



Louis Agassiz Fuertes.
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KEY

NORTH AMERICAN BIRDS

GENERAL ORNITHOLOGY

SPECIAL ORNITHOLOGY

Varied Bunting

(*Cyanospiza Versicolor*)

By G. R. SILLIMAN

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PHOTOGRAPHED BY G. R. SILLIMAN



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KEY

TO

NORTH AMERICAN BIRDS.

CONTAINING A CONCISE ACCOUNT OF EVERY SPECIES OF LIVING AND FOSSIL BIRD AT PRESENT KNOWN FROM THE CONTINENT NORTH OF THE MEXICAN AND UNITED STATES BOUNDARY, INCLUSIVE OF GREENLAND AND LOWER CALIFORNIA,

WITH WHICH ARE INCORPORATED

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GENERAL ORNITHOLOGY:

AN OUTLINE OF THE STRUCTURE AND CLASSIFICATION OF BIRDS;

AND

FIELD ORNITHOLOGY,

A MANUAL OF COLLECTING, PREPARING, AND PRESERVING BIRDS.

The Fifth Edition,

(ENTIRELY REVISED)



EXHIBITING THE NOMENCLATURE OF THE AMERICAN ORNITHOLOGISTS' UNION, AND INCLUDING DESCRIPTIONS OF ADDITIONAL SPECIES

IN TWO VOLUMES.

VOLUME II.

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PART III.—CONTINUED.

SYSTEMATIC SYNOPSIS

OF

NORTH AMERICAN BIRDS.

Order PICARIÆ: Picarian Birds.

THIS is a miscellaneous assortment (in scientific language, “a polymorphic group”) of birds of highly diversified forms, grouped together more because they differ from other birds in one way or another, than on account of their resemblance to one another. As commonly received, this order includes all non-passerine Land Birds down to those with a eered bill (Parrots and Birds of Prey). Excluding Parrots, which constitute a strongly marked natural group of equal value with those called orders in this work, *Picariæ* correspond to *Strisores* + *Scansores* of authors; including, however, some that are often referred to *Clamatores*. (This “order” *Scansores*, or *Zygodactyli*, containing all the birds that have the toes arranged in pairs, two in front and two behind (and some that have not), is one of the most unmitigated inflictions that ornithology has suffered; it is as thoroughly unnatural as the divisions of my artificial key to our genera.) I have no faith whatever in the integrity of any such grouping as “Picariæ” implies; but if I should break up this conventional assemblage, I should not know what to do with the fragments; not being prepared to follow Garrod to the length of a classification of birds based primarily upon the condition of certain muscles of the leg; and knowing of no available alternative. With this protest, and upon such understanding, I retain the Picarian group, as in the original edition of the Key, to include all the North American Land Birds of non-passerine character, without a hooked and eered bill, and without the proper characters of the Columbine and Galline families. The A. O. U. ignores the major group, and presents instead three orders—*Coccyges*, *Pici*, and *Macrochires*. With this procedure I have no quarrel, as the three are precisely coincident with my three suborders *Cuculiformes*, *Piciformes*, and *Cypseliformes*.

Manifestly, from what has been said, *Picariæ* are insusceptible of satisfactory definition; but I may indicate some leading features, whether of positive or negative character, that they

possess in common. The sternum rarely conforms to the particular passerine model, its posterior border usually being either entire or else doubly-notched. The vocal apparatus is not highly developed, having not more than three pairs of separate intrinsic muscles; the birds, consequently, are never highly musical. There are some modifications of cranial bones not observed in *Passeres*. *Picariæ*, like lower birds, usually lack a certain specialization of flexor muscles of the toes seen in *Passeres*. This anatomical matter requires special attention, as some important classificatory considerations are involved. The passerine rule is, that the *flexor hallucis*, which bends the hind toe, is perfectly distinct from the *flexor perforans*, which bends all the other toes; and that the former has but one tendon, going to hind toe, while the other has three tendons, going to all the rest of the toes. Passerine birds being considered to represent the "normal" (or usual) arrangement, are called *nomopelmous*; and all birds which do not have this arrangement I call *anomopelmous*. Passerine birds are also called *schizopelmous*, with reference to the complete separation of the hallucal from the other digital tendons. But the anomopelmous Picarian birds present several further specializations of the arrangement for bending their toes. In the Hummingbirds the flexor hallucis besides going to the first toe supplies also the second digit by a branch, and sends in addition the rudiments of little slips to the third and fourth digits. In the Hoopoes the arrangement is nearly schizopelmous, but there is a desmopelmous feature beyond the bases of the toes. In the Cuckoos, again, the tendons of the flexor hallucis and flexor perforans are connected by a vinculum or ligament at the point where they cross each other on the way to their respective digits; they are hence called *desmopelmous*, and this arrangement is also shared by psittacine and gallinaceous birds. Again, in the Swifts and Goatsuckers, of the group *Cypseliformes*, the respective tendons of these two muscles are extensively blended together; they are hence termed *sympelmous*. Fourthly, in numerous zygodactyle birds, the Woodpeckers and their allies, the flexor perforans has only one tendon, which goes to the "middle" or third toe, *i. e.* the outer anterior one, while the flexor hallucis splits into two or three tendons, which supply all the other toes; they are hence termed *antiopelmous*. Fifthly, in the Trogons, which are yoke-toed in a different way from any other birds, by reversion of the second instead of fourth toe, the flexor hallucis has two tendons which supply the two hind toes, and the flexor perforans has likewise two tendons, for the front toes; they are thus what is called *heteropelmous*. The technical terms here used of the birds themselves are equally applicable to the anatomical arrangements; one may speak, for example, of anomopelmous feet, or anomopelmous tendons, as well as of anomopelmous birds. Three of the five arrangements noted for Picarian birds, the sympelmous, antiopelmous, and heteropelmous, are peculiar to this group. With regard to the *ambiens* muscle, it is absent in most *Picariæ*, which are therefore *anomalogonatus*; but present in the *homalogonatus* Cuckoos and their near relatives the Turacous. Externally, the feet are very variously modified; one or another of all the toes, except the middle one, is susceptible of being turned, in this or that case, in an opposite from the customary direction; the fourth one being frequently capable of turning either way; while in five genera of *Picidæ* and one genus of *Picumnidæ* the first, and in two genera of *Alcedinidæ* the second, toe is deficient. When all four toes are turned forward, as in the Colies, the feet and their owners are termed *pamprodactylous*. When there are three in front and one behind, as in Kingfishers, the term *anisodactylous* is used; and when the digits of such a foot are extensively soldered together, the formation is called *syndactylous*. In some cases, as the family *Micropodidæ* or Swifts, some members of it are pamprodactylous, others anisodactylous. A very frequent arrangement is that of toes in pairs, two behind and two before; most such yoke-toed birds have the properly *zygodactylous* arrangement, by reversion of the fourth or outer toe, as in the Woodpeckers, Cuckoos, and others; but in the Trogons alone the second or inner toe is the reversed one, and the arrangement is styled *heterodactylous*. The tarsal envelop is never entire behind, as in the higher *Passeres*. Another curious peculiarity of the

fect is, that the claw of the hind toe is smaller, or at most not larger, than that of the third toe; and on the whole the hind toe itself is inconsiderable, weak if not wanting, not always perfectly incumbent and apposable. The wings, endlessly varied in shape, agree in possessing ten developed primaries, of which the first is rarely spurious or very short. (Notable exceptions to this occur in the *Pici* with spurious first primary, and in the *Indicatoriæ*, with only nine primaries.) A very general and useful wing-character is, that the coverts are larger and in more numerous series than in *Passeres*; the greater coverts being at least half as long as the secondary quills they cover, and sometimes reaching nearly to the ends of these quills. This is the common case among lower birds, but it distinguishes most of the *Picariæ* from *Passeres*; it is not shown, however, in the *Picidæ* and some others, as the *Indicatoriæ*, *Megalamidæ*, and *Rhamphastidæ*. The wing is quincuncubital as a rule (with variability in *Alcedinidæ* and some *Cypselidæ*). The tail is indefinitely varied in shape, but the number of its feathers is a good clue to *Picariæ*. There are not ordinarily more than ten perfect rectrices, and occasionally there are only eight, as in the Anis (*Crotophaga*); the Woodpeckers have twelve, but one pair is abortive; there are twelve, however, in the Kingfishers, Puff-birds, Indicators, and some others; ten or twelve indifferently in the Motmots. Pulviplumes occur in the *Leptosomatidæ* and *Podargidæ*. The bill shows numberless modifications in form, and has its own specialization in nearly every family; it assumes some of the most extraordinary shapes, as in the Hornbills and Toucans, and is seldom of the simple style seen in a Thrush or Finch; it is never hooked and cered, as in Parrots and Birds of Prey, nor soft and swollen at the nostrils, as in Pigeons.

With this sketch of some leading features of the group (it will enable the student to recognize any Picarian bird of this country at least, and that is my main object), I pass to the consideration of its subdivision, with the remark that a precedent may be found for any conceivable grouping of the families that is not perfectly preposterous, and for some arrangements that are nearly so. As well as I can judge from the material at my command, and relying upon authority for data that I lack, the provisional arrangement adopted in the 2d-4th editions of the Key must be entirely remodelled. Such is especially the case with the "Cuculiform" Picarians, which I justly stigmatized (p. 446) as "a mixed lot requiring to be reconstructed by exclusion of some of the families given as entering into its composition." There are at least 24 Picarian families, seven of them North American, roughly divisible into three groups or series, which I formerly called *Cypseliformes*, *Cuculiformes*, and *Piciformes*, answering to the *Cypselomorpha*, *Coccygomorpha*, and *Celeomorpha* of Huxley, or the so-called "orders" *Macrochires*, *Coccyges*, and *Pici* of the A. O. U. But I am now satisfied that we can best improve upon these divisions by effacing their alleged boundaries and remapping the 24 families by redistributing them directly into several more than three suborders or superfamilies. Such can be satisfactorily established, primarily upon strong anatomical grounds, secondarily upon good external characters. The structural modifications most serviceable for classification are: presence or absence of the ambiens muscle; the disposition of the digits and especially of their flexor tendons; conformation of the bony palate, sternum, and bones of the wing; presence or absence of colic cæca, as curiously related to the condition of the elæodochon; and various peculiarities of the pterylosis, such as the presence or absence of aftershafts, pulviplumes, and tuft on the oil-gland, condition of the dorsal and ventral tracts, number of remiges and rectrices, etc. The arrangement of the carotid arteries is also to be taken into account. Details of external form are insignificant in comparison with such morphological characters as those just indicated, and may even be deceptive; for the superficial resemblance is slight between some closely related families, and conversely. Thus, the great helmeted Hornbills are specially related to the small slender-billed Hoopoes; the Toucans, with their enormous bills, belong to the series which includes the Barbets, Puff-birds, Jacamars, and Woodpeckers; and other such instances could be cited.

There are more than 1,800 species of *Picariæ*, and the order as a whole is cosmopolitan. But it is richest in genera and species in the tropical regions of either hemisphere, and most of the families occur only in limited areas, especially the Ethiopian and neotropical. Thus, the *Leptosomatidæ* are peculiar to Madagascar, and the *Todidæ* to the Antilles. Exclusively Ethiopian are the *Irrisoridæ*, *Coliudæ*, and *Musophagidæ*; Ethiopian and Oriental are the *Indicatoridæ*, *Upupidæ*, *Bucerotidæ*, *Meropidæ*, *Coraciidæ*, and three of these families (not *Indicatoridæ* or *Bucerotidæ*) are represented in Europe. Exclusively neotropical are the *Rhamphastidæ*, *Galbulidæ*, *Bucconidæ*, *Momotidæ*, and *Steatornithidæ*; while the *Trochilidæ* are characteristic of the same region, but have a few nearctic representatives. The *Podargidæ* are Oriental and Australian. Two families, *Trogonidæ* and *Capitonidæ*, are remarkable in being represented alike in the tropical portions of both hemispheres. The *Alcedinidæ* are widely dispersed in the Old World, with one American genus. Finally, the *Micropodidæ*, *Caprimulgidæ*, *Picidæ*, and *Cuculidæ* are well represented in both temperate and tropical regions of both hemispheres.

The very numerous genera fall in at fewest the foregoing 24 families, which are universally recognized. The open questions are, whether a family *Macropterygidæ* should not be dissociated from the *Micropodidæ*, a family *Nyctibiidæ* from the *Caprimulgidæ*, a family *Centropodidæ* from the *Cuculidæ*, and the families *Picumnidæ* and *Iyngidæ* from the *Picidæ*. Without prejudice to these points, the 24 conceded families may be disposed in nine superfamilies or suborders, according to the following arrangement, which is much more natural than that given in former editions of the Key. The seven North American families, representing as many major groups, are marked with the asterisk, and will be found more fully characterized beyond, under their respective heads.

Natural Analysis of Suborders and Families of PICARIÆ.

A. Anomalogonatus; ambiens absent.

a. Formula A only, without B, X, or Y, *i. e.* femorocaudal present, accessory femorocaudal, semitendinosus, and accessory semitendinosus absent. Nude oil-gland and no cæca; spinal pterylla with narrow apertium. Sternum entire behind. Tensor patagii brevis peculiar.

aa. Feet anisodactylous. Palate "schizognathous." One family, American, and specially characteristic of the Neotropical region I. TROCHILIDÆ

*1. *Hummingbirds*. Bill tenuirostral, and tongue peculiar. Rectrices 10; secondaries only 6. A nest; eggs 2, white 1. *Fam.* TROCHILIDÆ

bb. Feet picarian, sympelmous and anisodactylous or pamprodactylous. Palate "ægithognathous." One family of both hemispheres (or two) II. CYPSELIDÆ

*2. *Swifts*. Bill fissirostral, and tongue not peculiar. Rectrices 10, often mucronate. A nest; eggs plural or single, white 2. *Fam.* MICROPODIDÆ

(NOTE. Sternum entire, phalanges 2-3-3-3, eggs plural, in *Micropodinæ*. Sternum entire, phalanges 2-3-4-5, eggs plural, in *Chaturinæ*. Sternum fenestrate, phalanges 2-3-4-5, egg single, in *Macropteryginæ* or *Fam.* MACROPTERYGIDÆ.)

ß. Formula including X, without B; usually A X Y, sometimes A X or X Y. Oil-gland and cæca variable. Spinal pterylla variable.

cc. Feet passerine, schizopelmous (to beyond bases of toes, where desmopelmous) and anisodactylous. (Formula A X Y.) Palate desmognathous. Manubrium sterni acute. Tufted oil-gland and no cæca. Sinistrocarotid. Bill tenuirostral; tongue lipoglossine. Sternum not entire. Spinal pterylla forked in scapular region. After shafts rudimentary or none. Two Old World families III. UPUPÆ

3. *Wood Hoopoes*. Sternum 2-fenestrate. Nostrils lateral, operculate. Plumage metallic; no crest. Tail long, graduated. African; 3 genera, *Irrisor*, *Scoptelus*, *Rhinopomastus* 3. *Fam.* IRRISORIDÆ

4. *Ground Hoopoes*. Sternum 2-notched. Nostrils superior, non-operculate. Plumage non-metallic; a large compressed crest. Tail short, square. African and Eurasian; one genus, *Upupa* 4. *Fam.* UPUPIDÆ

dd. Feet picarian, sympelmous and anisodactylous, and more or less syndactylous (toes 3 in front, 1 behind; the former more or less united in a fleshy sole). Palate desmognathous. (Formula A X Y, except in *Alcedinidæ*. Oil-gland and cæca variable.) Eggs white. Five families.

IV. HALCYONES

5. *Hornbills*. Sternum 2-notched at most. Skeleton pneumatic. Tufted oil-gland and no cæca. Carotids two, one or none functional. Pterylosis peculiar; spinal tract defective in cervical region, no aftershafts, no downfeathers, eyelids lashed. Rectrices 10. Bill enormous, helmeted, or otherwise peculiar. Tongue lipoglossine.

Chiefly Oriental and Austromalayan (subfamily *Bucerotinae*), but also Ethiopian (subfamily *Bucorvinae*); about 60 species 5. Fam. BUCEROTIDÆ

- *6. *Kingfishers*. (Formula A X.) Sternum 4-notched. Tufted oil-gland and no cæca. Bicarotidean. No spinal space and no aftershfts. Rectrices 12 as a rule, 10 in *Tanysiptera*. Feet thoroughly syndactylous (3-toed in two genera by loss of 2d toe). Bill long, but more or less fissirostral; tomia not serrate (exc. *Syna*). Tongue lipoglossine. Two subfamilies, chiefly Old World, only one genus American 6. Fam. ALCEDINIDÆ
- 7. *Motmots*. Sternum 4-fenestrate. Oil-gland nude or slightly tufted; no cæca. Bicarotidean. No spinal space; plumage aftershafed. Rectrices 12, in *Baryphthengus* 10, the middle pair long and usually spatulate. Bill serrate. Neotropical 7. Fam. MOMOTIDÆ
- 8. *Todies*. Sternum 4-notched. Tufted oil-gland and 2 cæca. Bicarotidean. No spinal space or fork. Rectrices 12, short, even. Bill long, flat, obtuse, minutely serrulate. Eggs plural, white. Nest burrowed under ground. Antillean; one small genus, *Todus* 8. Fam. TODIDÆ
- 9. *Bee-eaters*. Sternum 4-notched. Nude oil-gland and 2 cæca. Carotids variable. A spinal space. Toes syndactylous. Plumage aftershafed. Rectrices 10, 12?. Bill tenuirostral. African and Eurasiatic; 2 subfamilies, *Meropinae* and *Nyctiorhithinae* 9. Fam. MEROPIDÆ
- ee. Feet picarian, sympelmous and pamprodactylous (4 toes in front). Formula A X Y. Palate desmognathous; no vomer nor basipterygoids. Tufted oil-gland and no cæca. Sinistrocarotidean. Plumage aftershafed. Spinal pteryia simple in scapular region. Sternum 4-notched. Rectrices 10. A nest; eggs white. One family, Ethiopian V. PAMPRODACTYLIDÆ
- 10. *Colies*. Bill short and stout. Tail very long. One genus, *Colius* (including *Rhabdocolius* and *Urcolius*), of about 9 species 10. Fam. COLIIDÆ
- ff. Feet picarian, sympelmous and anisdactylous (in one family somewhat zygodactylous). Palate various. Nude oil-gland, or none; cæca. Spinal pteryia furcate in scapular region. Five (or six?) families VI. CORACIDÆ
- 11. *Kirumbos*. Palate desmognathous. Fourth toe versatile; foot thus pseudozygodactylous, Formula A X Y. A pair of uropygial powder-down patches; plumage aftershafed; frontal antie plumose; sexes unlike, ♂ metallic. Rectrices 12. Bill stout; nostrils anterior. One Madagascar genus, of one or two species 11. LEPTOSOMATIDÆ
- 12. *Rollers*. Palate desmognathous; basipterygoids rudimentary; vomer attenuate. Formula A X Y. No powder-down. Two carotids. Nude oil-gland. Plumage aftershafed, alike in both sexes, non-metallic, but brilliant. Rectrices 12. Bill stout; nostrils subbasal. Two subfamilies; *Coraciinae*, two arboreal, diurnal genera, Eurasiatic and African; and *Brachypteraciinae*, three terrestrial, somewhat nocturnal genera, confined to Madagascar 12. CORACIDÆ
- *13. *Gatsuckers*. Palate schizognathous; basipterygoids small; palatines expanded posteriorly; vomer truncate in front. Two carotids. Sternum 2- or 4-notched. Nude oil-gland, small. Plumage aftershafed. Rectrices 10. Bill very small, weak, but deeply fissirostral. Habits partly nocturnal. No nest; young downy; eggs normally 2, colored or colorless. Nearly cosmopolitan 13. CAPRIMULGIDÆ
(NOTE. No powder-down, sternum 2-notched, phalanges 2-3-4-4, middle claw pectinate, and bill not toothed, in *Caprimulginae*; powder-down, sternum 4-notched, phalanges normal, 2-3-4-5, no pectination, and bill toothed in *Nyctibiinae* or fam NYCTIBIIDÆ)
- 14. *Frog-mouths*. Palate desmognathous; basipterygoids rudimentary; palatines expanded in lateral processes. Sternum 4-notched. No oil-gland (*Podargus*); uropygial powder-down patches (not in *Ægotheles*?). Rectrices 10. Phalanges normal, 2-3-4-5, and claw not pectinate. Rictus enormous. Habits nocturnal. A nest; eggs white or colored; young downy. Oriental and Australian. *Podargus* and *Batrachostomus*, of the subfamily *Podarginae*, nostrils basal; *Ægotheles*, of the subfamily *Ægothelinae*, nostrils subterminal 14. Fam. PODAROIDÆ
- 15. *Oil-birds*. Peculiar in the formula X Y, and otherwise; perhaps should stand alone as a suborder, *Steatornithes*, related to the Owls. Palate desmognathous; basipterygoids develop 1: palatines contracted. Sternum 2-notched. Large nude oil-gland. Two carotids. Bronchial syringes. Skull owl-like. Rectrices 10. One genus, Neotropical 15. Fam. STEATORNITHIDÆ
- gg. Feet picarian in a peculiar way, heteropelmous and heterodactylous (zygodactylous, but by reversion of second toe). Formula A X (as in Kingfishers). Palate schizognathous; basipterygoids present. Nude oil-gland and 2 small cæca. Sternum 4-notched. Sinistrocarotid. General pterylosis passerine; spinal pteryia simple; plumage aftershafed. Rectrices 12. One family, of both hemispheres VII. TROGONIDÆ
- *16. *Trogons*. Bill stout, serrate or smooth 16. TROGONIDÆ
- hh. Feet picarian, antiopelmous and perfectly zygodactylous (in the usual way, by reversion of fourth toe; hallux wanting in certain 3-toed genera). Formula including X, usually also Y. Palate and carotids variable. No basipterygoids. Oil-gland variable. Aftershfts small or vestigial. Spinal pteryia simple. Sternum and tensor patagii brevis characteristic. Wing-coverts tending to reduction to passerine smallness. Six (or eight?) families VIII. PICIDÆ
- *17. *Woodpeckers*. Palate of the peculiar structure called saurognathous; vomers paired. Formula A X Y (with some exceptions). Manubrium sterni furcate. Sinistrocarotid. Tufted oil-gland and no cæca. Syrinx broncho-tracheal, with one pair of intrinsic and one of extrinsic muscles. Wing-coverts passerine. Rectrices normally 12, one pair spurious. Bill peculiar; tongue usually lumbriciform. Hallux missing in five genera. Nest in holes; eggs plural, white. Nearly cosmopolitan; three subfamilies, *Picinae* with rigid acuminate rectrices, *Picumninae* and *Iynginae* with soft rectrices, the two latter sometimes separated as different families 17. Fam. PICIDÆ

