshire and Cornwall, where it is known as "Kitty Carew," from its call.

*P. gravis.* 19". The Great Shearwater. Legs yellow. Bill horny. Back and upper tail-coverts conspicuously edged dusky. Sides of neck distinctly defined. Middle of abdomen and under tail-coverts sooty. It "shears the water" as it alights and dives. In flight it keeps its wings bent, and glides along without much flapping, rolling from side to side, and just skimming the waves. Hind toe replaced by a sort of spur. Atlantic Ocean from Greenland to Cape of Good Hope and Falkland Islands.

*P. kuhli.* 20". Legs yellow. Bill yellow, tip dusky. Sides of neck mottled. Flanks and mid-abdomen white. Mediterranean Sea and Atlantic.

*P. creatopus.* 20". Legs yellow. Bill yellow, tip dusky. Sides of head mottled. Above, including upper tail-coverts, dark grey-brown. From California to coast of Chili.

*Plumage generally sooty.*

*P. carneipes.* 19½". Legs flesh colour. Bill flesh, tip dusky. Under wing-coverts sooty. Australia and New Zealand seas, northwards to Japan.

*P. griseus.* 18". The Sooty Shearwater. Legs hazel. Bill dusky. Above sooty, edged paler. Below brown. Under wing-coverts, ashy with dark shafts. Formerly taken to be the young of the Great Shearwater. From Faroe Islands to Straits of Magellan in Atlantic, and Kurile Islands to Auckland Islands in the Pacific.

*P. tenuirostris.* 13". Legs yellow. Bill dusky. Above sooty brown. Under wing-coverts pale grey. Australia and New Zealand seas, northwards to Japan and Alaska and eastwards to Samoa.

*P. nativitatis.* 14". Similar to *P. tenuirostris.* Legs and feet black. Below dark brown. Central N. Pacific Ocean.

*Nostrils united in a single opening directed forwards.*

Also the genus *Priofinus.* With nasal tube comparatively short. One species—*P. cinereus*, 19", legs flesh brown, bill yellow, nares and culmen black, above ashy with dark shafts, below white, sides of head and neck pale grey, Southern Oceans.

Also the genus *Thalassœca.* With nasal tube comparatively long. One species—*T. antarctica*, 17", legs yellow, bill blackish, above brown, upper tail-coverts white, tail white, tipped brown, throat pale brown, below white, Antarctic Seas.

Also the genus *Priocella.* With tail of fourteen feathers. One species—*P. glacialoides*, 18", legs flesh colour, bill yellow, nares, culmen and tip black, above pale grey, a dark spot in front of the eye, forehead, cheeks, and below white, tail pale grey, South Seas.

*Also with tarsus not compressed. Tail moderate, rounded.*

The genus *Majaqueus.* With nasal tube almost united into a single opening directed forwards. Claw of hind toe small. Two species—*M. equinoctialis*, 20", the Black Shearwater, legs black, bill yellowish, above sooty with pale edgings, chin and shafts of primaries white, South Seas, north to about lat. 30° S.; *M. parkinsoni*, 18", similar to *M. equinoctialis*, but chin sooty black, New Zealand seas.

Also the genus *Œstrelata.* Dove-like Fulmars. With nasal opening directed slightly upwards. Claw of hind toe small. Thirty species of "Swimming Petrels":—

*Œ. macroptera.* 16½". Legs and bill black. Entire plumage sooty brown. Southern Oceans.

*Œ. sterrima.* 14". Legs dark red. Similar to *Œ. macroptera.* Mascarene Islands.

*Œ. lessoni.* 18″. Legs yellow. Bill black. Above grey. Whole head, except round the eye, white. Southern Indian Ocean, Australian and New Zealand seas.

*Œ. hesitata.* 16″. The Capped Petrel. Above sooty. Crown and in front and below eye black. Back of neck, upper tail-coverts, and below white. W. Indies.

*Œ. jamaicensis.* 14″. Legs and bill black. Back of neck and whole plumage sooty brown. Jamaica.

*Œ. rostrata.* 14″. Legs yellow. Bill black. Above, under surface of wings and tail-feathers blackish brown. Below and under tail-coverts white. Central Pacific Ocean.

*Œ. parvirostris.* 15″. Similar to *Œ. rostrata.*

*Œ. incerta.* 17½″. Legs yellow. Bill black. Above brown, edged paler. Sides of neck and breast pale brown. Mid-throat nearly white. S. Atlantic, near Cape of Good Hope.

*Œ. mollis.* 14″. Legs and bill black. Above grey. A black patch in front of and beneath the eye. Forehead, throat, and neck in front more or less white. Sides of breast grey. South Seas, northwards in the Atlantic to Madeira.

*Œ. magentæ.* From the S. Pacific.

*Œ. phæopygia.* 17″. Legs yellow. Bill black. Above brownish black. Under wing-coverts white. Tail black. From the Galapagos to the Hawaiian Archipelago.

*Œ. brevipes.* 11½″. The White-throated Petrel. Legs yellow. Bill black. Back, wing-coverts, and upper tail-coverts grey. Tail greyish black, laterals pale grey. W. Pacific, New Hebrides, and Fiji Islands, to the southern ice barrier, lat. 68° S., and straying to the English coast.

*Œ. hypoleuca.* 13″. Similar to *Œ. brevipes*, but larger under wing-coverts, mostly dark. N. Pacific Ocean.

*Œ. nigripennis.* 12½″. Above slaty grey, with dark patch on rump. Feathers of head and neck narrowly edged white. Superciliary white spot. Kermadec Islands.

*Œ. brevirostris.* 14½″. Legs dusky. Bill black. Bill much compressed. Nearly uniform slate-grey. S. Atlantic and S. Indian Oceans.

*Œ. solandri.* 18″. Legs and bill black. Head dark brown. Plumage greyish sooty. Concealed bases of feathers of under surface white. Australia.

*Œ. externa.* 16″. Legs yellow. Bill black. Above grey-black, edged paler. Bases of all feathers white. Back of neck white. Tail grey-black. Coast of Chili.

*Œ. cervicalis.* 19″. Similar to *Œ. externa*, but margins of wing beneath are dark. Kermadec Islands.

*Œ. neglecta.* 15½″. The Norfolk Island Shearwater. Legs yellow. Bill black. Above brown, edged paler. Cheeks mottled brown. Under surface white. Sides of neck and breast pale brown. S. Pacific Ocean.

*Œ. arminjoniana.* 16″. Legs yellow. Bill black. Above brown, below white. Chin, sides of neck, and breast mottled grey-brown. Mid-throat white. Trinidad.

*Œ. trinitatis.* Similar to *Œ. arminijoniana*, but under surface sooty.

*Œ. heraldica.* 14″. Legs yellow. Bill black. Above dark brown, edged grey. Forehead and cheeks white, mottled brown. Lateral under tail-coverts vermiculated with grey. Western Pacific.

*Œ. gularis.* Similar to *Œ. heraldica*, but abdomen is slaty grey and larger under wing-coverts white. Antarctic Ocean.

*Œ. fisheri.* Crown white, spotted grey. Back grey. Tail mostly white, irregularly barred and vermiculated with grey. A black spot beneath eye. Under feathers smoky, but pure white beneath surface.

*Œ. scalaris.* 10″. Above dark grey, tipped ashy white. Chin, throat, chest, centre of breast, and under tail-coverts pure white, rest of lower parts irregularly barred grey.

*Œ. leucoptera.* 12″. Legs yellow. Bill black. Above slaty black, below white. Forehead and sides of neck spotted slaty. Axillaries white. East coast of Australia.

*Œ. defillippiana.* Similar to *Œ. leucoptera*, but upper surface much greyer, the wings and a patch on the rump alone being black. Coast of Chili.

*Œ. cooki.* Similar to *Œ. leucoptera*, but much more grey. New Zealand seas.

*Œ. longirostris.* 9¾″. Like *Œ. brevipes*, but bill much longer, and tail less graduated. Japanese coast.

*Œ. axillaris.* 12″. Similar to *Œ. cooki*, but purer grey, without dark patch on rump. Axillaries black. Chatham Islands.

Also the genus *Pagodroma.* With nasal tube high. Claw of hind toe large. One species—*P. nivea*, 14″ to 16″. The Snowy Petrel. Legs yellow. Bill black. Pure white. Antarctic Seas.

Also the genus *Bulweria.* With long cuneate tail. Nasal tubes fleshy at the end, openings

separate, and directed forwards and upwards. Two species—*B. bulweri*, 11″, Bulwer's Petrel, legs yellow, bill black. Sooty brown, wing-coverts and chin paler and greyer, Temperate N. Atlantic and Temperate N. Pacific; *B. macgillivrayi*, 11½″, similar to *B. bulweri*, but colour uniformly sooty, Fiji Islands. (B.M. Cat., xxv. 368-421.)

## Subfamily FULMARINÆ. FLYING PETRELS.

Sides of the palate with lamellæ more or less distinctly developed. Tail of from twelve to sixteen feathers.

### Genus **DAPTION.**

δάπτω = I devour.

Bill short, thick, and well hooked at tip. Lower mandible truncated. Few lamellæ on inner margin of upper mandible. Inter-ramal space bare. Nostrils terminating in single orifice, but divided within. Wings long. First primary longest. Tail short, slightly rounded, of fourteen feathers. Tarsus reticulate. Claw of hind toe stout.

**282. Daption capensis.** THE CAPE PETREL or PIED FULMAR.

(Called also "Cape Hen," "Cape Pigeon," "Pintado Petrel.")

Has a spread of wing 2½ feet.

♂ 16″; weight 14 to 18 oz. Legs dark brown. Bill blackish. Head, above, and primaries soot-brown. Wing-coverts, back, and upper-tail white, each feather tipped soot-brown. Below white. Small white streak below eye. Southern seas generally, north to Ceylon and to lat. 5° S. on the coast of Peru. (B. 1540. S. F. vii. 442.)

Also the genus *Fulmarus*. With stouter bill. Nasal tube large and high at the base. Three species.—*F. glacialis*, 18½″, the Fulmar Petrel, known to sailors as "the Mollymoke" and "the Mall Duck," legs flesh colour, bill dark, nasal tubes always dark, head, neck, and under surface white, above bluish grey. Flight like a Gull's, but with wings out straight and not curved, N. Atlantic Ocean; *F. glupischa*, similar to *F. glacialis*, but with nasal tubes and bill yellow, N. Pacific, southwards to W. Mexico; *F. rodgersi*, similar to *F. glacialis*, but back and rump distinctly mingled white.

Also the genus *Halobæna*. With nasal tube short. Tail of twelve feathers. First and second primaries subequal. Lamellæ rudimentary. One species—*H. cærulea*, 11″, the Blue Petrel, legs blue, bill black, edged blue. Above ashy blue, below white, feathers of mid-forehead widely tipped white, outer tail-feather white, the two next ashy, and the three next ashy, with white tips, Southern Seas between lat. 40° and 60° S.

Also the genus *Prion*. With lamellæ well developed. First primary longest. Four species from Southern Ocean—*P. vittatus*, 12″, the Blue or Vittated or Broad-billed Petrel, legs light blue, bill blue-black. Above ashy blue, a band across the back, lateral rectrices grey, with black shafts. Eye-stripe and below white; *P. banksi*, similar to *P. vittatus*, but bill narrower and lamellæ less visible; *P. desolatus*, similar to *P. banksi*, but lamellæ not visible when bill is closed; *P. ariel*, the Brown-banded Petrel, with crown paler than the back, lamellæ feebly developed.

Also the genus *Ossifraga*. Nasal tube very long and stout. Inter-ramal space feathered throughout. Tail of sixteen feathers. One species—*O. gigantea*, 34″, the Giant or Osprey Petrel, legs black, bill yellow. Uniform chocolate, edged paler, Southern Seas, north to about lat. 30° S. (B.M. Cat., xxv. 422-436.)

## Family PELECANOIDIDÆ. DIVING PETRELS.

Nostrils distinct, opening upwards on each side of the middle of the base of the culmen. Second primary slightly longest. Margin of breast-bone even.

### Genus **PELECANOIDES.**

Chin with pouch. No hind claw.

**283. Pelecanoides urinatrix.** THE LITTLE DIVING PETREL.

♂ 8½″. Legs greenish. Bill black. Above black. Chin black. Below white. Sides of neck grey. Axillaries dusky grey. Australian and New Zealand seas.

Also those of Cape Horn and the Falkland Islands. Reported also from southern parts of Bay of Bengal. (J. 977.)

Also *P. exsul*. Similar to *P. urinatrix*, but feathers of sides and middle of throat with subterminal grey bar. Flanks mottled grey, each feather with grey shaft. Under wing-coverts grey, edged white, with dark shafts. From Crozette Islands to Kerguelen Land.

*P. garnoti*. 9½″. Similar to *P. exsul*, but larger. Below pure white. Axillaries dusky grey. Callao to Valparaiso.

## Family DIOMEDEIDÆ. ALBATROSSES.

Nostrils lateral, separated by the wide culmen, each in a separate horny sheath opening forwards. First primary the longest. Margin of breast-bone uneven. Of large size, and known in flight by the white of under-wing, with hindmost edge of white or brown. Most clumsy on the water, and very timid in approaching anything that moves. Name probably a composition of Arabic-Portuguese "Alcatraz," meaning any big sea-bird. Rarely, if ever, seen within the tropics. Common in Great Southern Ocean, and curiously enough, though some frequent the Behring Strait, the bird is practically unknown in the North Atlantic. Stretch of wing from 10 to 17 feet. An Albatross supports 20 lbs. weight on an area of 16 s.f. of wing for hours together without any apparent effort, crossing and recrossing wake of ship steaming sixteen miles an hour, and all this with wings perfectly still, except for an occasional flap. An Albatross on the wing shows the most important characters by which a bird is externally distinguished from other animals. The surface of the body is clothed with feathers, which (in the majority of birds), by the great size and special arrangement on the forelimbs, enable these to act as organs of flight. The mouth is in the form of a horny beak. (N.H.M.)

### Genus **DIOMEDEA.**

Sides of mandible without longitudinal groove. Tail short and rounded. Southern Ocean and N. Pacific Ocean.

(i.) *Interscapular region and mid-back white.*

*D. exulans*. 42″. Legs flesh. Bill yellow. Head white. Upper back with narrow transverse dark lines. Wing-coverts slaty black. Primaries black. Under-wing and axillaries white. Tail white, irregularly marked on both webs near tips. Southern Ocean, Cape seas, S. Atlantic, and S. Pacific to New Zealand. Young brown, face white.

*D. regia*. 48″. Similar to *D. exulans*, but without transverse dark lines on back. Wing-coverts dark grey. Tail white, without marks. New Zealand. Young white.

*D. chinoptera*. 48″. Similar to *D. regia*, but wing-coverts nearly white. A large white patch on inner web of under surface of primaries. Southern Indian Ocean.

*D. albatrus*. 37″. Legs dark. Bill yellow. Head buff. Crown, nape, and back of neck tinged buff. Scapulars, wings, and end of tail grey-black. A large white patch near distal end of humerus. Shafts of primaries and of tail yellowish white. N. Pacific Ocean. Young sooty brown.

(ii.) *Interscapular region and mid-back brown or black.*

*D. irrorata*. 35″. Legs dark. Bill yellow, tip dusky. Head and neck white. Back, wings, and tail sooty. Above freely mottled and barred white. Below sooty, freely mottled and freckled white. West coast of Peru.

*D. nigripes*. 28″. Legs black. Bill red-brown. Above sooty brown. A large triangular spot behind and below eye. Below sooty. Tail white at the base. N. Pacific Ocean.

*D. immutabilis*. 32″. Legs pink. Bill grey, tip black. Head, neck, rump, upper tail-coverts, and under surface white. Back, wings, and end of tail sooty. Under wing-coverts brown and white. Laysan Island and vicinity.

*D. melanophrys*. 30″. Legs yellow. Bill yellow, tip darker. Plumage white. Short black band on either side of eye. Back and wings black. Tail slate-grey, shafts white. Southern Ocean, straying to N. Atlantic.

*D. bulleri*. 34″. Legs red. Bill yellow, sides slaty. Above sooty. Below white. Tail dark grey-brown. New Zealand.

Also the genus *Thalassogeron*. Sides of mandible without longitudinal groove. Tail rounded. Six species, viz.—

*T. culminatus*. 36″. Legs yellow. Bill, culmen yellow, sides black. Head and neck whitish grey. A dark patch in front of and above the eye. Above sooty. Rump and under surface white. Tail dark grey, shafts white. Southern Oceans, ranging to Pacific coasts of C. America.

*T. chlororhynchus.* 33″. Legs flesh colour. Like *T. culminatus*, but with an indistinct grey mark in front of the eye. Southern Oceans.

*T. eximius.* Similar to *T. chlororhynchus*, but lower mandible is black. No dark spot behind eye. S. Atlantic Ocean.

*T. cautus.* 35″. Legs grey. Bill, culmen yellow, sides grey. Head, neck, lower back, upper tail-coverts, whole under surface, under wing-coverts, and axillaries white. A greyish black mark in front of the eye. Back, wings, and tail ashy. Tasmania.

*T. salvini.* 38″. Similar to *T. cautus*, but forehead and crown more grey. New Zealand.

*T. layardi.* Allied to *T. cautus.* Cape seas.

Also the genus *Phœbetria.* Sides of mandible with a deep longitudinal groove. Tail long and cuneate. One species—*P. fuliginosa*, 36″, legs hazel, bill black, groove orange, plumage sooty, white ring round eye, Southern Oceans. (B.M. Cat., xxv. 440–455.)

## Order **PHŒNICOPTERI.**

Bill abruptly bent in middle. Margins of bill laminated. Desmognathous. Tarsus scutellated in front and behind.

PHŒNICOPTERUS, PHŒNICONAIAS } FLAMINGOES.

## Order **ANSERES.**

Bill straight, with distinct nail at tip of upper mandible. Margins of bill laminated (*Merginæ* serrated). Tarsus reticulated at back, and generally in front. Desmognathous. Young hatched covered with down and able to run at once.

| | | |
|---|---|---|
| Hind toe not lobed | CYGNUS | SWANS. |
| | ANSER | GEESE. |
| | SARCIODORNIS | SPUR-WINGED GEESE. |
| | ASARCORNIS | |
| | RHODONESSA | |
| Hind toe narrowly lobed | DENDROCYCONA | WHISTLING TEAL. |
| | TADORNA | SHELDRAKES. |
| | CASARCA | |
| | SPATULA | SHOVELLERS. |
| | ANAS | WILD DUCKS. |
| | EUNETTA | |
| | CHAULELASMUS | |
| | NETTIUM | TEAL. |
| | MARECA | WIGEONS. |
| | DAFILA | PINTAIL DUCKS. |
| | QUERQUEDULA | GARGANEY TEAL. |
| | NETTOPUS | COTTON-TEAL. |
| | MARMARONETTA | MARBLED TEAL. |
| Hind toe broadly lobed | NETTA | POCHARDS. |
| | NYROCA | |
| | FULIGULA | |
| | CLANGULA | |
| | ERISMATURA | |
| | MERGUS | MERGANSERS. |
| | MERGANSER | |

## Order **PALAMEDEÆ.** Screamers.

Bill like a fowl's. With soft skin at base. Tip obtuse, bent down. Margins of bill not laminated. Tarsus reticulated in front and behind. No ventral bare tract. Desmognathous. Neotropical. Young hatched covered with down and able to run at once. May be regarded as a much-modified arboreal form of Goose.

### Family PALAMEDEIDÆ. Screamers.

Peculiar to America. Anterior toes very long, connected by rudimentary webs. Hind toe long and strong. Feet very large, covered with small hexagonal scales. Small soft plumes on neck. Wings large, with two spurs. Of large size. Two genera, viz.—

The genus *Palamedea*. With lores feathered. A long frontal horn. Head not crested. Tail fourteen feathers. One species—*P. cornuta*, 34″, legs ashy, bill grey. Neck, upper parts, wings, tail, and breast black, abdomen black. Inhabiting marshes on north parts of S. America.

The genus *Chauna*. With lores naked. No frontal horn. Head crested. Tail twelve feathers. Two species—*C. chavaria*, 28″, legs and bill red, plumage slate-black, cheeks and throat white, from Venezuela and Colombia; *C. cristata*, 36″, legs red, plumage dark grey, cheeks and throat grey, naked ring round neck, S. America.

## Order **PHŒNICOPTERI.** Flamingoes.

Bill abruptly bent in the middle. Margins of bill laminated. Tarsus scutellated in front and behind. Ventral tract bare. Desmognathous. Young covered with down and able to run. When hatched the bill is straight. Tropical.

### Family PHŒNICOPTERIDÆ.

Neck and leg of great length. Bill suddenly bent down. Have fleshy tongue and anatomical structure of Ducks. Anterior toes united to the claws; webs incised. Primaries twelve (fifth remex present in wing). Fifth secondary wanting. After-shaft. Oil-gland tufted. General plumage rosy. Found in warmer parts of the world. Nest of mud. One egg, white.

### Genus **PHŒNICOPTERUS.**

φοινικόπτερος = red-feathered.

Upper mandible convex and overlapping the lower. First and second quills subequal and longest. Small hind toe. Throat naked.

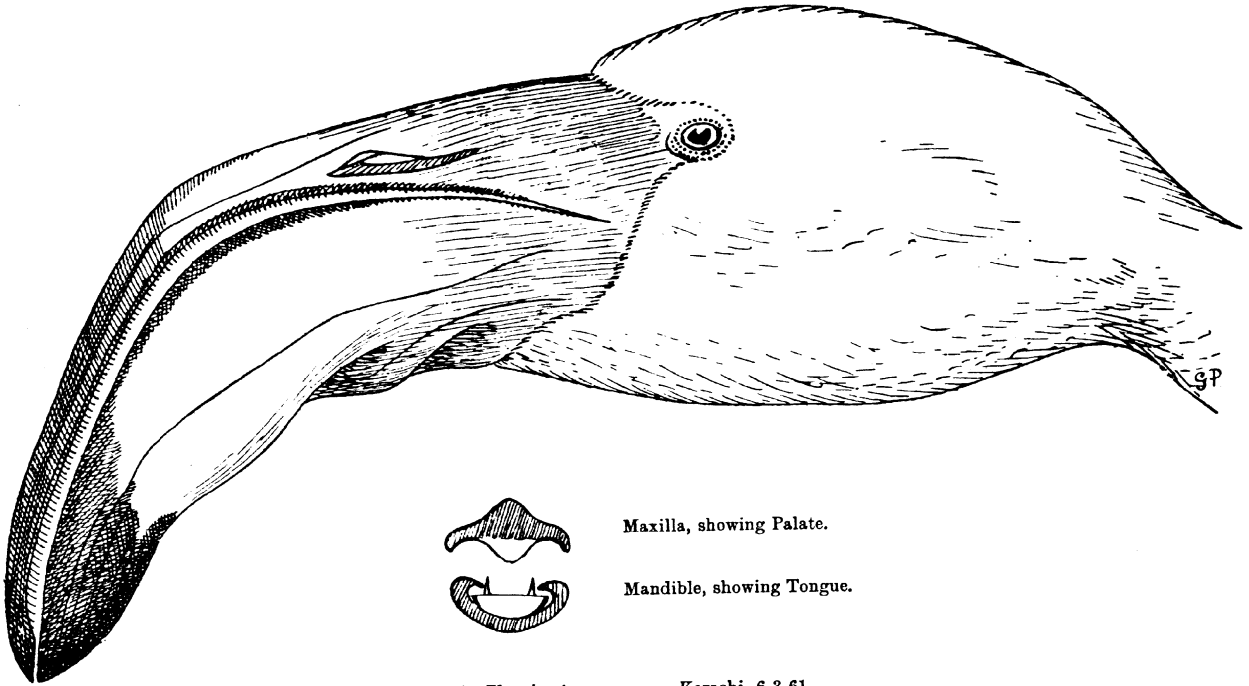
#### 284. **Phœnicopterus roseus.** The Common Flamingo.