18. *Guide-birds*. Palate called ægithognathous or schizognathous; vomer forked. Intrinsic syringeal muscles one pair. Formula A X Y. Manubrium sterni acute. Sinistrocrotid. Tufted oil-gland and no cæca. Ventral pteryla forked on throat. Wing-coverts passerine. Primaries only 9. Rectrices 12 (in *Indicator*), or 10 (in *Prodotiscus*). Bill moderate. Two genera, African and Asiatic 18. *Fam.* INDICATORIDÆ
19. *Barbets*. Palate called ægithognathous or desmognathous; vomer forked. Formula A X Y. Manubrium sterni acute. Sinistrocrotid. Tufted oil-gland and no cæca. Syrinx simply broncho-tracheal, without intrinsic muscles. Ventral pteryla forked. Wing-coverts passerine. Rectrices 10. Bill moderate, highly bristly. About 30 Old World genera; 2 genera (*Capito* and *Tetragonops*) Neotropical 19. CAPITONIDÆ (or MEGALÆMIDÆ)
20. *Toucans*. Palate desmognathous; vomer truncate. Nasals holorhinal; no basipterygoids. Formula A X Y. Manubrium sterni acute. Sinistrocrotid, as a rule. Tufted oil-gland and no cæca. Plumage aftershafted. Wing-coverts passerine. Rectrices 10. Bill enormous; tongue macroglossine, horny, and feathery. Nest in holes in trees; eggs white. Five or more Neotropical genera; 50 or more species 20. *Fam.* RHAMPHASTIDÆ
21. *Jacamars*. Formula A X Y or A X. Bicarotidean. Nude oil-gland, but cæca developed. Ventral pteryla branched in gular region; plumage brilliant, aftershafted; wing-coverts subpasserine. Rectrices 12 (reduced to 10 in two genera). Hallux missing in one genus (*Jacamaralcyon*); feet somewhat syndactylous. Bill tenuirostral, with keeled gonys and ridged culmen. Nest in burrows. Eggs 2, white. Neotropical. *Galbulinae*, 5 genera; *Jacamaropinae*, one genus 21. *Fam.* GALBULIDÆ
22. *Puff-birds*. Palate desmognathous. Formula A X Y? Bicarotidean. Nude oil-gland, but large cæca. Ventral pteryla unbranched in gular region; plumage dull, not aftershafted; wing-coverts not passerine. Rectrices 12. Bill stout, with flat gonys. Nest in burrows. Eggs 2, white. Neotropical; genera 7 or more. 22. *Fam.* BUCCONIDÆ

B. Homalognathous; ambiens present.

Formula A B X Y or A X Y; *i. e.* femorocaudal present, its accessory present or absent, semiteudinosus and its accessory present.

Feet picarian, desmopelmous and zygodactylous (in the usual way by reversion of 4th toe; hallux always present).

Palate desmognathous. Spinal pteryla forked in scapular region IX. COCCYGES

*23. *Cuckoos*. Feet perfectly zygodactylous. Nude oil-gland and 2 cæca. Plumage not aftershafted. Rectrices 10 (8 in *Gaira* and *Crotophaga*). (Formula normally A X Y, but A B X Y in *Centropus*, etc.) Syringes variable. Cosmopolitan; genera upward of 40, in several subfamilies 23. *Fam.* CUCULIDÆ

24. *Turacous*. Feet imperfectly zygodactylous; fourth toe versatile. Tufted oil-gland and no cæca. Plumage aftershafted. Rectrices 10. (Formula A B X Y.) Ethiopiau; genera 6 24. *Fam.* MUSOPHAGIDÆ

It must be obvious, from the foregoing exhibit, that no linear arrangement of the groups can possibly exhibit their various interrelations; and consequently, any sequence of the families we may adopt becomes a choice of evils. By common consent, the highly specialized *Trochilidæ* stand at or near the "head" of the series, and near or next to them come the *Micropodidæ* (*Cypselidæ*). Again, the homalognathous *Cuculidæ* and *Musophagidæ*, differing most from all the rest, and even hinting at gallinaceous affinities, are best put at the "foot" of the series. But between these extremes there is room for wide difference of opinion in arranging the families of the whole order, even when we have only those of North America to deal with. It will be observed that our seven families represent as many of the whole number of suborders, only the *Panprodyli* (the Colies) and the *Upupæ* being unrepresented in our fauna. Now the *Upupæ* are certainly "high" in the Picarian series, with their passerine feet, etc. — so high that Salvin makes them head the order, even taking precedence of the *Trochilidæ*. Yet their closest relationships are with the *Bucerotidæ*, or Hornbills; and to bring out this fact I am obliged, in the foregoing schedule, to bring in the *Halcyones* next after the *Upupæ*. But this arrangement has the disadvantage of throwing the *Caprimulgidæ* far out of their undeniable bearing upon the *Cypselidæ*, and so upon the *Trochilidæ*; for the actual relationships of these three families are so close that with most authors they form one suborder — the so-called *Macrochires*, *Cypseliformes*, or *Cypselomorpha*. In a faunal work like the present it may not be necessary to insist upon considerations involved in the relationships of the Hoopoes and Hornbills; and it is easy to bring the *Caprimulgidæ* next after the *Cypselidæ*, by simply transposing the places occupied by the *Halcyones* and *Coraciæ* in the foregoing scheme. Making this single change, the sequence of our seven suborders and seven families becomes: TROCHILLI, *Trochilidæ*; CYPSELI, *Micropodidæ*; CORACIÆ, *Caprimulgidæ*; HALCYONES, *Alcedinidæ*; TROGONES, *Trogonidæ*; PICI, *Picidæ*; and COCCYGES, *Cuculidæ*. This arrangement seems to me to be as "natural" as any that can be devised; it certainly brings out some good points,

as in placing the yoke-toed (whether heterodactylous or zygodactylous) families together, after the anisodactylous or pamprodactylous ones; it heads the list with the Hummers, and foots it with the Cuckoos; and it violates no obvious interrelations of the intermediate families. Having these recommendations, this is the sequence I shall adopt in the present edition of the Key.*

SUBORDER TROCHILI: HUMMINGBIRDS.

See p. 540 for analytical characters of this group, especially in comparison with the fissirostral macrochirous type—the *Cypseli*. The skeleton agrees closely, in general, with that of the Swifts, but has many minor peculiarities in detail, among which the most prominent are the modifications of the facial bones conformably with the long slender bill. The palatal arrangement is schizognathous. The deeply carinate sternum widens toward its unnotched xiphoid border; there is no manubrium; the furculum is U-shaped, with rudimentary hypodidium; the coracoid canaliculate; the humerus very short and stout, the radius arched, the metacarpus and phalanges greatly elongated. A chief anatomical peculiarity is the structure of the tongue, which somewhat resembles a Woodpecker's in being protrusible or capable of being thrust far out of the beak by a muscular mechanism connected with the long horns of the hyoid or tongue-bone, which curve up around the back of the skull; the tongue is in effect a sheathed double-barrelled tube, appearing like two cylinders united for some distance, then opening out with a thin lacerated edge. This structure is supposed to be used to suck the sweets of flowers. There are no cæca, and the oil-gland is nude. The myological formula lacks the ambiens, accessory femoro-caudal, semitendinosus, and its accessory, as in the Swifts: the flexor longus hallucis supplies the hallux and by a branch the second digit, besides sending the remnants of slips to the third and fourth; the second, third, and fourth digits are supplied as usual by the flexor digitorum. There are no sterno-tracheals. There is one carotid artery, the left. The pterylosis is characteristic. This is a highly monomorphic or monotypic group, containing a single definitely circumscribed family, peculiar to America, and specially characteristic of the Neotropical region.

Family TROCHILIDÆ: Hummingbirds.

Tenuirostral macrochirous Picariae. These beautiful little creatures will be known on sight by their diminutive size and gorgeous coloration, without regard to their technical characters. They are called Hummingbirds because their wings make such a noise in flight, whirring so rapidly that the eye cannot follow their vibrations. The French know them as *oiseaux-mouches*, or “bird-flies,” for the same reason; their curious resemblance to insects has struck every one who ever saw a Hummer poised on misty pinions before a flower, when a second glance might be required to distinguish the feathered bird from a furred sphinx-moth. In powers of flight the Hummers are equalled by few if any birds, and certainly surpassed by none in the marvellous rapidity with which they dart through the sunshine.

* The arrangement in former editions of the Key is: CYPSELIFORMES, *Caprimulgidae*, *Cypselidae*, *Trochilidae*; CUCULIFORMES, *Trogonidae*, *Alcedinidae*, *Cuculidae*; PICIFORMES, *Picidae*. This is bad, both in the construction of suborders and sequence of families. In the classification adopted in the A. O. U. Lists there is some faulty construction of three major groups as in Key, with an improvement in their sequence. Reversing the A. O. U. arrangement, which proceeds from lowest to highest, in order to correctly exhibit its relations with the foregoing, we find it to be: Order MACROCHIROUS; Suborder TROCHILI, *Trochilidae*; Suborder CYPSELI, *Micropodidae*; Suborder CAPRIMULGI, *Caprimulgidae*. Order PICI; no suborder, *Picidae*. Order COCCYGOES; Suborder ALCYONES, *Alcedinidae*; Suborder TROGONES, *Trogonidae*; Suborder CUCULI, *Cuculidae*. In the Standard Natural History, Dr. Stejneger judiciously recognizes the seven North American superfamilies of Picarian birds; but their sequence is less happy, especially in the wide separation of *Caprimulgidae* from *Cypselidae* and *Trochilidae*. His sequence reversed, or from highest to lowest, is, for the foregoing families: *Trochilidae*, *Micropodidae*, *Trogonidae*, *Picidae*, *Alcedinidae*, *Caprimulgidae*, *Cuculidae*. Both the number and the sequence of groups, so far as those of North America are concerned, as given in the foregoing text, are identical with those presented in the British Museum Catalogues.

The flying-apparatus, as in the Swifts, presents a very deep-keeled entire sternum, for attachment of powerful pectoral muscles; a very short upper-arm, but the distal segments of the fore limb lengthened, particularly the hand, bearing a long, thin-bladed, or even falcate wing; primaries 10, the 1st usually longest; secondaries reduced to 6, and very short. Tail of 10 rectrices, but otherwise too variable to be characterized, presenting almost every peculiarity in size and shape as a whole, in size and shape of individual feathers, and often differing in form as well as color in the opposite sexes of the same species. Feet extremely small and weak, unfit for progression, formed exclusively for perching; tarsi naked or feathered. Hind toe incumbent, as in Passerine birds. Claws all large, sharp and curved. The bill exhibits the tenuirostral type in perfection, being long and extremely slender for its length; it is usually straight, subulate or awl-shaped, or with lancet-shaped tip; it is often decurved, sometimes



FIG. 354. — Hummingbirds. (From Michelet.)

recurved, and again bent almost at an angle; in length it varies from less than the head to more than all the rest of the bird. The cutting edges of the mandibles are inflected, and either serrate, serrulate, or smooth; the rictus is devoid of bristles. The nostrils are linear, with a supererminent scale or operculum, sometimes naked, oftener feathered. In size the Hummers average the least of all birds, the giants among them alone reaching a length of 6 or 7 inches, the pygmies being under 3 inches; the usual stature is 3 or 4 inches. In a few the coloration is plain, or even sombre; most have glittering iridescent tints — “the most gorgeously brilliant metallic hues known among created things.” The sexes are usually unlike in color.

Hummingbirds, like poets, belong to the *genus irritabile*; they are very nerry if not also brainy little creatures, of greater courage than discretion, quick-tempered and extremely pugnacious — the Kingbird which has just whipped a Hawk or a Crow may be assaulted and worsted by the impetuous Ruby-throat. The food of Hummers was formerly supposed to be the sweets of flowers. It is now known that they are chiefly insectivorous. Their little nests are models of architectural beauty. The eggs are always two in number, elliptical in shape, and white in color. The young hatch weak and helpless, requiring to be fed by the parents, Hummers being thus of altricial nature. The voice is not musical.

The family is one of the most perfectly circumscribed in ornithology, and one of the largest groups of its grade. So intimately and variously are the genera interrelated that every attempt to divide it into subfamilies has proven unsatisfactory. Hummers are peculiar to America. Species occur from Alaska to Patagonia; but we have a mere sprinkling in this country. The centre of abundance is in tropical South America, particularly Colombia. Nearly 500 specimens are current. The genera or subgenera vary with authors from 50 to 150. Mr. D. G. Elliot, one of the highest authorities upon the subject, gives 426 species, assigned to 125 genera. The latest monographer, Mr. Osbert Salvin, one of the most careful and critical ornithologists who ever lived, arranges the Hummers in 3 series called *Serrirostres*, *Intermedii*, and *Lavirostris*, with 127 genera and 480 species. None of the known North American Hummers exhibits the extremes of shape of bill or tail which some of the tropical genera

illustrate; in only one (*Calothorax lucifer*) is the bill decidedly curved. Only one species is more than 5 inches long — the magnificent *Cæligena clemenciae*. Some curious shapes of tail, including marked sexual characters in this respect, are exhibited by certain genera, especially the wonderful *Loddigesia*.

Only one species, the common Ruby-throat, is known to occur in the East; this was the only one known to Wilson. Audubon gave four species, but one of them erroneously. Since his time, many new forms of these exquisite creatures have successively been brought to light over our Mexican border. In 1858, Baird gave seven (one of them *Lampornis mango*, erroneously, as Audubon had done). In 1872, in the Key, I was able to increase the number to ten, but with two wrongly given (the *Lampornis* and *Agyrtrix linnei*). The same ten, with the two errors, were given by Baird and Ridgway in 1874. Within ten years the discoveries were so many, that, after eliminating the two errors, I was able to describe in 1884 no fewer than fifteen perfectly distinct species of United States Hummingbirds; and I then stated that I had no doubt that several others would in due time be found over our Mexican border. The sixteenth (*Cæligena clemenciae*) was added to the 3d ed. of the Key, 1887; the seventeenth and eighteenth (*Trochilus violijugularis* and *S. flossii*) were installed in the 4th ed., 1890. I have now to include the nineteenth (*Basilinna leucotis*). But *Atthis heloise* is not confirmed, reducing for the present the total to eighteen. Among the probabilities are *Lamproloma rhami* and *Campylopterus hemileucurus*.

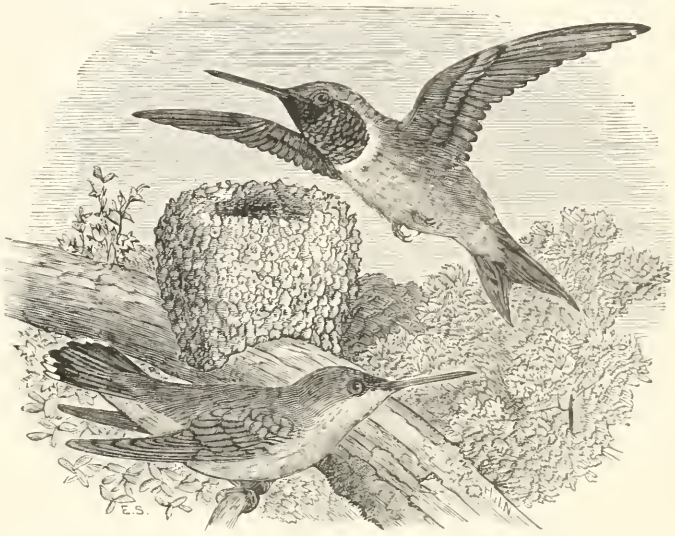


FIG. 355.—Ruby-throated Hummingbirds, ♂, ♀, and nest, nearly nat. size. (Sheppard del. Nichols sc.)

The discrimination of the females and young is difficult; but with the adult males there should be no trouble. The following table is intended to enable the student to tell the genus and species directly of any United States Hummer, if the specimen he has in hand be an adult male. If a female or young, he must refer to the detailed descriptions. He will be much assisted by the figures of generic details drawn from nature by Mr. R. Ridgway for Mr. D. G. Elliot's monograph, and kindly loaned to me by Professor Baird.

Analysis of Genera and Species of N. A. Trochilidæ (adult males).

Frontal feathers not fully covering nasal scale.	Tarsi feathered.	Tail emarginate.	Bill broad, in part flesh-colored.
Nasal scale entirely naked.	White stripe on head.	Crown, face, and chin blue-black.	Tail mostly rufous <i>Basilinna rufus</i>
			Tail mostly blue <i>Basilinna leucotis</i>
Nasal scale partly naked.			
	Crown green; throat blue; tail blackish		<i>Iache latirostris</i>
	Throat green; tail rufous; sides rufous		<i>Amizilis cerviniventris chalconota</i>
	Throat green; tail rufous; sides green		<i>Amizilis tzacall</i>

Frontal feathers covering nasal scale.

Bill not perfectly straight.

Bill curved throughout. Tail forked, with almost filiform lateral feather *Calothorax lucifer*
 Bill nearly straight. Length over 4 inches. Throat and breast green *Eugenes fulgens*

Bill perfectly straight.

Length over 5 inches *Cœlogena clemenciæ*
 Length under 4 inches.

Crown as well as throat with metallic scales.

Scales lilac-crimson. Lateral tail-feather parallel-edged *Calypte annæ*
 Scales violet. Lateral tail-feather acutely falcate *Calypte costæ*
 Scales red *Selasphorus floresii*

Crown simply glossy, like back; throat with metallic scales.

Middle tail-feathers unlike back in color.

Scales confined to ends of throat-feathers, their bases snow-white *Stellula calliope*

Middle tail-feathers like back in color; throat-scales forming a continuous surface.

Lateral tail-feathers white-tipped; none acuminate. Outer primary abruptly emarginate and acute
Athis morcomi

Lateral tail-feathers not white-tipped; some or all acuminate.

Throat-scales coppery-red; back and tail greenish; outer two primaries acute, falcate; all the
 tail-feathers acuminate, the two outer acicular *Selasphorus alleni*

Throat-scales coppery-red; back and tail mostly chestnut; primaries as in *S. alleni*; next to
 middle tail-feather abruptly notched *Selasphorus rufus*

Throat-scales lilac-red; back golden-green; 1st primary emarginate, turned outward, next ob-
 liquely incised at end *Selasphorus platycercus*

Throat-scales opaque black, becoming violet posteriorly; back golden-green; primaries not
 peculiar *Trochilus alexandri*

Throat-scales ruby-red; back golden-green. Primaries not peculiar (Eastern)

Trochilus colubris

EU'GENES. (Gr. *εὐγενής*, *eugenes*, well-born.) **FULGENT HUMMERS.** Of great size: about 5 inches long. Bill much longer than head, not quite straight, flattened and slightly widened at base, subcylindrical in continuity, with lancet-pointed tip. Frontal feathers extending on nasal scale. Tail ample, in ♂ moderately forked, in ♀ double-rounded, all the feathers broad, with rounded ends. Tarsi feathered. A tuft of downy-white at insertion of feet. Outer primary but little narrower or more falcate than the rest. Sexes nearly alike in form, unlike in color. Bill black; no white on tail of ♂.



FIG. 356. — Nests of Rivoli and Black-Chinned Hummers.

E. fulgens. (Lat. *fulgens*, glittering. Figs. 356, 357, 358.) **REFULGENT HUMMINGBIRD.** RIVOLI HUMMINGBIRD. PAPANTZIN. ♂: Tail simply forked. General body-color shining golden-green above and below, duller on belly and crissum, on breast showing opaque black when viewed from before backward. Crown glittering metallic violet in proper light, opaque black viewed obliquely from behind forward. Gorget glittering emerald-green in proper light, opaque greenish-black from the opposite direction. White marks about eyes. Tail like body, but more brassy. Wing-coverts and lining of wings like body; quills dusky-purplish. Large: length about 5.00; extent 6.50; wing 2.75; tail 1.75; bill over 1.00 from feathers on culmen, nearly 1.50 along gape. ♀: Upper parts like those of ♂, but crown like back. No emerald gorget, whole under parts whitish, specked here and there with green; throat with dusky specks.

Wings as in ♂, but tail very different; double-rounded, both central and lateral feathers shorter than intermediate ones; middle feathers brassy-green, others the same in decreasing

extent, increasing in blackish toward ends, and squarely tipped with dull white. Smaller: length about 4.50; wing 2.50; tail 1.50; bill, however, about as long. A large

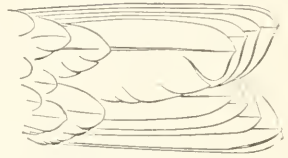


FIG. 358. — Tail of the same, ♂, nat. size. (From Elliot.)

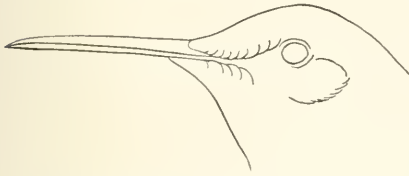


FIG. 357. — Refulgent Hummingbird, head, nat. size. (From Elliot.)

and most magnificent species, inhabiting the table lands of Mexico, and N. to Arizona, where it breeds in the Huachuca Mts. up to 6,000 feet or more. Nest often high in trees, saddled on a limb, composed chiefly of vegetable down, lichened outside with cobweb; with a cavity, top 1.75×0.75 ; eggs 0.63×0.40 , June, July. See Osprey, Jan. 1899, p. 65, plate.

CÆLIG'ENA. (Lat. *cæligenu* or *cæligena*, heaven-born; *cælum* or *cælum*, the sky, heaven: *gignere*, to beget, bear; in passive, to be born.) HEAVENLY HUMMERS. CAZIQUE. Of greatest size; our species over 5.00. Bill longer than head, straight; wings long and ample; tail large, rounded, with broad feathers; tarsi feathered. Sexes nearly alike; ♂ ♀ with white stripe on head and lateral tail-feathers white-tipped.

C. clemen'cia. (To —.) BLUE-THROATED HUMMINGBIRD. TOPILTZIN. Adult ♂: Above bronzed green, purer green on neck, more bronzy on rump; crown dark; a long sharp white postocular stripe; gorget metallic azure-blue; quills and tail-feathers purplish-black, the outermost pair of the latter broadly tipped with white. Below dull gray; flanks glossed with green, under tail-coverts edged with white. Bill black. ♀ similar, lacking gorget; throat gray. Very large: ♂ 5.40; extent 7.50; wing 3.10; tail 2.00; bill about 1.00. This magnificent species had long been known as an inhabitant of the table lands of Mexico, when it was discovered over our borders in the Sta. Catalina Mts., Ariz., by F. Stephens, May 14, 1884: see BREWST. Auk, Jan. 1885, p. 85; COVES, Key, 3d ed. 1887, p. 879.

TRO'CHILUS. (Gr. *τροχίλος*, *trochilos*, Lat. *trochilus*, a runner: a plover so named by Herodotus: by Linnæus transferred to Hummingbirds.) GORGET HUMMERS. Bill slender and subulate, not widened at base; frontal feathers covering nasal scale. Tail in ♂ forked or emarginate, with lanceolate feathers; in ♀ simply rounded or double-rounded, with broader feathers. Outer 4 primaries not peculiar: but 1st one strongly curved or bowed at end inward; inner 6 abruptly smaller and more linear (in ♂ at least). Tarsi naked. Bill black. A metallic gorget in ♂, not prolonged into a ruff; no scales on crown. ♀ lacking gorget,

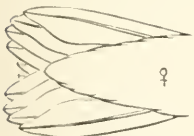


FIG. 359. — Ruby-throated Hummingbird, ♀ tail, nat. size. (From Elliot.)

and tail white-tipped.

T. co'lubris. (Latinized from the barbarous *colibri*. Figs. 355, 359, 360.) RUBY-THROATED HUMMINGBIRD. SCRAPPER. ♂: Tail forked, its feathers all narrow and pointed: no scales on crown; metallic gorget reflecting ruby-red. Above, golden-green; below, grayish, sides green; wings and tail (except middle feathers) dusky-purplish. ♀: Throat white, sometimes specked with dusky; tail double-rounded, central feathers shorter than next, lateral then graduated; all broader than in ♂ to near end, then



FIG. 360. — Ruby-throated Hummingbird, ♂, nat. size. (From Elliot.)

rapidly narrowing with concave inner margin; tail with black bars, and lateral feathers white-tipped; no rufous on tail in either sex. Length of ♂ 3.25; extent 5.00; wing 1.75; tail 1.25; bill 0.66. Young ♂ begins by winter to show the red. Eastern N. Am., especially U. S., abundant in summer, generally seen hovering about flowers, sometimes in flocks, extends N. to the Fur Countries, W. to the Great Plains, and in winter S. to Cuba, Mexico, and Veragua; breeds from Florida to Labrador. Feeds on insects and sweets of flowers. Nest a beautiful structure, of downy substances, stuccoed with lichens outside; eggs 2, white, 0.50×0.33 .

T. alexan'dri. (To Dr. Alexandre, of Mexico, its discoverer. Figs. 356, 361.) ALEXANDER HUMMINGBIRD. BLACK-CHINNED HUMMINGBIRD. SPONGE HUMMER. Size and general appearance of *T. colubris*. ♂: Tail double-rounded; central

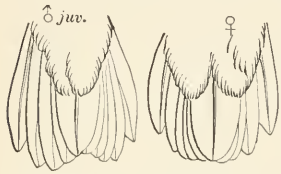


FIG. 361. — Alexander Hummingbird, tail of young ♂ and ♀, nat. size. (From Elliot.)

emargination about 0.10, lateral graduation more; the feathers all acuminate, and whole-colored. Upper parts, including two middle tail-feathers, as in *T. colubris*. Gorget opaque velvety-black, only posteriorly glittering with violet, sapphire, and emerald. Other under parts whitish, green on sides. Length 3.25; wing 1.75; tail 1.25; bill from frontal feathers 0.75. ♀: Tail slightly rounded (without appreciable central emargination); lateral feathers scarcely acuminate; middle feathers like back, darkening at ends; others with broad purplish-black space near end, and white-tipped; thus so closely resembling *colubris* ♀ that lack of decided emargination of tail is the principal character. No gorget, the throat often with dusky specks. Eggs 0.50×0.32 , indistinguishable from those of common Ruby-throat. Pacific coast region from Lower California to British Columbia, and E. to Rocky Mts. and Texas; winters in Mexico.

T. violijugularis. (Lat. *viola*, a flower, the violet, as if diminutive of a digammatized form of Gr. *ἰον*, *ion*, used for violaceous, Gr. *ἰοειδής*, *ioeides*, of a violet-blue color, and Lat. *jugularis*, of the jugulum or throat.) VIOLET-THROATED HUMMINGBIRD. Adult ♂: Above, metallic golden-green; sides dull-green; flanks less green, the feathers tipped with brown; gorget violet glancing to steel-blue; wings dusky-purplish with a buff line along edge of manus, the coverts dull-green; primaries broad to the tip, that of the first recurved; tail slightly forked; its feathers broad except the last pair, which are narrowly linear; shafts of the outer pair abruptly angulated; middle feathers and base of second pair metallic green; rest dusky-purplish; under tail-coverts white with green spots. Length 3.60; wing 1.80; tail 1.20; bill 0.75. A

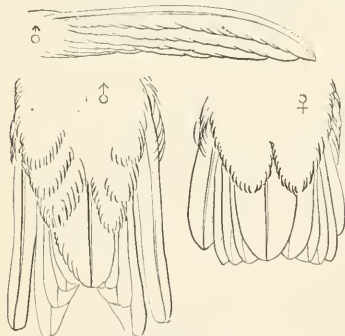


FIG. 362. — Anna Hummingbird, ♂, ♀, nat. size. (From Elliot.)

very dubious species, known only from the type specimen, taken Apr. 5, 1883, at Santa Barbara, S. Cal. (See Bull. Coop. Club, Sept. 15, 1899, p. 99.) *Trochilus violajugulum* [sic] JEFFRIES, Auk, April, 1888, p. 168; A. O. U. Committee's Suppl. List, 1889, p. 10; A. O. U. List, 2d ed. 1895, No. 429. 1. *T. violijugularis* COUES, Key, 4th ed. 1890, p. 903.

CALYP'TE. (Gr. *καλυπτή*, *Kalupte*, a proper name.) HELMET HUMMERS. Crown of ♂ with metallic scales like the gorget, which is prolonged into a ruff; outer primary not attenuate; tail of ♂ forked, the outer feather abruptly narrow and linear, of ♀ slightly double-rounded. No peculiarity of primaries. Bill ordinary, as in *Selasphorus* or *Trochilus*; black. No rufous color anywhere. Tail of ♂ unvaried; of ♀ white-tipped. (Our only genus with bill ordinary and scales on crown of ♂.)



FIG. 363. — Anna Hummingbird, ♂, nat. size. (From Elliot.)

C. an'næ. (To Anna, Duchess of Rivoli. Figs. 362, 363.) ANNA HUMMINGBIRD. ♂: Top of head with metallic scales like those of throat, the latter prolonged into a ruff; the iridescence lilac-crimson, covering whole head and throat, except a separating line through eye. Tail deeply forked; middle feathers very broad and rounded, the lateral all successively more narrowed and linear, especially the outermost, but all with obtuse ends. Outer primary narrower than the next, but of no special peculiarity. Back and middle tail-feathers golden-green; other tail-feathers, like the wing-quills, purplish-dusky, without any rufous or white; under parts whitish, nearly everywhere glossed over with green. Length about 3.50; wing 1.90; tail 1.35; bill 0.75. ♀ like ♂ excepting on head and tail. No metallic scales on head; crown like back, golden-green; throat whitish, with dusky, often metallic red, specks. Tail rounded, slightest central emargination, all but middle feathers (which are like back) green (or gray) at base, then black for a space, then white-tipped (no rufous). Under parts gray, with much green gloss. California, common, resident; L. Cala; S. Arizona; Guadalupe Isl.

C. cos'tæ. (To The Marquis de Costa, of Chambéry, France. Fig. 364.) COSTA HUMMINGBIRD. ♂: Metallic scales on top and sides of head as well as throat, latter prolonged into a flaring ruff; iridescence violet, sapphire, steel-blue or purplish, not red. Tail lightly forked; middle feathers broad and obtuse, lateral narrowing successively, but outermost abruptly narrowest, falcate — very noticeable. Outer primary simple. Back and middle tail-feathers golden-green; other tail-feathers like wing-quills, purplish-dusky. Below whitish, the belly gray, glossed with golden-green. Small: length 3.00–3.25; wing 1.75–1.80; tail 1.00; bill 0.67. ♀: No scales on head. Tail simply rounded, or with least possible central emargination; lateral tail-feathers narrowing, but outermost not noticeably different from the next. Crown like back; throat like belly, with dark specks. Middle tail-feathers like back, others green or gray, then black, then white-tipped. Entire under

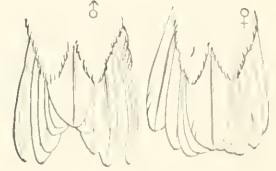


FIG. 364. — Costa Hummingbird, ♂, ♀, nat. size. (Elliot.)

parts whitish. Compared with *annæ*, our only other species with scales on crown in ♂, *costæ* is smaller; throat ruff much more flaring; glitter entirely different (not red at all); tail less forked, with almost acicular falcate outermost feather; under parts less glossed with green. ♀ *costæ* lacks green gloss on under parts, which are more white, has much narrower tail-feathers, and is smaller, in comparison with ♀ *annæ*. ♀ *costæ* more closely resembles ♀ *Stelula calliope*, but the latter has traces at least of rufous on tail and under parts. Also resembles ♀ *Trochilus*, but has all the lateral tail-feathers white-tipped. Arizona, Nevada, and southern California, Utah, and New Mexico, and southward in migrations in L. Cala. and W. Mexico.

SELASPHORUS. (Gr. *σέλας*, *selas*, light; *φορός*, *phoros*, bearing.) LIGHTNING HUMMERS. Bill slender and subulate; frontal feathers covering nasal scale. Tail in ♂ ♀ graduated or rounded, not forked, and extensively rufous or tipped with white; central much broader than lateral feathers. Details of shapes of feathers varying with species and sexes (see descriptions, and figs. 365, 366). Outer primary, or 2 outer ones, of ♂ abruptly attenuate, the end bowed; inner 6 primaries not abruptly narrower than those farther outward. Tarsi naked. Bill black. A metallic gorget in ♂, little or not produced into a ruff; no scales on crown (except in *floresii* — if this species belongs here). ♀ lacking gorget, and tail white-tipped. Eggs of our species indistinguishable, nearly or quite 0.50×0.33 .

S. flore'sii. (To Signor Flores, of Mexico.) FLORES'S HUMMINGBIRD. Adult ♂: Crown glittering red with metallic scales, like the gorget, as in the genus *Calypte* (to which the bird may belong — in part at least): thus distinguished from any other species of *Selasphorus*. Middle pair of tail-feathers green and rufous; outermost pair dusky; belly white; sides and flanks green. Length 3.25; wing 1.75; tail 1.40; culmen 0.65. ♀ unknown. The alleged species is not well established, either generically or specifically; and its occurrence in the U. S. is accidental. It was originally described from Bolaños, Mexico, by GOULD, Mon. Troch. iii.

pt. xxiii, Sept. 1861, pl. 139. A specimen was taken at San Francisco, Cal., in May, 1885; see W. E. BRYANT, *Forest and Stream*, xxvi, No. 22, 1886, p. 426; COUES, *Key*, 4th ed. 1890, p. 903; A. O. U. List, 2d ed. 1895, No. [431. 1.]. The bird was needlessly renamed *Trochilus rubromitratus* and *Selasphorus rubromitratus*; see RIDGW. Auk, Jan. 1891, p. 114.

S. rufus. (Lat. *rufus*, reddish.) RED-BACKED RUFOUS HUMMINGBIRD. NOOTKA HUMMINGBIRD. ♂: No metallic scales on crown. Gorget glancing coppery-red, somewhat prolonged into a ruff. Tail euneate; middle pair of feathers broad, narrowing rather suddenly to a point. Next pair broad, *nicked* or *emarginate near end* (fig. 365). Next three pairs successively narrowing gradually, but not even the outer becoming acicular. Two outer primaries



FIG. 365. — Tail of *S. rufus*, nat. size.

narrow, falcate, gradually very acute, the ends bowed inward. General color above and below cinnamon-red, becoming more or less green on crown, sometimes flaked with green on back, fading to white on belly. Tail-feathers cinnamon-red, deepening to dusky-purplish at ends. Quills dusky-purplish. Length about 3.50; wing 1.50–1.67, averaging 1.60; tail 1.30; bill 0.65. ♀ showing same characters of tail and wing, but less plainly. Coloration extensively rufous, but overlaid with green; no gorget, replaced usually by a few metallic feathers; under parts extensively white, but shaded with cinnamon on sides and crissum. Middle tail-feathers glossed with greenish, darkening to black at end, and usually touched with cinnamon at base; other tail-feathers extensively rufous, then black, finally white-tipped. Length 3.50; wing 1.70; tail 1.20. On comparing ♀ *rufus* with ♀ *platycercus*, a great difference in size of outer tail-feather is observable; in *rufus* it is only 0.12 broad, and under 1.00 long; in *platycercus* it is 0.25 wide, and over 1.00 long. Rocky Mts. to the Pacific, N. to Mt. St. Elias, Alaska; E. to portions of Texas, Montana, etc.; S. in winter on the table lands of Mexico; the commonest and most extensively distributed species in the West; noted as the northernmost species of the family. (This is *T. rufus* GM., the true "Nootka Sound Hummingbird;" ♂ easily known by its cinnamon-red back, and nick in next to middle tail-feather. *S. henshawi* ELLIOT.)

S. alteni. (To C. A. Allen, of California. Figs. 366, 367.) GREEN-BACKED RUFOUS HUMMINGBIRD. ALLEN HUMMINGBIRD. In generalities similar to the last. ♂: Two



FIG. 366. — Tail of *S. alteni*, nat. size.

outer tail-feathers on each side very small and narrow, the outermost almost acicular; next little larger; 3d abruptly larger; 4th from the outer smaller than 3d or middle pair. Upper parts golden-green, dullest on crown. Under tail-coverts, belly, and sides cinnamon, paler on median line, white on breast next to the gorget. Tail-feathers cinnamon, tipped and edged with dusky-purplish. Gorget fiery-red. Length about 3.25; wing 1.50; tail 1.18; bill 0.64. ♀ similar to ♀ *rufus*; averaging smaller; tail-feathers narrower, especially the outer ones. Coast region of California and northward to British Columbia; E. into Arizona. (This is the bird often described as ♀ *rufus*; carefully distinguished by HENSHAW, *Bull. Nutt. Club*, ii, 1877, p. 53; considered by ELLIOT to be true *rufus* GM.)