**Bag-hans, Raj-hans,** *India;* **Pukonga** (Telugu); **Pu-nari** (Tamil); **Urian,** *Ceylon.*

♂ 52″; 10 lbs. ♀ 42″. Legs rose-red. Bill rosy, black tip. Plumage rosy white. Quills black.—*Young:* Mixed brown and dusky. From the Mediterranean to Lake Baikal, Africa, India, and Ceylon. One or two eggs (3·6 × 2·2), white. (J. 944. B. 1575.) See illustration, p. 250.

Also *P. chilensis*. 42″. Similar to *P. roseus*. Legs grey. Bill white, with black tip. Wings more vermilion. South of S. America.

*P. ruber*. 42″ to 48″. Legs and feet lake. Bill yellowish, with black tip. General plumage vermilion. Florida to north of S. America.





Maxilla, showing Palate.

Mandible, showing Tongue.

284. *Phœnicopterus roseus.* Karachi, 6.3.61.

### Genus **PHŒNICONAIAS.**

Upper mandible flat and included between rami of lower. Small hind toe. Throat feathered.

**285. Phœniconaias minor.** THE SMALLER FLAMINGO.

♂ 33″ to 36″. ♀ 30″. Legs deep red. Bill dark red, tip black.—*In winter:* Pale rose.—*In summer:* Bright rose, with cherry-coloured plumes on scapulars. E. Africa, Madagascar, and N.W. India. (B. 1576. S.F. i. 35.)

Also the genus *Phœnicoparrus*. Hind toe wanting. Lamellæ on upper mandible prominent and horizontal. Two species, from the Andes of Peru and Chili—*P. andinus*, 48″, legs yellowish, bill pale yellow, tip black, quills and tertials black; and *P. jamesi*, 36″, quills black, tertials rosy.

## Order **ANSERES.** SWANS, GEESE, DUCKS, and MERGANSERS.

Bill straight, with distinct nail at tip of upper mandible. Margins of bill laminated (*Merginæ* serrated). Tarsus reticulated at back, and generally in front. Ventral tract bare. Desmognathous. Posterior border of breast-bone with a notch (in some a foramen) on each side of keel. Young hatched covered with down, and able to run or swim at once. Cosmopolitan.

### Family ANATIDÆ.

Bill broader at base than high, of equal width or wider at tip, with numerous lamellæ. Tongue large and fleshy, denticulated laterally to correspond with lamellæ. Anterior toes fully webbed to end of digits (*Anseranas* excepted). Hind toe always present. Primaries eleven. Fifth secondary wanting. After-shaft rudimentary or wanting. Oil-gland tufted. Monogamous. In moulting most, if not all, shed all their quill-feathers at once, and are consequently for a time unable to fly. Rough nest. Numerous eggs. Swans and Geese have no lobe on the hind toe. In Ducks the hind toe is narrowly lobed, while the Diving Ducks and Mergansers have a broad lobe.

#### (i.) *Hind toe not lobed* (286–297).

#### Subfamily CYGNINÆ.

Lengthened neck, but short legs. Bill high at base, and of equal breadth throughout. Lores bare (except in *Coscoroba*.) Of very large size. Feed on seeds, roots of water-plants, and also on grass. Sexes alike, no seasonal change. Principally Arctic.

#### Genus **CYGNUS.**

κύκνος = a Swan.

Bill covered with short fleshy core that extends in a point to the eye on each side. Nostrils more or less in middle of bill, rather oblique and oval. Lores naked. Second and third quills equal and longest. Hind toe short, and without any marginal lobe.

*With large tubercle on bill.*

**286. Cygnus olor.** THE MUTE SWAN.

(The "Tame Swan" of Europe.)

*Ŏlor* = a Swan, in classical Latin, especially in poetry. Perhaps a Spanish word. Cf. Welsh *alarch.*

**Penr,** *Punjab;* **Koday,** *Yarkand.*

♂ 55½" to 60"; 15 lbs. ♀ 53"; 13 lbs. Legs black. Bill, lower mandible black, upper mandible red-orange, with lores, tubercle, base, nostrils, nail, and edges black. Plumage white, with cream or buff tinge. Tail comparatively long and wedge-shaped. Remiges thirty-one.—*Female:* Similar, but smaller, with smaller frontal tubercle. Sits on eggs for six weeks.—*Young,* sooty grey, do not acquire full plumage till second year. Europe, N. and C. Asia. An occasional visitor to N.W. India and Sind. Nest of dead reeds and grass 2 feet high and 5 feet across. Five to eleven eggs (4½ × 3), greenish white. Hybrids with *C. musicus* and *C. atratus.* (B. 1577. H. & M. iii. 41.)

Also *C. immutabilis.* The Polish Swan, the wild variety of *C. olor,* but legs are ashy grey, and tubercle is less developed. Generally regarded as a quasi albino produced by domestication. None of the characters attributed to this bird are constant. Hybrids with *B. leucopsis,* the Barnacle Goose, and *B. canadensis.*

*C. melancoryphus.* 48". The Black-necked Swan. Legs flesh colour. Bill leaden, base and knob red. Plumage white, with head and upper-neck black. Narrow white eye-ring. S. America.

*With no protuberance on bill.*

**287. Cygnus musicus.** THE WHOOPER SWAN.

*Mūsĭcus* = musical; from *Mūsa* = the Muse.

♂ 60"; 19 lbs. ♀ 52"; 16½ lbs. Legs black. Bill, lores, and base yellow, anterior part black. Frontal feathers prolonged into an angle. Remiges thirty-four. Plumage white, with occasionally some ferruginous yellow on the head.—*Female:* Similar, but smaller.—*Young:* Greyish brown. Legs flesh colour. Bill flesh colour, tip and margins black, with orange band across nostrils. Arctic Europe and Asia, migrating to S. Europe, Turkistan, China, and Japan. Resident in Iceland. One specimen of this bird (or of *C. davidi*) was obtained in Nepal in 1829. Two to seven eggs (4½ × 2·85), white. Hybrids with *C. olor.* (B. 1578. H. & M. iii. 47.)

Also *C. bewicki.* ♂ 42" to 50". ♀ 39" to 40". Bewick's Swan, named after Thomas Bewick (b. 1753, d. 1828), author of the *History of British Birds.* Similar to *C. musicus,* but smaller. Bare space from eye to nostril deep yellow. Breeds in Arctic Siberia, and migrates to Great Britain, W. and C. Europe, Caspian, S. Siberia, China, and Japan. Two to three eggs (4 × 2·57), white.

*C. americanus.* 53" to 55". The Whistling Swan. Legs black. Bill black. Lores black, with yellow spot. Plumage white. Head, and sometimes the neck and below, tinged rusty. Tail of twenty feathers. N. America, accidental in Scotland.

*C. buccinator.* 58½" to 68". The Trumpeter Swan. Legs, bill, and lores black. Plumage white. Head, and sometimes neck and below, tinged rusty. Tail of twenty-four feathers. N. America.

**288. Cygnus davidi.**

Bill vermilion, tip black. Legs orange. Entirely white. Smaller than *C. bewicki.* Its nearest ally is *C. coscoroba* of Chili, but it is larger than that. Mr. Horace Vere, of the Indian Salt Revenue, wrote to me from Dera Ghazi Khan

on 30.4.92: "Regarding a Swan I saw and fired at (but failed to kill) in March, 1891, it was neither Bewick's Swan, nor the Mute Swan, nor the Whooper, as it had bright orange legs. This bird is not mentioned in your book on birds, and I fancy it must have been a specimen of *Cygnus davidii*, mentioned in Hume's book as a possible visitor to India."

Also the genus *Chenopis*. The Black Swan. One species—*C. atratus*, 40", legs black, bill light scarlet, tips white, and crossed with a broad band of white, Australia (except northern part) and Tasmania.

Also the genus *Coscoroba*. With lores feathered. One species—*C. coscoroba*, 40", legs and bill orange-red, plumage white, but tips of primaries black, south of S. America.

## Subfamily ANSERINÆ. GEESE.

Bill short, high at base, and conical. No cere on the bill. Laminar teeth more or less exposed. Large heavy body, with long neck and small head. Hind toe moderately large, without lobe. Tarsus reticulated throughout. Plumage dull, and without coloured speculum on wing-secondaries. Apparently only one moult of all the feathers, which takes place soon after the young are hatched. Sexes differ slightly. Live in flocks. Breed mostly in Polar regions.

### Genus **ANSER**. TRUE GEESE.

*Anser, anseris* = a Goose.

Bill at base nearly as high as head. Cutting edges of bill distinctly arched, with indentations of upper mandible visible (except in *A. indicus*). Of large size and grey plumage. Legs usually reddish. Tail short, rounded, of sixteen or eighteen feathers. Nest of grass on the ground, lined with down. Six to twelve eggs, yellowish white.

*Tip of upper mandible white.*

#### 289. Anser ferus. THE LAG OR GREY GOOSE.

**Raj-hans, Hans,** *India;* **Kallank, Karhans,** *Bhaugulpore;* **Sona,** *N.W.P.;* **Mogala,** *Nepal;* **Kangnai,** *Manipur;* **Ghaz,** *Kashgar.*

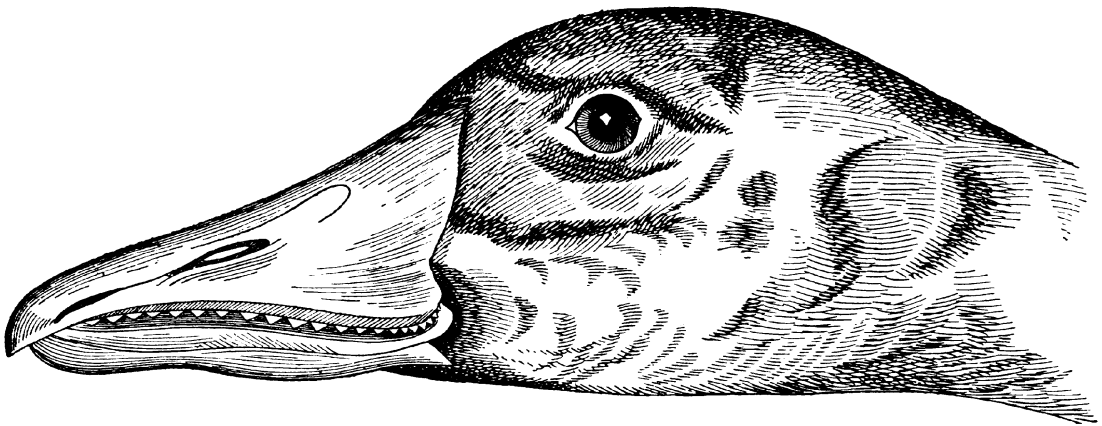
♀ 30" to 35"; 5¾ to 9 lbs. Legs tile-red. Bill fleshy, tip white. Head and neck dove-brown, tinged grey. Irides deep brown. No white on forehead. Above dark brown, edged paler. Below light brown, with black bars on lower breast. Female one-seventh shorter than the male. The origin of the Domestic Goose in Europe. Blyth states that the tame Geese of India are a mixed race, and hybrids between *A. ferus* and *C. cygnoides*, the Chinese Goose. Europe north of 50° lat., C. Asia, and S. Siberia, migrating to S. Europe, N. Africa, S.W. Asia, and N. India. Six to fourteen eggs ($3\frac{1}{2} \times 2{\cdot}4$), chalky white. (J. 948. B. 1579.) See illustration, p. 254.

Also *A. rubrirostris*. 33". Legs and bill red, similar to *A. ferus*, but more marked with black below. Distinguished by many as the Eastern race.

#### 290. Anser albifrons. THE WHITE-FRONTED OR LAUGHING GOOSE.

*Albifrons* = with a white forehead; from *albus* + *frons*.

♂ 26" to 28"; 4½ to 5½ lbs. Legs orange. Bill yellow, nail white. Forehead and cheeks white, with brown band. Above ash-brown. Beneath white, with black cross-bands.—*Female:* Smaller, with less black on the breast. From Greenland to Siberia, migrating to the Mediterranean, Egypt, the Caspian, N. India, Assam, Upper Burma, and China. Eggs ($2{\cdot}9 \times 2$) creamy white. (J. 947. B. 1580.)



289. *Anser ferus.*

**291. Anser erythropus.** THE DWARF WHITE-FRONTED GOOSE.

♂ 22″; 4 lbs. Legs red. Bill orange, tip horny. Similar to *A. albifrons*, but smaller, and white of forehead extending as far as the eye. Back and scapulars dark grey, with cross bands. Primaries grey. Abdomen black, bordered white. Flanks dark grey. Lapland and Siberia, migrating in winter south from W. Europe through N. India to Japan. Eggs (2·9 × 2) white. (J. 948. B. 1581.)

Also *A. gambeli*. 29″. Very similar to *A. albifrons*. Legs yellow. Bill white. Stripe on forehead pale yellow. Northern America (except Greenland), migrating south as far as Cuba, and along E. Asiatic coast to Japan.

*Tip of upper mandible black.*

**292. Anser brachyrhynchus.** THE PINK-FOOTED GOOSE.

Short-beaked, from βραχύς + ῥύγχος.

♂ 26″ to 36″; 6 lbs. ♀ 5 lbs. Legs pink. Bill pink, nail and base black. Head and neck brown. Body brown, with white wavy lines. First and second primaries bluish, others black. Breeding in Europe, migrating in winter to W. Europe. Often reported as occurring in India, but no Indian specimen has been preserved. Eggs (3·1 × 2·1) creamy white. (J. 946. B. 1582.)

**293. Anser segetum.** THE BEAN-GOOSE.

*Sĕgĕtum* = gen. pl. of *sĕges* = a cornfield.

♂ 31″. Legs orange-yellow. Bill black, with orange band, nail black, and shaped like a horse-bean. Like the Grey-lag, but smaller. Colour nearly uniform. Breeds in N. Russia and Lapland, migrating to the Caspian, Europe, and N. Africa. Eggs (3·2 × 2·1) creamy white. Rate of flight said to be twenty-five miles an hour. Doubtful if it occurs in India. (H. & M. iii. 67.)

Also *A. serrirostris*, like *A. segetum*, with the head brownish grey, but larger, and with the bill much thicker; and *A. middendorffi*, also like *A. segetum*, but larger, with head and neck buff-brown, culmen 3·15″. E. Siberia to China and Japan.

**294. Anser indicus.** THE BARRED-HEADED GOOSE.

*Indĭcus* = Indian; from its native country.

**Birooa, Raj-hans,** *N.P. IV.*; **Paria,** *Nepal*; **Nang-pa,** *Ladak*; **Dod-sarlehake,** *Mysore*; **Neer bathoo,** *Coimbatore*; **Kangnai,** *Manipur*; **Badi-hans,** *Chittagong.*

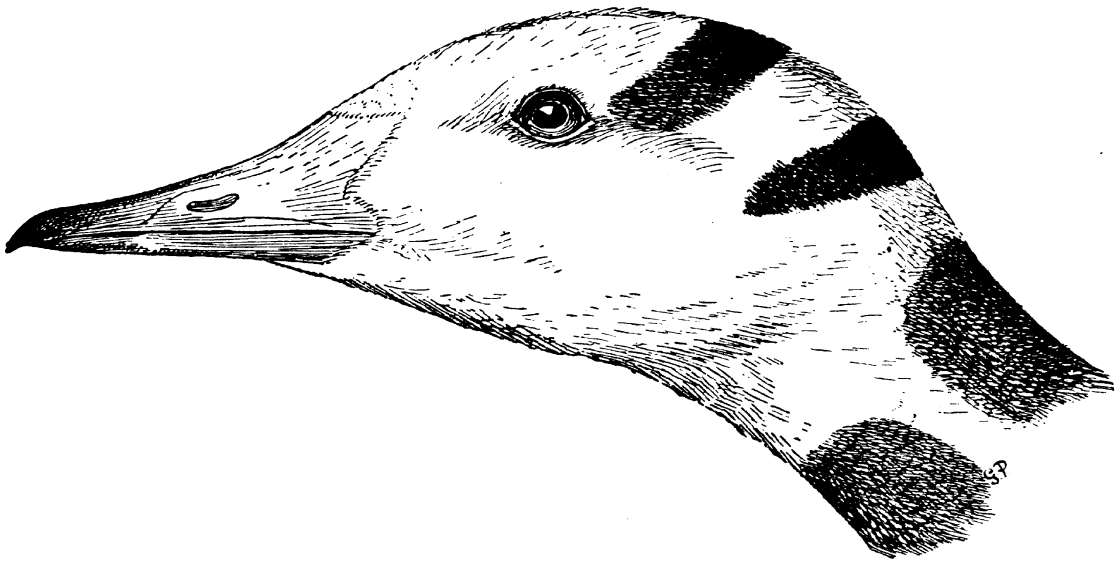
♂ 27¼″ to 33½″; 4 to 7 lbs. Legs orange. Bill yellow, tip black, cutting edges nearly straight and indentations only visible near front of bill. Two bars on head and neck. Above ash-grey. Flanks cinnamon. Breeds in C. Asia. Arrives in India towards end of October and leaves in March. (J. 949. B. 1583.) See illustration, p. 256.

Also the genus *Cygnopsis*. With bill longer than the head and flattened near tip. Serrations on cutting edge visible from outside. One species—*C. cygnoides*, 36″, the Chinese Goose, legs orange, bill black, rusty white band round base of bill. Above grey-brown, breast buff, abdomen white, breeds in E. Siberia and winters in China, apparently resident in Japan.

Also the genus *Chen*. Snow-Geese. Bill very stout. Serrations on cutting edges visible from outside. Plumage white or bluish, with primaries blackish. Four species.

*C. cærulescens*. 30″. The Blue-winged Goose. Legs red. Bill red. Commissural space black. Head and upper neck white. Body grey-brown. Rump and wings grey. Tail ashy, bordered white. N. America, east of Rocky Mountains.

*C. hyperboreus*. 23″ to 28″. The Snow-Goose. Legs orange. Bill purplish, nail whitish. Plumage white. Head often stained rusty. Wing-coverts grey. Breeding in Alaska and migrating to Japan, S. California, and Mississippi valley. Five eggs (3·3 × 2·12), dirty white.



294 *Anser indicus.* Rookun, 9.12.74.

*C. nivalis.* 30″ to 38″. The (Eastern) Snow-Goose. Similar to *C. hyperboreus*, but larger. Breeding ground unknown. United States and Bermudas during migration and in winter.

*C. rossi.* 20″ to 26″. Legs reddish. Bill dull red, tip white, basal part often wrinkled and warty. Plumage as in *C. hypoboreus*. Arctic America, migrating in winter to S. California and Montana.

Also the genus *Philacte*. With serrations only visible near angle of mouth. One species—*P. canagica*, 26″, legs orange, bill purplish, with white spot on each side of lower mandible, head and nape white, tinged rufous, plumage ashy, barred white and black, N.E. Asia and N.W. America.

Also the genus *Branta*. Brent Geese. With cutting edges of bill almost straight, and serrations not visible from outside. Eight species:—

*B. canadensis.* 41″ to 42″. The Canada Goose. Legs and bill black. Head and neck black. Chin and throat white. Above brown, edged lighter. Rump and tail black. Upper tail-coverts white. Below brown, fading into white. Temperate N. America. Eggs (3·5 × 2·4) pinkish.

*B. hutchinsi.* 25″ to 34″. Similar to *B. canadensis*, but smaller. Arctic and sub-Arctic America, Japan to E. Siberia.

*B. occidentalis.* 35″. Below brownish grey, abruptly defined against white of anal region. White cheek-patches usually separated by black throat-stripe. North-west coast of America.

*B. minima.* 23″ to 25″. Similar to *B. canadensis*, but smaller. Pacific coast of N. America, south in winter to California, straying to Sandwich Islands.

*B. leucopsis.* 25½″ to 28″. The Barnacle Goose. Bill and legs black. Head white. Crown and nape black. Black stripe from eye to bill. Greenland to Nova Zembla, migrating to the Baltic, Denmark, England, and casually to Atlantic coast of N. America.

*B. bernicla.* 21″ to 23″. The Brent Goose. Legs black, tinged olive. Bill black. Head, neck, and breast black. White patch on each side of neck. Above and below brown-grey. Tail-coverts above and below white. Arctic Circle, migrating to N. Europe and the Mediterranean. Eggs (2·7 × 1·9) white.

*B. nigricans.* 22″ to 29″. Similar to *B. bernicla*. Legs and feet black, but with conspicuous white collar. Breast and abdomen black. W. Arctic America, migrating to California and Japan.

*B. ruficollis.* 22″. The Red-breasted Goose. Head black, white patch in front of the eye. Neck and upper breast chestnut, with white band. N. Siberia (where it is known as the "Shakvoy"), migrating in winter to the Caspian. Accidental in Europe and Egypt. Eggs (2·7 × 1·8) greenish white.

Also the genus *Nesochen*. With webs deeply excised. One species—*N. sandwichensis*, 22½″, head and throat black, sides of neck buff. Above umber-brown, barred whitish, breast and belly grey-brown, Sandwich Islands.

Also the subfamily CEREOPSINÆ. NEW HOLLAND GEESE.

Bill rather thick and high at base. Cere much developed. Plumage dull, without coloured speculum on wing-secondaries. Hind toe moderate. Seldom enter water. Appear to have affinities both with *Rasores* and *Grallatores*. One genus, *Cereopsis*, one species, viz.—*C. novæ hollandiæ*, 34″, legs orange, bill black, cere yellow, crown whitish, plumage brown-grey, S. Australia and Tasmania. Apparently allied to this is the extinct *Cnemiornis calcitrans*, of New Zealand, known only from its bones, which are found together with remains of *Dinornithidæ*.

## Subfamily PLECTROPTERINÆ. SPUR-WINGED GEESE.

Forehead and base of bill furnished with caruncles. Long spurs on the wings (*Cairina* excepted). Hind toe rather long. Tail rather long, broad, and rounded at tip. Upper parts mostly glossy.

*With lores densely feathered.*

### Genus **SARCIDIORNIS.**

σαρκίδιον; from σάρξ = a bit of flesh, and ὄρνις = a bird.

Bill with large fleshy boss. Plumage black and white. Wing with prominent tubercle. Tail of twelve feathers, rounded. Hind toe with a narrow lobe. Placed by Blanford under *Anatinæ*.

**295. Sarcidiornis melanonotus.** THE COMB DUCK or BLACK-BACKED SPUR-GOOSE.

**Nukhta,** *India;* **Nukwa,** *Chota Nagpur;* **Jutu chillawa** (Telugu); **Neerkoli,** *Coimbatore;* **Tanbay,** *Pegu;* **Bowkban** (Karen).

♂ 30″ to 34″; 6 lbs. ♀ 26″. Legs greenish. Bill and comb black. Head and neck white, spotted glossy black. Above black, glossed purple. Lower neck, all round breast, abdomen, lower tail-coverts, and tail white. Rump ash-grey. Sides and flanks white, tinged grey.—*Female:* No boss on bill. India, Ceylon, Burma, Africa (south of the Sahara), and Madagascar. Seven to twelve eggs (2·41 × 1·72), ivory-white. (J. 950. B. 1584.)

Also *S. carunculatus.* 24″. Similar to *S. melanonotus*, but sides and flanks brown-black, and rump black, glossed green. S. America.

## Genus **ASARCORNIS.**

Resembles *Sarcidiornis* in structure and plumage, but there is no knob on the bill of the male bird. Placed by Blanford under *Anatinæ.*

**296. Asarcornis scutulata.** THE WHITE-WINGED WOOD-DUCK.

*Scŭtŭlata* = diamond or lozenge-shaped, chequered.

**Deo-hans,** *Assam.*

♂ 28″ to 32″. Legs orange. Base orange, base and tip black. Head and neck white, speckled black. Lower parts brown, tinged with dusky red. Assam, Tenasserim, Malay Peninsula, and Java. (J. 955. B. 1585. H. & M. iii. 147.)

## Genus **RHODONESSA.**

Similar to *Sarciodornis*, but bill is lower at the base. Distinguished by plumage more than by structure. Egg nearly spherical.

**297. Rhodonessa caryophyllacea.** THE PINK-HEADED DUCK.

**Saknal,** *Bengal;* **Lal sira,** *India;* **Doomrar,** *Nepal;* **Doomar,** *Tirhoot.*

♂ 24″. Legs black. Bill rosy, tip bluish.—*In summer:* Rosy tuft. Plumage chocolate. Wing-lining pink.—*Female:* More dull. Vertex with brown spot. India, Assam, and N. Burma. Nine eggs (1·78 × 1·66). (J. 960. B. 1586.)

Also the genus *Pteronetta.* With plumage plain, with no mottlings and no metallic speculum as in *Asarcornis*, but the frontal feathers in a straight line. One species from Equatorial Africa, viz. *P. hartlaubi*, 22″, legs brown, bill black with yellow band, head and upper neck black, a white square patch on frontal edge. Plumage chestnut, tail brown.

Also *with lores naked:*—

The genus *Plectropterus.* With forehead and base of bill furnished with caruncles. Four species, viz.—

*P. gambensis.* 38″. Legs flesh colour. Bill coral-red. Above metallic black, glossed green. Breast and sides black. Sides of head, throat, upper wing-coverts, abdomen, thighs, and under tail-coverts white. Frontal knob and bare rhomboidal spaces on sides of neck. Equatorial Africa.

*P. rüppelli.* 40″. Similar to *P. gambensis*, but with very high frontal knob. N.E. Africa.

*P. niger.* 38″. Legs dull red. Bill crimson. Similar to *P. gambensis*, but with small frontal knob, many caruncles on naked skin of forehead, and no bare spaces on sides of neck. Throat and under tail-coverts black. S.E. Africa.

*P. scioanus.* Similar to *P. niger*, but with scarcely any frontal knob, and no caruncles on forehead. Shoa.

Also the genus *Cairina.* With wings without spurs. One species—*C. moschata*, 29″, the Muscovy Duck, legs black, bill black and pink, head, crest, neck, and below brown-black,

hind neck and back dark green, glossed purple and margined black, upper and under wing-coverts white, Tropical America.

Also the subfamily ANSERANATINÆ.

Feet semipalmated. Hind toe very long, and on same level with the others. One genus, *Anseranas*, one species, viz.—*A. semipalmata*, 38″, head, neck, mantle, wings, tail, and thighs black. Back, rump, breast, abdomen, upper and under tail-coverts white, Australia and Tasmania.

Also the subfamily CHENONETTINÆ.

With hind toe narrowly lobed. Usually with metallic colours or speculum on the wings. Bill rather short and goose-like. Three genera. The genus *Cloëphaga*. Kelp Geese. With tail nearly even, upper wing-coverts white. Six species from S. America, viz.—

*C. melanoptera*. 28″. Legs red. Bill red, nail black. Plumage white. Speculum brown, shading to dark green.—*Female:* The same, but smaller.

*C. hybrida*. 24″. Legs yellow. Bill black, yellow spot at base. Plumage white.—*Female:* Breast barred black and white. Speculum green, black, and white.

*C. magellanica*. 26″. Legs leaden. Bill black. Head, neck, and scapulars grey. Hind neck barred black. Breast white. Speculum grey, green, and white.—*Female:* Head rufous, plumage barred black and rufous.

*C. inornata*. Similar to *C. magellanica*, but breast banded black.—*Female:* Head grey.

*C. rubidiceps*. 23″. Legs yellow. Bill black. Head, neck, mid-abdomen and under tail-coverts cinnamon.—*Female:* Similar, but smaller. Falkland Islands.

*C. poliocephala*. 24″. Legs orange. Bill black. Head grey. Mid-breast and centre of abdomen white. Speculum grey, green, and white.—*Female:* Similar.

Also the genus *Cyanochen*. With tail graduated. Upper wing-coverts blue. One species from Abyssinia and Shoa—*C. cyanopterus*, 26″, legs black, bill black, head and neck ashy, back, scapulars, and below brown, mottled paler, primaries and tertiaries glossy black, secondaries glossy green, tipped white.

Also the genus *Chenonetta*. Maned Geese. With tail graduated. Upper wing-coverts grey. One species from Australia, viz.—*C. jubata*, 20″, legs dark brown, bill olive, head and neck brown, long plumes down back of neck chocolate. Back grey, rump, upper tail-coverts, and tail black, breast grey, mottled black, abdomen and under tail-coverts black, speculum white, green and white.

## Subfamily ANATINÆ. RIVER-DUCKS.

Hind toe narrowly lobed (298–314). Bill rather flat and broad, usually of even width throughout or wider at tip, not raised at base. Numerous fine lamellæ. Usually with metallic colours or speculum on the wing. Cosmopolitan. Rapid flight.

## Genus **DENDROCYGNA**.

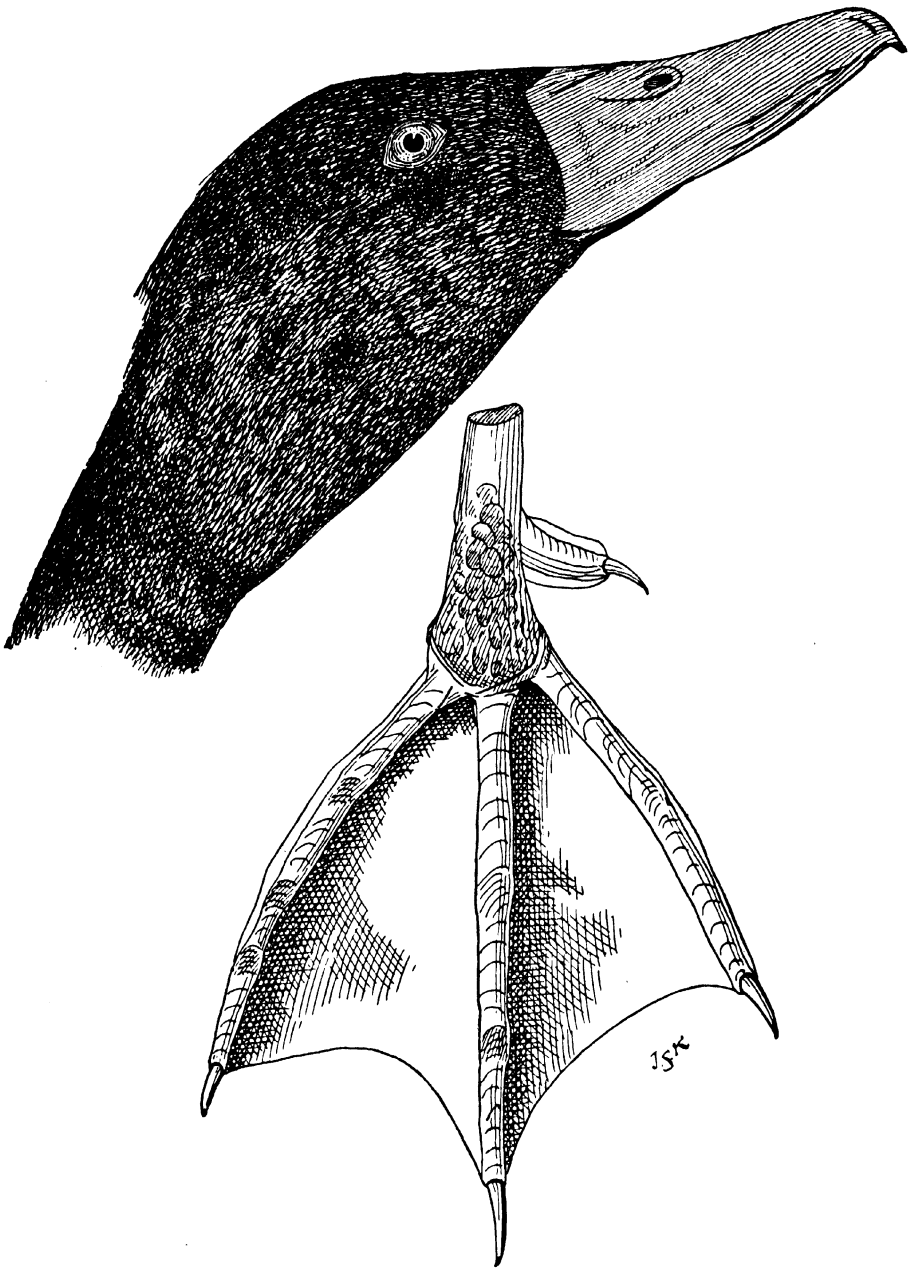
δένδρον = a tree; κύκνος = a Swan.

Bill raised at the base, large, long, and of uniform width; nail prominent, suddenly bent down. Second and third and fourth primaries subequal and longest. No wing-spot. Tail short, rounded, of sixteen feathers. Tarsus reticulated throughout. Tropical regions.

### 298. **Dendrocygna javanica**. THE COMMON WHISTLING TEAL.

**Soreil, Saral,** *Bengal;* **Silli,** *India;* **Chihee,** *Etawah;* **Horali,** *Assam;* **Yerra chilluwa** (Telugu); **Yerreindi,** *Quilon;* **Sisalee,** *Pegu;* **Tingi,** *Manipur;* **Saaru,** *Ceylon;* **Sisali,** *Burma.*

♂ 16″ to 18″; 1 to 1¼ lbs. Legs dark. Bill brown, nail black. Head wood-brown, darkening on to black. Rump and wing-coverts maroon. Upper tail-coverts chestnut. Lower surface light chestnut, whitish on lower tail-coverts. India, Ceylon, Burma, Siam, Cochin, S. China, Malay Peninsula, Sumatra, Borneo, and Java. Eight to fourteen eggs (1·88 × 1·40), white. Nest with eggs found on 19th August in Calcutta. (J. 952. B. 1589.)



299. Mandalay, 15.2.89.

**299. Dendrocygna fulva.** THE LARGE WHISTLING TEAL.

**Murghabi,** *Bengal;* **Badak,** *Deccan;* **Yerrinda,** *Travancore;* **Silli,** *India;* **Sisalee,** *Pegu.*

♂ 18″ to 21″; 1¾ lbs. ♀ 19½″; 1½ lbs. Legs leaden. Bill leaden. Head (with slight crest) and neck chestnut. A gorget of whitish hackles, and black stripe down back of neck. Flank-feathers long, with dark edges. Upper tail-coverts whitish. C. and S. America, Africa (south of the Sahara), Madagascar, India, Ceylon, and Burma. Eggs 2·18 × 1·7. (J. 953. B. 1590.) See illustration, p. 260.

Also *D. arcuata.* 17″. Legs and bill dark ashy. Head and line down back of neck chocolate. Back and scapulars black, edged rufous. Breast pale rufous, dotted black. Abdomen whitish, with brown spots. Philippines, Celebes, Borneo, Java, Moluccas, New Guinea, Australia, and Fiji Islands.

*D. viduata.* 17½″. Legs leaden. Bill brown, nail black. Anterior part of head and throat white. Lower neck chestnut. Back brown, with narrow fulvous bars. Rump and upper tail-coverts black. W. Indies, S. America, Africa (south of the Sahara), and Madagascar.

*D. autumnalis.* 19″. Legs pink. Bill coral-red, nail blue. Mantle and back chestnut. Rump, upper tail-coverts, abdomen, flanks, and under wing-coverts black. C. America.

*D. discolor.* Similar to *D. autumnalis,* but mantle is grey-brown. Breast grey. North of S. America.

*D. arborea.* 22″. Legs and bill black. Breast reddish brown, indistinctly spotted white. Abdomen and under tail-coverts white, thickly spotted black. Upper tail-coverts black. Bahamas and Antilles.

*D. guttata.* 17″. Legs ashy. Bill black. Superciliary stripe, sides of head, and upper neck grey. Upper tail-coverts black, broadly barred white. Upper breast rufous, with white spots. Celebes, Moluccas, and New Guinea.

*D. eytoni.* 16″. Legs rose. Bill reddish, with mottled patch. Sides of breast reddish, barred black. Wing with no chestnut colour. Feathers of flanks buff, long, and acuminate, margined black. Australia and New Zealand.

*Tarsus scutellate in front near the foot.*

*Wing speculum always present, more or less conspicuous.*

## Genus **TADORNA.**

*Tadorna,* an Italian word, which seems first to occur in Bélon, 1585, as the Latinised name of a bird.

Bill short, high, swelling at base, and concave in middle. Tip flat and turning up. Nail hooked. Tail rounded, of fourteen feathers.

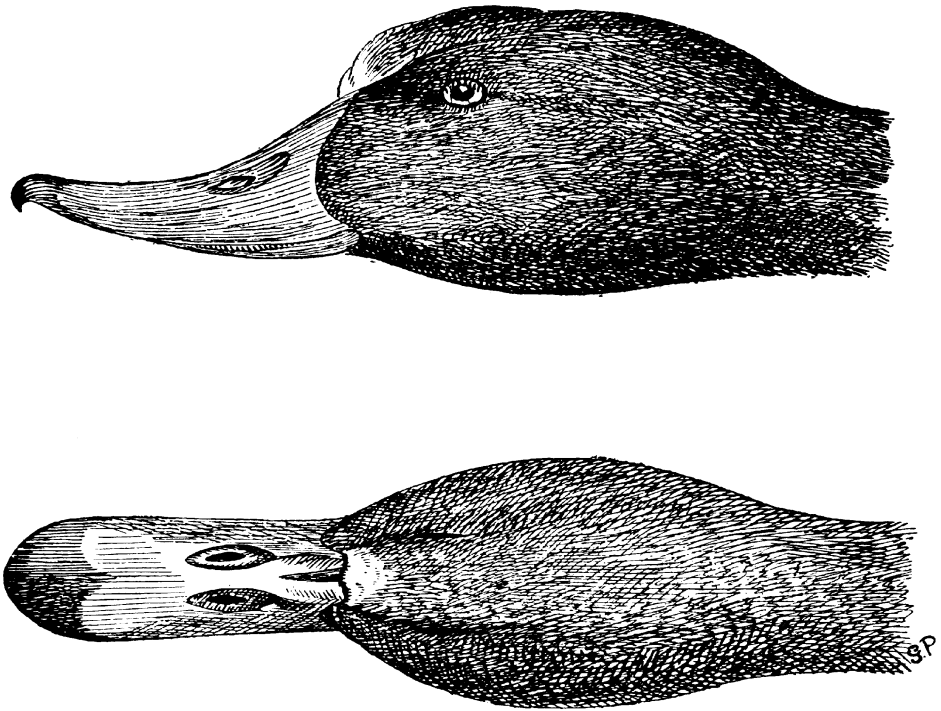
**300. Tadorna cornuta.** THE BURROW DUCK OR COMMON SHELDRAKE.

*Cornūta* = horned; from *cornu* = a horn.

**Shah-chakwa,** *Upper India;* **Niraji,** *Sind;* **Shah moorghabi,** *Cabul.*

♂ 23″ to 26″; 3 lbs. ♀ 21″ to 22″; 2 lbs. Legs red. Bill and basal knob red, tip black. Head and neck glossy green. White collar. Chestnut breast-band, uniting on back. Mesial black line. Speculum chestnut, black, and green. Tail white, tipped black.—*Female:* No knob at base of bill. Lower plumage white, mottled brown; no band. Europe and Asia, migrating in winter to S. Europe, N. Africa, W. Asia, N. India, S. China, and Japan. Nest in a burrow. Seven to sixteen eggs (2·6 × 1·9), buff. Hatched in twenty-eight to thirty days, and immediately led to the sea. (J. 956. B. 1587.) See illustration, p. 262.

Also *T. radjah.* 19″. Legs and bill white, no knob at base. Head, neck, breast, and abdomen white. Tail black. Moluccas, Papuan Islands, and Australia.



300. *Tadorna cornuta.* Helaya, 1872.

## Genus **CASARCA.**

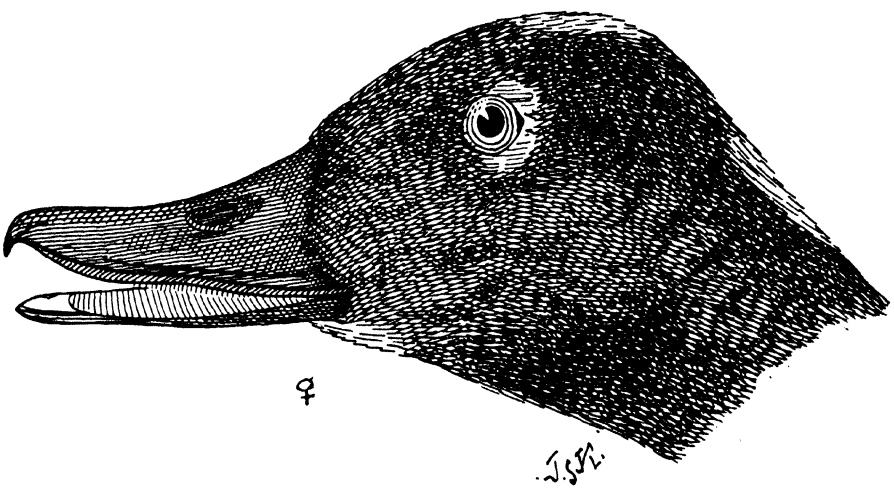
*Casarca*, a proper name=Goose, in South Russian; Tartar *karakchás*=black Goose.

Similar to *Tadorna*, but bill of uniform width, depressed towards tip. Nail large, and less hooked. Brilliant wing-spot.

### 301. Casarca rutila. The Brahminy Duck or Ruddy Sheldrake.

**Sarkhab, Chakwa, Chakwi,** *India;* **Mungh,** *Sind;* **Sarza,** *Sattara;* **Neerbathoo,** *S. India;* **Bassana Chilluwa** (Telugu); **Hintha,** *Pegu;* **Surkhed,** *Cabul;* **Hangat,** *Yarkand.*

♂ 24″ to 27″; 3 to 4¼ lbs. ♀ 21¾″ to 24″; 2 to 3¼ lbs. Legs black. Bill black. Head and neck buff, with black collar. Upper tail-coverts, tail, and quills green-black. Breast and under tail-coverts orange-brown.—*Female* smaller and no collar. S. Europe, N. Africa, W. and C. Asia, visiting Afghanistan, India, Ceylon (rarely), Assam, Burma, China, and Japan. Nine to sixteen eggs (2·6 × 2), pale buff, unglossed. Young when hatched carried to the water. No proof of any change of plumage in summer. Held sacred by the Mongols and Calmucs. (J. 954. B. 1588.)



*C. rutila*, 6.12.73.

Also *C. cana*. 22″. Head and neck ashy. Rufous collar. Breast fulvous. Abdomen chestnut. Under tail-coverts bright fulvous. S. Africa.

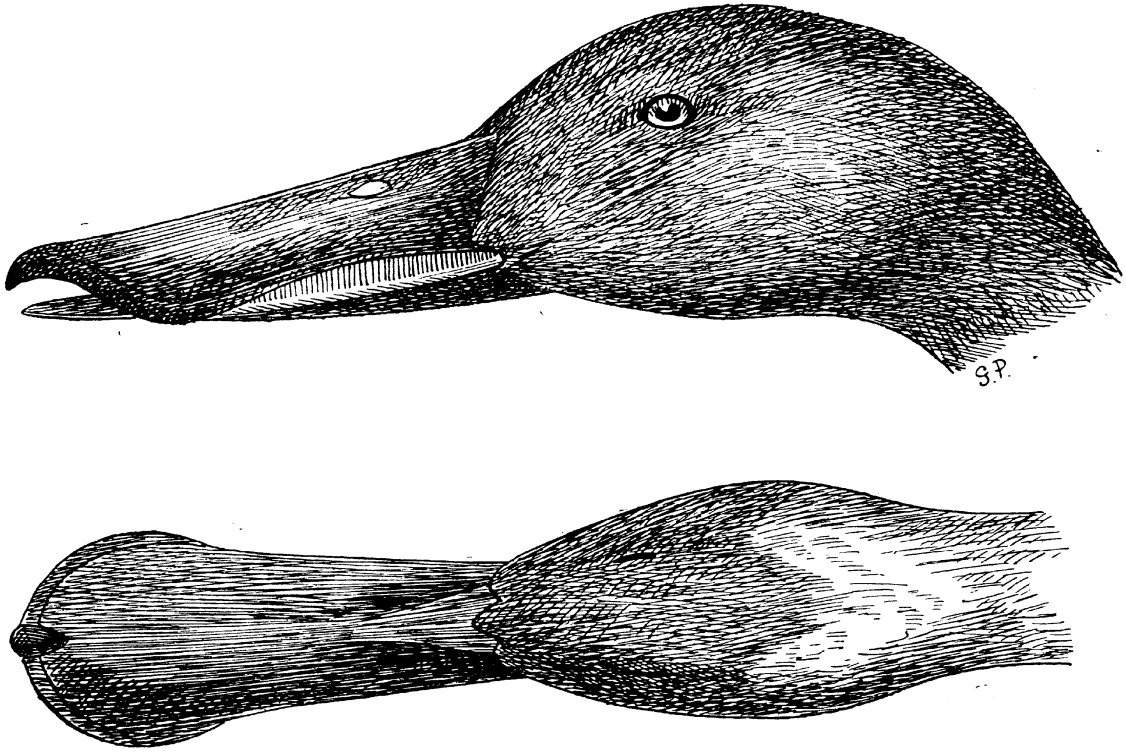
*C. variegata*. 24″. Head and neck glossy black. Back, scapulars, breast, and sides black with grey wave lines.—*Female:* Head and upper neck white. New Zealand.