S. platycercus. (Gr. *πλατύς*, *platus*, broad; *κέρκος*, *kerkos*, tail. Fig. 368.) BROAD-TAILED HUMMINGBIRD. ♂: No scales on top of head; crown like back. A gorget of scales, not prolonged into a ruff. Outer primary attenuate, acuminate, ending acicular, the point

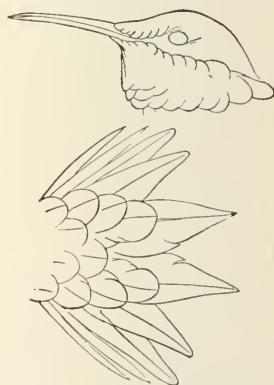


FIG. 367. — Green-backed Rufous Hummingbird, ♂, nat. size. (From Elliot.)

turned outward; next primary also narrowed, not so much as the 1st, its end obliquely incised with a slight nick. Tail ample; middle feathers scarcely or not shorter than the next, but the rest rapidly graduated; middle and several lateral ones broad, briefly acuminate, the outermost narrowed linearly with rounded end. Above, including crown, golden-green; two middle tail-feathers purer shining grass-green; lateral tail-feathers purplish-dusky, some of them with narrow longitudinal chestnut *edging* only on one or the other web (a strong character of the species: compare extensively rufous tail-feathers of the two foregoing species). Gorget glancing lilac-red: other under parts whitish, glossed with golden-green on sides and sometimes elsewhere. Quills purplish-dusky. Length nearly or quite 4.00; extent 4.75-5.00; wing nearly or quite 2.00; tail 1.35; bill 0.70. ♀: Outer primary narrow and falcate, but without special attenuation at end. Outermost tail-feather narrower than the rest, as in ♂, but others rounded at ends, not acuminate. Lateral tail-feathers chestnut at base quite across, then black for a space, then white-tipped. Above, like ♂; below, no gorget; throat white with dark specks; no green on sides, which are more or less rufous, as in *S. rufus* ♀, from which some care must be taken in discrimination. It is usually less

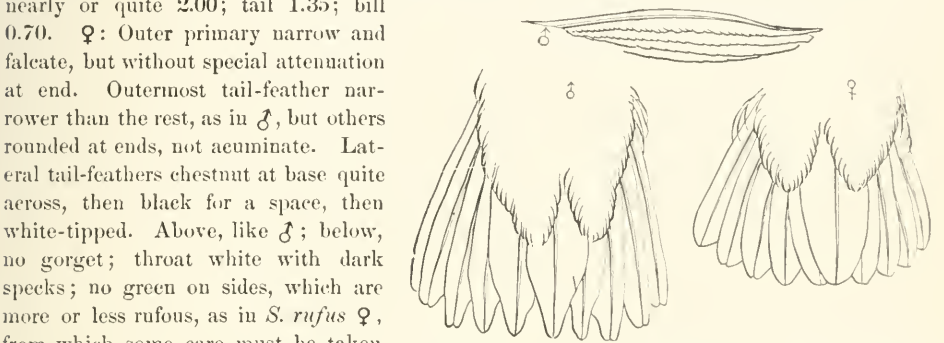


FIG. 368. — Broad-tailed Hummingbird, ♂, ♀, nat. size. (From Elliot.)

rufous below; middle tail-feathers entirely green, these having dark ends in ♀ *rufus*; rufous on lateral tail-feathers confined to their bases and of less extent than the black, while in ♀ *rufus* the rufous equals or exceeds the black area; next to middle tail-feather in ♀ *platycercus* green, with only rufous edging of outer web near base, short black end, and white tip; in ♀ *rufus* the same feather is rufous on both webs to an extent equal to the green, black, and white spaces all together. Though such details are not absolutely constant, they suffice to distinguish all the many specimens I have examined. Rocky Mt. region, U. S. and southward; N. to Wyoming, Idaho, Utah, Nevada; Sierras Nevadas of California; S. in winter to Guatemala.

ATTTHIS. (Gr. 'Αθήϊς, *Atthis*, Attie; also a proper name.) **ATTIC HUMMERS.** Crown of ♂ not metallic like gorget, which is prolonged into a ruff; outer primary of ♂ attenuate; tail graduated, the feathers rounded at end, the lateral ones black-barred and white-tipped in both sexes (peculiar in this respect among North American genera). Bill only about as long as head. Size very diminutive.

NOTE. — *A. heloise*, the Heloise Hummingbird of the Key, 2d-4th eds., 1884-90, p. 465, and of A. O. U. List, 1st ed. 1886, No. 435, proves to have been admitted upon an erroneous identification of a young specimen of *Stellula calliope* from El Paso, Texas; see Ridow. Auk, Jan. 1891, p. 115; A. O. U. COMM., Auk, Jan. 1899, p. 111. Its place is taken by the following species:

A. mor'comi. (To G. Frean Morcom of Los Angeles, Cal.) **MORCOM'S HUMMINGBIRD.** Adult ♂: Outer primary attenuate at end, with a needle-like point, as in *S. platycercus*, but not bowed outward. Tail graduated, the central feathers, however, slightly shorter than the next, all rounded-end, none notably narrowed. No scales on crown; those of

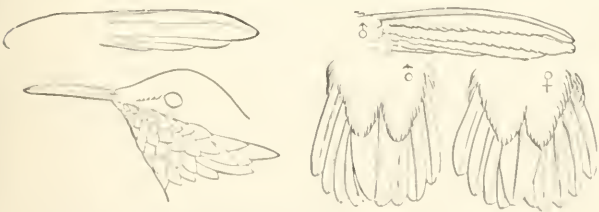


FIG. 369. — Heloise Hummingbird, ♂, ♀, nat. size. (From Elliot.)

throat produced into a ruff. Bill diminutive. Plumage unknown. Adult ♀: No peculiarity of outer primary. Above, including crown and middle tail-feathers, bright bronzy-green, inclining to grayish-brown on crown, and middle tail-feathers tinged with rufous on basal half, and outer web edged with same nearly to tip; other tail-feathers cinnamon-rufous on basal half, then with a narrow green metallic bar, then black for 0.20, then tipped with white. Below white, becoming cinnamon-rufous on sides and flanks, with a tinge of same on under tail-coverts; throat marked with spots and streaks of bronzy-green (gorget of ♂ doubtless glaucing violet, sapphire, and lilac, as in *heloisæ*). Primaries plain purplish-dusky, as usual. Length 2.95–3.00; wing 1.40; tail 0.75; bill 0.50. Huachuca Mts., S. Arizona, July 2, 1896; type 153,886, U. S. Nat. Mus. RIDGW. Auk, Oct. 1898, p. 325; A. O. U. Suppl. List, Auk, Jan. 1899, p. 111, No. 435 (vacated by *A. heloisæ*).

STELLULA. (Lat. *stellula*, dim. of *stella*, a star.) STARRY HUMMERS. No scales on crown; those of throat confined to tips of the lengthened feathers, thus not forming a continuous metallic surface, but set like stars in a fleecy, snowy bed. Tail of ♂ slightly double-rounded, the lateral feathers graduated, the central also shorter than the next; middle feathers *unlike* back in color; all broad, and rather widening to near the suddenly contracted ends; outer feather slightly incurved, the others ending about as acutely as a silver teaspoon. Outer primary simple. Bill longer than head, ordinary, but not entirely black. ♀ like ♂ in form of tail and wings. Size very diminutive.

S CALLIOPÉ. (Gr. Καλλιόπη, *Kalliope*, Lat. *Calliope*, one of the Muses. Fig. 370.) CALLIOPE HUMMINGBIRD. ♂: Crown and back golden-green. All tail-feathers dusky, with rufous at base and slightly pale tips. Gorget violet or lilac, set in snowy-white; sides of throat, and crissum, white. Below, white, glossed with green on sides. Bill yellowish below. Length 2.75; wing 1.60; tail 1.00; bill 0.60. ♀: Form of ♂; color of upper parts the same. No gorget; throat whitish with dark specks; other

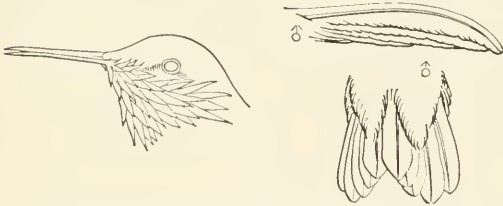


FIG. 370. — *Stellula calliope*, ♂, nat. size. (From Elliot.)

under parts quite strongly tinged with rufous. A white mark under eye; bill light at base below. Middle tail-feathers green, not so golden as the back, ending with dusky; others green (or gray) for a distance decreasing on successive feathers, crossed with black, tipped with white to reciprocally increasing extent, and touched with rufous at base, as in several allied species; but the small size, slight rufous on tail, and extensive rufous on under parts, are characteristic. Eggs 0.47×0.30 . Mts. of whole Pacific slope, U. S. and British Columbia; E. to Montana, Colorado, and New Mexico; S. into Mexico.

CALOTHORAX. (Gr. κάλος, *kalos*, beautiful; θώραξ, *thorax*, chest.) LUCIFER HUMMERS. Very different from any of the foregoing. Bill curved throughout, longer than head; but nasal scale covered as usual by feathers, and bill black. Tail deeply forked; lateral tail-feather shorter than next, and in our species filiform and acicular. Tarsi partly plumose. Sexes unlike.

C. lucifer. (Lat. *Lucifer*, the light-bearer; *lux*, light, *fero*, I bear. Fig. 371.) LUCIFER HUMMINGBIRD. COHUATL. ♂: Above, bronzy-green; gorget lilac-purple; three outer tail-feathers purplish-dusky. Below, white, bronzed with green on flanks. Bill black. Length 3.50; wing 1.50; tail 1.35; bill 0.75. ♀: Above, like ♂, but browner on head; no gorget; under parts rufous; belly white. Middle tail-feathers bronzy-green; next green tipped with black; rest rufous basally, then crossed with black and tipped with white. Tail not so deeply forked as in ♂. The ♀ may be known by the curved bill. Mexico to southern Arizona and western Texas; introduced into our Fauna upon a ♀ wrongly identified as "*Doricha enicura*." (See Bull. Nutt. Club, ii, 1877, p. 108.)

AMIZILIS. (Latinized from *amazili*, vox barb.) **AMAZILI HUMMERS.** Belonging to a group which includes *Basilinna* and *Iache*; very unlike any of the others. Nasal scale large and tumid; nasal slit entirely exposed; feathers extending in a point on sides of culmen, sweeping obliquely across basal part of nasal scale, and forming at angle of mouth a deep re-entrance with those of chin, which reach much farther forward on interramal space. Bill light-colored, dark-tipped, quite broad and flattened at base, thence gradually tapering to the acuminate tip, slightly bent downward, the curve most noticeable just back of the middle. Tarsi appearing feathered nearly to toes, but really naked except at the top in front. No lengthened ruffs or tufts about head; no metallic scales on top of head, different from those of upper parts at large; no special head-markings. Tail ample, forked or emarginate, the feathers all broad and obtuse, with simply rounded ends. No peculiar primaries, though the outer ones are narrower and more falcate than the next. Of large size, usually 4.00–5.00. Sexes alike in form and color. An extensive genus, covering some 25 species, two of which are known to reach our border: foregoing characters more particularly applicable to these. (*Amazilia* of former eds. of the Key.)

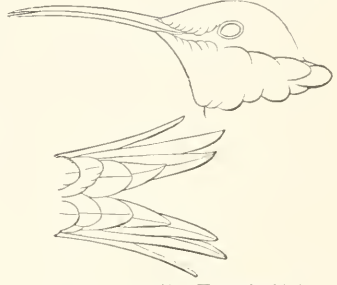


FIG. 371. — Lucifer Hummingbird. ♂. nat. size. (From Elliot.)

A. tzacatl. (Apparently Aztec, *Çacatl*, grass, herbage; given as the proper name of a certain Toltec chief.) **RIEFFER'S HUMMINGBIRD. DUSKY-TAILED HUMMINGBIRD. TZACATL.** Adult ♂ ♀: Above, metallic grass-green, or golden-green, more brassy on crown and rump; long upper tail-coverts cinnamon-rufous. Wings purplish-dusky, their coverts like back. Tail deep chestnut, the feathers edged and ended with bronzy-purplish. Throat, breast, and sides metallic green, glittering emerald in certain lights on the former, on the latter duller and more bronzy; feathers gray beneath the metallic tips, and this color prevailing on abdomen; crissum rufous; flank-tufts fleecy white. Bill extensively light-colored, dusky at end. Length about 4.00; wing 2.25; tail 1.60; bill 0.80. Differs from the next in not having the under parts extensively fawn-colored. Lower Rio Grande of Texas, to S. Am. *A. fuscicaudata* of 2d–4th eds. of Key, 1884–90, p. 466; *A. fuscicaudata* of A. O. U. Lists, 1886–95, No. 438; but *Trochilus fuscicaudata* FRASER, P. Z. S. 1840, p. 17, is antedated by *T. tzacatl* DE LA LLAVE, Registro Trimestre, ii, No. 5, for Jan. 1833, pub. not before Mar. p. 48: see RICHM. Auk, Oct. 1899, p. 323.

A. cerviniventris chalcono'ta. (Lat. *cervinus*, like a deer, *cervus*; in this case meaning fawn-colored; *ventris*, of the belly; Gr. *χαλκός*, *chalkos*, brazen; *νωτός*, *notos*, back.) **RUFOUS-BELLIED HUMMINGBIRD.** Adult ♂ ♀: Upper parts shining golden-green, nearly uniform from head to tail, but top of head rather darker, and with reddish gloss in some lights, and upper tail-coverts somewhat shaded with reddish. Metallic gorget of great extent, reaching fairly on breast, glittering green when viewed with bill pointing toward observer, dusky-green when seen in opposite direction. Less scintillating and more golden-green feathers extend a little farther on breast and sides, and most of the under wing-coverts are similar. Belly and under tail-coverts very dull rufous or pale cinnamon; flocculent snowy-white patches on flanks. Wings blackish, with purple and violet lustre. Tail large, forked about 0.33; color intense chestnut, having even a purplish tinge when viewed below; middle feathers glossed with golden-green, especially noticeable at their ends, and all the rest tipped and edged for some distance with dusky. Length 4.00 or more; extent 5.50; wing 2.30; tail 1.50; bill 0.90. Lower Rio Grande of Texas and southward. Only differs from the type form in paler belly and crissum. OBERH. Auk, Jan. 1898, p. 32; A. O. U. Suppl. List, Auk, Jan. 1899, p. 112, No. 439. (*Amazilia cerviniventris* of former eds. of Key and A. O. U. Lists.)

BASILIN'NA. (Gr. βασιλινα, *basilinna*, a queen.) **QUEEN HUMMERS.** Head appearing more globose than in any other North American genus, in consequence of non-extension of feathers on base of upper mandible, where they do not reach opposite those on chin, leaving the turgid nasal scale entirely exposed. Bill broad at base, tapering regularly to tip, with distinct supranasal grooves; scarcely longer than head, straight. Tarsi feathered. Tail ample, all the feathers broad and rounded; nearly even, in ♂ a little double-rounded by shortness of both lateral and central pair of feathers, in ♀ simply a little rounded. No peculiarity of primaries.

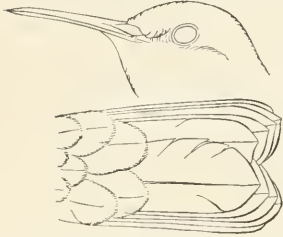


FIG. 372. — Xantus Hummingbird, nat. size. (From Elliot.)

Sexes nearly alike in form; ♀ lacking green gorget of ♂; bill in ♂ ♀ partly flesh-colored; ♂ ♀ with white stripe on head; no pure white on tail.

B. xan'tusi. (To L. J. Xantus de Vesey. Fig. 372.) **XANTUS HUMMINGBIRD.** Adult ♂: Above, and throat, metallic grass-green; below, cinnamon-rufous; face blue-black; a white stripe behind eye; wings purplish-dusky; tail purplish-chestnut, the central feathers glossed with golden-green; bill flesh-colored, black-tipped. ♀: Shining green above, including central tail-feathers; below, and face, pale rufous, whitening about vent, and sides greenish; head-stripe rufous, whitening on auriculars; tail-feathers, except central pair, chestnut, with dark terminal spot. Length 3.50; extent 4.75; wing 2.10; tail 1.25; bill 0.72. Eggs 0.47 × 0.30. Cape St. Lucas, N. to lat. 29°.

B. leuco'tis. (Gr. λευκός, *leukos*, white; οὖς, ὠτός, *ous, otos*, ear.) **WHITE-EARED HUMMING NICOTENCAL.** Adult ♂: Above, shining grass-green, more golden on rump, darker on nape and occiput; face and chin metallic blue; white postocular streak; throat, breast, belly, and crissum green, posteriorly mixed with whitish; central rectrices like back, lateral ones steel-blue, bronzed at tips; bill flesh-colored, black-tipped. ♀ with crown and nape dark brown, the feathers edged with rufous; black spot under the white streak; below, dusky whitish; throat buff with dusky specks; flanks with green spots; crissum whitish with dusky specks; lateral tail-feathers tipped with grayish-white; bill mostly black. Young ♂ like ♀. Size of the foregoing. Central America and Mexico to S. Arizona, where discovered on the Chiricahua Mts. at an altitude of about 10,000 feet, by Dr. A. K. Fisher, June 9, 1894; Auk, Oct. 1894, p. 325; A. O. U. List, 2d ed. 1895, No. 440. 1.

I'ACHIE. (Gr. Ἰαχή, *Iache*, a proper name. Fig. 373.) **CIRCE HUMMERS.** Near *Amizilis*; with broad and not perfectly straight bill longer than head, reddish at base, and frontal feathers partly covering nasal scale; supranasal groove very distinct. Tail ample, forked, with broad obtuse feathers; no wing- or tail-feathers peculiar in shape. Tarsi feathered. Sexes unlike in color.

I. latiro's'tris. (Lat. *latus*, broad; *rostrum*, beak.) **CIRCE HUMMINGBIRD.** ♂: Above and below glittering green; more golden above, more emerald below; throat sapphire-blue; tail steel-blue-black, the feathers tipped with gray; flanks and under tail-coverts white. Bill reddish, tipped with black. Length nearly 4.00; wing 2.00-2.25; tail 1.30, forked 0.35; bill 0.80. ♀ above like ♂, but middle tail-feathers bronzy-green; others bronzed at base, then broadly bluish, then white-tipped. Under parts dark gray. Easily recognized among our species by the special coloration, as described, and by peculiarities of bill; in all our genera excepting *Iache*, *Amizilis*, and *Basilinna*, the nasal scale is covered by extensive frontal feathers. S. Arizona, S. W. New Mexico, and Mexico.

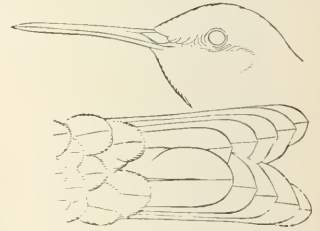
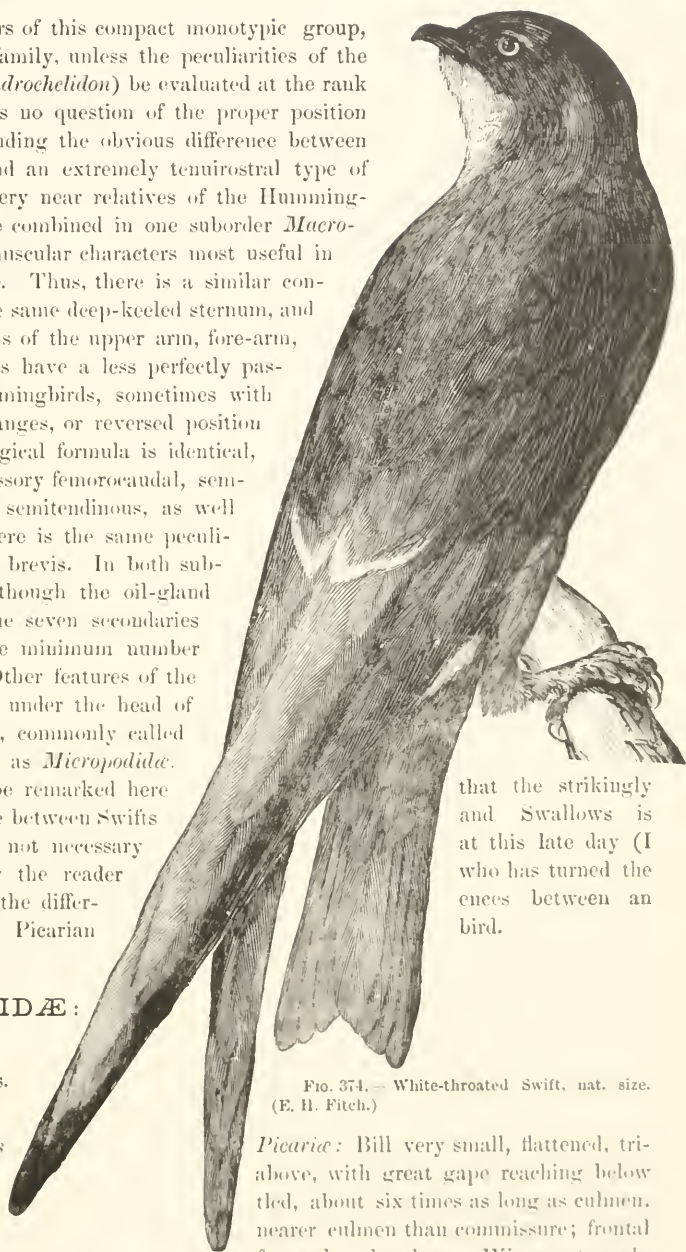


FIG. 373. — Circe Hummingbird, ♂, nat. size. (From Elliot.)