*C. tadornoides*. 24″. Head and upper neck dark glossy green. White neck-ring. Breast red. Tail, upper and lower tail-coverts black. S. and W. Australia and Tasmania.

Also the genus *Chenalopex*. With no prominent lamellæ on edges of bill. Two species:—

*C. ægyptiacus*. 28″. The Egyptian Goose. Legs pink. Bill pink, base and tip black. Head and upper neck grey-brown. Base of bill, eye-patch, hind neck, and neck-ring ruddy. Mantle grey, finely lineated. Back, rump, upper tail-coverts, and tail black. Wing-coverts white. Africa and Palestine.

*C. jubatus*. 20″. Legs yellow. Bill black. Head, neck, and breast dull grey. Mantle and scapulars ruddy. Greater wing coverts green, glossed purple. N. of S. America.



302. *Spatula clypeata.*

## Genus **SPATULA.**

*Spătŭla*=a small flat instrument, anything broad like a spoon, *spătha.*

Bill much dilated. Lamellæ very fine, closely set, and projecting.

### 302. **Spatula clypeata.** The Shoveller.

*Clypĕăta*=armed with a shield, *clypeus* or *clipeus;* from its white shield-like gorget.

**Tidari, Punana,** *N.W.P.;* **Alipat,** *Sind;* **Kanak-aurdak,** *Yarkand.*

♂ 19″ to 22″. ♀ 18″ to 19″. Legs orange. Bill brownish. Head, back, rump, upper and lower tail brown, glossed green. Scapulars black, with broad white stripe along the middle. Lesser coverts grey. Speculum bright green. Upper breast white, lower breast and abdomen chestnut. Male assumes plumage of female in summer.—*Female:* Dark brown, edged whitish. Northern Hemisphere between lat. 10° and lat. 68° N. A winter visitor to India, Ceylon, and Burma. Seven to nine eggs (2·0 × 1·5), greenish buff. On 4.11.75, the Mohanas in Sind had their fowling nets all ready, but said that the Ducks would not arrive in any number till the next full moon (November 13th). (J. 957. B. 1602.)

Also *S. rhynchotis.* 22″. Legs yellow. Bill purplish. Head and neck bluish grey. Crown, base of bill, and chin black. White band between base of bill and eye, extending to the throat. Australia, Tasmania, and New Zealand.

*S. platalea.* 20″. Legs yellow. Bill blackish. General plumage reddish, spotted black. S. America.

*S. capensis.* 20″ to 21″. Legs yellow. Bill red-brown. Mantle and above brown, with narrow wave lines. Below grey-brown, thickly mottled. Speculum dark green. Scapulars dark blue, with no white on central parts. S. Africa.

Also the genus *Malacorhynchus.* With spatulate bill and a soft membrane on the sides near the tip. One species.

*M. membranaceus.* 17″. Legs brownish green. Bill greyish blue. Crown brown. Sides of head and chin white. Brown eye-patch, with an oblong mark of rose-pink behind it. Australia and Tasmania.

## Genus **ANAS.**

*νῆττα*=a duck, from *νέω*=to swim.

Bill not so deep as wide, of nearly uniform width. Lamellæ short. Nostrils near base of bill. Metallic speculum formed by the outer webs of the secondary quills. Fifth remex wanting. Tail rather pointed, of eighteen to twenty feathers. Tarsus shielded in front. Hind toe with small, narrow lobe. Cosmopolitan.

### 303. **Anas boscas.** The Mallard or Common Wild Duck.

**Nilsir,** *India;* **Lilgah,** *Nepal;* **Niroji,** *Sind;* **Sabz-zurdan,** *Cabul;* **Sun,** *Yarkand.*

♂ 22½″ to 24″; 2½ to 4 lbs. ♀ 20″ to 21½″; 2 to 2½ lbs. Legs orange. Bill yellowish, nail black. Head emerald-green. White neck-ring. Chestnut gorget. Speculum Prussian blue, bordered black above and white below. Back vermiculated white and brown. Four central tail-feathers glossed purple and curled. Tail of twenty feathers. To avoid calling a drake a duck, the name of Wild Duck was dropped in favour of Mallard, which simply means Drake. After the breeding season the drake moults in June into female plumage. When the body-moult is complete, the bird loses its quills, and is for a time unable to fly. The ordinary male plumage is reassumed by a second moult in September. "20th August.

Our two Wild Ducks are very happy on the tank in the garden, and they have now been joined by a pair of Dabchicks. The mallard has lost his green head and his tail-curls, and is coloured as the female, only with his breast and back more rufous, his bill being now a bright dead yellow" (*Kandahar in 1879*, p. 249). —*Female:* Brown, edged lighter. Head and neck yellowish, unspotted. Below buff, with brown centres. Tail brown, edged buff. The original source from which tame ducks are derived. Temperate regions of Northern Hemisphere, migrating south in winter. Breeds in the Himalayas and Kashmir. Unknown in S. India, Ceylon, Pegu, and Tenasserim. Six to twelve eggs (2·23 × 1·6), greenish white.

The Wild Ducks (*A. boscas*) afford an example of the changes of plumage in the different sexes, ages, and seasons of the year which may take place in certain species of birds.

At first the young are clothed with down, alike in colour. The down is soon replaced by true feathers. In this stage also the two sexes are almost exactly alike, both closely resembling the adult female.

The females, from the time they acquire their complete covering of feathers, remain for the rest of their lives practically alike, undergoing no change with the different seasons. Their dress is highly protective, being very inconspicuous as long as the birds remain among the reeds and sedges which grow in the places they usually frequent and where they make their nests.

The males for a considerable part of the year put on a very handsome and conspicuous dress, which attains its perfection shortly before the pairing season begins, or about mid-winter. By the time the young are hatched a change begins to take place, the brilliant plumage disappears, and the bird "goes into an eclipse," as Waterton described it. It loses all the characteristic appearance of the male, even the four curling central tail-feathers, and assumes a dress so closely resembling that of the female that at a little distance it is impossible to distinguish the sexes. While in this condition the moult of the large wing-feathers takes place, the bird being for a time unable to fly. After remaining in this garb about three months it rapidly acquires the winter dress, which is nearly complete by the beginning of October, although the brilliant glossy green of the head and the rich dark maroon of the breast are not yet fully developed, the feathers of the latter being bordered by a light edge which they afterwards lose.

Precisely similar changes take place in many other species of Duck, though not in all. In the Sheldrake (*T. cornuta*), for example, the males and females are both conspicuously coloured, and change but little with the seasons. (N.H.M. J. 958. B. 1592.) See illustration, p. 267.

Also *A. wyvilliana*. 18″. Like *A. boscas*, but speculum is greenish blue, and under tail-coverts black, mixed with chestnut. Sandwich Islands.

*A. laysanensis*. 17″. Legs orange. Bill blackish. General plumage rufescent. Irregular white ring round the eye. Speculum purple, green, and white. Laysan Islands.

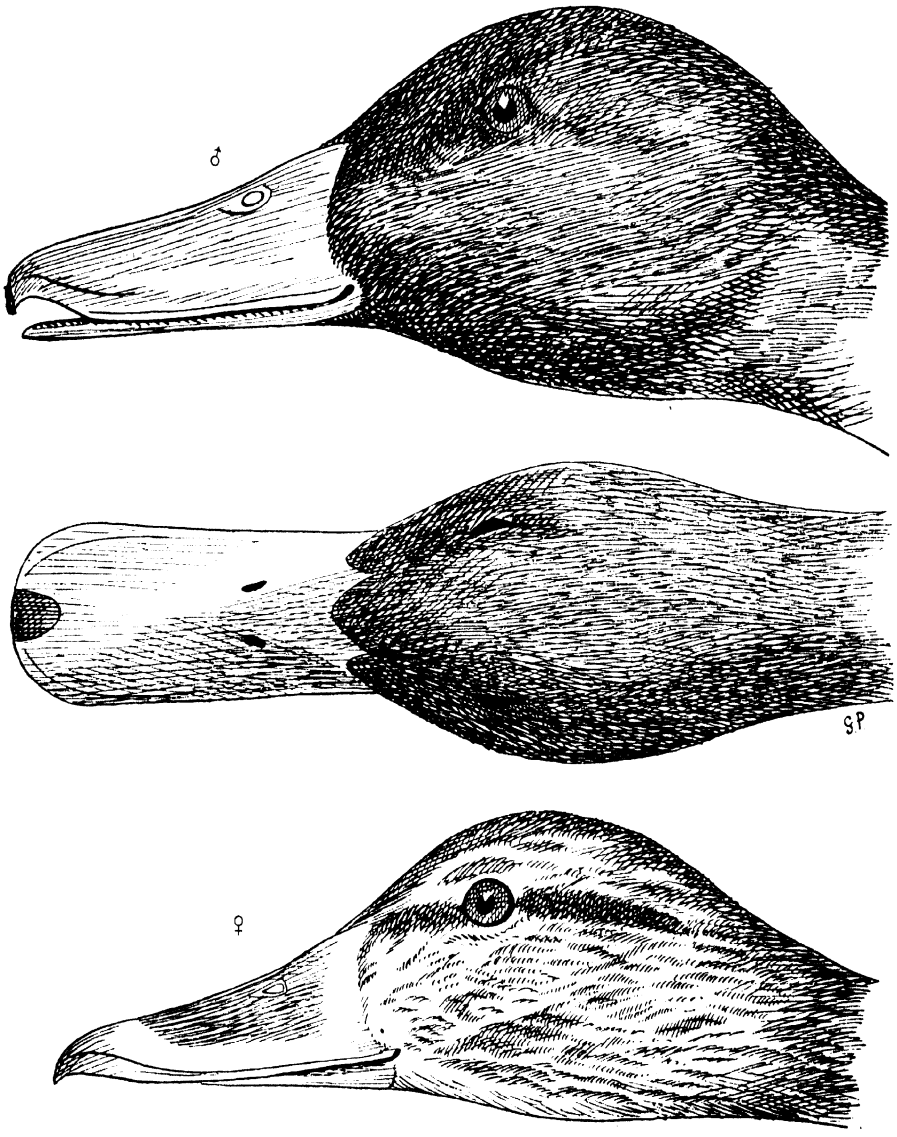
*Central tail-feathers not curled up.*

*A. melleri*. 21″. Legs flesh colour. Bill black. Feathers brown, margined red. Speculum black, glossy green, and black. Madagascar.

*A. obscura*. 21″. Legs orange. Bill yellowish. Feathers brownish black, edged pale fulvous. Speculum glossy violet, surrounded by black. E.N. America and Bermudas.

*A. fulvigula*. Similar to *A. obscura*, but much paler. Speculum bluish green. Florida.

*A. maculosa*. Similar to *A. fulvigula*, but cheeks are streaked with brown. Speculum




303. *Anas boscas.*

*A. diazi.* Resembles *A. fulvigula*, but last row of wing-coverts with subterminal band of white, and secondaries with broad terminal bar of white. Speculum green. Mexico.

*A. aberti.* In colour like *A. fulvigula*. Secondaries widely tipped white, preceded by a black bar. Speculum grass-green. Mexico.

*A. luzonica.* 20″. General plumage grey. Crown and nape brown. Eye-stripe, throat, and neck rufous. A black band from lores through eyes. Speculum black, green and black. Philippines.

*A. superciliosa.* 24″. Legs yellow. Bill plumbeous, nail black. Above and below brown, edged buff. Band from forehead through eyes brown-black. Speculum black, green and black. Java to S. New Guinea, Australia, New Zealand, and Polynesia.

*A. oustaleti.* Similar to *A. superciliosa*, but paler below, and speculum bluish purple. Ladrone Islands.

### 304. Anas pœcilorhyncha. The Spotted-billed Duck.

**Garmpai,** *India;* **Gugral,** *N.W.P.;* **Hunjur,** *Sind;* **Kara,** *Manipur;* **Naddun,** *Nepal.*

♂ 24″ to 26″; 2¼ to 3¼ lbs. ♀ 22″ to 24″; 2 to 2¾ lbs. Legs orange. Bill black, base red, tip yellow, nail black. Brown eye-line. Speculum green, with black tip, edged white. Greater coverts white, edged deep black. Breast white, conspicuously spotted black. Sexes alike, but female has eighteen tail-feathers (two less than the male). India, Ceylon, Assam, and Burma. Six to twelve eggs (2·15 × 1·70), greyish white. (J. 959. B. 1593.) See illustration, p. 269.

Also *A. zonorhyncha.* 23″. Legs bright red. Bill black, tip yellow. Similar to *A. pœcilorhyncha*, but breast is brown, unspotted. Speculum black, glossy blue and black. China, Mongolia, E. Siberia, Japan, and Kurile Islands.

*A. undulata.* 20″. Legs black. Bill yellow, with longitudinal patch on culmen, and nail black. Above dark brown, edged paler. Broad speculum, black, green, and white. S., E., and W. Africa.

*A. sparsa.* 21″. Legs orange. Bill yellow, culmen and nail black. General plumage sepia, edged lighter. Speculum black, green, and white. Conspicuous white bars across tail, upper tail-coverts, and tertials. S. and E. Africa.

*A. specularis.* 21″. Legs red. Bill black. Head and neck brown. Large spot between bill and eyes. Chin and mid-throat white. Above glossy brown-black, edged paler. Speculum copper-red, with black band. S. America.

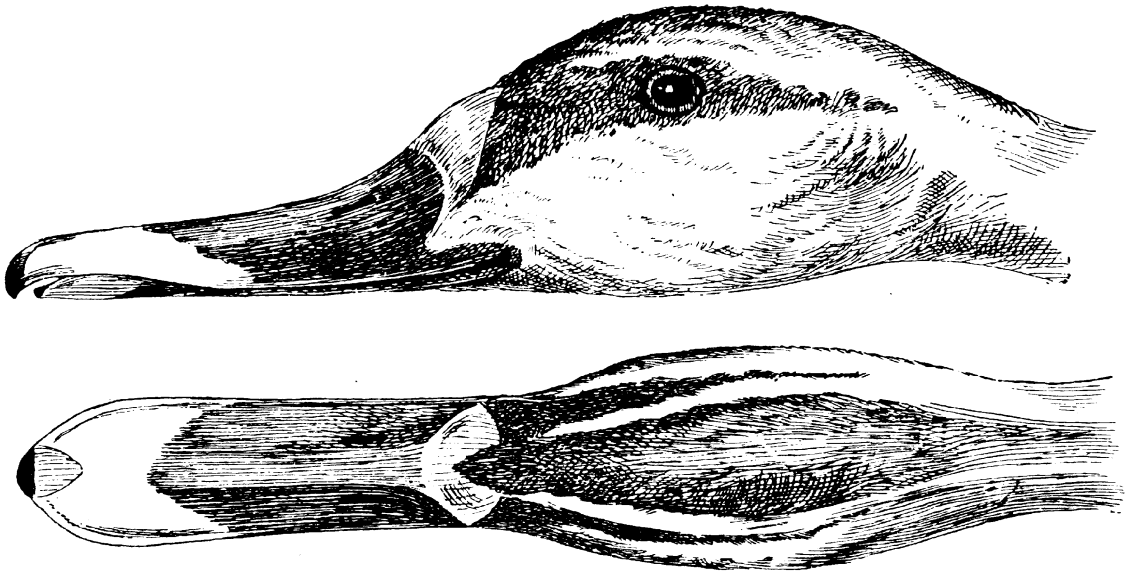
*A. cristata.* 24″. The Crested Duck. Legs grey. Bill brown. Head and neck grey, finely spotted brown. Occipital patch brown. Nape with long pendent crest. Chin and throat white. Above brown, edged paler. Speculum copper-red and black. S. America.

## Genus **EUNETTA.**

Bushy nuchal crest. Elongate sickle-shaped tertiaries. Upper and under tail-coverts exceeding the tail in length. Fourteen tail-feathers. Sexes distinct. Females do not differ in structure from those of *Nettium.*

### 305. Eunetta falcata. The Crested or Falcated Teal.

♂ 19¾″; 1⅝ lbs. Legs drab. Bill black. Frontal spot white. Head bronze, with green eye-patch. Throat white, with greenish band across it. Back mottled grey and white. Tail brown. Falcate tertiaries black, glossed green, shafts white. Breast and abdomen white, with dark brown bands.—*Female:* Head and neck brown, streaked white. Speculum black, glossed green. E. Asia and Japan. Visits N. India and Burma in winter. Eggs (2·2 × 1·56) creamy white. (B. 1594.



304. *Anas pœcilorhyncha.* Kipling, Lahore, 1876.

## Genus **CHAULELASMUS.**

χαυλός = loose, gaping; a word found only in classical Greek, χαυλιόδους = with outstanding teeth; and ἐλασμός = metal beaten out, a metal plate, from ἐλαύνω = I drive, strike, beat out. From the projecting laminæ of the upper mandible.

Bill narrows slightly towards tip. Small nail. Lamellæ long and quite prominent. Speculum black and white. Tail of sixteen feathers.

### 306. Chaulelasmus streperus. The Gadwall or Grey Duck.

*Strĕpĕrus* = noisy.

**Mila**, *India;* **Beykhur**, *N. W. P.;* **Mail**, *Nepal;* **Burd**, *Sind;* **Syah-dum**, *Cabul.*

♂ 20″ to 21½″; 1½ to 2 lbs. ♀ 18″ to 20″; 1 to 1¾ lbs. Legs dull yellow. Bill black. Head grey, speckled brown. Back brown, with white crescentic lines. Wing-coverts chestnut. Speculum white and black.—*Female:* Brown, edged buff. Bill pale, with red margins. Abdomen white. Northern Hemisphere, and in winter to N. Africa, Palestine, India, Burma (not observed in Ceylon), China, and Japan. In America as far south as Mexico and Jamaica. Six to thirteen eggs (2·35 × 1·63), creamy. Masson saw flocks of from twenty to thirty in Teesta and Great Rungeet valleys. (J. 961. B. 1595.)

Also *C. couesi.* 17″. Like *C. streperus*, but smaller. Bill and feet black. Lamellæ small and closely packed, about seventy-five in number, while in *C. streperus* there are only about fifty. Fanning Island.

## Genus **NETTIUM.** Teal.

Bill moderate, of uniform width, not gradually tapering towards tip. Lamellæ scarcely prominent. Tail of fourteen to sixteen feathers. Central tail more or less acuminate, and extending somewhat beyond the lateral ones. Cosmopolitan.

### 307. Nettium formosum. The Baikal or Clucking Teal.

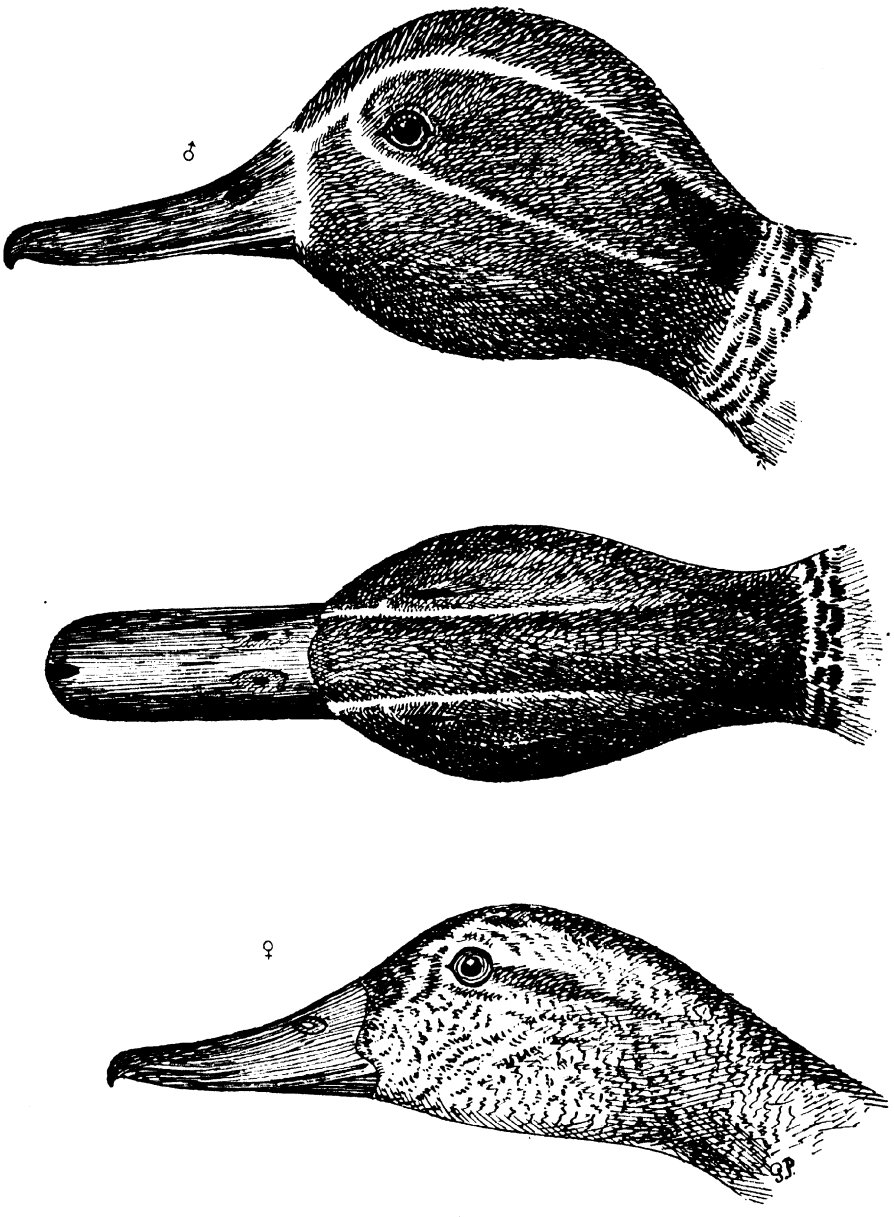
♂ 15½″ to 18″; 1 lb. Legs greenish blue. Bill bluish brown. Forehead, crown, band from eye to throat, chin, and throat black. Green band from eye to eye, round nape. Sides of head, and upper neck buff. Narrow borders to all black areas on head and neck white. Back, sides of breast, and flanks finely vermiculated grey and white. Secondaries bronze-green near coverts, tips black. Speculum green, ending velvet-black, bordered silver.—*Female* dusky, edged rufous. Tail-coverts white, with brown spots. Spot near base of bill and another below eye buff. E. Siberia, S. China, and Japan, straggling occasionally to W. Asia and Europe. Rare in India. Eggs (1·85 × 1·35) pale grey-green. (J. 966. B. 1596. H. & M. iii. 225.)