SUBORDER CYPSELI: SWIFTS.

See p. 540 for characters of this compact monotypic group, which consists of a single family, unless the peculiarities of the genus *Macropteryx* (or *Dendrochelidon*) be evaluated at the rank of another family. There is no question of the proper position of *Cypseli*; for, notwithstanding the obvious difference between an extremely fissirostral and an extremely tenuirostral type of bill, the Swifts are such very near relatives of the Hummingbirds, that the two might be combined in one suborder *Macrochires*. The skeletal and muscular characters most useful in classification are quite alike. Thus, there is a similar conformation of the palate; the same deep-keeled sternum, and the same relative proportions of the upper arm, fore-arm, and manus; but the Swifts have a less perfectly passerine foot than the Hummingbirds, sometimes with a different ratio of the phalanges, or reversed position of the hallux. The myological formula is identical, in the absence of the accessory femoro-caudal, semitendinosus, and accessory semitendinous, as well as of the ambiens; and there is the same peculiarity of the tensor patagii brevis. In both suborders there are no *carca*, though the oil-gland is nude; and in *Cypseli* the seven secondaries are but one more than the minimum number found in the Hummers. Other features of the *Cypseli* will be pointed out under the head of the only established family, commonly called *Cypselidae*, but now known as *Micropodidae*. Furthermore it need only be remarked here the close superficial resemblance between Swifts simply mimetic; and it is not necessary trust also not required by the reader "Key" thus far) to argue the difference between Oscine Passerine and any Picarian



that the strikingly and Swallows is at this late day (I who has turned the eyes between an bird.

Family MICROPODIDÆ:

Swifts.

(*Cypselidae* of former eds. of the Key.)

Fissirostral macrochirus angular when viewed from eyes, unnotched, unbristled. Nostrils exposed, superior, feathers tending to reach

FIG. 374. — White-throated Swift, nat. size. (E. H. Fitch.)

Picariae: Bill very small, flattened, triangular above, with great gape reaching below, about six times as long as culmen, nearer culmen than commissure; frontal forward under them. Wings extremely long, thin, and pointed (frequently as long as the whole bird); primaries acute and somewhat falcate; secondaries extremely short and few. Tail of 10 rectrices, variable in shape, often mucronate. Feet small, weak, the envelop rather skinny than scaly; tarsi naked or feathered;

hind toe frequently elevated, or versatile, or permanently turned sideways or even forward (pamprodactylous) or the four toes tending to divaricate in right and left pairs; lateral toes nearly or quite as long as the middle: anterior toes deeply cleft, with basal phalanges (in the true Swifts) extremely short, penultimate very long, the number of phalanges frequently abnormal (2, 3, 3, 3, instead of 2, 3, 4, 5; see p. 133, fig. 40); claws sharp, curved, never pectinate. Plumage compact, usually sombre and whole-colored, or only relieved with white; sexes alike and young little different (plumage softer, more varied, and young unlike adults, in the genus *Macropteryx*). Sternum deep-keeled, widening behind, its posterior margin normally entire (exceptionally 2-fenestrated, in *Macropteryx*); furculum stout, rather U- than V-shaped. Volitorial ability very great. Nidification various, always peculiar. Eggs several (except in the Tree Swifts), narrowly oval, white. Young hatched naked and helpless.

“One of the most remarkable points in the structure of the *Cypselidæ* is the great development of the salivary glands. In all the species of which the nidification is known, the secretion thus produced is used more or less in the construction of the nest. In most cases it forms a glue by which the other materials are joined together, and the whole nest is affixed to a rock, wall, or other object against which it is placed. In some species of *Collocalia*, however, the whole nest is made up of inspissated saliva, and becomes the ‘edible bird’s nest’ so well known in the East.” (SCLATER.)

The student will have observed that the characters of the *Micropodidæ* as above drawn require several exceptions to be taken in the case of the genus *Macropteryx* (or *Dendrochelidon*), which contains five or six species of East Indian Tree Swifts, differing notably from other Swifts. The osteological peculiarities of these birds are decided in several respects, affecting the bones of the skull, sternum, fore-arm, tarsus, and toes (see LUCAS, Auk, Jan. 1889, pp. 8-13). The plumage is peculiar, approaching that of Caprimulgin birds; the egg is stated to be single, and the nidification to resemble that of the Frog-mouths (*Batrachostomus*). The departure of the Tree Swifts from *Micropodidæ* proper is on the whole in the direction of the *Caprimulgi*. If we exclude this remarkable genus as the type of a separate family *Macropterygidæ* or *Dendrochelidonidæ*, the remaining Swifts form a well defined family of 8 genera and about 75 species, inhabiting all the temperate and tropical regions of the globe. They are divisible into two subfamilies, mainly according to the structure of the feet; and both of these divisions are represented in North America.

Analysis of Subfamilies and Genera.

MICROPODINÆ. Front toes with 3 joints apiece. Hind toe lateral or versatile. Tarsi feathered.	
Toes feathered. Tail not spiny	<i>Aëronautes</i>
CHÆTURINÆ. Front toes with 3, 4, and 5 joints from inner to outer. Hind toe posterior or lateral, but not reversed.	
Tarsi and toes naked.	
Tail emarginate, not mucronate	<i>Cypseloides</i>
Tail rounded, mucronate	<i>Chaturia</i>

Subfamily MICROPODINÆ: Typical Swifts.

Ratio of phalanges abnormal, the 3d and 4th toes having each 3 joints like the 2d; basal phalanges of all the anterior toes very short (fig. 40). Hind toe reversed (in *Micropus* or *Cypselus*), or lateral (in *Aëronautes* and *Panyptila*). Tarsi feathered (in *Micropus*); toes also feathered (in *Aëronautes* and *Panyptila*). This subfamily contains about one-third of the species of Swifts, most of which belong to the genus *Micropus*. This genus is chiefly Old World, but two South American species are referred to it by late authority. *Panyptila* is a neotropical genus, to which our Rock Swift has usually been referred; but in *Panyptila* the tail is deeply forked, with acuminate lateral feathers (compare *Aëronautes*, below). There are two species of *Panyptila*, *P. cayanensis* and *P. sancti-hieronymi*. An interesting feature is shown by the group of Palm Swifts, in which, as first pointed out by HARTERT, there is a

curious sort of spurious zygodactylism; for the toes are in right and left pairs, the third and fourth toes being one side, the first and second on the other side. In the typical Palm Swifts, constituting the genus *Tachornis* as now restricted and defined, the toes are naked. There are several Old World species, and one West Indian (*T. phœnicobia*). The other genus of Palm Swifts has feathered toes; its single species, *Claudia squamata*, inhabits South America. The Palm Swifts "build tiny nests agglutinated with saliva to the leaves of palms," while the species of *Micropus* usually nidificate in holes in rocks, about buildings, etc., only occasionally in trees. The most remarkable nests in the whole subfamily are those constructed by the Swifts of the genus *Panyptila*, which glue together plant-seeds to form a tube about two feet long, hung to the under side of an overhanging rock or tree trunk, with the entrance at the lower end of the tube, and a shelf at its top inside, like a cornice or bracket, on which the eggs rest.

ÆRONAUTES. (Gr. ἀήρ, ἄερος, *air*, *air*, atmosphere; ναύτης, *nautes*, a sailor; *i. e.* an *æronaut*: well applied to these "sky-scrapers.") SKY SWIFTS. ROCK SWIFTS. Tail about $\frac{1}{2}$ as long as wing, moderately forked, with stiffish and narrowed, but not acuminate spiny, feathers. Wing pointed by the 2d primary, the 1st decidedly shorter. Tarsi feathered to the toes; those also feathered to some extent. Hind toe elevated, lateral, but not reversible. Front toes with slight basal webs. Eyelids naked. Colors black and white. *Æronautes* HARTERT, Brit. Mus. Cat. B. xvi, 1892, p. 459; *Panyptila* of all former eds. of the Key: for the change of name, see above. The genus was wrongly united with *Micropus* in the A. O. U. List of 1886.

A. saxatilis. (Lat. *saxatilis*, rock-inhabiting; *saxum*, a rock.) WHITE-THROATED ROCK SWIFT. Black or blackish; chin, throat, breast, and middle line of belly, tips of secondaries, edge of outer primary and lateral tail-feathers, and a flank-patch, white. Forehead and line over eye pale; a velvety black space before eye. Bill black; feet drying yellowish. The purity of color varies with wear of the feathers, some specimens being dull sooty brownish, others more purely and even glossy blackish. The extent of white along belly is very variable. The flank-patches are conspicuous, in life sometimes almost meeting over rump. Length 6.50–7.00; extent about 14.00; wing about the same as length; tail about 2.66, forked, soft. Western U. S., Rocky Mts. to the Pacific, and S. in winter to Guatemala; N. to Montana and Idaho; E. to W. Texas and eastern foothills of the mountains, as the Black Hills of S. Dakota, etc.; migratory in most of its U. S. range, but resident on and near our southern border; occurs in Lower California and on some of the islands; not yet known to occur in Oregon, Washington, or anywhere N. of the U. S.; breeds in suitable places throughout its U. S. range. This is a large and beautiful Swift—a high-flier of almost incredible velocity, with a loud shrill twitter, nesting in the most inaccessible cliffs, sometimes by thousands, in May, June, and July. The nest is securely placed far in holes and crevices of rocks or indurated earths, usually at a great height; it is a saucer-like structure, about 5×2 inches, with a shallow cavity, made of various vegetable materials well glued together with saliva, and lined with feathers. Eggs several, in one instance 5, narrowly subelliptical, 0.87×0.52 , white. The name of this bird seems as hard to find as its nest and eggs! The species is unquestionably the *Acanthylis saxatilis* of WOODHOUSE, Sitgreave's Rep. Expl. Zuni and Col. R. 1853, p. 64, type locality Inscription Rock, N. M. I stood on this very rock July 3, 1864, and knew that Dr. Woodhouse's birds were flying in my face; hence *Panyptila saxatilis* COUES, Key, orig. ed. 1872, p. 182, later eds. 1884–90, p. 456, and now *Æronautes saxatilis*: see my Birds N. W. 1874, p. 265, for particulars. Next, this Swift was described as *Cypselus melanoleucus* BAIRD, Pr. Phila. Acad. 1854, p. 118; whence *Panyptila melanoleuca* BAIRD, B. N. A. 1858, p. 141; *Micropus melanoleucus* RIDGW. Auk, July, 1884, p. 230; A. O. U. List, 1st ed. 1886, p. 223; *Æronautes melanoleucus* HARTERT, as above; A. O. U. List, 1895, No. 425.

Subfamily CHÆTURINÆ: Spine-tail Swifts.

Toes with normal number of phalanges, all but the penultimate ones extremely short. Anterior toes cleft to base (no webbing). Hind toe not reversed, but sometimes versatile; our species



FIG. 375 — *Chacturinae*. Head and mucronate tail-feather of *Chactura pelagica*, nat. size. (Ad. nat. del. E. C.)

have it obviously elevated. Tarsi never feathered; naked and skinny, even on the tibio-tarsal joint. In the principal genus, *Chactura*, containing about two-thirds the species of the subfamily, of various parts of the world, the tail-feathers are stiffened and *mucronate* by the projecting rachis. There are over 30 species of these spine-tailed Swifts, in several sections of the genus, by some systematists ranked as separate genera (especially *Hemiproene*); but they are much alike, and our familiar Chimney Swift is a fair example of them all. *Cypseloides* is an exclusively American genus of 5 or 6 species, one of which occurs in our country. The third genus is

Collocalia, containing the Swiftlets or so-called Salanganes, some 12 or 15 species of which range widely over warm and temperate parts of the Old World from Africa to Oceania. The Swiftlets include such species as *C. fuciphaga*, which build the "edible" nests of their own saliva, more or less mixed with fucus or other seaweeds, mosses, etc.

CYPSELOIDES. (Gr. κύψελος, *kypselos*, Lat. *cypselus*, the European Swift, *Cypselus apus*, now called *Micropus apus*; εἶδος, *eidos*, form, likeness.) CLOUD SWIFTS. Tail forked or emarginate, with obtusely-pointed but non-mucronate stiffish feathers. First primary longest. Tarsi naked, skinny. Hind toe elevated, but perfectly posterior. Front toes cleft to base. Nostrils embedded in feathers. Unicolor. (Genus *Nephocetes* BAIRD, 1858, correctly *Nephæctes*, as in former editions of the Key, p. 457, where it is said to be "scarcely different" from *Cypseloides*; and I am glad to see that it has been replaced by *Cypseloides* in the A. O. U. Lists.)

C. niger borealis. (Lat. *niger*, black; *borealis*, northern. Our species is a variety of the West Indian *C. niger*. Fig. 374.) NORTHERN BLACK CLOUD SWIFT. Adult ♂ ♀: Entire plumage sooty-black, with slight greenish gloss, little paler below than above; feathers of head and belly with grayish edges. A velvety black area in front of eye; forehead hoary; eyelids partly naked. Bill black; feet probably dusky-purplish in life. Length 7.00 or more; wing the same; tail 2.75, forked nearly 0.50 in adult ♂, merely emarginate in ♀; tarsus 0.50; middle toe and claw about the same. Young: Tail rounded; plumage dull blackish, nearly every feather skirted with white, especially noticeable on belly, rump, and upper tail-coverts and inner wing quills; erissum mostly white; supposed to require several years to perfect the black plumage. Rocky Mts. to the Pacific, U. S. and British Columbia; a great black Swift still imperfectly known; supposed to nest in cliffs up to 11,000 feet; ranges to about 13,000; crops found filled with *Ephemeride*. The bird breeds in holes and crevices in cliffs, often inaccessible, like the Rock Swift, in June and July, and it has been observed in so many localities during the breeding season that it may be confidently stated to nest in suitable places nearly or quite throughout its North American range. It is migratory with us, arriving over our borders late in April, and returning in September. It is more common in the Pacific coast region than in the interior, and ranges S. in winter to Costa Rica. The West Indian habitat once assigned was an error, it being that of *N. niger* proper, from which our bird differs decidedly in being larger — average wing measurements over 6.50, instead of about 6.00. I am at a loss to understand why the A. O. U.

persisted in refusing to recognize *borealis* as a subspecies till 1897, when it accepted the position I had maintained in the Key since 1872: see Auk, Jan. 1897, p. 126, No. 422. The bird is recognized as a full species by Dr. Selater, and as a good subspecies by Mr. Hartert; and Major Bendire also separates the two forms, though he does not venture to differ from the A. O. U. in nomenclature (Life Histories, ii, 1896, p. 175). The differences are at least as great in size as those separating *Chactura vauri* from *C. pelagica*. In these days, when North American Ornithology has been thoroughly Brehmized, with hair-splitting and heart-rending super-refinements, the present case can only be explained as a miracle.

CHÆTURÆ. (Gr. *χαίτη*, *chaite*, a bristle; *οἶρα*, *oura*, a tail. Fig. 375.) SPINE-TAIL SWIFTS. Tail short, less than half as long as wing, even or a little rounded, mucronate, — the stiff spiny shafts of the feathers protruding like needles beyond the webs. First primary longest. Tarsi naked and skinny. Hind toe elevated, but posterior. Front toes all of about the same length, cleft to base. Feathers reaching to but not far below nostrils. Unicolor or bicolor (our species one-colored, sombre.) Sexes alike.

C. pelagica. (Gr. *πελάγιος*, *pelagios*, Lat. *pelagicus*, pelagic, marine, or oceanic; application to this bird questionable. In 1758 Linnæus named it *Hirundo pelagica*, but in 1766 he

changed the specific term to *pelasgia*. The Πελασγοι or *Pelasgi* were anciently a nomadic tribe, and the implication of the term in ornithology is supposed to be the bird's migration, without any reference to the sea. Gr. adjectival forms of the word are *πελασγικός*, *πελάσγιος*, *πελασγίς*, *πελυσγιάς*, becoming in Lat. *Pelasgius*, *Pelasgius*, *Pelasgis*, *Pelasgins*, meaning Pelasgian, Grecian, Hellenic; *Pelasgia*, noun, is found as the name of a certain district of Thessaly. The adj. *Pelasgius* occurs in Pliny, and *pelasgia* is the feminine form of this, which I adopted in the 2d-4th eds. of the Key. But I now follow the A. O. U. in reverting to *pelagica* LINN. 1758, without prejudice to the question of what this word was intended to mean. Figs. 376, 377.) CHIM-



FIG. 376. — Chimney Swift.

CHIMNEY SWIFT. CHIMNEY "SWALLOW." "CHIMNEY SWEEP." Sooty-brown, with a faint greenish gloss above; below paler, becoming gray on the throat; wings black; a velvety black space about eyes. Length about 5.00 or rather more; wing the same; extent about 12.50; tail 2.00, even or a little rounded, spiny. The sexes are quite alike, and the young hardly differ after they are fully fledged. Eastern U. S. and adjoining British Provinces, N. to lat. 54° in the interior, W. to the Great Plains, S. in winter to Central America; migratory, and very abundant in summer, but not known to winter within our limits; migrates in March, April, Sept., and Oct., breeds throughout its North American range, mostly in June and July. Like Swallows, which this bird so curiously resembles, not only in form, but in mode of flight, food, and twittering

notes, it has mostly forsaken the ways of its ancestors, who bred in hollow trees, and now places its curious open-work nest of bits of twig glued together with saliva, inside disused or little used

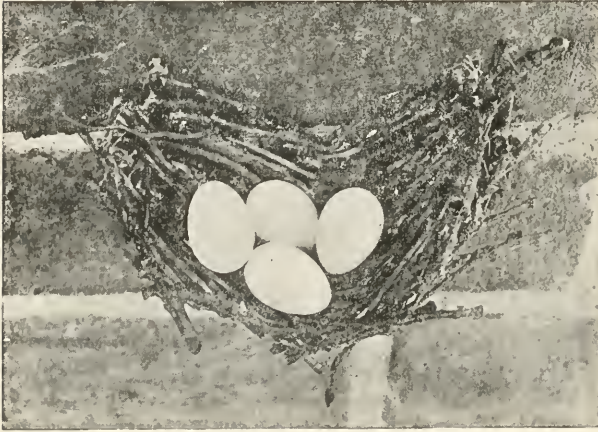


FIG. 377. — Nest and Eggs of Chimney Swift.

chimneys in settled parts of the country. In districts still primitive, however, it continues to use hollow trees, to which it resorts by thousands to roost. Not impossibly winters in such retreats in a lethargic state! The dry twigs for its pretty basket-like nest are snapped off the trees by the birds in full flight. No soft lining is used; the nest is shaped like half a saucer, 3 or 4 inches across by 2 or 3 in the other width, and less than an inch deep; the twigs used are from half an inch to 2 inches or even more in length, and a sixteenth to

an eighth of an inch thick, usually much varnished over with the dried saliva. The eggs are 4-5, seldom 6, 0.70 to 0.80 long by 0.53 broad, thus narrowly elliptical, and pure white. So great are the volitional powers of this bird, that the sexes can come together on the wing.