### 308. Nettium crecca. The Common Teal.

*Crecca*, probably from its note. Cf. *Crex*, *q.v.*, and the German *Kriech-Ente;* old English *Cracker* = Pintail.

**Moorghabi**, *India;* **Kerra**, *N. W. P.;* **Naroib**, *Bengal;* **Baiji-lagairi**, *Nepal;* **Kardo**, *Sind;* **Killowai**, *Madras;* **Sorlai haki**, *Mysore;* **Churaka**, *Cabul;* **Alahbash**, **Kurak-aurdak**, *Yarkand.*

♂ 14½″ to 16″; 10 to 15 oz. ♀ 13½″ to 15″; 7½ to 12 oz. Legs greyish. Bill black. Head and upper neck chestnut. Green eye-patch. Speculum green, with black sides, with yellow bar above. Lower neck, upper back, and sides of body narrowly barred black and white. Outer secondaries black, inner green. Tail of sixteen feathers. Assumes the female plumage about end of July.—




308. *Nettium crecca.*

*Female:* Throat, cheeks, and eye-band yellow, spotted black. Above dark brown, edged paler. Europe, N. Africa, Asia, visiting India, Ceylon, Burma, China, and Japan in winter. Not observed in S. Tenasserim, the Andamans, the Nicobars, or in Malabar. Eight to twelve eggs (1·7 × 1·3), buff. (J. 964. B. 1597. H. & M. iii. 205.)

Also *N. carolinense.* The American Teal. Similar to *N. crecca*, but the whitish line surrounding the green eye-patch is almost obsolete, the scapulars are pale slate-grey with no white, and there is a broad whitish crescent on each side of the breast. N. America and W. Indies, occasionally in Europe.

*N. castaneum.* 18½″. Legs leaden. Bill bluish, nail and edges black, red band near tip of lower mandible. Head and neck dark glossy green. Mantle and back black, edged chestnut. Breast and abdomen chestnut, spotted black. Speculum black, green, and white. Australia, New Zealand, and a straggler in Celebes and Java.

### 309. Nettium albigulare. The Andaman Teal.

♂ 16″ to 18″; 1 lb. ♀ 15″ to 16″; 12 oz. Legs plumbeous. Bill plumbeous, nail black. Upper part of head dark brown. Cheeks, chin, throat, and foreneck white. Eye set in white ring. Full short occipital crest. Above dark brown, edged paler. Brilliant longitudinal metallic green wing-band. Outer web of first secondary white, of seventh to ninth bronze, of others black. S. Andaman Island. Eggs (1·93 × 1·43) creamy. (B. 1598. H. & M. iii. 243.)

Also *N. gibberifrons.* 17″. The Oceanic Teal. Similar to *N. albigulare*, but no white eye-ring, and usually no white on outer web of first secondary. Celebes, Java, Timor, Flores, and Sumba.

*N. bernieri.* 16″ to 17″. Legs and bill red. Head and neck pale brown, streaked blackish. Back brown, edged grey. Tail brown, tipped paler. Breast and abdomen dull red, mottled pale brown. Speculum black, with no metallic green band. Madagascar.

*N. capense.* 15½″. Legs yellow. Bill crimson. Head and neck white, dotted black. Above fulvous, barred and spotted brown. Throat white. Upper breast barred with brown. Speculum green, with white bar in front. S. Africa.

*N. flavirostre.* 15″ to 16″. Legs grey-blue. Bill yellow, nail black. Head and neck grey-brown, barred blackish. Above grey-brown, with black spots and margined red-brown. Breast and below whitish, spotted and barred. Upper wing-coverts grey, tipped hazel, forming a band above the black speculum. S. America.

*N. oxypterum.* 17½″. Similar to *N. flavirostre*, but abdomen is unspotted white. Scapulars with small black spots and broad rufescent edges. Peru and N. Chili.

*N. andium.* 16″ to 17″. Similar to *N. flavirostre*, but legs are flesh-coloured and bill dark without any yellow. Ecuador and Venezuela.

*N. georgicum.* Similar to *N. flavirostre*, but speculum is entirely black, with no longitudinal metallic green band on the upper part. S. Georgia.

*N. punctatum.* 13″. Legs purplish. Bill light purple, base black. Upper part of head black. Back black, edged light brown. Wings brassy green. Speculum glossy green, bordered black. S. and E. Africa and Madagascar.

*N. brasiliense.* 17″. Legs and bill red. Head and nape black. Back brown. Sides of head and neck grey. Neck and breast reddish. Upper wing-coverts velvety black. Axillaries white. S. America.

*N. torquatum.* 14″. Legs yellow. Bill black. Back grey-olive. Breast rosy, spotted black. Axillaries black. Speculum bronze-green. S. America.

## Genus **MARECA.**

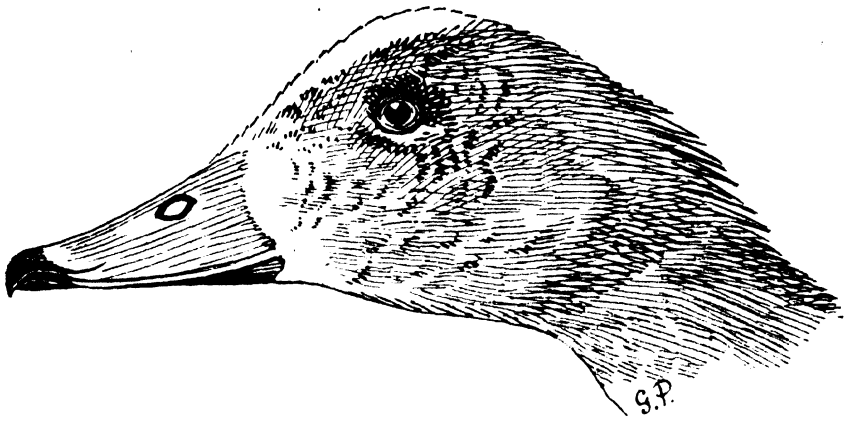
*Marēca*, the native name, according to Marcgrave, of the Brazilian Teal (*Nettium brasiliense*).

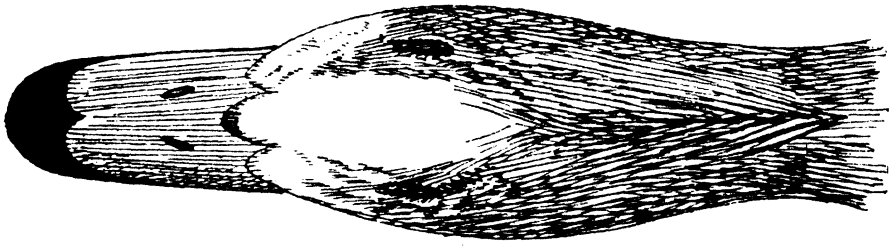
Bill raised at base, narrowing towards the tip, nail black. Lamellæ scarcely prominent. Short tail cuneate of fourteen feathers. Tarsus scutellate in front. Hind toe small, with narrow lobe. Palæarctic, Nearctic, and Neotropical regions.

### 310. Mareca penelope. The Wigeon or Whew.

*Pēnĕlŏpē*; *πηνέλοψ*=a kind of Duck with purple stripes, in classical Greek, which was said to have fed Penelope (subsequently the wife of Ulysses) after her parents had thrown her into the sea.

**Pea-san**, Patari, *N. W.P.*; **Cheyun**, *Nepal*; **Parow**, *Sind*; **Ade**, *Ratnagiri*.



Munchur Lake.

♂ 19″ to 19½″; 1¼ to 1½ lbs. ♀ 18″ to 19″; 1⅛ to 1¾ lbs. Legs leaden. Bill blue, black tip. Crown yellow. Neck chestnut. Back, scapulars, rump, sides of breast, and flanks vermiculated black and white. Speculum green, bounded above and below with black. Upper tail-coverts grey, outer feathers black.—*Female* fulvous. Head chestnut, speckled black. Green speculum wanting. Iceland to Kamschatka, wintering in Africa, Persia, N. India (not recorded in Ceylon), Burma, China, Japan, and E.N. America. Seven to twelve eggs (2·0 × 1·45), buff. (J. 963. B. 1599.)

Also *M. americana*. 18″ to 21″. The American Wigeon. Legs light blue. Bill blue, tip black. Forehead and crown whitish. Sides of head and upper neck whitish, with black spots. Speculum black and green. Axillaries white. N. America and occasionally the W. Indies.

*M. sibilatrix*. 20″. Legs and bill black. Head and neck black. Forehead and cheeks white. Lower neck barred black and white. Upper tail-coverts, breast, and abdomen white. Speculum black. South of S. America.

## Genus **DAFILA.**

Tail long, of sixteen or eighteen feathers, with central tail elongated. Lamellæ not projecting. Bill a little broader at tip than at base.

### 311. **Dafila acuta.** The Pintailed Duck.

*Acūta*=sharp, pointed; from *acŭo*=I sharpen.

**Sinkpar,** *N. W. P.*; **Dighons,** *Bengal*; **Laitunga,** *Manipur*; **Taw-boy,** *Burma*; **Digoonch,** *Nepal*; **Kokarali, Drighush,** *Sind*; **Sinkdum,** *Cabul*; **Chasugshu-aurdah,** *Yarkand.*

♂ 22″ to 29″; 1¾ to 2¾ lbs. ♀ 20″ to 22″; 1 to 2 lbs. Legs grey-black. Bill black, sides blue. Head umber. White neck-streaks. Back and sides finely vermiculated black and white. Speculum green, glossed purple, bordered above by a pale bar and below by a white one. Long central tail black.—*Female* largely marked dark brown, edged white. Speculum dull, unglossed. Northern Hemisphere, and wintering in N. Africa, India, Ceylon, Burma, China, Japan, and N. and C. America. Five to nine eggs (2·1 × 1·5), greenish buff. (J. 962. B. 1600.) See illustration, p. 275.

Also *D. modesta.* Probably to be identified with *D. acuta.* C. Pacific.

*D. eatoni.* 17″. Legs dark slate. Bill plumbeous. Head and upper neck dark brown, with darker shaft stripes. Back brown, with narrow white wave lines. Throat divided from neck by a white band. Below dully grey, thickly dotted on breast with small black spots. Speculum hazel, black, bronze-green, black and white. Kerguelen Island.

*D. spinicauda.* 20″. Legs plumbeous. Bill yellow, culmen black. Crown rufous. Upper neck with black shaft streaks. Throat whitish. Below dark brown, edged white. Wings grey-brown. Speculum black, glossed green, margined white above and below. Tail grey-brown, margined rufous. Central tail dark brown. S. America.

Also the genus *Pœcilonetta*, with narrow speculum. Tail rufous or brown. Three species, viz.—

*P. bahamensis.* 19″. Legs brown. Bill bluish, with two red spots at base of upper mandible. Crown, nape, lower neck, upper back, breast, and abdomen reddish, with black spots. Cheeks, sides of head, and throat white. Speculum fawn, glossy green, black and fawn. Bahamas, Antilles, and S. America.

*P. galapagensis.* 14″. Similar to *P. bahamensis*, but the cheeks are white, thickly speckled brown. Galapagos Islands.

*P. erythrorhyncha.* 17″. Legs dark ashy. Bill purple. Upper half of head dark brown. Sides of head and throat white. Neck grey, mottled black. Back brown, edged buff. Below whitish, with grey-brown spots. Speculum fawn, black and fawn. Tail and upper tail-coverts brown, edged grey. Africa and Madagascar.

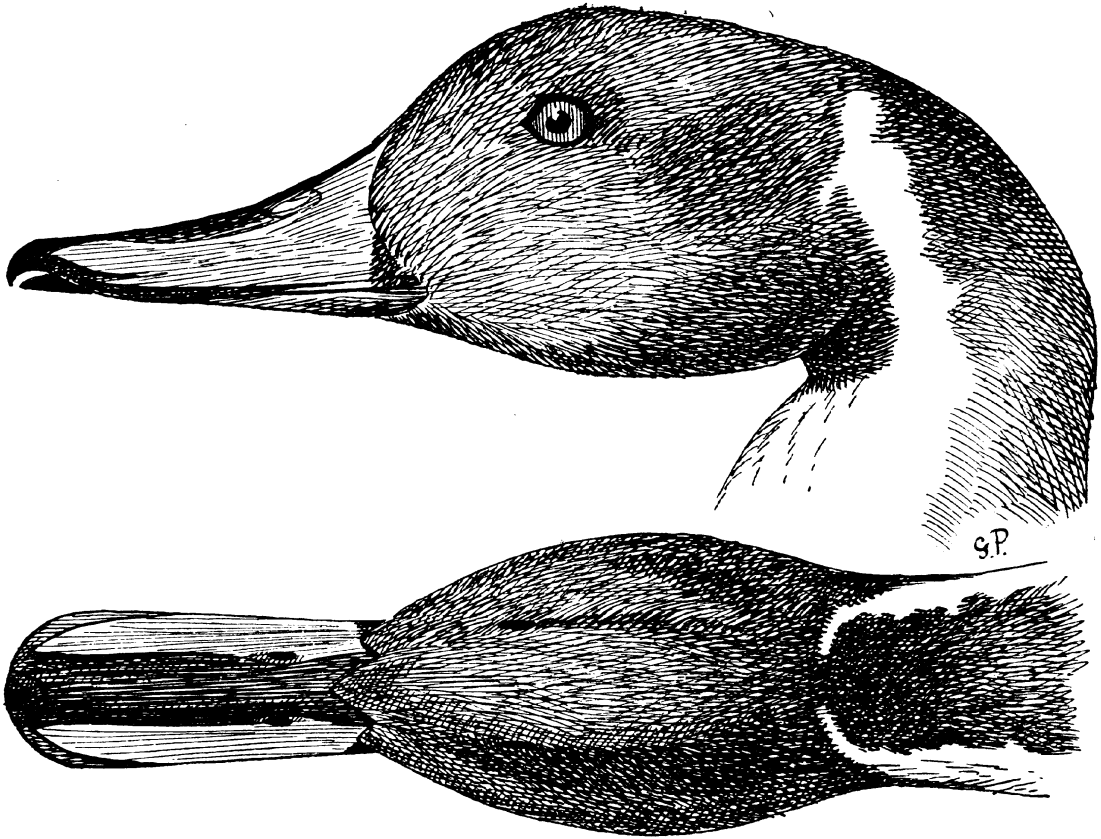
Also the genus *Elasmonetta.* With edges of upper mandible fringed in front with a narrow soft membrane. Lamellæ extremely developed. One species from New Zealand, viz. *E. chlorotis*, 18″, legs slate-grey, bill bluish black, head and neck brown, collar white. Breast and abdomen chestnut, spotted black. Speculum cinnamon, black and rufescent white. Tail brown, edged lighter.

Also the genus *Nesonetta.* With wings very small, useless for flight. Lamellæ moderate. One species, viz. *N. aucklandica*, 14″, coloured similar to *E. chlorotis.* Aucklands.

## Genus **QUERQUEDULA.** Garganey Teal.

*Querquedŭla*, a kind of Duck mentioned by Varro and Columella; perhaps from κέρκουρος =a light vessel used by the Cyprians, or from κέρκαιρω=I ring. Professor Skeat says the name is from an onomatopœic base, *querq* or *kark*, significative of any loud noise. According to O. Müller's conjecture, from the Greek κέρκουρος. Hence the French *çerçelle.*

Differs considerably from *Nettium* in structure, plumage, and habits. A soft membrane fringes the end of the upper mandible, and the upper wing-coverts are blue or bluish grey. Northern Hemisphere and Neotropical region.



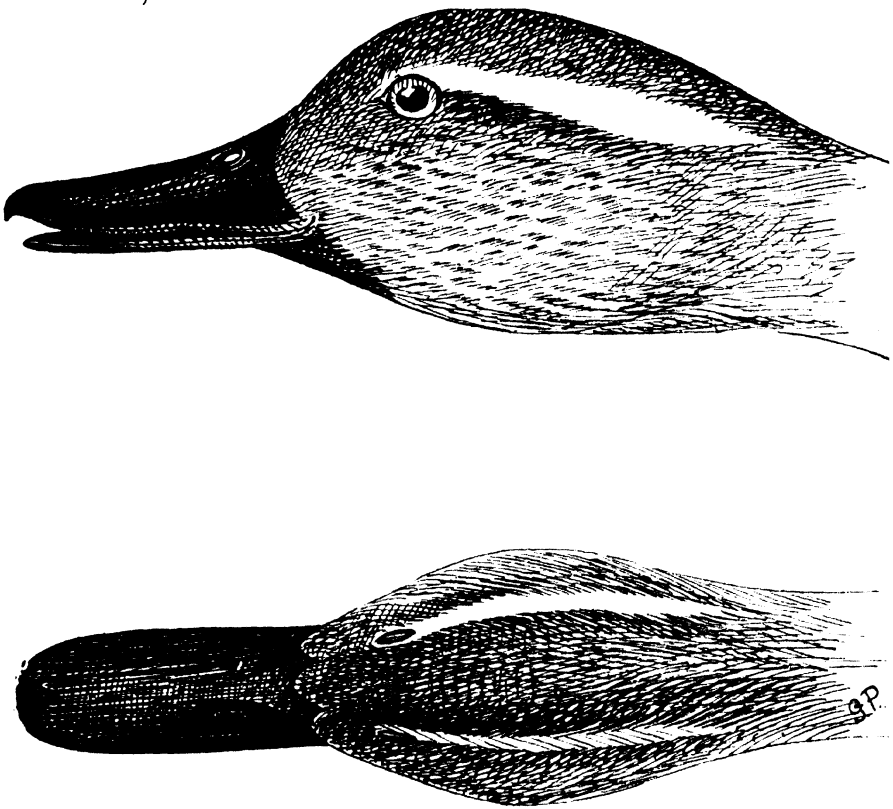

311. *Dafila acuta.*

### 312. Querquedula circia. The Garganey or Blue-winged Teal.

*Circia*, the ancient name, though not used by any classical author; probably from the root of *κίρκος* = the Hawk.

**Chaitwa**, *N. W. P.*; **Ghangroib**, *Bengal*; **Sitch-dum**, *Cabul*; **Karak-aurdak**, *Yarkand*.

♂ 16″; 10 oz. to 1 lb. ♀ 15″; 9 to 15 oz. Legs dusky. Bill blackish. Crown and nape brownish black. White streak over eye. Neck and throat rufous, streaked white. Chin black. Scapulars lanceolate, with broad white shaft stripes. Speculum greyish green, with white bar above and below.—*Female* dusky, edged whitish. Wing-coverts ash-grey. Palæarctic region, wintering in N. Africa, Palestine, India, Ceylon, Burma, China, Japan, Philippines, Borneo, Java, and Celebes. Four to thirteen eggs (1·87 × 1·37), creamy white. (J. 965. B. 1601.)



312. *Querquedula circia.*

Also *Q. discors*. 16″. Legs yellow. Bill black. Upper wing-coverts bright smalt-blue. A large crescentic white band extending from the forehead to sides of throat. Back dusky, with **U**-shaped bars of buff. N. and C. America.

*Q. cyanoptera*. 18″. Legs yellow. Bill black. Similar to *Q. discors*, but no crescentic band between the eyes and bill. Head, neck, and breast bright chestnut. W. America.

*Q. versicolor*. 16½″. Legs green. Bill black, with orange patch on each side at base of upper mandible. Upper wing-coverts lead colour. Rump and upper tail-coverts with narrow white bars. Mantle black, edged yellow. Breast buff. Abdomen white, with black spots and bars. S. America.

*Q. puna*. 19½″. Legs lead colour. Bill light blue, ridge black. Like *Q. versicolor*, but rump uniform brown, with no white bars. Peru, Bolivia, and N. Chili.

## Genus **NETTOPUS.**

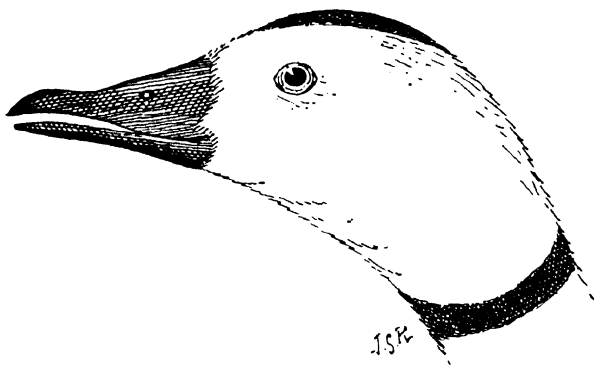
*νῆττα* = a Duck; from *νέω* = I swim, and *πούς* = a foot.

Bill Goose-like, narrowing in front. Lamellæ concealed. Tail short, rounded, of twelve feathers. Hind toe with narrow lobe. Placed in British Museum Catalogue under *Plectropterinæ*.

### 313. Nettopus coromandelianus. The Cotton Teal or White-bodied Goose Teal.

**Girri,** *India;* **Gur-gurrah,** *Etawah;* **Bullia-hans,** *Dacca;* **Ade adla,** *Ratnagiri;* **Chiksarle-haki,** *Mysore;* **Neer-akee,** *Coimbatore;* **Karagat,** *Aracan;* **Kalaghat,** *Burma.*

♂ 12½″ to 14″; 8 to 11 oz. ♀ 12½″ to 12¾″; 6½ to 9 oz. Legs greenish. Bill black. Face, neck, and below white. Black neck-collar. Above black, glossed brown.—*Female:* Brown. Neck mottled, with numerous black bands. No white patch on primaries. India, Ceylon, Andamans, Burma, China, Philippines, and Celebes. Eggs 1·70 × 1·29. (J. 951. B. 1591.)



313. *N. coromandelianus.*

Also *N. albipennis.* 13½″. Similar to *N. coromandelianus.* E. Australia.

*N. pulchellus.* 13½″. Legs and bill black. Forehead, sides of head, throat, breast, and abdomen white. Crown brown, banded dark green and pale brown. Neck, back, scapulars, and upper wing-coverts dark glossy green. Lower neck and sides banded white and dark green. White band across wing. S. New Guinea, Australia, Moluccas, and Celebes.

*N. auritus.* 11½″. Legs black. Bill yellow. Sides and lower part of neck rufous. Large sea-green patch on hind head.—*Female:* Without the green patch, and with sides of head white, speckled black. Madagascar and Africa.