C. vauxi. (To Wm. S. Vaux, of Philadelphia.) VAUX'S SWIFT. Similar; paler; rump and upper tail-coverts lighter than rest of upper parts; throat whitish. Smaller; length 4.50; wing the same; tail 1.67. Pacific Coast region, U. S. and British Columbia, rarely in the interior E. of the Sierras Nevadas and Cascade ranges; S. in winter to Central America. Nest and eggs as in the common species; eggs averaging a trifle smaller. This species still uses hollow trees to breed in, but is already beginning to utilize chimneys.

NOTE. — One or two other species of this genus, representing the subgenus *Hemiprocne*, may be expected over our border — especially the COLLARED SWIFT, *Hemiprocne zonaris* of Mexico, etc. This is a large handsome bird, blackish, with a white collar around the neck behind, and a white breast; length about 9.00; wing nearly as much; tail 3.00. The Half-collared Swift, *H. semicollaris*, also inhabits Mexico.

SUBORDER CORACLE: CORACIAN BIRDS.

See p. 541 for characters of this group, framed to include the five families *Leptosomatidæ*, *Coraciidæ*, *Caprimulgidæ*, *Podargidæ*, and *Steatornithidæ*. Only one of these, the *Caprimulgidæ*, is North American. In former editions of the Key, this family included the *Podargidæ* and *Steatornithidæ*, and was brought under a suborder *Cypseliformes*, corresponding exactly to the "order" *Macrochires*, of the present A. O. U. classification, and including the *Trochilidæ* and *Micropodidæ*. (It should be observed here that the original *Macrochires* of Nitzsch included only the "long-handed" families, the Swifts and Hummers, as did also the precisely equivalent *Cypseliformes* of Garrod; but that the *Cypseliformes* of Coues, like the *Cypselomorphæ* of Huxley, combined the *Caprimulgidæ* with the *Cypselidæ* and *Trochilidæ*.) But the undeniably close relations of the Goatsuckers, Swifts, and Hummers are overbalanced by the closer affinities of the Caprimulgin Birds with the Rollers and Kirumbos; hence the present association of all the Coracian birds in one suborder. The *Steatornithidæ*, a monotypical neotropical family consisting of a single species, *Steatornis caripensis*, the Guacharo

or Oil-bird, is so peculiar in many respects that it is sometimes set apart in a superfamily or suborder *Steatornithes* (see p. 541 for characters); otherwise the transition from the *Caprimulgidæ* on the one hand, through the *Podargidæ*, to the *Leptosomatidæ*, and thus to the *Coraciidæ*, on the other hand. A curious evidence of affinity between these families may be witnessed in the lofty tumbling of our Night-hawks, comparable with those aerial evolutions which have given the Rollers their name. A marked feature of Coracian birds is the presence of pulviplumes in some of the families. The conformation of the palate is too various to furnish decisive indications; it is of a type called agithognathous or schizognathous in one of the families, but desmognathous in the others. The syrinx is tracheo-bronchial, or pseudo-bronchial, or bronchial; in the latter case there are of course a pair of syringes, as in *Steatornis*; the syringeal muscles are not more than one pair. The oil-gland is nude, if present; there are cæca. The sternum is deep-keeled, 2- or 4-notched. The spinal pteryla forks over the shoulders. Two carotids occur (always?). The ambiens is absent; neither is there any accessory femorocaudal, and in *Steatornis* the femorocaudal itself is missing; the flexor digitorum profundus, and not the flexor hallucis, supplies the hallux, by the symmetrical arrangement of tendons. The feet are anisodactylous, in the Kirumbos imperfectly zygodactylous by versatility of the 4th digit; in the true Goatsuckers this digit lacks one phalanx; there are also some other peculiarities of the feet, which as a rule are very small, weak, and scarcely fitted for progression, or even for perching in an ordinary fashion. The rectrices are 10 or 12; primaries 10; secondaries more than 7. The suborder as a whole consists of nocturnal Picarian birds, with more or less resemblance to Owls; the Oil-bird is quite owl-like, and even so diurnal a family as the Rollers contains nocturnal species. The suborder as a whole is nearly cosmopolitan; but four of its five families inhabit restricted areas, and only one is common to both hemispheres. This is the

Family CAPRIMULGIDÆ: Goatsuckers.

(So called from a traditional superstition.) *Fissirostral Coracian Picaria*. Head broad, flattened; neck inappreciable; eyes and ears large. Bill extremely small in its horny portion, which is depressed, and triangular when viewed from above, but with enormous gape reaching below the eye, and generally with bristles attaining an extraordinary development. Nostrils basal, exposed, roundish, with a raised border, sometimes prolonged into a tube. Wings more or less lengthened and pointed, deriving their sweep mainly from elongation of the distal joints and the feathers, the proximal segment being short; of 10 primaries and more than 7 secondaries; the latter not so extremely short as in *Cypselidæ* and *Trochilidæ*. Tail variable in shape, of 10 rectrices. Plumage aftershafted; pulviplumes present only in one genus (*Nyctibius*). Feet extremely small; tarsus usually short, and partly feathered; hind toe very short, commonly elevated and turned sideways; front toes connected at base by movable webbing, and usually showing abnormal ratio of phalanges, the 4th toe having but 4 joints (p. 133, fig. 41); middle toe lengthened beyond the short lateral ones, its claw usually pectinate (fig. 380). The small oil-gland is nude, and cæca are present. The arrangement of the palatal bones is not desmognathous; small basipterygoids are present; the palatines are expanded laterally; the vomer is truncate in front. The sternum is 2-notched (4-notched only in *Nyctibius*). As thus defined (to the exclusion of *Podargidæ* and *Steatornithidæ*, which used to

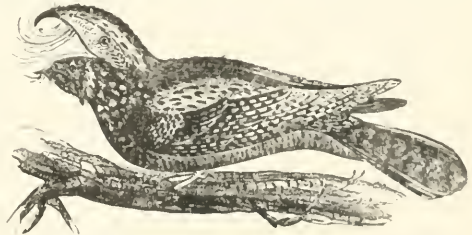


FIG. 378. — Whip-poor-will, a setirostral Caprimulgine. (From Tenney, after Wilson.)

be forced into this family), the *Caprimulgidæ* are a definitely-circumscribed, easily-recognized group of about 20 genera and 100 species, of temperate and tropical parts of both hemispheres. They are all more or less nocturnal, and have a certain resemblance to Owls. The flight is perfectly noiseless; the plumage is very soft and lax, as in Owls, and the colors are blended in the most intricate pattern. In certain exotic genera, either the wing or tail develops a pair of immensely lengthened feathers. Thus, in the African pennant-winged *Cosmetornis vexillarius* an inner primary of the ♂ is prolonged into a slender streamer a foot and a half long; and in the related African standard-bearer, *Macrodipteryx macrodipterus*, the same primary of the ♂ is similarly elongated, with a bare shaft bearing a webbed spatula or racket at its end. The African *Scotornis climacurus* has greatly produced central tail-feathers; but the peculiar development of rectrices reaches an extreme in the South American lyre-tailed Goatsuckers, *Macropsalis lyra* and its congeners. The whole family is strictly insectivorous, and consequently the species of temperate latitudes are migratory. None of the species are nest builders, the eggs being simply dropped in open places; these are normally two in number, generally colored, sometimes unmarked. The young hatch downy, but helpless. The *Caprimulgidæ* are divisible, according to the structure of the feet and other characters, into two subfamilies: *Nyctibiinæ*, phalanges normal, middle claw not pectinate, pulviplumes present, sternum doubly-notched, upper mandible toothed, containing one genus (*Nyctibius*) of tropical America; and *Caprimulginae*, comprising the rest of the family. The latter alone is represented in North America. Our "Whippoorwills" are typically caprimulgine, and give a good idea of the essential characters of the family; our "Night-hawks" are more aberrant, representing a particular section of the subfamily; but neither of these gives any hint of the singular shapes which some of the genera assume.

Subfamily CAPRIMULGINÆ: True Goatsuckers; Night-Jars.

Sternum singly-notched on each side behind. No pulviplumes. Bill not toothed. Ratio of phalanges abnormal (2-3-4-4). *Outer toe 4-jointed* (fig. 41); *middle claw pectinate*;

hind toe very short, elevated, semi-lateral; *anterior toes movably webbed at base*; lateral toes not nearly reaching base of middle claw. Tarsus very short, commonly much feathered (longer and naked in *Nyctidromus* and *Phalacroptilus*). Besides the semipalmation of the feet, there is another curious analogy to wading birds; for the young are downy at birth, as in *Præcoces*, instead of naked, as is the rule among *Altrices*. The plumage is soft and lax, much as in the Owls; the birds have the same noiseless flight, as well as, in most cases, nocturnal or crepuscular habits; and some of them bear an odd resemblance to Owls. Besides this fluffiness and laxity of the plumage, the skin is very thin and tender; it is difficult to make good specimens of the Whippoorwills, and the curiously variegated blended shades, of exquisite beauty, like the powdery coloration of a moth's wings, are at best not easy to describe. An evident design of the capacious mouth is the capture of insects; the active birds quarter the air with wide-open mouth, and their minute prey is readily taken in. But they also secure larger insects in other ways; and to this end the rictus is frequently



FIG. 379. — Night-hawk, a glabroirostral Caprimulgine. (From Tenney, after Wilson.)

strongly bristled, as in the *Tyrannidæ* and *Capitonidæ*. The most usual quarry consists of nocturnal or crepuscular moths and beetles. In all our genera except *Chordeiles*, the rictal bristles are 1.00 or more in length, in a firm regular series along gape — relatively longer and

stiffer than whiskers of a cat. Our several genera are readily discriminated by good characters of nostrils, enormous rictal bristles, and comparatively short wings of Night-jars proper, in comparison with slight bristles, forked tail, and long pointed wings of *Chordeiles*; they respectively represent two sections of the subfamily — *Setirostres*, bristled-billed (fig. 378), and *Glabrirostres*, smooth-billed (fig. 379). Most genera of the subfamily are setirostral, and most such species belong to the Old World genus *Caprimulgus*, from which our *Antrostomus* differs little; leading glabrirostral genera, besides *Chordeiles*, are *Lyncornis*, *Podager*, and *Lurocalis*. In both sections the feet are so extremely short that the birds cannot perch in the usual way, but sit lengthwise on a large branch, or crouch on the ground. They lay two lengthened, more or less nearly elliptical, white or thickly spotted eggs, on or near the ground, in stumps, etc. The sexes are distinguishable, but nearly alike. The voice is peculiar, and has given several of the species their fanciful onomatopœtic names.

Analysis of Genera.

- A. *Setirostres*. Long rictal bristles. Plumage very lax.
 - Tarsus extensively feathered. Nostrils not extensively tubular.
 - Tail rounded, much shorter than wing. Primaries all mottled, without white spaces. Eggs colored. Large and medium-sized *Antrostomus*
 - Tarsus naked, except on joint above. Nostrils extensively tubular.
 - Tail square, much shorter than wing. Primaries all mottled, without white spaces. Eggs colorless. Small. (Western.) *Phalaenoptilus*
 - Tail rounded, about as long as wing. Outer primaries mostly whole-colored, with great white spaces. Eggs colored. Very large. (Southwestern.) *Nyctidromus*
- B. *Glabrirostres*. No long rictal bristles. Plumage more compact.
 - Tarsus moderately feathered. Nostrils not extensively tubular.
 - Tail forked, much shorter than the pointed wing. Outer primaries mostly whole-colored, with great white spaces. Eggs colored. Medium-sized *Chordeiles*

NYCTIDROMUS. (Gr. νύξ, gen. νυκτός, *nux*, *nuctos*, night; δρόμος, *dromos*, act of coursing.

Fig. 380.) NIGHT COURSERS. Nostrils prolonged as cylindric tubes opening forward and outward. Rictal bristles immense, simple; other bristle-tipped or bristle-bearded feathers about bill. Tarsus lengthened, but not exceeding middle toe without claw, naked except just on the joint. Wing scarcely rounded; tipped by 2d, 3d, and 4th quills, 1st longer than 5th, folding to about middle of tail, which is rounded, and approximately of equal length with the wing. Plumage not so lax as in a Whippoorwill; in this, as in the stiffish primaries with little marbling but great white spaces, and under parts barred crosswise, is seen an approach to *Chordeiles*, between which genus and *Phalaenoptilus Nyctidromus* probably comes. One or two species, long well known in tropical America.



FIG. 380. — Head, foot, and pectinated claw of *Nyctidromus*, nat. size. (Ad. nat. del. R. Ridgway.)

N. albicollis merrilli. (Lat. *albus*, white; *collum*, neck. To Dr. J. C. Merrill, U. S. A.) MERRILL'S PARAUQUE. Adult ♂: Assuming brownish-gray as ground color of upper parts: Crown heavily dashed with black streaks along the middle line, with narrow black shaft-lines at the sides and on nape. Back more diffusely streaked with black in smaller pattern.

tending to break up in chains of shaft-spots, and with lighter gray and brown marbling. Scapulars and tertiaries boldly and beautifully marked with firm, even, sharp lines of white or tawny-white—the arrow-headed edgings of angular black terminal fields. Wing-coverts curiously mottled with black, white, and tawny—the white and tawny conspicuous as large irregularly roundish spots. Five outer primaries with a large oblique white spot, on 1st at about its middle, on others nearing their ends; these primaries otherwise plain blackish, except a little marbling at their ends—the whole effect thus as in *Chordeiles*. Other primaries and all secondaries blackish, fully scalloped and barred with tawny in increasing amount and regularity from without inward. Four middle tail-feathers clouded with the same variegated colors as other upper parts, but without definite white—the markings tending to wavy cross-bars. Next two lateral feathers on each side with great white spaces on one or both webs at end, 2-3 inches long, the rest of these feathers chiefly barred with black and tawny; outer feather chiefly black, but with marbling, and with white and tawny. Ear-coverts rich chestnut, well contrasted with surroundings. Throat with a broad white collar, some of the white feathers black-tipped. Under parts ochraceous or pale tawny, varied with whitish, and pretty regularly barred crosswise with blackish-brown, thus somewhat as in *Chordeiles*. Length 13.00; extent 25.00; wing and tail, each, 7.50; tail graduated 1.00; tarsus 1.00; middle toe and claw 1.25. Another Texas specimen (perhaps ♀, but with even more white on tail, but white on only 4 primaries) is much smaller: length about 10.50; wing 6.50; tail 6.00. The species is said to be very variable in size and markings; ♀ to have the collar buff. N. E. Mexico into Texas, where common in the valley of the Lower Río Grande. Eggs 2, laid on the ground in woods or thickets; 1.25×0.92 , creamy-buff or salmon-color, splashed and spotted with pinkish, brown, and lilac; the markings generally profuse and evenly distributed, but sometimes mainly confined to the larger end, or quite faint over the whole surface; size also varying about 0.25 in length. They are found in Texas from the middle of April through June. (*N. albicollis* of the 2d and 3d eds. of the Key, in the 4th ed. 1890, p. 902, distinguished from the stock form of tropical America, after SENNETT, Auk, Jan. 1888, p. 44; A. O. U. List, 2d ed. 1895, No. 419.)

ANTROSTOMUS. (Gr. *άντρον*, *antron*, a cave; *στόμα*, *stoma*, mouth; alluding to the cavernous mouth. Fig. 381.) AMERICAN NIGHT-JARS. Nostrils oval, with a raised rim not



FIG. 381. — Head and foot of Whipoorwill, nat. size. (Ad. nat. del. R. Bidgway.)

prolonged as a tube, opening upward and outward. Rictal bristles immense, with or without lateral filaments, and other bristly or bristle-bearded feathers about bill. Tarsus not longer than middle toe without claw, feathered in front nearly to toes. Wing rounded, tipped by 2d and 3d quills, folding to beyond middle of tail, which is rounded (not enough so in fig. 383) and much shorter than wing. Plumage very lax, with minutely marbled coloration, in some places as if dusted or frosted over; primaries weak, all mottled with tawny, without great white spaces; under parts mottled, with little tendency to regular crosswise barring; markings of crown longitudinal. Size medium and rather large; sexes distinguishable; eggs 2, heavily colored. Highly nocturnal. Containing those shadowy birds, consorts of bats and Owls,—those scarce-embodied voices of the night, here, there, and everywhere unseen, but shrilling on the ear with sorrow-stricken iteration.

Analysis of Species and Subspecies.

Large: wing 8.00 or more; rictal bristles garnished with lateral filaments. Tail with large whole-colored spaces in ♂ only. (<i>Antrostomus</i> proper)	<i>carolinensis</i>
Small: wing 7.00 or less, rictal bristles simple. Tail with light spaces in both sexes.	
Eastern N. Am.	<i>vociferus</i>
Arizona and New Mexico	<i>v. macromystax</i>

A. carolinensis. (Lat. Carolinian. Fig. 382.) CHUCK-WILL'S-WIDOW. *The rictal bristles with lateral filaments.* Singularly variegated with black, white, brown, tawny, and rufous, the prevailing tone fulvous; a whitish or tawny throat-bar; several lateral tail-feathers with large whole-colored space in ♂, all variegated in ♀. Adult ♂: Taking dark wood-brown as ground color of upper parts, this is heavily dashed with black, lengthwise on crown in large pattern, elsewhere similar in smaller style, everywhere minutely punctuated with ochrey and gray, as if dusted over; wing-coverts and inner quills more boldly varied with black centre-fields and tawny or whitish edgings of the feathers. Four middle tail-feathers singularly clouded with

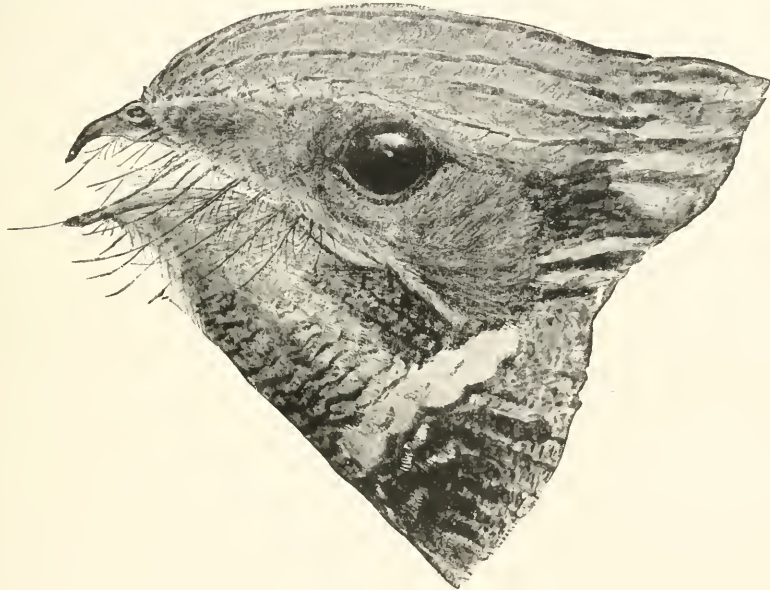


FIG. 382. — *Antrostomus Carolinensis*, nat. size. (L. A. Fuertes.)

gray and tawny on a seeming black ground, the pattern tending crosswise. All other tail-feathers with inner webs having 2-3 inch long whole-colored spaces, *white* viewed from above, *tawny* seen from below (a curious difference, which has caused some confusion in descriptions of the sexes of this bird); their outer webs mottled with black and tawny. Primaries black, fully mottled with broken-up tawny-reddish cross-bars. General tone of under parts ochraceous, becoming quite so posteriorly, with pronounced tendency to black cross-waves. Length 11.00-12.00; extent about 25.00; wing 8.00 or more; tail 6.00 or more; whole foot 1.75. ♀ only differs in lacking whole-colored spaces on tail, all the feathers being motley throughout; primaries more closely mottled with reddish; rather smaller; but the Chuck-will's-widow is on the whole about twice as bulky as the Whippoorwill, and should never be mistaken for it. South Atlantic and Gulf States; Cuba; S. in winter to the U. S. of Colombia; N. on the Atlantic only to Virginia regularly, to Massachusetts accidentally, in the Mississippi valley to Indiana, Illinois, Missouri, and casually Kansas; W. in portions of Arkansas, Indian Ter-

ritory, and Texas; resident on our southern border, migratory in the rest of its range, April and Sept.; breeds throughout, chiefly in May and June. No nest; eggs laid on the ground, in woods, 2 in number, equal-ended or nearly so, averaging 1.45×1.05 , creamy or pinkish, but very heavily marked in intricate pattern with browns and neutral tints; the tone extremely variable in its blotching, marbling, and clouding, indescribable in few words. The bird feeds mainly upon large night-flying lepidopterous and coleopterous insects, but includes many others in its fare, and has long been known to devour occasionally small birds. It is very common in the Southern States, but an elusive recluse.