Also the genus *Æx.* With head crested. Two species, viz.—

*Æ. sponsa.* 19″. The Summer Duck. Legs chrome-yellow. Bill purplish tip, and nail black, milk-white from nostril to nail, lower edge yellow. Head and crest dark green. Cheeks purple. Chin, throat, and upper foreneck white. A broad black patch on sides of neck. Mantle, back, rump, and upper tail-coverts bronze-green. Lower breast and abdomen white. Axillaries white, spotted black. Nearctic region, from 50th parallel to the Gulf of Mexico.

*Æ. galericulata.* 17″. Legs orange. Bill reddish brown, nail bluish. Crest coppery red. Chin and throat cinnamon. Sides of neck with long pointed feathers, chestnut, with white shaft streaks. Axillaries brown-grey. C. and S. China, Formosa, and Japan.

## Genus **MARMARONETTA.**

Bill as in *Nettium.* Head with a short but full occipital crest. Plumage dull grey, without any coloured speculum. Tail of fourteen feathers.

**314. Marmaronetta angustirostris.** THE MARBLED TEAL.

♂ 18½″ to 19″; 1 lb. 5 oz. ♀ 17″ to 17½″; 1 lb. 3 oz. Legs brown. Bill with blue spot above nail. Dark brown eye-patch. Back grey-brown. Scapulars with yellowish spots.—*Female:* Eye-patch less conspicuous. From the basin of the Mediterranean to India. Eggs (1·85 × 1·4) creamy. (B. 1603. H. & M. iii. 237.)

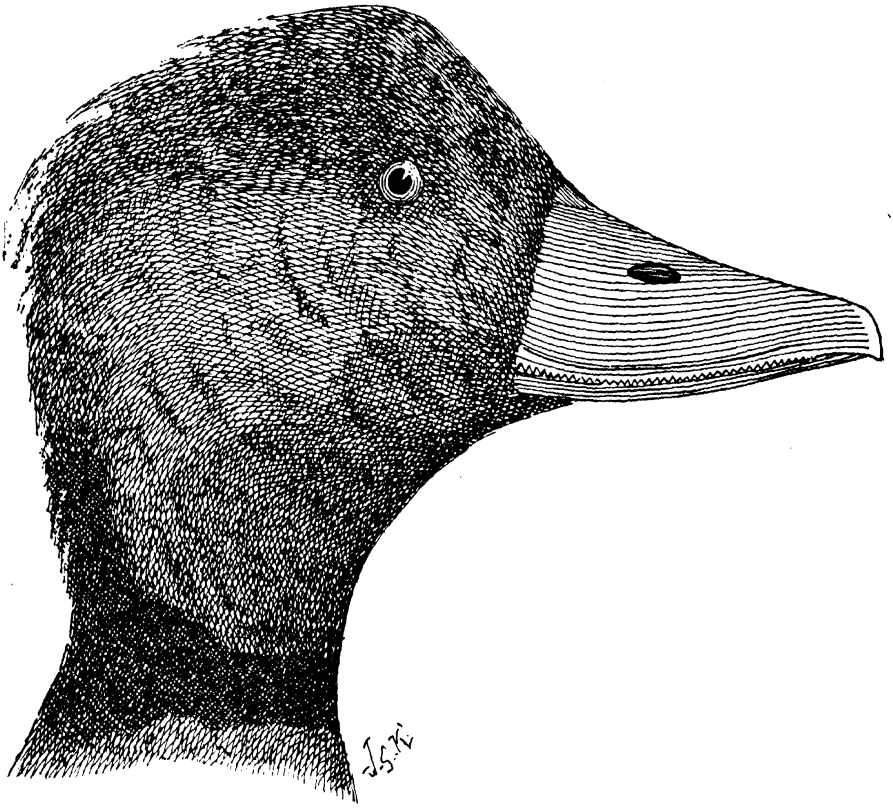
Also the genus *Stictonetta*. With bill broader towards the tip, and with the nail bent backwards as in *Erismatura*. One species—*S. nævosa*, 17½″, legs bluish green, bill greenish grey, plumage dark brown, minutely freckled white, S. and W. Australia and Tasmania.

Also the genus *Heteronetta*. With nail almost perpendicular, and plumage like that of the species of the genus *Erismatura*.

*H. atricapilla*. 14½. Legs horny brown. Bill blackish, with basal spot on each side flesh colour. Head and upper neck black. Chin white. Above dark brown, finely vermiculated pale rufous. Below dirty white. S. America.

## Subfamily FULIGULINÆ. SOFT-TAILED DIVING DUCKS.

Stout, heavy body. Coloured in masses. Speculum less plain or wanting. Hind toe short and broadly lobed (315–322). Feet large and webbed to the toes. Tail-feathers normal, not stiff. Thick plumage and rather short wings. Obtain their food principally by diving. Post-nuptial plumage, when the males become more or less like the females during the time that they moult their quills.



315. *N. rufina.*

*Primaries partly whitish.*

Genus **NETTA.**

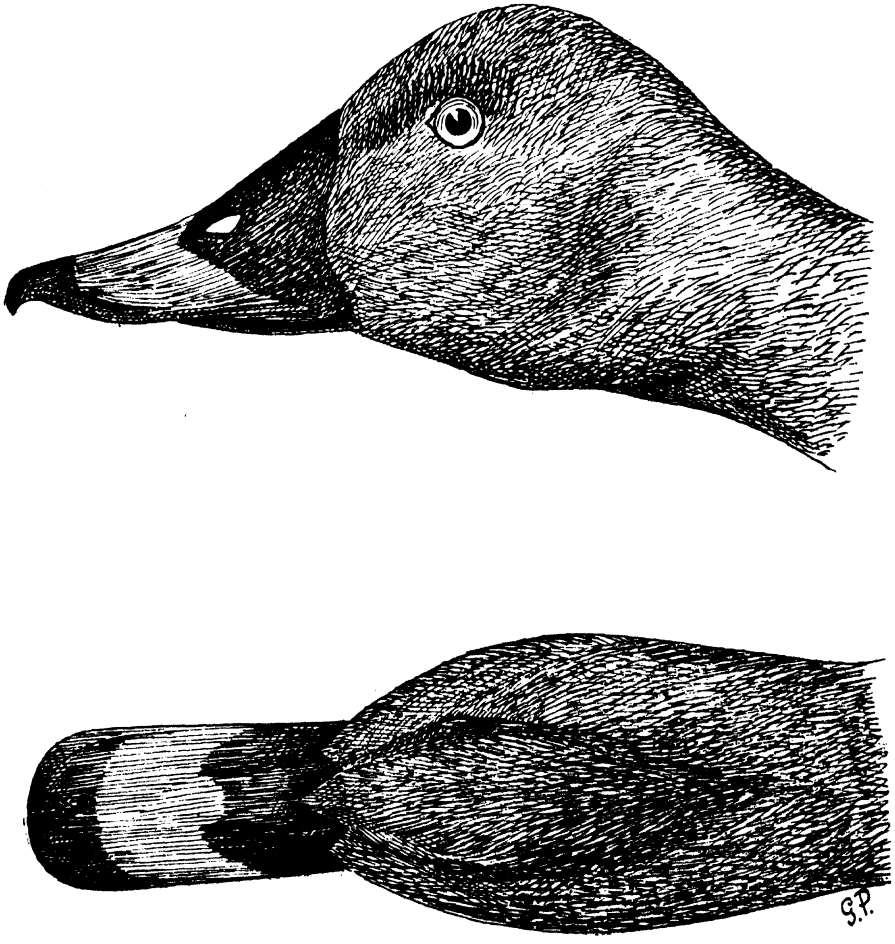
Bill long; tip depressed, with rather large nail. Lamellæ distant, large, and prominent. Tail short, cuneate, of sixteen feathers.

### 315. Netta rufina. The Red-crested Pochard.

*Rūfina*, apparently an adjectival form, from *rūfus* = red.

**Doomer**, *Nepal;* **Rattoba**, *Sind;* **Nool-gool**, *Cabul;* **Kizil-bash aurdak**, *Yarkand;* **Lalsir**, *N.W.P.*

♂ 22″. Legs waxy. Bill red, tip white. Crown-feathers chestnut, elongated. Neck, breast, and abdomen black. Flanks and shoulder marks white. Speculum white.—*Female* on water appears grey-brown of a uniform colour (in contradistinction to the Pintail), with dark eye-stripe and crest. End of bill red. From the basin of the Mediterranean to Turkistan, N. and C. India, Assam, and Burma. Eggs (2·3 × 1·6), brownish green. (J. 967. B. 1604.) See illustration, p. 278.




316. *Nyroca ferina.*

## Genus **NYROCA.**

Differs from *Netta* in having serrations on upper mandible less prominent. The bill is narrower and longer than in *Fuligula*. Tail cuneate, of fourteen feathers. Hind toe broadly lobed.

### 316. Nyroca ferina. The Red-headed Pochard or Dun-Bird.

*Fĕrīna* = of or belonging to wild animals, *fĕræ;* perhaps in reference to its "game" flavour. Cf. German *Tafel-Ente*, "Table-Duck."

**Lalsir**, *N.W.P.;* **Lalmuriya**, *Bengal;* **Cheoon**, *Bengal;* **Thadingnam**, *Manipur;* **Rutubah**, *Sind;* **Surkh-sir**, *Cabul.*

♂ 18″ to 18½″; 2 to 2¼ lbs. ♀ 17″ to 18″; 1¼ to 2¼ lbs. Legs bluish. Bill blue, tip and base black. Head and neck chestnut, without purple gloss. Back, breast, scapulars, and sides white, with black lines. Upper and under tail-coverts black.—*Female:* The same, with breast red-brown, mottled white. No white on forehead or lores. No white speculum. From Iceland to Japan, wintering in S. Europe, N. Africa, Asia Minor, Persia, India, Burma, China, and Japan. Eggs (2·3 × 1·7) greenish buff. (J. 968. B. 1605.) See illustration, p. 279.

Also *N. americana.* Similar to *N. ferina*, but the head and neck are glossed purple, abdomen is white, not vermiculated, and the bill is pale blue with only the tip black. N. America.

*N. vallisneria.* 20″ to 22″. The Canvas-back. Similar to *N. ferina*, but bill is entirely greenish black and lower breast and abdomen white. N. America. The Canvas-back derives its delicious flavour from the fresh-water plant, a species of vallisneria, commonly called "wild celery," which grows in great profusion at the head of Chesapeake Bay. "It is not generally known that the breeding places of the Canvas-back are in Canada, Greenland, and Iceland, whither they repair in April or May, when the weather becomes too hot for a thickly feathered bird to be able to bear it. The forests in Canada which surround the lakes, pools, and bayous, on the fringes of which the birds lay their eggs, are being rapidly levelled by the axe of the lumberman, and the eggs are picked up and either sold or used by the human intruders upon what was once a vast solitude. Writing upon this subject an American expert says: 'Thousands upon thousands of ducks' eggs are marketed every year in the Dominion, and by these exhausting methods, rather than by the numbers actually shot, the Ducks have been greatly diminished. This condition of affairs seems to be beyond remedy, since a state of the American Union cannot make a treaty with a foreign power, and the Washington Government is not likely to interfere on behalf of a Maryland industry, or to provide such compensation as Canada might ask if it was proposed to her to protect the Ducks in their native habitat. So the prospect is that fifty years will see the extermination of the finest wild-fowl in the world and one of the most prized delicacies of the table.'"—*Daily Telegraph*, 11.4.99.

### 317. Nyroca baeri. The Eastern White-eyed Pochard.

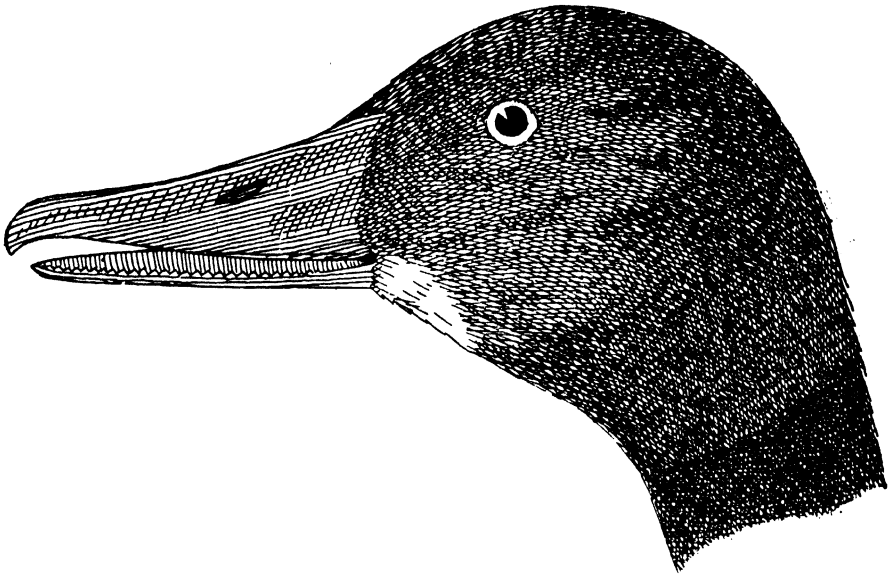
♂ 18″. Legs lead-grey. Bill bluish, base and nail black. Head and upper neck black, glossed green. Primaries, basal part light grey. Otherwise as in *N. ferruginea.*—*Female:* Chestnut patch on lores. E. Siberia, China, and Japan. Common in Bengal. (B. 1607.)

### 318. Nyroca ferruginea. The Ferruginous or White-eyed Pochard.

*Nyrōca*, Latinised from the Russian name, *Ootna nyrok.*

**Karchiya**, *N.W.P.;* **Lalbigri**, *Bengal;* **Burnu**, *Sind;* **Malac**, *Nepal;* **Chiki**, *Yarkand.*

♂ 16″ to 17″; 1⅛ to 1½ lbs. ♀ 15″ to 16½″; 1¼ lbs. Legs grey. Bill bluish. Head and breast red. A white spot on chin. Collar black. Abdomen white.—*Female:* Brown, edged paler. Mediterranean basin, C. and E. Europe, and S.W. Asia as far east as Kashmir, visiting India and Burma in winter. Not recorded from S. India or Ceylon. Nine to fourteen eggs (2·1 × 1·49), pale brown. (J. 969. B. 1606.) See illustration, p. 281.



318. *N. ferruginea.*

Also *N. innotata.* 15½″. Similar to *N. ferruginea*, but head and neck are darker chestnut, and more glossy, and there is no white spot on the chin. Madagascar.

*N. australis.* 20″. Legs grey. Bill and nail black, with slate band at tip. Head and neck dark brown-chestnut. No white spot on the chin. Irides white. Speculum white, tipped brown. Australia, Tasmania, and New Zealand.

*N. brunnea.* 19½″. Legs black. Bill grey, nail black. Crown black. Sides of head and upper neck chestnut-brown. Sides reddish brown. Breast brown. Speculum white, with black band. Abdomen dusky. S. Africa.

*N. nationi.* Similar to *N. brunnea*, but more red below. Peru.

*N. erythrophthalma.* Allied to *N. brunnea.* America.

## Genus **FULIGULA.**

*Fŭlĭgŭla*, for *fulicula*, diminutive of *fŭlix* or *Fulica*, q.v. *Fūlĭgo* = soot.

Bill broad throughout; tip broadest. Nostrils advanced. Head in adults glossy black. Northern Hemisphere and New Zealand subregion.

### 319. Fuligula marila. The Scaup Pochard.

*Marĭla*, from μαρίλη = the embers of charcoal; from its pitch-black fore parts.

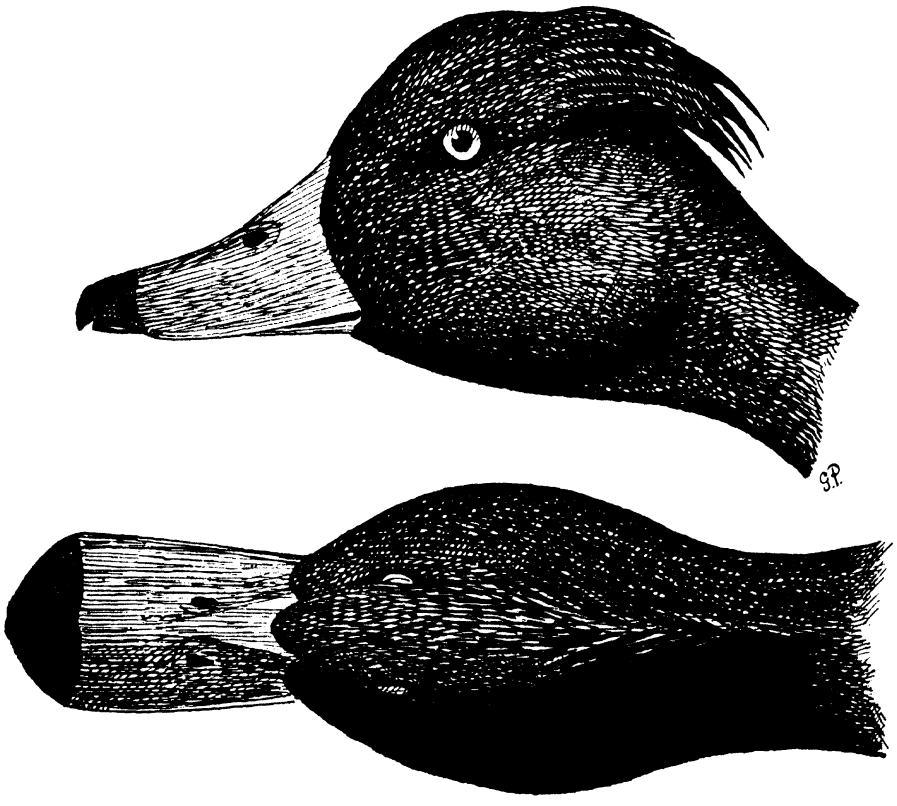
♂ 18″ to 20″. ♀ 19″ to 20″. Legs ashy. Bill blue, black tip. Head, neck, and breast deep black. No distinct crest. Speculum, abdomen, and sides white. Back and scapulars grey, irregularly waved black.—*Female:* Head, neck, back, and upper breast brown. Forehead, lores, and chin white, encircling the base of the bill. Breeds in the Arctic region as far north as lat. 70°, and visits in winter the basin of the Mediterranean, Black and Caspian Seas, N. India (rarely), China, Formosa, Japan, and corresponding latitudes in N. America. Eggs (2·7 × 1·5) pale buff. Corresponds with *F. nearctica* of N. America, and *F. marilloides* of E. Asia. (J. 970. B. 1608.)

Also *F. affinis.* 16″. Similar to *F. marila*, but head and neck are glossed with purple instead of green. N. America.

### 320. Fuligula fuligula. The Tufted Pochard.

**Dubaru**, *N.W.P.*; **Malac**, *Nepal*; **Turando**, *Sind*; **Ablak**, *Cabul*.

♂ 16½″ to 17″; 1½ to 2 lbs. ♀ 15″ to 16¾″; 1¼ to 1¾ lbs. Legs leaden. Bill grey, black tip. Black silky crest. Irides golden yellow. Head, neck, and breast



black. Speculum white, with greenish edge. Back black, speckled whitish. Abdomen and sides white.—*Female:* Brown, where the male is black. Throughout the Palæarctic region, breeding far north, and migrating in winter to N. Africa, China, Japan, N. India, and Burma. Not recorded from Pegu, Tenasserim, Ceylon, or S. India. Eggs (2·3 × 1·6) pale buff. (J. 971. B. 1609.)

Also *F. novæ hollandiæ*. 17″. Legs black. Bill blue, tip black. No pendent occipital crest. Chin white. Abdomen brown, with irregular lines of black and white. New Zealand, with Auckland and Chatham Islands.

*F. collaris*. 17″. Legs pale slaty. Bill leaden, with bands of bluish white, tip black. Head, neck, and chest black, glossed purple. Chestnut collar. Speculum bluish grey. N. America and W. Indies.

Also the genus *Metopiana*. With indentations of upper mandible not prominent. Bill rough at base. One species—*M. peposaca*, 12″, legs yellow. Bill rosy red, tip black. Head, breast, and neck black. Abdomen and flanks minutely vermiculated grey and grey-brown. Wings black, with green gloss, speculum white. S. America.

*Primaries uniform dark brown.*

## Genus **CLANGULA.**

*Clangŭla*, from *clango*=resound, clank; diminutive of *clanga*; κλαγγή=*clangor*, any sharp sound, especially the scream of Cranes.

Head crested full and puffy. Differ from other Sea-Ducks in preferring fresh water. Bill short and tapering slightly. Lamellæ short, stout, and not close together. Tail much rounded, of sixteen feathers. Tarsus scutellate in front. Hind toe broadly lobed. Northern Hemisphere.

### 321. **Clangula glaucion.** The Garrot or Golden-eyed Pochard.

*Glaucĭon*=γλαύκιον, a grey-eyed water-bird in Athenæus, 395 B.C.; from γλαυκός=bluish-grey. Generally Latinised into *glaucium* by pre-Linnæan writers, and always by botanists, including Linnæus.

♂ 16″ to 19″; 2 to 2½ lbs. ♀ 15½″ to 16½″; 1½ to 2 lbs. Legs yellow. Bill bluish. Head black-green, with white mouth-patch. Neck, breast, and below white. Back and tail black. Remiges twenty-six.—*Female:* Head and upper neck brown. Imperfect collar white. Breeds in Arctic and sub-Arctic regions, and migrates in winter to S. Europe, N. Africa, Persia, N. India (rare), China, and the United States of America. Ten to nineteen eggs (2·3 × 1·6), pale green. (B. 1610. H. & M. iii. 285.)

Also *C. islandica*. 20″. The Iceland Duck. Legs yellow. Bill plumbeous. Head and neck glossy blue-black. Triangular white patch across lores. Back, rump, upper tail-coverts, and wing black. Long white patch on wing. Tail dark grey. Iceland, migrating to N. America and occasionally to Europe.

*C. albeola*. 12½″. The Buffel-headed Duck. Legs pink. Bill bluish black. Head and upper neck metallic green, bronze, and violet. Patch of white from eye to occiput. Neck all round, breast, and below white.—*Female:* Head, neck, and above grey-brown. Ear-coverts white. N. America.

Also the genus *Harelda*. With crest and central tail long and pointed. Edges of upper mandible partly bent inwardly. One species, viz.—

*H. glacialis*. 22″. The Long-tailed Duck. Legs blue. Bill pinkish, with base and tip dark grey. Head and neck white. Forehead and sides of head grey. Dark oval patch on each side of neck, above black. Remiges twenty-six. Beneath white. Central tail black, laterals white.—*Female:* 16″. Forehead, crown, and nape brown. White neck-ring. Arctic regions, visiting in winter the Caspian, Asia, N. Japan, China, N. America. Eggs (2·1 × 1·5) pale olive.