A. vociferus. (Lat. *vociferus*, voice-bearing. Figs. 378, 381, 383.) WHIPPOORWILL. NIGHT-JAR. *The rictal bristles simple.* Upper parts variegated with gray, black, whitish, and tawny; prevailing tone gray; black streaks sharp on head and back; colors elsewhere delicately marbled, including four median tail-feathers; wings and their coverts with bars of rufous spots; lateral tail-feathers black, with large white (σ) or small tawny (φ) terminal spaces; a white (σ) or tawny (φ) throat-bar. Adult σ : Assuming stone-gray as ground-color of upper parts: Crown with a purplish cast, heavily dashed lengthwise with black; back

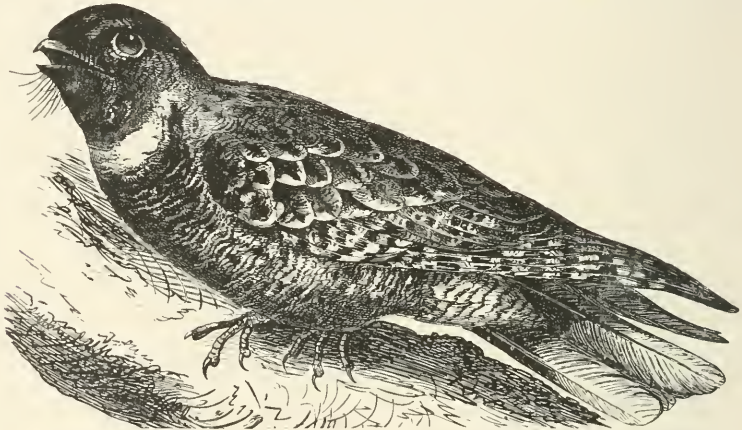


FIG. 383. — Whippoorwill, $\frac{1}{2}$ nat. size. (From Brehm. Tail not rounded enough.)

darker, with smaller streaks; tail beautifully marbled with slate-gray and black tending crosswise on 4 middle feathers; scapulars with bold black centre-fields set in frosty marbling; hind neck with white specks, as if continued around from white throat-bar. Primaries black, with a little marbling at their ends, fully broken-banded with tawny-reddish; no white spaces. Three lateral tail-feathers mostly black, with pure white terminal spaces 1-2 inches long. Under parts quite blackish, on breast powdered over with hoary-gray, more posteriorly marbled with gray and tawny, tending crosswise. Lores and ear-coverts dark brown. It is only in perfect plumage that the colors are as slaty and frosty as described; ordinarily more brown and ochrey. Length 9.00-10.00; extent 16.00-18.00; wing 6.00 or more; tail 6.00 or less; whole foot 1.40; longest rictal bristle about 1.50; the distance across from one corner of mouth to the other about as much as length of gape. Adult φ : General tone more brownish and ochrey; throat-bar tawny-whitish; tail-spaces very slight and ochraceous; rather smaller. Eastern U. S. and British Provinces, N. in Canada to lat. 54° in the region of Lake Winnipeg, W. to Manitoba and Assiniboia, the Dakotas, Nebraska, Kansas, Indian Territory, and Texas; S. in winter to Guatemala; casual in some of the West Indies; migratory in nearly all its N. A. range, but winters on our Gulf coast; breeds from the S. States northward, mainly in May and June; migrates mainly in April and Sept. A shady character, oftener heard than seen, of recluse nocturnal habits and perfectly noiseless flight, in the breeding season ceaseless in

uttering with startling vehemence its uncouth cries. The notes are likened to the phrase which has given the name; they are very rapidly reiterated, with strong accent on the last syllable; when very near, a clicking sound, and sometimes low murmuring tones, may also be heard. No nest; 2 eggs on ground (dead leaves) or log or stump, in woods, 1.20 × 0.90, down to 1.10 × 0.80, nearly equal-ended, white or creamy-white, spotted with browns, lilac and neutral tints. The young are helpless, shapeless, downy masses; both eggs and young are often removed in the parent's mouth if disturbed, as a cat carries off her kittens, — a practice, however, habitual in this curious family of birds. Unlike the Night-hawk, the Whippoorwill rarely flies by day, unless flushed from its shady retreats.

A. v. macromys'tax. (Gr. μακρός, makros, long; μύσταξ, mustax, a moustache.) STEPHENS' WHIPPOORWILL. ARIZONA WHIPPOORWILL. Similar: larger: rictal bristles longer and stouter. ♂: Throat-bar and superciliary streak ochraceous; lores and ear-coverts tawny; white spaces on tail short; under tail-coverts nearly unbarred. Length 10.20; extent 19.40; wing 6.65; tail 5.45; longest rictal bristle 1.80; longest tail-spot 1.55. Arizona, New Mexico, S. W. Texas, and S. on the table lands of Mexico to Guatemala. Discovered over our border May 22, 1880, in the Chiricahua Mts. of Arizona, by F. Stephens; an egg taken July 4 was white, immaculate but for faint neutral tint shell-spots, 1.17 × 0.87. *A. v. arizonæ* BREWST. Bull. Nutt. Club, vi, Apr. 1881, p. 69; COUES, Key, 2d ed. 1884, p. 452; A. O. U. List, 1st ed. 1886, No. 417 a; RIDGW. Man. 1887, p. 299.

Caprimulgus macromystax WAGL. Isis, 1831, p. 533; *C. vociferus macromystax* HARTERT, Ibis, 1892, p. 286; *A. v. macromystax* A. O. U. Auk, Jan. 1894, p. 48; List, 2d ed. 1895, No. 417 a.

PHALÆNO'PTILUS. (Gr. φάλανα, phalaîna, a moth; πτίλον, ptilon, feather: alluding to the powdery plumage, like the furriness of a moth's wings. Fig. 384.) POOR-WILLS. Nostrils tubular, cylindric, opening forward and outward. Rictal bristles immense, but simple. Tarsus naked except just on the joint above (as in *Nyctidromus*), as long as middle toe without claw. Tail square, much shorter than the rounded wings, which fold nearly to its end. Plumage peculiarly soft and velvety, in hoar-frosted pattern of coloration. Markings of crown transverse; primaries barred with black and tawny. Size small. Sexes alike. Note dissyllabic. Eggs white.



FIG 384.—Head and foot of Nuttall's Poorwill, nat. size. (Ad. nat. del. R. Ridgway.)

Analysis of Subspecies.

The normal stock form	<i>nuttalli</i>
Bleached desert form	<i>n. nitidus</i>
Dark coast form	<i>n. californicus</i>

P. nut'talli. (To Thos. Nuttall.) NUTTALL'S POOR-WILL. Adult ♂ ♀: Assuming the upper parts of a beautiful bronzy-gray ground color, this is elegantly frosted over with soft silver-gray, and watered in wavy cross-pattern with black, these black double crescents enlarging to herring-bone marks on scapulars and inner quills. Four middle tail-feathers patterned after back; others with finer black bars on motley brown ground, and short white tips. Primaries and longer secondaries bright tawny, with pretty regular black bars, and marbled tips (the half-opened wing viewed from below is curiously like that of the Short-eared Owl). A large firm silky-white throat-bar. Under parts grounded in blackish-brown, giving way behind through ochrey with dark bars to nearly uniform ochrey. It is impossible in words to give an idea of the artistic blending of the colors in this elegant little Night-jar. The sexes scarcely differ; specimens before me marked ♀ have as purely white throat as the ♂, but the

tail-tips are shorter and tinged with tawny. Length 7.00–8.00; extent 15.00; wing about 5.50; tail 3.50 or less; tarsus, or middle toe without claw, 0.65. Great Plains nearly to the Pacific, U. S. and British border, W. to the Sierras Nevadas of California and Cascade ranges of Oregon and Washington, E. casually to Iowa and Missouri, S. to Guatemala; abundant; migratory, but breeds throughout its U. S. range, and winters sparingly on our southern border. Note of two syllables, the first of the “whippoorwill” omitted. Eggs 2, 1.05×0.80 , down to 0.90×0.75 , averaging 1.00×0.75 , elliptical, *white*, with a faint blush, occasionally with a few fugacious shell-markings about the larger end. They are laid from May to August, on the bare ground.

P. n. nitidus. (Lat. *nitidus*, shining.) FROSTED POOR-WILL. Similar to the last, but with dark markings of upper parts fewer and sharper on a much paler ground, and cross-bars on under parts finer and paler. Described as a bleached desert race from Texas and Arizona, N. to western Kansas. BREWST. Auk, April, 1887, p. 147; COUES, Key, 4th ed. 1890, p. 902; A. O. U. List, 2d ed. 1895, No. 418 a.

P. n. californicus. (Lat. Californian.) DUSKY POOR-WILL. Like the stock form, but darker. Pacific coast region, Lower California and northward. Two skins from Nicasio and Calaveras, California, are said to be “altogether darker than any from elsewhere.” RIDGW. Mau. 1887, p. 588; COUES, Key, 4th ed. 1890, p. 902; A. O. U. List, 2d ed. 1895, No. 418 b.



FIG. 385. — Night-hawk, Female, nat. size. (L. A. Fuertes.)

CHORDEILES. (Gr. χορδή, *chorde*, a stringed musical instrument; δειλῆ, evening: alluding to the crepuscular habits. The malformed name *Chordeiles* of SWAINSON, 1831, continues to be so misspelled in the A. O. U. Lists. Fig. 385.)

NIGHT-HAWKS. *Glabirostral*: the rictus without long stiff bristles. Horny part of beak extremely small. Nostrils cylindric and rimmed about, hardly tubular, opening outward and upward. Tarsus feathered part way down in front. Tail lightly forked, much shorter than the extremely long, pointed, stiff, and thin bladed wing,

with 1st primary as long as the next. Plumage more compact and smooth than in Night-jars; primaries mostly whole-colored (in *texensis* spotted), with large white (or tawny) spaces on the outer 4–6; under parts barred across; a large white (or tawny) V-shaped throat-bar. Eggs 2, heavily colored. Not strictly nocturnal. Remarkably volitorial.

Analysis of Species and Subspecies.

- Primaries dusky, with large white spot on 5 of them, in both sexes, about half way from bend to point of the wing.
 Large; wing over 7.00, usually near 8.00.
 The ordinary form, dark. N. Am. Chiefly Eastern *virginianus*
 The lighter tawny form. Western N. Am. *v. henryi*
 The pale silvery-gray form. Great Plains *v. sennelli*
 Small; wing about 7.00. Florida and Gulf coast *v. chapmani*
 Primaries more or less spotted with tawny, with large white (♂) or tawny (♀) spaces on 4 of them nearer point than bend of the wing. Small: wing about 7.00. Southwestern *texensis*

C. virginianus. (Lat. Virginian. Figs. 379, 385, 386.) NIGHT-HAWK. MOSQUITO-HAWK. BULL-BAT. PYRAMIDIG. PISK. Above, mottled with black, brown, gray, and tawny, the former in excess; below from breast transversely barred with blackish and white or pale fulvous; throat with a large white (♂) or tawny (♀) cross-bar; tail blackish, with pale marbled cross-bars and a large white spot (wanting in the ♀) on one or both webs of nearly all the feathers toward the end; primaries dusky, unmarked except by one large white spot on

outer *fece*, about midway between their base and tip; secondaries like primaries, but with whitish tips and imperfect cross-bars. Sexes nearly alike: ♀ with white spaces on the quills, but those on tail replaced by tawny or not evident. Young similar, with wing-spots from the nest, but the markings finer and more intricately blended, in effect more like *Antrostomus*; quills edged and tipped with tawny. Length 9.00 or more; extent about 23.00; wing about 8.00; tail 4.50; whole foot 1.25; culmen scarcely 0.25; gape about 1.25. Temperate N. Am., chiefly Eastern, abundant; migratory; breeds throughout its N. Am. range: winters beyond, in the Bahamas, Central, and much of South America. The N. limit is reached in Labrador, the region immediately S. of Hudson's Bay and N. of Lake Winnipeg, and farther N. W. to lat. 65°; western limits uncertain, owing to blending with the two next varieties; but specimens indistinguishable from the stock form occur in British Columbia, Washington, Oregon, and California. The extensive migrations occur in April and May, and from late August through October. This species flies abroad at all times, though perhaps most active toward

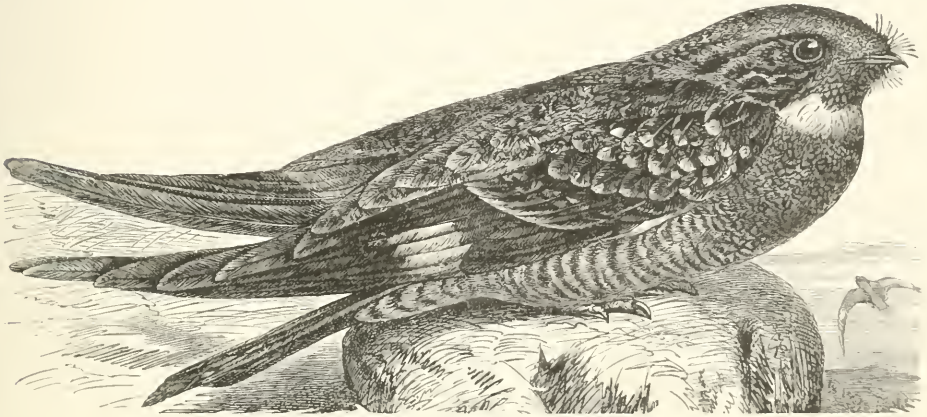


FIG. 386. — Night-hawk, or Bull-bat, ♂ nat. size. (From Brehm. Bill too bristly.)

evening and in dull weather; and is generally seen in companies, busily foraging for insects with rapid, easy, and protracted flight; in the breeding season it performs curious evolutions, falling through the air with a loud booming sound. No nest; 2 eggs laid May–July, mostly in June, on bare ground or rock in field or pasture (often burnt over) or on a flat city roof, 1.32×0.87 to 1.10×0.80 , averaging 1.20×0.85 , more or less elliptical, finely variegated with stone-gray and other neutral tints, over which is scratched and fretted dark olive-gray; but the pattern and tints are too variable to be concisely described. The general effect is a dark marbling. The young hatch covered with fluffly down, whitish below, varied with blackish and brown above, thus resembling their native earth. It may be necessary in this family for the young to be covered from the first, to protect them from the cold ground. On being disturbed while brooding the female feigns lameness, dragging and fluttering about, moaning piteously, and will sometimes remove her young. The Night-hawk has been given in previous editions of the Key as *C. popetue*, following Baird's adoption in 1858 of Vieillot's barbarous name, applied to the ♀ in 1807. This was in consequence of some uncertainty supposed to attach to the *Caprimulgus virginianus* of the older ornithologists, that of Vieillot being the Whippoorwill, and that of Brisson, 1760, for example, applying to the Night-hawk in part only. But as there seems to be no necessary doubt about *C. virginianus* GM. S. N. 1. 1788, p. 1028, I am glad to follow the A. O. U. Committee in dropping the objectionable *popetue*.

C. v. sennetti. (To Geo. B. Sennett, the distinguished ornithologist.) **SENNETT'S NIGHT-HAWK.** This is that pale subspecies of the Night-hawk which is characteristic of the un-

wooded country from Texas to Dakota: silvery grayish-white predominating above, the white below greatly in excess of the narrow, irregular or broken, dark bars, and little or no rufous anywhere — in the latter respect especially differing from *C. v. henryi*. *Chordiles popetue sennetti* COUES, Auk, Jan. 1888, p. 37; *Chordeiles virginianus sennetti* CHAMB. Syst. Tabl. Canad. Birds, 1888, App. A, p. 14; *Chordeiles popetue sennetti* COUES, Key, 4th ed. 1890, p. 902; A. O. U. List, 2d ed. 1895, hypothetical No. 16. 1, p. 330, admitted to the regular list at the Cambridge meeting of the Committee, Nov. 15, 1896; A. O. U. Suppl. List, Auk, Jan. 1897, p. 121, No. 420 c.

C. v. henryi. (To Dr. T. C. Henry.) WESTERN NIGHT-HAWK. The lighter-colored form prevailing in the dryer or unwooded portions of western United States; gray and fulvous in excess of darker hues; white patches on wing, tail, and throat usually larger; under tail-coverts more nearly uniform; but no specific character can be assigned.

C. v. chapmani. (To Frank M. Chapman, the distinguished ornithologist.) CHAPMAN'S NIGHT-HAWK. FLORIDA NIGHT-HAWK. Similar to *C. virginianus* in color, but rather more tawny, and decidedly smaller; wing 7.00; tail 4.00. Florida to Texas, and southward. *C. popetue minor* COUES, 2d and 3d eds. of the Key, p. 454, in which this form was referred to the Cuban; *C. virginianus minor* COUES, Birds N. W. 1874, p. 264; RIDGW. Man. 1887, p. 301; A. O. U. List, 1st ed. 1886, No. [420 b.]; *Chordeiles popetue chapmani* COUES, from Sennett's MS. Auk, Jan. 1888, p. 37; *Chordeiles virginianus chapmani* SCOTT, Auk, Apr. 1888, p. 186; COUES, Key, 4th ed. 1890, p. 903; A. O. U. List, 2d ed. 1895, No. 420 b.

C. acutipennis texensis. (Lat. *acutus*, acute; *penna*, a feather: alluding to the sharp-pointed wings. Of Texas: our bird a northern race of the S. Am. species.) TEXAS NIGHT-HAWK. Smaller than the common Night-hawk, and otherwise very distinct. General tone lighter, pattern more blended and diffuse, more as in *Antrostomus*. Adult ♂: Assuming upper parts gray, this color intimately punctate with lighter and darker shades, more boldly marked with blackish, chiefly in streaks, and with tawny and white, largest on scapulars and wing-coverts. Under parts barred, as in *virginianus*, with blackish, tawny, and whitish, but the two former prevailing. A large white V on throat. Four outer primaries with large white spot on both webs, nearer tip than bend of wing; inner primaries and all secondaries spotted with tawny in broken bars. Tail blackish, with broken gray or tawny bars, and a complete subterminal cross-bar of white on all the feathers but the central pair. ♀ lacking this white, all the tail-feathers being motley-banded with gray and tawny throughout; primaries all spotted with tawny, larger spots of this color replacing the white of the ♂; throat-V tawny. Young more suffused with tawny on a pearly-gray, black-speckled ground; but young ♂ with white tail- and wing-spots from the first. Length 8.00–9.00; extent 20.00–22.00; wing about 7.00; tail 4.00 or more. Southwestern U. S., valleys of the Rio Grande and Colorado, Texas to California, and southward in winter to Central America; N. in summer over the borders of Utah and Nevada, and in California to lat. 38°; E. occasionally to the Mississippi valley in Louisiana; common, in some places as abundant as *C. virginianus*, whose general habits and traits it shares, though the difference in appearance between the two is obvious when they are flying. This species comes over our borders in April, breeds May, June, and July, and leaves in October. Eggs 2, laid on the ground, subelliptical, averaging 1.05 × 0.75, but varying over 0.20 in length, profusely and minutely marbled and veined with various dark tints, but the general effect decidedly lighter in tone than that of the eggs of *C. virginianus*.

SUBORDER HALCYONES: HALCYONIFORM BIRDS.