Also the genus *Cosmonetta*. With no distinct crest. Bill conical, almost tapering to a point. One species, viz.—

*C. histrionica*. 17½″. The Harlequin Duck. Legs brown. Bill blue. A black band from base of bill over the crown to occiput margined white in front and chestnut behind. Broad patch of white at base of bill. Spot on ear-coverts and a band on side of neck white. Lower neck with white collar and a white crescentic band on side of breast. Speculum blue. General plumage slate colour.—*Female:* Above brown. White patch in front and below eye and on ear-coverts. Iceland, N. America, and N.E. Asia, south in winter to Europe, California, and Japan. Said to breed in the Ural. Eggs (2·2 × 1·6) buff.

Also the genus *Œdemia*. General plumage of males black, and of the females grey-brown, but not barred. Six species, viz.—

*Œ. nigra*. 20″. The Common Scoter. Legs black. Bill black, with yellow patch round nostrils, and a bulb at base. All black. Remiges twenty-six. Tail of sixteen feathers. N. Palæarctic region, winters in the Baltic and on coasts of W. Europe, and occasionally the Azores and the Mediterranean. Six to nine eggs (2·6 × 1·7), sandy buff.

*Œ. americana*. 17″ to 21½″. Similar to *Œ. nigra*, but basal half of upper mandible, including knob, yellow. N. America and N.E. Asia, migrating south to California and Japan.

*Œ. fusca*. 22″. The Velvet Scoter. Legs crimson. Bill orange. All black, except a small

white patch under eye and white wing-band.—*Female:* Sooty, no white on head. N. Palæarctic region, south in winter to Europe, Black Sea and Caspian. Occasional in Greenland.

*Œ. deglandi.* 20″ to 23″. Similar to *Œ. fusca*, but flanks are olive-brown. N. America, in winter south to the Great Lakes.

*Œ. carbo.* Similar to *Œ. deglandi*, but black more intense. N.E. Asia, south in winter to Japan and China.

*Œ. perspicillata.* 21″. The Surf Scoter. All black, except patches of white on forehead and nape.

Also the genus *Tachyeres.* With central tail narrow, short, and curled up. One species, viz.—

*T. cinereus.* 30″. The Loggerhead. Legs orange. Bill orange, nail black. Alar tubercles orange. Head and neck grey. Red patch on throat. Above grey, banded darker. Abdomen white. Straits of Magellan and Falkland Isles.

Also the genus *Camptolæmus.* With some patches of stiff feathers on the cheeks. One species, viz.—

*C. labradorius.* 22″. The Labrador Duck. Legs yellow. Bill blue, sides of base and edges orange, rest black. Lower mandible spatulate. Head, neck, throat, scapulars, and wings (except primaries) white. Neck-collar, back, rump, upper tail-coverts, tail, and below black. Now supposed to be extinct. Formerly N. Atlantic coast of N. America.

Also the genus *Heniconetta.* With edges of upper mandible bent inwardly, end of lower mandible spatulate, and metallic speculum in both sexes. One species, viz.—

*H. stelleri.* 18″. The Rufous-breasted Eider Duck. Legs dark grey. Bill lead colour, tip white. Head and neck white. Lores and short tuft olive. Eye-space, spot on tuft, and neck-collar black. Chin and throat black, followed by two white rings. Above black. Below tawny. Black spot on each side of breast. Tertials more or less falcate. Arctic and sub-Arctic coast, occasionally found in temperate Europe.

Also the genus *Arctonetta.* With a pad of feathers encircling the eyes. One species, viz.—

*A. fischeri.* 21½″. The Blue-eyed Duck. Legs olive. Bill orange. Crown and occiput with hood of stiffened hair-like green feathers. White pad on orbits bordered black in front and behind. Dark green stripe below the eye. Throat, neck, back, and falcated tertials, and a patch on each side of rump white. Rump, upper tail-coverts, and below smoky grey. Alaska.

Also the genus *Somateria.* With lores separated from forehead by a bare space. Bill rather narrow and pointed. Inner secondaries sickle-shaped. Four species, viz.—

*S. mollissima.* 22″. The Common Eider Duck. Legs light olive. Bill olive, nail brownish white. Crown black, with white central line. Nape with stiff pale green feathers. Cheeks, neck, back, and scapulars white. Back, rump, and upper tail-coverts black. Throat white. Below black.—*Female:* Dark brown, with white tips to some of the secondaries and the greater wing-coverts. From Iceland to the Kara Sea, migrating to the Baltic, North Sea, English Channel, and occasionally S. Europe. Eggs (3·1 × 2·0) greenish buff. Corresponds with *S. borealis*, the Nearctic form from E. Arctic America.

*S. dresseri.* Similar to *S. mollissima*, but throat with a V-shaped dusky mark. Atlantic coast of N. America, south in winter to the Great Lakes.

*S. v. nigrum.* Similar to *S. dresseri*, but throat mark is black. N.W. America and N.E. Asia.

*S. spectabilis.* 24″. The King Eider. Legs orange. Bill with basal tubercles orange. Crown grey. Black line of feathers round base of bill. Black spot under eye. Cheeks, throat, upper neck and upper back white. Narrow black chevron under the chin. Breast buff. Upper tail-coverts, tail, and under parts black-brown. Arctic regions, migrating south in winter to California, and rarely to British Isles, France, and Scandinavia. Eggs (2·5 × 1·8) greenish yellow.

## Subfamily ERISMATURINÆ. STIFF-TAILED DIVING DUCKS.

Bill more or less depressed. Hind toe broadly lobed. Tail-feathers narrow, and very stiff.

## Genus **ERISMATURA.**

Bill with upper mandible swollen at base, upper mandible overlapping the lower, nail very small, bent inwards. Lamellæ coarse. Stiff and pointed tail of eighteen feathers. Hind toe broadly lobed. Feet large.

**322. Erismatura leucocephala.** THE WHITE-FACED DUCK.

♂ 16½″ to 18″. Legs plumbeous. Bill ultramarine. Crown black. Sides of head white. Blackish neck-ring. Above hair-brown, minutely speckled fulvous. Below bright orange-fulvous.—*Female:* Head black, with chin, lower cheeks, and a stripe from upper mandible to gape white. Mediterranean to C. Asia, occasionally visiting N. India. Seven to nine eggs, dull white. (B. 1611. H. & M. iii. 289.)

Also *E. jamaicensis.* 16″. Legs grey-blue. Bill grey-blue. Upper part of head black, cheeks and chin white. Back, scapulars, sides, and flanks chestnut. Below silver-white. Temperate N. America.

*E. maccoa.* 18″. Legs dark blue. Bill blue-black. Head and neck black. Upper breast, sides, and flanks chestnut. Beneath silver-grey. S. Africa.

*E. vittata.* 17½″. Legs black. Bill blue-grey. Head and nape black. Throat, breast, sides, flanks, and above bright chestnut. Axillaries grey, edged white. S. America.

*E. australis.* 16″. Legs grey. Bill light blue. Head, throat, and neck black. Breast, back, and flanks chestnut. Rump black, freckled red. Below rufous-white. S. and W. Australia and Tasmania.

*E. ferruginea.* 17″. Similar to *E. vittata*, but chin is white, and under tail-coverts rusty-red. Bolivia and Peru.

*E. æquatorialis.* Similar to *E. ferruginea*, but under tail-coverts are white. Ecuador.

Also the genus *Thalassiornis.* With nail of bill perpendicular :—

*T. leuconota.* 16″ to 17″. Legs dark brown. Bill blue. Upper part of head, nape, and throat black. Spot near base of bill buff. Sides of head yellow, spotted black. Back, scapulars, and wing-coverts banded black and red. Rump white. Abdomen dusky. S. Africa.

Also the genus *Nomonyx.* With nail of bill perpendicular :—

*N. dominicus.* 15″. Legs brown. Bill blue, nail and tip black. Head black. Chin with naked skin black. Neck and breast cinnamon. Wings brown, with white speculum. Tropical America, including the West Indies.

Also the genus *Biziura.* With pendent lobe on chin. Tail of twenty-four feathers. One species, viz.—

*B. lobata.* 26″. Legs grey. Bill and lobe green-black. Upper part of head and nape dark brown, sprinkled lighter. Chest and flanks blackish brown, narrowly barred white. Below buff. Australia (except northern part) and Tasmania.

## Subfamily MERGINÆ. MERGANSERS.

Lower mandible without lamellæ, but with tooth-like serrations on both mandibles. Tail moderate, not particularly stiff. Hind toe broadly lobed (323–325). Feet large.

## Genus **MERGUS.**

*Mergus, i,* m. [*mergo*], a diver ; a diving-bird, in classical Latin.

Bill narrow and toothed. An occipital crest, small in females. Do not acquire full plumage till second autumnal moult. Tail wedge-shaped, of sixteen or eighteen feathers. Palæarctic region.

**323. Mergus albellus.** THE SMEW or NUN or WHITE-HEADED MERGANSER.

*Albellus* = the little white (*albus*) bird.

**Nihenne,** *Etawah ;* **Chota Khoruk,** *Cabul ;* **Boz aurdak,** *Yarkand.*

♂ 17″ to 18″; 1¼ to 1¾ lbs. ♀ 15½″ to 16¾″; 1 to 1½ lbs. Legs lavender. Bill bluish. Greater part of plumage white. A black patch, including eye and gape. Beneath white, with two black bands. Rump grey.—*Female:* Head red-brown. Below clouded ashy. N. Europe and Asia. In winter visits C. and S. Europe, C. Asia, China, and N. India. Eggs (2·0 × 1·51) creamy buff. (J. 973. B. 1612.)

## Genus **MERGANSER.**

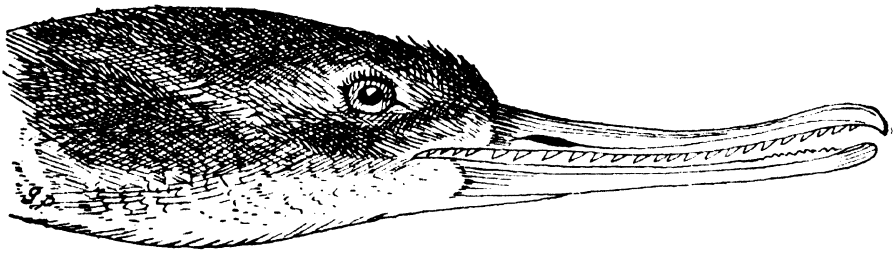
Bill longer than in *Mergus*, narrow, and strongly hooked at end. Serrations of both mandibles tooth-like, with points directed backwards. Head crested. Tail cuneate, of eighteen feathers.

### 324. **Merganser castor.** The Goosander.

*Merganser* = a diving Goose; from *mergus* + *anser*. Coined by Gesner, on account of the bird's size.

**Ala ghaz aurdak**, *Yarkand.*

♂ 25″ to 28″; 2¾ to 3¼ lbs. ♀ 23″ to 25″; 2 to 2¾ lbs. Legs orange. Bill blood-red, with black ridge. Crest, head, and neck glossy green. Above black



324. *Merganser castor.* Bishop, Charbar, Mekran coast, 29.1.75.

and ashy. Breast and abdomen white. Wing-coverts orange.—*Female:* Ashy red head. W. Europe to Kamschatka, and in winter extends from S. Europe to China and Japan. Found in Himalayas in summer at 10,000 feet and upwards. Seven to twelve eggs (2·7 × 1·85), white. (J. 972. B. 1613.)

Also *M. comatus.* 25″ to 27″. Similar to *M. castor.* Distinguished by Salvadori as the Indian bird.

*M. americanus.* Similar to *M. castor*, but male has a conspicuous black band across wing. N. America, occasional in Bermudas.

*M. squamatus.* 23″. Long occipital crest. Head above rufous, sides of head and throat paler. Sides of breast and flanks with two or three narrow crescentic bands on each feather. China.

### 325. **Merganser serrator.** The Red-breasted Merganser.

*Serrātor* = one using a saw, *serra.*

♂ 22″ to 26″; 2 lbs. ♀ 21″ to 23½″. Legs deep red. Bill deep red. Light brown band, streaked black round base of neck. Narrow black band down back of neck. Flanks white, vermiculated grey and black. Rump white.—*Female:* Crown and nape dull brown. Chin and throat white. Northern Hemisphere, and wintering in Mediterranean area, C. Asia, United States, etc. Six to twelve eggs (2·6 × 1·7), pale buff. (B. 1614. H. & M. iii. 305.)

Also *M. australis.* 19″. Legs red-brown. Bill red-brown, tip black. Head and neck brown in both sexes. Flanks dark grey. Under tail-coverts grey, edged white. Aucklands.

*M. brasilianus.* 19″. Legs and bill greenish black. Head and upper neck glossy black. Lower parts barred, white and black. S.E. Brazil.

Also the genus *Lophodytes.* With serrations of both mandibles short, blunt, and not inclined backwards at tips. One species, viz.—

*L. cucullatus.* 17½″. The Hooded Merganser. Legs yellow. Bill black. Head and upper neck black. Semicircular crest white, edged black. Above brown-black. Rump and below white. N. America, casual in British Isles. Eggs (2 × 1·7) white.

Also the subfamily MERGANETTINÆ. TORRENT DUCKS.

Tail rather long and stiff. No tooth-like serrations on edge of mandible. Three genera, viz.—

The genus *Salvadorina*. With prominent lamellæ. Wing with a distinct speculum. One species, viz.—

*S. waiginensis*. 17½". Legs yellow. Bill brown, nail yellow. Head and neck dark brown, edged paler. Chin white. Above black, barred white. Below buff, spotted brown. Speculum white, black and white. Waigiou.

The genus *Hymenolæmus*. Similar to *Salvadorina*, but no wing-speculum. One species, viz.—

*H. malacorhynchus*. 19". Legs dark brown. Bill white, tip and edge black. General plumage lead-blue. Breast thickly spotted chestnut. New Zealand.

Also the genus *Merganetta*. With no prominent lamellæ. Tail-feathers very stiff, and with very narrow webs. Six species. Confined to the Andes:—

*M. armata*. 17". Legs red. Bill yellow. Head and neck white. Cheeks, throat, and breast black. Two white bands across the wings.

*M. frœnata*. 18". Similar to *M. armata*, but has a black band over and before the eyes, with triangular white patch on lores separated from the white superciliary stripe.

*M. turneri*. 17". Neck and sides of head white. Breast and flanks black. Feathers of back edged rufous.

*M. garleppi*. 17". Similar to *M. armata*, but no black band across breast, and feathers of back edged grey.

*M. columbiana*. 15". Legs red. Bill yellow, culmen black. Breast and abdomen white. Feathers of back edged olive.

*M. leucogenys*. Similar to *M. columbiana*, but breast and abdomen tinged rusty. (B.M. Cat., xxvii. 327–485.)

## Order **PYGOPODES.**

Bill straight and pointed. Hind toe. Anterior toes lobed or webbed. Plumage very short and dense. After-shaft. Feathers of neck continuous. Fifth secondary wanting. Oil-gland tufted. Skull schizognathous. Posterior border of breast-bone with one notch on each side. Legs placed far back; unable to sit upright on land. Live afloat. Cosmopolitan. Nest among rushes, on or near water. Three to six eggs.

| | | |
|---|---|---|
| Hind toe raised . . | PODICIPES . | GREBES. |
| Hind toe on same level . | COLYMBUS* . | DIVERS or LOONS. |

## Order **PYGOPODES.** GREBES and LOONS or DIVERS.

Bill straight and pointed. Hind toe. Anterior toes lobed or webbed. Plumage very short and dense. After-shaft. Feathers of neck continuous. Fifth secondary wanting. Oil-gland tufted. Skull schizognathous. Posterior border of breast-bone with one notch on each side. Legs placed far back; unable to sit upright on land. Live afloat. Cosmopolitan. Nest among rushes on or near water, with three to six eggs.

### Family PODICIPEDIDÆ.

Hind toe raised and lobed. Anterior toes with lateral lobes webbed at base. Tail rudimentary or wanting. Under plumage silky. Feathers of forehead normal. Head often tufted. Twelve primaries.—*Young* striped black and white, hatched covered with down and able to swim. Cosmopolitan. Grebes have a habit of eating their own feathers. Floating nest, three to six eggs, pale green.

* Not represented in India.

## Genus **PODICIPES.**

From *pōdex*, gen. *pōdĭcis* = the fundament, and *pēs* = a foot.

Bill straight, compressed. Nostrils long. Tarsus compressed, with large scutellæ in front, serrated behind. Hind toe bordered by web.

(i.) *With humeral feathers nearly pure white.*

**326. Podicipes cristatus.** The Great Crested Grebe.

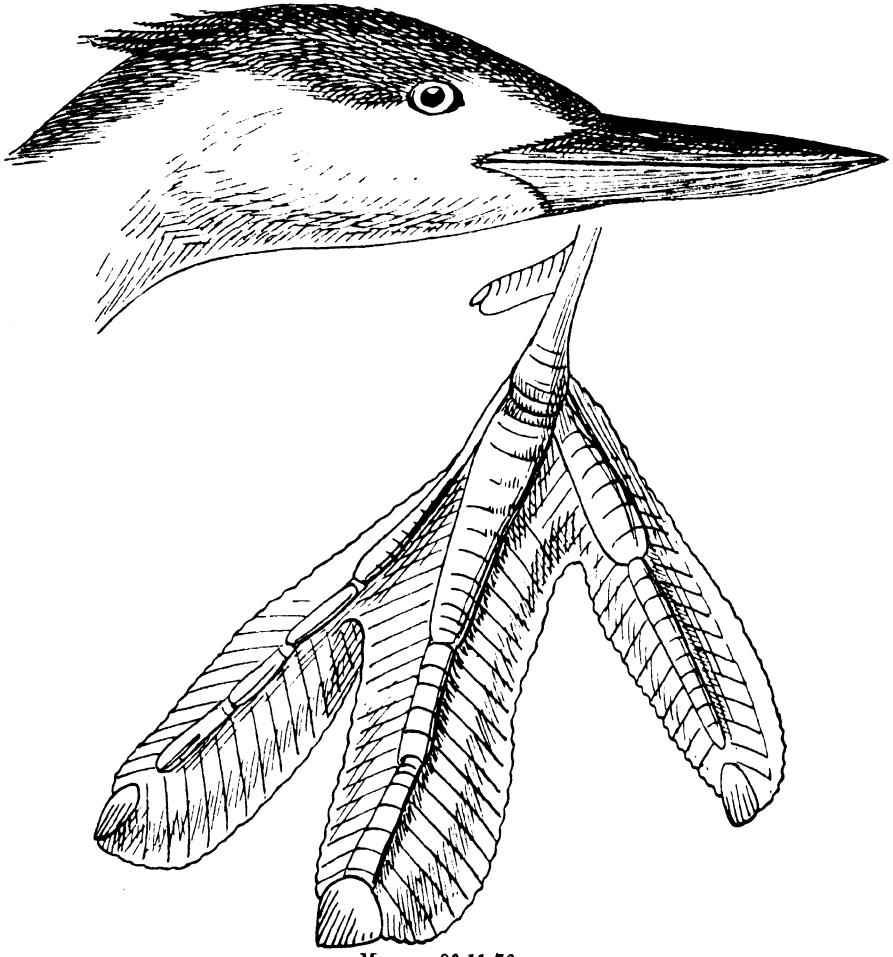
♂ 21″ to 24″; 2½ to 3½ lbs. ♀ 20″; 2¼ lbs. Legs leaden. Bill, from gape 2·6″, brown, tip white. Double black crest. Red and black collar. White eye-stripe. Lesser wing-coverts form a wide white band along edge of wing.—*In winter* the crest is smaller.—*Young:* No crest, and collar rusty. Temperate parts of Europe, Asia, Africa, Australia, and New Zealand. Nest usually afloat. Three to four eggs (2·2 × 1·4), green. (J. 974. B. 1615.)

Also *with humeral feathers dark brown* :—

*P. micropterus.* 16″. Breast and belly rufous, tipped silvery. Foreneck white. From S. Peru.

*P. griseigena.* 18″. The Red-necked Grebe. Breast and belly silvery white. No white eye-stripe. Foreneck chestnut. From Europe and W. Asia, ranging to N. Africa.

*P. holboelli.* 19″. Similar to *P. griseigena.* From north of N. America, ranging to Greenland, E. Siberia, N. United States, and Japan.



Manora, 30.11.76.

(ii.) *With breast and belly silvery white.*

**327. Podicipes nigricollis.** THE EARED GREBE.

With black neck; from *niger*+*collum*.

♂ 13″; 1 lb. ♀ 12″. Legs greenish. Bill, from gape 1·2″, curved upwards, black.—*In summer:* Broad streak of long, silky, orange-brown feathers behind eye. Foreneck black. Sides and flanks streaked orange. Above brownish black. Four inner primaries all white.—*In winter:* Eye-tuft wanting, and no rufous on flanks. C. and S. Europe, Africa, through C. Asia to China and Japan. Eggs (1·9 × 1·1) green. (B. 1616. S.F. i. 266.)

Also *with foreneck black*:—

*P. californicus.* 11½″. Similar to *P. nigricollis*, but with inner primaries ash-brown. From N. and C. America.

Also *with foreneck and chest chestnut*:—

*P. auritus.* 13½″. The Sclavonian Horned Grebe. With wide rufous band on each side of the crown. Circumpolar, ranging to Mediterranean and Caspian Seas, Japan, and N. United States.

Also *with foreneck white*:—

*P. calipareus.* 10½″. With forehead and crown pale brown. From S. America.

*P. juninensis.* 11½″. With forehead and crown ashy. From Peru.

*P. taczanowskii.* 11½.″ With ear-coverts ashy, tinged golden. From C. Peru.

Also *with breast and belly chestnut*:—

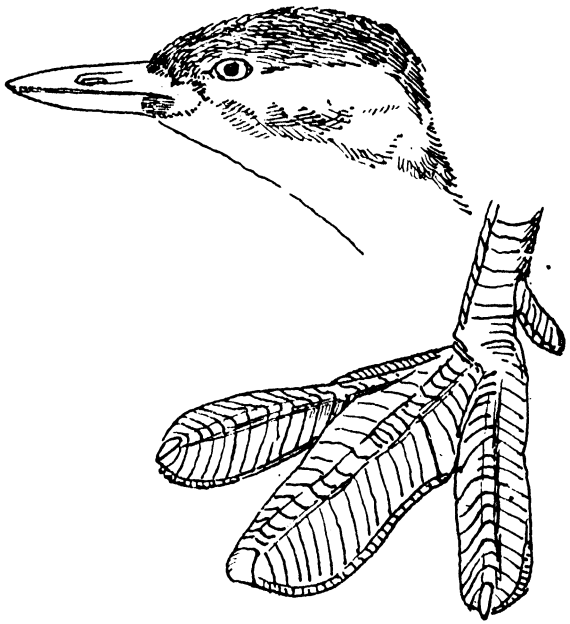
*P. rollandi.* 14″. With ear-coverts white, and long feathers on side of head white, with black tips. From Falkland Isles.

(iii.) *With no long hair-like feathers on sides of head or ear-coverts.*

**328. Podicipes albipennis.** THE DABCHICK or INDIAN LITTLE GREBE.

**Panturri, Churaka,** *India;* **Dubari,** *Bengal;* **Manu-gudi-kodi** (Telugu); **Mukelepan,** *Ceylon.*

♂ 8″ to 9″. Legs greenish. Bill from gape 1″, decurved, black, with white tip. Chin black. Cheeks, ear-coverts, and sides of neck bright chestnut. Above



Sukhail, 5.2.88.

black, tinged green.—*In winter:* Crown and hind neck brown, chin white. Distinguished from *P. fluviatilis* by having the secondaries white throughout in adults, and the black on chin and sides of face less extended. India, Ceylon, and Burma. Nest usually floating. Four or five eggs (1·39 × 0·99), white discoloured. (J. 975. B. 1617.)

### 329. Podicipes albescens.

♂ 7½″. Legs greenish. Bill black. Forehead and fore part of crown black. Hind part of crown, nape, and foreneck chestnut (the collar is unlike that of any known species). Above white, with dark shaft stripes. Secondaries white, with dark shaft stripes. A single specimen obtained by the late Mr. Mandelli in Sikkim. Considered by many to be a partial albino of *P. albipennis*. (B. iv. 476.)

### 330. Podicipes philippensis.

♂ 9½″. Legs blackish grey. Bill black, whitish at tip. Differs from *P. fluviatilis* in having the rufous of face continued right up to the eye and over greater part of the throat. Chin and upper throat blackish. Breast and abdomen silvery white, slightly mottled blackish. Inner secondaries with inner webs and tips white, rest of outer webs brown. S. China, ranging to Burma, Philippines, and Borneo. (B. M. Cat., xxvi. 511.)

### 331. Podicipes capensis.

♂ 9½″. Legs black. Bill black above, orange below. Differs from *P. fluviatilis* in having basal portion of primaries and almost entire webs of secondaries white with white shafts. Madagascar and Africa, across S.W. Asia to India, Burma, and Ceylon. (B.M. Cat., xxvi. 513.)

Also *P. fluviatilis*. 9½″. The Little Grebe or Dabchick. Chestnut on sides of head separated from hinder margin of eye by a wide blackish tract. Under parts mostly black. C. and S. Europe, ranging into C. Asia and Japan.

*P. tricolor*. 9½″. With chin blackish, throat and feathers below eye chestnut, below mostly black. From Borneo and Celebes to New Guinea.

*P. novæ hollandiæ*. 9½″. Chin and throat black. Foreneck sooty. Band from eye down side of neck chestnut. Java, Australia, and New Guinea.

*P. pelzelni*. 9½″. Chin, throat, and foreneck white. Chestnut patch on each side of nape. From Madagascar.

*P. dominicus*. 8½″. Chin and throat black. Sides of head and neck uniform grey. From C. and S. America and W. Indies.

Also *with long hair-like feathers on each side of head:*—

*P. poliocephalus*. 9½″. Breast and below silvery white. From Australia and Tasmania.

*P. rufipectus*. 11″. Chest chestnut. Inner primaries and secondaries tipped dark brown. From New Zealand.

*P. americanus*. 11½″. Ear-coverts white, breast and below rufous. From S. America.

Also the genus *Podilymbus*, or Thick-billed Grebes. With feathers of forehead bristly. Males much larger than females. One species, viz.—

*P. podicipes*. ♂ 14″. ♀ 12″. The Pied-billed Grebe. From N. and S. America.

Also the genus *Æchmophorus*. With culmen slightly upturned. Nuptial and winter plumage alike. Two species, viz.—

*Æ. major*. 26″. Chin and throat dark grey. From S. America.

*Æ. occidentalis*. ♂ 26½″. ♀ 18½″. From N. America. (B. M. Cat., xxvi. 5 7-558.)

Also the family COLYMBIDÆ. DIVERS or LOONS.

Hind toe on a level with others. Anterior toes united by a web. Short tail of eighteen or twenty stiff feathers. Primaries eleven.

One genus, *Colymbus*. Peculiar to Northern Hemisphere, frequenting seas in preference to fresh water. Nest of water plants near water, with two or three eggs, olive, with dark spots. Five species, viz.—

*C. septentrionalis*. 24″. The Red-throated Diver. Above ash-brown, spotted white. Bill black. Head and neck streaked black and white, and patched grey. Circumpolar, ranging south in winter to the Mediterranean, Black, and Caspian Seas, S. China, California, and Florida.

*C. arcticus*. 28″. The Black-throated Diver. Above uniform brown. Wing-coverts spotted white. Bill black. Head and neck streaked black and white, and patched grey. Iceland, N. Europe, and Asia, ranging south in winter to Mediterranean, Black and Caspian Seas.

*C. pacificus*. 24″. A subspecies resembling *C. arcticus*, but with neck smoky white. N. America, also recorded from Japan.

*C. glacialis*. 33″. The Great Northern Diver. Above ash-brown, margined grey. Throat with two black rings, and two black and white rings streaked vertically. Bill black. N. America, Greenland, Iceland, Europe, Asia to Behring Straits, south in winter to Gulf of Mexico and Mediterranean Sea.

*C. adamsi*. 36″. The White-billed Diver. Similar to *C. glacialis*, but bill is pale yellow or whitish. North of N. America and Asia, ranging south in winter to Japan, and occasionally to Norway and the British Isles. (B.M. Cat., xxvi. 485-501.)

## Order **ALCÆ.*** Auks, Razorbills, Guillemots, and Puffins.

Bill high and sharp on culmen. No hind toe. Anterior toes fully webbed. Third toe longest. Tail twelve to eighteen feathers. Schizognathous. Differ from Gulls in their squat appearance, extraordinary diving powers, close-set plumage, manner of nidification, and shape of egg. Two moults in a year. Breed in Arctic and sub-Arctic regions, never found south of equator. No nest, one egg (the Black Guillemot excepted).

### Subfamily Alcinæ. Auks, Razorbills, and Guillemots.

Feathers on lores extend at least to posterior border of nasal opening. Nostril rather exposed, or overhung, or partially concealed by dense velvety feathers. Seven genera.

*Bill greatly compressed and tranversely grooved.*

One genus, *Plautus*. With inter-ramal feathers extending beyond anterior border of nasal opening. Tail of fourteen feathers. One species, viz.—

*P. impennis*. 30″. The Great Auk or Garefowl, now extinct. Head, throat, back, and tail black. Breast and abdomen white. A large white oval patch in front of the eye. No nest, one egg ($4\frac{7}{8} \times 2\frac{7}{8}$), white, clouded brown. Formerly inhabiting coasts and islands of N. Atlantic, south of the Arctic Circle. Wing from 6″ to $6\frac{1}{2}$″, and incapable of flight.

"Mr. Stevens, the auctioneer of King Street, Covent Garden, sold on 12.3.88 a Great Auk's egg for £225. There are only sixty-seven recorded specimens of this egg. So plentiful was this bird some 250 years ago, that vessels fishing on the Newfoundland coast were victualled with Garefowls, and as the crews could secure them when found on land by the simple process of placing a plank from shore to the boat up which the birds could be driven, they were not slow to avail themselves of the supply. This wholesale slaughter naturally resulted in the extinction of a bird which had no power of flight. It survived in Europe but a few years after its extinction in America, and the last two specimens of which we have trustworthy evidence were killed in Iceland in 1844" (*Illustrated London News*, 17.3.88).

One genus, *Alca*. With inter-ramal feathers extending to anterior border of nasal opening. Tail of twelve feathers. One species, viz.—

*A. torda*. 15″ to $17\frac{1}{2}$″. The Razorbill. Wings $7\frac{1}{8}$″, fully developed, reaching nearly to end of tail. Flies well. Head and above black, below white. Bill black, with transverse white band across both mandibles. Coasts of N. Atlantic, ranging south in winter to New England in America, the Mediterranean, and occasionally to the Canary Islands. No nest, one egg ($2{\cdot}8 \times 1{\cdot}8$), buff, marbled and spotted brown. Both male and female take part in duties of incubation, and when the young bird is ready for the sea, it is taken by one of the parents by the neck (like a cat would her kitten), and carried to the water.

* Not represented in India.

*Bill small and swollen, without ridges.*

One genus, *Alle*. With inter-ramal feathers extending far beyond nasal opening. Tail of twelve feathers. One species, viz.—

*A. alle*. 7½″ to 8½″. The Rotch or Sea-Dove or Little Auk. Wing 4⅜″, well developed. Flight rapid. Above black, edged white. Wings and tail black. Below white. Noisy birds. Almost exclusively oceanic, and seldom approach land except in the breeding season. Sleeps on the water. No nest. One egg (2 × 1·33), greenish white. Arctic Ocean, ranging in winter as far south as Azores and Canary Islands.

*Bill elongate and moderately compressed.*

One genus, *Uria*. With inter-ramal feathers extending to or slightly beyond anterior border of nasal opening. Eight species, viz.—

*With tail of twelve feathers. Wing-lining white.*

*U. troile*. 17″ to 18″. The Guillemot. Wing 7½″ to 8″. General colour above smoky brown, below white. An expert diver. A remarkably silent bird. Remiges twenty-six. Coasts and islands of N. Atlantic and Pacific Oceans, ranging south to Japan, California, New England, Portugal, and occasionally in Mediterranean and in Atlantic to about 30° N. lat. No nest. One egg (3·2 × 2·0), green or buff, plain or blotched with brown.

*U. ringvia*. The Bridled Guillemot. Similar to *U. troile*, but has feathers round eye and along the crease behind it white.

*U. lomvia*. 18″ to 19″. Brünnich's Guillemot. Similar to *U. troile*. Colour of upper parts is grey-black. Remiges twenty-six. Arctic Ocean, visiting Norway in winter and more rarely the British Isles.

*U. grylle*. 11½″ to 13″. The Black Guillemot. Black above and below. Greater and median wing-coverts white. Legs and feet vermilion. In winter, white below and flanks barred black. The change is performed by a direct moult. Remiges thirty. No nest. Two eggs (2·3 × 1·6), greenish, clouded and spotted brown. Dives as quickly as it flies. North Atlantic, and in winter as far south as north of France.

*U. mandti*. 12″. Similar to *U. grylle*. Primary coverts white almost to base. Circumpolar, south to Labrador, Alaska, E. Siberia, and Kamschatka.

*With tail of fourteen feathers. Wing-lining grey.*

*U. columba*. 14½″. Similar to *U. grylle*. Plumage above slaty black with grey gloss. N. America. From California across Behring Sea, probably to E. Siberia.

*U. snowi*. Similar to *U. columba*, but wings entirely black or with three narrow white bands. Orbital region black. Kurile Islands, ranging south to Kamschatka and Japan.

*U. carbo*. 14½″. Like *U. snowi*, but orbital region white. Coasts of N. Asia.

Also the genus *Brachyrhampus*. With tail of fourteen feathers, and inter-ramal feathers extending slightly beyond nasal opening. Three species, viz.—

*B. marmoratus*. 9½″. Outer tail brownish black, upper parts barred chestnut. Pacific coast of N. America.

*B. perdix*. 10″. Outer tail brownish black, and upper parts barred buff. Coast of N.E. Asia.

*B. brevirostris*. 9½″. With outer tail-feathers white. Coasts of N. Pacific and Behring Sea.

Also the genus *Micruria*. With tail of twelve feathers. From the coast of Labrador. Two species, viz.—

*M. hypoleuca*. 8½″. Lining of wing pure white.

*M. cuvieri*. 8½″. Lining of wing smoky grey.

Also the genus *Synthliborhampus*. With tail of fourteen feathers. Two species, viz.—

*S. antiquus*. 10½″. With forehead without crest, and black on throat continued down foreneck. Coast of N. Pacific.

*S. wumizusume*. 10½″. With crest of narrow black feathers on forehead; grey on throat not continued down middle of foreneck. Coasts of Japan.

## Subfamily FRATERCULINÆ. PUFFINS.

Feathers on lores not extending to posterior border of nasal opening. Nostril overhung by a horny scale. Puffins are distinguished from the rest of the Auks by their peculiar bill, deeply grooved, while in summer there are some wattles on the face. They have ornamental plumage in the shape of brightly coloured crests and tufts of feathers on the sides of the head, as well as an ornamental colour on the bills, which is shed after the breeding season, just as other birds moult their feathers. Six genera.

*Inner claw like the others. Terminal portion of upper mandible not transversely grooved. Tail of fourteen feathers.*

One genus, *Ptychorhampus*. With breadth of upper mandible at base greater than the depth. Head and neck devoid of ornamental plumes. One species, viz.—

*P. aleuticus*. 9″. Above smoky black. Breast and below white. Small patch of white feathers above eye. Pacific coasts of N. America.

One genus, *Simorhynchus*. With breadth of upper mandible about equal to depth. Head and neck with ornamental plumes. Three species, viz.—

*S. cristatellus*. 10½″. The Crested Auk. With long frontal crest, dark brown, curving forwards. Lores uniform brown. Belly grey. Coasts of N. Pacific and Behring Sea, from Japan to Alaska.

*S. pygmæus*. 7½″. The Pigmy Auk. With long frontal crest. White patch on lores. Belly white. From N. Japan.

*S. pusillus*. 6½″. The Minute Auk. No crest. Forehead and lores with short, narrow, white plumes behind the eye. From Japan and Alaska.

One genus, *Phaleris*. With breadth of upper mandible at base less than the depth. Culmen forming a blunt razor edge. Sides of head with ornamental plumes. One species, viz.—

*P. psittaculus*. 10½″. The Parroquet Auk. Bill salmon-red. Coasts of N. Pacific from Kurile Islands to Alaska.

One genus, *Cerorhyncha*. With rather long bill. Head and neck plumes, and in breeding season an elevated horn at base of culmen. Tail of sixteen or eighteen feathers. One species, viz.—

*C. monocerata*. 14″. Bill orange. Coast and islands of N. Pacific from Japan to Alaska and California.

*Inner claw much more strongly curved than others. Terminal part of upper mandible transversely grooved. Tail of sixteen feathers.*

One genus, *Lunda*. Lower mandible without grooves. Lengthened crest of silky feathers. One species, viz.—

*L. cirrhata*. 16″. The Tufted Auk. Bill vermilion. Tuft of yellow hairy feathers from behind eye. Coasts and islands of N. Pacific, from N. Japan to California. Also off Greenland.

One genus, *Fratercula*. Lower mandible grooved. In summer a deciduous nasal shield, and eyelids with deciduous horny appendages. No ornamental nuptial crests. Two species, viz.—

*F. arctica*. 13″. The Puffin or Sea-Parrot. Sides of head and chin grey. Collar black, and not extending beyond throat. Basal half of mandibles slate, terminal half carmine, with an intermediate band of pale yellow. Legs orange. Coasts and islands of N. Atlantic and Arctic Oceans, from north of N. America to Nova Zembla, and south to Great Britain, France, Portugal, and Canary Islands.

*F. corniculata*. 16″. Sides of head white. Collar black, extending to chin. Basal half of mandibles yellow. Coasts and islands of N. Pacific from Sea of Ochotsk to British Columbia.

## Order **IMPENNES**.* PENGUINS.

Beak never hooked. Schizognathous. Breast-bone half as broad as it is long, with a pair of notches posteriorly. First and second digits of the hand fused together in adults. Three metatarsals very short and separated by deep grooves their whole length. No quill-feathers in the wing. No power of flight. Young born helpless and covered with down. Peculiar to Southern Hemisphere.

Penguins are distinct structurally from all birds. In habits and appearance they resemble Divers, Grebes, and Auks. Externally the small scale-like feathers uniformly covering the whole body (without any bare spaces) are very characteristic. The fore-limbs, having no definitely arranged quill-feathers, more resemble fins than wings. The wing serves as a swimming organ. It shows but little external differentiation, being covered at its interior margin by overlapping scales, which gradually merge into scale-like feathers towards the posterior edge. There is nothing comparable to the remiges of other birds, and this wing probably represents one of the most primitive forms. The skeleton of this extremity is modi-

* Not represented in India.

fied much as that of the flippers of the Whales and Porpoises, the bones being flattened and so jointed as to allow very little motion at the elbow and wrist. The pollex or first digit is fused into the others. The legs are very short, and the feet have three principal toes turned forwards and webbed and a small pendent hind toe.

The Penguins, though totally unable to fly, are expert swimmers and divers. They feed entirely on fish and other marine animals. In breeding time they congregate in vast numbers upon the desolate shores near which they habitually dwell, forming a rude nest of grass upon the ground in which they lay two white or greenish-white eggs (4·85 × 3·25). Though closely resembling each other anatomically, they present considerable external differences in the form of the bill and the decorative tufts on the head. By these characters they have been divided into five genera containing eighteen species. (N.H.M.)

The genus *Aptenodytes*. With both mandibles long and curved downwards towards the tip. Tail of twenty feathers. Two species, viz.—

*A. fosteri*. 48″. Weight 60 to 90 lbs. The Emperor Penguin. Basal part of lower mandible (flesh colour) partially concealed by feathers. Crown, cheeks, chin, and throat black. Above bluish green, each feather with dark base and a bluish-white subterminal spot. Foreneck and below white, black of throat meeting white of foreneck in a concave semicircle. Yellow semicircular patch on each side of head, shading into white on side of the neck, which is partially divided by a black shoulder-patch. Feet black. Immature and young birds want the yellow patch on side of the head; the back is darker and more regularly spotted; the shoulder-patches are wanting. Antarctic shores.

*A. patagonicus*. 36″. The King Penguin. With basal part of lower mandible (flesh colour) bare. Black of throat ending in a point on foreneck and margined on each side by orange-yellow bands which connect the orange-yellow patches on sides of the head with that of the lower foreneck. General colour as in *A. fosteri*. Feet black. Nestling covered with brown down. From Straits of Magellan to New Zealand isles, 40° to 60° S. lat.

"King Penguins, like the Royals, have only one egg. They have no nest whatever, and manage the hatching in a most wonderful manner. The egg (4·0 × 2·84) is placed on the two feet, and then the bird, taking up a stooping position, loosens the skin on the breast. This looseness is utilised to form a sort of pouch, completely covering the egg. By this means the egg never touches the cold stones, and is warmly covered up all round" (*Pall Mall Magazine*, November, 1897).

Also the genus *Pygoscelis*. With lower mandible never curved down towards the tip. No superciliary band of golden feathers. Tail twelve to sixteen feathers. Three species, viz.—

*P. tæniata*. 30″. The Gentoo Penguin. Above slate-grey, each feather with dark base and blue-grey tip. Breast and below white. Chin and throat grey or brownish. Wide white band above eye curving back towards crown. Flipper margined white on both sides. Feet yellow. Tail sixteen feathers in adults, eighteen in young. The Falkland, Kerguelen, and Macquarie Islands.

*P. adeliæ*. 30″. General colour as in *P. tæniata*, but no band across crown, and inner margin only of flipper margined white. Feet black. Tail fourteen feathers. Egg 2·75 × 2·25. Antarctic continent.

*P. antarctica*. 30″. General colour as in *P. adeliæ*, but chin and throat white, and a narrow black line crossing the throat in a semicircle from ear to ear. Feet black. Bill black. Tail twelve feathers in adults, fourteen in young. Falkland Islands and vicinity.

Also the genus *Catarrhactes*. Royal Penguins. With a superciliary band of golden feathers. Tail twelve to sixteen feathers. Seven species:—

*Superciliary band not uniting on forehead.*

*C. chrysocome*. 25″. The Rock Hopper Penguin. Superciliary band of golden feathers greatly elongate posteriorly. Above dark slate, each pointed feather black, edged externally dark slate. Top of head black. Straggling crest. Head, chin, and throat smoky black. Below white. Bill orange. Tail sixteen feathers. From Tierra del Fuego to the New Zealand group.

*C. pachyrhynchus*. 28″. The Thick-billed Penguin. Superciliary band not greatly elongate posteriorly. Inner margin of flipper with one row of narrow white-edged feathers. Bill red. Feet pink. Tail sixteen feathers. New Zealand islands.

*C. sclateri*. 28″. Similar to *C. pachyrhynchus*, but inner margin of flipper has two rows of narrow white-edged feathers. Tail sixteen feathers. New Zealand islands.

*C. vittatus*. 26″. Allied to *C. pachyrhynchus*, but flipper is uniform dark brown, and not margined posteriorly white. Dunedin, N.Z.

*Superciliary band uniting on forehead.*

*C. chrysolophus.* 30″. The Macaroni Penguin. Plumage above as in *C. chrysocome.* Frontal plumes passing back over crown gold and black. Lores, chin, throat, and sides of head and neck blackish. Bill dark red. Feet pink. Tail fourteen feathers. Falkland Isles to Kerguelen Land.

*C. schlegeli.* 30″. Allied to *C. chrysolophus*, but lores, chin, throat, sides of head and neck pure white. Tail fourteen feathers. New Zealand islands.

*Superciliary band united at back of crown.*

*C. antipodum.* 30″. The Yellow-crowned Penguin. General colour above slate-grey, tipped blue. Forehead and crown pale golden. Chin and throat white. Bill dull red. Feet grey. Tail of twenty feathers. Female similarly marked, but lighter in colour, and crown less developed. New Zealand Archipelago.

Also the genus *Eudyptula.* Basal part of mandible entire. Tail very short, of sixteen feathers. Two species, viz.—

*E. minor.* 16″. Above slate-blue, each feather with brownish base and black shaft. Only the inner margin of flipper bordered white. Tail sixteen feathers. Australia, Tasmania, New Zealand, and Chatham Isles.

*E. albosignata.* 16½″. Similar to *E. minor*, but both outer and inner margins of flipper bordered white. Tail sixteen feathers. Coasts of New Zealand.

Also the genus *Spheniscus.* With basal part of mandibles furrowed by numerous longitudinal ridges. Tail very short, of eighteen to twenty feathers. Four species.

*Foreneck pure white (between black bands on throat and chest).*

*S. demersus.* 27″. The South African Penguin. Eyebrow-stripe white, and extending to lores, and encircling the face-patch. Forehead, mid-crown, and nape black, shading into grey on upper parts. Chin, throat, and sides of head black. Curved black band across chest continued down each side of body to the tail. Breast and belly white, irregularly spotted black. Bill black, with red spot. Tail twenty feathers. Coasts of S. Africa.

*S. humboldti.* 27″. Allied to *S. demersus.* White eyebrow-stripe narrow, commencing behind the eye. Tail of twenty feathers. W. coast of S. America.

*Foreneck with wide black band (between black bands of throat and chest).*

*S. magellicanus.* 28″. The Jackass Penguin. Similar to *S. demersus*, but under surface of flipper white, dotted black. Tail twenty feathers. South coast of S. America.

*S. mendiculus.* 20″. Allied to *S. magellicanus*, but under surface of flipper black, with wide white band down the middle. Bill long and slender, basal two-thirds of upper mandible yellow. Tail of eighteen feathers. Galapagos Islands. (B.M. Cat., xxvi. 623–653.)

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