See p. 540 for analytical characters of this suborder, as framed to include the five families *Bucerotidæ*, *Alecedinidæ*, *Momotidæ*, *Todidæ*, and *Meropidæ*. The first and last of these are exclusively Old World; the second is chiefly Old World, with one American genus; the third

is Neotropical, the fourth Antillean. The suborder is less compact than most others of *Picariæ*, and includes birds of such extremely dissimilar external appearance as the tiny Todies, no larger than some Hummingbirds, of dainty aspect and brilliant plumage, and the great gaunt ungainly Hornbills, with their monstrous beaks and sombre or sordid hues. The feet are anisodactylous, with three toes in front and one behind (anomalous exception in two 3-toed genera of Kingfishers, lacking the 2d digit), and more or less perfectly syndactylous, having the anterior toes united for some distance in a single flat fleshy sole. They are also sympelmonous by blending of the flexor tendons of the toes, whereof the hallux is supplied by a slip from the flexor digitorum perforans, not from the flexor hallucis. The spinal pterygia is well defined and not branched over the shoulders, and the ventral tract has an open space. The palate is desmognathous in the five families, and in none of them are there basipterygoids; the sternum is usually 4-notched or 4-fenestrate except *Bucrotidæ*. The oil-gland and cæca are variable in the several families. The myological formula is A X Y (except in *Alcedinidæ*, where it is A X, as in *Trogonidæ*), the femorocaudal, semitendinosus and its accessory present, but accessory femorocaudal absent, like the ambiens. The plumage is aftershafted in *Momotidæ* and *Meropidæ*. The rectrices are oftenest 12, often 10. The most peculiar family is the *Bucrotidæ*, which some authors set apart in a group by itself; its relationships appear to be with the *Upupæ*.

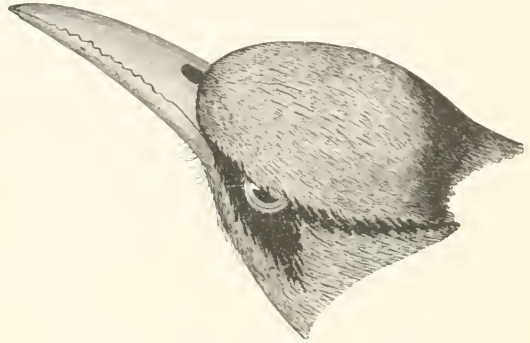


FIG. 387. — Head of Blue-headed Saw-bill, nat. size.

[Family MOMOTIDÆ: Sawbills.

Feet syndactylous by cohesion of third and fourth toes (p. 135); *tomia serrate*. *Plumage aftershafted*. No cæca. Two carotids. Sternum 4-fenestrate. Rectrices 12 (10 in *Baryphthengus*), as a rule the middle pair elongated and more or less spatulate. A small family of tropical American birds, comprising about 18 species of 7 genera, none having rightful place here: but *Momotus ceruleiceps* (fig. 387) comes near our border, and is included to illustrate the suborder *Halcyones*. In this species, the central tail-feathers are long-exserted, and spatulate by absence of webs along a part of the shaft — a mutilation which is naturally progressive in this family, and may be facilitated or expedited by the birds themselves; bill is about as long as head, gently curved; nostrils rounded, basal, exposed; wings short and rounded; tarsi scutellate anteriorly. Color greenish, with top of head blue, encircled with black; long auriculars black, and a bunch of black, or blue and black, feathers on breast; middle tail-feathers blue toward ends, with black tips. Length 14.00-15.00; wing 5.50; tail 8.00 or more; bill 1.50. Mexico, N. to Nuevo Leon.]

Family ALCEDINIDÆ: Kingfishers.

Feet syndactylous by cohesion of third and fourth toes (p. 135, fig. 44); *tomia simple* (or slightly serrulate). *Plumage not aftershafted*. No cæca. Two carotids. Tufted oil-gland (except some of *Tanysiptera*). Sternum 4-notched. Bill long, large, straight, acute (rarely hooked): somewhat "fissostral," the gape being deep and wide. Tongue rudimentary or

very small (lipoglossine). Nostrils basal, reached by frontal feathers. Feet very small and weak, scarcely or not ambulatorial; tibiæ naked below; tarsi extremely short, reticulate in front; hallux short, flattened underneath, its sole more or less continuous with sole of inner toe; soles of outer and middle toe in common for at least half their length; inner toe always short, rudimentary, or wanting (in two genera, *Ceryx* and *Aleyone* — an abnormal modification). Developed toes always with normal ratio of phalanges (2, 3, 4, 5; p. 133); middle claw not serrate. Wings long, of 10 primaries. Tail of 12 rectrices (only 10 in the racket-tailed *Tanysiptera*) variable in shape. Two subfamilies; all Old World excepting one genus.

“The Kingfishers form a very natural family of the great Picarian order, and are alike remarkable for their brilliant coloration and for the variety of curious and aberrant forms which are included within their number. . . . ‘Their characteristic habit is to sit motionless watching for their prey, to dart after it and seize it on the wing, and to return to their original position to swallow it.’ . . . The *Alcedinidæ* nest in holes and lay white eggs. It is, however, to be remarked that, in accordance with a modification of the habits of the various genera, a corresponding modification has taken place in the mode of nidification, the piscivorous section of the family nesting for the most part in holes in the banks of streams, while the insectivorous section of the family generally nest in the holes of trees, not necessarily in the vicinity of water.” (SHARPE.)

One would gain an imperfect or erroneous idea of the family to judge of it by the American fragment, of one genus and 6 or 8 species. According to the author of the splendid monograph above cited, there are in all 125 species, belonging to 19 genera. They are very unequally distributed. *Ceryle* alone is nearly cosmopolitan, absent only from the Australian region; the northern portion of the Old World has only 2 peculiar species; 3 genera and 24 species are characteristic of the Ethiopian region: one genus and 25 species are confined to the Indian; while no less than 10 genera and 59 species are peculiar to the Australian. The species are now known to be over 150 in number, but this increase does not materially affect the items just given regarding their distribution. In the subfamily *Daceloninæ*, which contains a majority of the genera and species, the bill is more or less depressed, with smooth, rounded, or sulcate culmen; and these birds are hardly “fishers,” kingly or otherwise, for they live in the woods and are mainly insectivorous. The largest genus is *Haleyon*, with over 50 species. The next largest is *Tanysiptera*, containing the 20 racket-tailed species; *Ceryx* has nearly as many 3-toed species; one of the most notable birds of the subfamily is the Laughing Jackass of Australia, *Dacelo gigas*. In the

Subfamily ALCEDININÆ, Piscivorous Kingfishers,

the bill is compressed, with carinate culmen. *Ceryle* is the only American genus, with 3 North American species, others in South America, and several more in Europe, Asia, and Africa. The other Old World genera are *Pelargopsis*, *Alcedo*, *Corythornis*, and *Ceryx*, the latter 3-toed. The *Alcedininæ* are all thoroughly aquatic and piscivorous, seeking their prey by plunging into the water from on wing; and nest in holes in banks, laying numerous white eggs.

CERYLE. (Gr. *κήρυλος*, *kerulos*, a kingfisher.) BELTED KINGFISHERS. Head with an occipital crest. Bill longer than head, straight, stout, acute. Wings long and pointed. Tail rather long and broad (in comparison with some genera), much shorter than wing. Tarsi short; legs naked above tibio-tarsal joint. Plumage belted below.

Analysis of Subgenera and Species.

STREPTOCERYLE. Large, with small feet; upper parts dull bluish.

Wing over 7.00, bill over 3.00. Under parts mostly rufous. Texas *torquata*

Wing under 7.00, bill under 3.00. Under parts mostly white. N. Am. *alcyon*

CHLOROCERYLE. Small, with large feet. Upper parts glossy greenish.

Wing under 4.00, bill under 2.00. Under parts mostly white *americana septentrionalis*

(Subgenus STREPTOCERYLE.)

C. (S.) torqua'ta. (Lat. *torquate*, collared.) COLLARED KINGFISHER. "RINGED" KINGFISHER. GREAT RUFOUS-BELLIED KINGFISHER. Resembling the common species, but much larger and otherwise different. Adult ♂: Above, ashy-blue, streaked with black, especially on the head; a white collar around the back of the neck. Tail-feathers with transverse white spots, but none on outer webs of primaries toward their bases. Below, mostly rich rufous, the throat and vent only white (no dark pectoral band as in *C. alcyon*). Adult ♀: Rufous of under parts extending on the crissum, and a dark bluish breast-band. Very large: Length about 16.00; wing 7.50; bill over 3.00. A well-known species of tropical America, casually N. to the Rio Grande of Texas (Laredo, June 2, 1888, specimen in Mus. Acad. Philada.). STONE, Auk, Apr. 1894, p. 177; A. O. U. List, 2d ed. 1895, No. [300. 1].

C. (S.) al'cyon. (Lat. *alcyon*, a kingfisher. Fig. 388.) BELTED KINGFISHER. Upper parts, broad pectoral bar, and sides under wings, dull blue with fine black shaft-lines. Lower eyelid, spot before eye, a cervical collar and under parts except as said, pure white; ♀ with chestnut belly-band and sides of the same color. Quills and tail-feathers black, speckled, blotched or barred on inner webs with white; outer webs of secondaries and tail-feathers like back; wing-coverts frequently sprinkled with white. Bill black, pale at base below. Feet dark; tibiae naked below. A long, thin, pointed occipital crest; plumage compact and oily to resist water, into which the birds constantly plunge after their finny prey. Length 12.00-13.00; extent 21.00-23.00; wing 6.00-6.50; tail 3.50-5.00; whole foot 1.33; culmen 1.75-2.25. N. Am., common everywhere, resident or only forced southward by freezing of the waters. This fine bird, whose loud rattling notes are as familiar sounds along our streams as the noise of the mill-dam or the



FIG. 388. — Belted Kingfisher.

machinery, burrows to the depth of 6 or 8 feet in the ground, and lays as many crystal white subspheroidal eggs, 1.35×1.05 , at the enlarged extremity of the tunnel. Although fish forms the main fare, this bird shows its family traits by devouring many other animals, as small snakes, lizards, frogs, toads, crawfish, grasshoppers, crickets, beetles, etc. I have often seen it away from water in the West, where no fish could be had. The situation of the burrow in the face of cut-banks of earth is more constant than its dimensions; sometimes the eggs can almost be reached at arm's length, and again they may be three to five yards under ground. The usual diameter of the hole will hardly admit the arm, but the farther end of the burrow is pocketed to a diameter of 8 or 10 inches. There is no true nest, but the eggs are usually

found on a layer of fish-bones and scales. The eggs are oftenest 6 or 8 in number, as said, sometimes only 5, and again 12 or more may be found in a nest. Some large specimens are nearly 1.50, and some runts only 1.20 in length; but the breadth is more constant, and the shape thus extremely variable. Cock-burrows are sometimes made by the ♂, and the holes of Swallows are sometimes enlarged to suit the Kingfisher.



FIG. 389. — Paradise Trogon, or Quesal (*Pharomacrus mocino*), ♂, ♀. (From Michelet.)

These birds are unique, not only in their suborder but in the class *Aves*, in the disposition of the digits and their flexor tendons. They are yoke-toed, having the toes

(Subgenus CHLOROCERYLE.)

C. americana septentrionalis. (Lat. American. Lat. Northern, with reference to the northerly subspecies of the tropical American stock form.) TEXAN GREEN KINGFISHER. Adult ♀: Entire upper parts dark glossy-green, with bronze lustre, the bases of nearly all the feathers snowy-white, which appears sometimes upon the surface; crown, scapulars, and wing-coverts superficially sprinkled with white. Wing-quills dusky on inner webs, green on the outer, both marked in regular double series with pairs of white spots, scallops, or bars. Central tail-feathers dark green, usually touched with white along the edges, the others green with white bars becoming confluent at the bases of the feathers, where forming white spaces more extensive than the green portion. Cervical collar and entire under parts white; breast with a dark green band, the belly, sides, and crissum spotted with glossy-green. Bill black, usually light at base below; feet dark. Adult ♂ differs in having no green spots across belly and rufous instead of green breast-band. Young ♂ has rusty tinge on breast. Length about 8.00; wing 3.25-3.50; tail 2.50; bill 1.67-1.87; whole foot 1.00, with relatively longer tarsus than in either of the foregoing. Valleys of the Lower Rio Grande and Lower Colorado, and southward to Panama; common and resident in some parts of Texas, where it breeds. I saw it in Arizona on the Colorado, in 1865. Nesting substantially as in *C. alcyon*: eggs 4-6, very thin and smooth, like porcelain, rounded oval, 0.90-1.00 × 0.70-0.75. This is *C. americana* and *C. cabanisi* of writers referring to the northern form, which seems to differ mainly in the larger bill. *C. americana cabanisi* of former eds. of the Key, 1872-90. *C. cabanisi* A. O. U. List, 1st ed. 1886, p. 209. *C. americana septentrionalis* SHARPE, Cat. B. Brit. Mus. xvii, 1892, p. 134; A. O. U. List, 2d ed. 1895, No. 391.

SUBORDER TROGONES: TROGONS.

Or HETERODACTYLI: see p. 541, for principal analytical characters in comparison with other sub-

two before and two behind, and thus apparently zygodactylous, but in a peculiar way; for the 1st and 2d digits point backward, the 3d and 4th forward. This arrangement is called *heterodactylous*, and it is further pronounced in the disposition of the flexor hallucis, which supplies both hind toes, the flexor digitorum supplying the front toes, by the arrangement known as heteropelous. The myological formula is A X, as in the Kingfishers; that is, the femoro-caudal and semitendinosus are both present, but their respective accessories absent, as is also the ambiens. The palate is schizognathous; basipterygoids are present. The sternum is 4-notched; oil-gland nude, but cæca present; one carotid. General pterylosis passerine; spinal tract unbranched; aftershafts very long; rectrices 12. One family, of warm parts of both hemispheres.

Family TROGONIDÆ: Trogons.

Heterodactylous and heteropelous Picariæ (see above). Feet very small and weak, unfitted for progression; the birds perch in wait and dart into the air for their prey, somewhat like Flycatchers, whether their food be insects or fruits. Bill short and stout, with hooked tip usually dentate or denticulate on the tomlia, its base more or less hidden by appressed antrorse feathers, and further garnished with bristles. Wings short and rounded. Tail long, of 12 broad feathers (in one genus with extraordinary development of the upper coverts in the ♂). General plumage soft and lax, of gorgeous coloration, well aftershafted; skin tender; eyelids lashed. No subfamilies need be recognized in this compact group of nearly or quite 50 species: but the genera are several. The most splendid of these is *Pharomacrus*, with 4 species of Central and South America, as *P. mocimo*, the famous Quesal or Paradise bird, as large as a Magpie, with the glitter of a Hummingbird, and a long flowing train which a Peacock might envy, if grace to be tasteful as well as showy were given that proud bird. A Mexican Trogon is *Euptilotis neoxenus*. The Cuban is *Prionotulus temurus*; the Haitian is *Tmetotrogon* (or *Tennotrogon*) *rhodogaster*. The African Trogons are three species of the genus *Hapaloderma*, as *H. narina*. Those of the Orient are more numerous species of the genera *Harpactes* and *Hapalarpactes*. The remaining species of the family belong to the genus

TROGON. (Gr. τρώγων, a gnawer: alluding to the dentate bill.) TOOTHED TROGONS. The leading genus of the family in number of species, about 25, all American, one of them reaching our borders. In all these the bill is dentate as well as hooked at the end, and the sexes differ in the coloration of the middle tail-feathers.

T. ambiguus. (Lat. ambiguous, equivocal, as doubtfully distinct from *T. mexicanus*; but it is a perfectly good species. Fig. 300.) **COPPER-TAILED TROGON.** Adult ♂: Above, metallic green, glaucous golden, bronzy or coppery; middle tail-feathers the latter, broadly black tipped; outer tail-feathers white for a long space, but mostly vermiculated with narrow black zigzags; wing-coverts and inner quills finely undulated with black and white; primaries fuscous, with light edging. Front and sides of head blackish; breast like back, with a pure white band; rest of under parts rich red-carmine, scarlet, or vermilion. Length about 11.50; wing 5.25; tail 6.75. ♀: Brown where the ♂ is green, gray where he is black, the middle tail-feathers quite rufous. Young birds vary interminably in acquiring the coloration of the adults. Mexico to the U. S. border, in the lower Rio Grande valley of Texas, in New Mexico, and in Arizona. It is a regular summer visitant in the mountains of southern Arizona, and breeds there in June; it has been observed from May to August, and young birds have been taken, but the nest and eggs remain to be discovered (1896).



FIG. 300.—Head of Copper-tailed Trogon, nat. size.

SUBORDER PICI: PICIFORM BIRDS.

See p. 541 for analytical characters of this group, as framed to include the six families: *Picidæ*, *Indicatoridæ*, *Cupitoniidæ* (or *Megalæmiidæ*), *Rhamphastidæ*, *Galbulidæ*, and *Bucconidæ*. The name "*Pici*" here adopted for the suborder is not a happy one, because it is so closely identified with a particular one of the six families, and because it is not equivalent to the *Piciformes* of former editions of the Key, which included only the *Picidæ* (with *Picumnidæ* and *Iyngidæ*, now reduced to subfamilies). But I find no more eligible name; for the same objections apply to the *Picoideæ* of Dr. Stejneger. The *Celcomorphæ* of Huxley would cover the case better, but by common consent the peculiar terminology of this great scientist is rejected. The name *Scansores* in a new restricted sense is adopted for exactly this group in the British Museum Catalogues; but only one of the families of the suborder as now framed is strictly "scansorial," and the connotations of the antique term *Scansores* are so wild and vague that its imposition upon any modern scientific group seems to me highly objectionable. With this explanation, I avail myself of the makeshift name *Pici* in the present connection.

Pici are a less homogeneous group than most Picarian suborders, being in this respect about as heterogeneous as *Coraciæ* and *Halcyonæ*. But these birds must go somewhere, and may well be brought under one superfamily or subordinal group, as they agree in certain important structural characters, however diverse they are in external features and physiological adaptations to different modes of life. Little given to climbing as are the birds of most of these Piciform families, yet they agree to a dot in the actual structure of the feet, being all antiopelmous as well as zygodactylous. The flexor digitorum profundus or perforans has but a single tendon, which supplies the 3d digit (outer one of the two anterior ones), while the proper flexor hallucis supplies the other digits by means of three slips (two if the hallux proper is missing, as it is in five genera of *Picidæ*), besides sending a slip to the other flexor. The myological formula always includes a semitendinosus and usually also its accessory (not in *Picidæ* proper). The palate is variable (with a special modification in the case of *Picidæ*). The sternum and tensor patagii brevis are characteristic; the earotids are not, neither is the oil-gland nor the cæca. Evidences of passerine affinity are found in the reduction or tendency to reduction in extent of the wing-coverts (except in *Bucconidæ*), reduction of the primaries to 10 with the first spurious (*Picidæ*) or even to 9 (*Indicatoridæ*); the rectrices are 12 or 10 indifferently, even in the same family (*Indicatoridæ*, *Galbulidæ*). The bill varies with the families (peculiar in *Picidæ*, enormous in *Rhamphastidæ*, tenuirostral in *Galbulidæ*, etc.). Referring again to the tabular exhibit of the six families on pages 541, 542, I pass to the only one represented in North America.

Family PICIDÆ: Woodpeckers, Piculets, Wrynecks.

Anomalognatous antiopelmous zygodactylous Picariæ, with sawrognathous palate and of scansorial habits. (Degradation of the families *Picumnidæ* and *Iyngidæ*, as given in former editions of the Key, to rank as subfamilies *Picumninæ* and *Iynginæ* of one family *Picidæ* makes the latter equivalent to my former *Piciformes*, and my former *Picidæ* to my present *Picinæ*.) This is a large but well-defined and perfectly circumscribed family, found in most parts of the world, and well represented in North America. In the antiopelmous structure of the flexor tendons the *Picidæ* agree perfectly with the other families of their suborder. Regarding their zygodactylism, it is perfect, with the anomalous and sporadic omission of a hind toe in five genera otherwise intimately related in their respective subfamilies; among the *Picinæ* the four

genera *Picoides*, *Gauropicoides*, *Gecinulus*, and *Tiga* are 3-toed by lack of hallux; in *Picomnina*, the single genus *Sasia* is in like case. In palatal characters the *Picidæ* exhibit "a simplification and degradation of the ægithognathous structure," as Huxley puts it, and this condition is called by Parker "saurognathous." Surognathism consists essentially in lack of fusion of parts along the midline; the vomer is double, in permanently paired halves, *i. e.* there are two vomers, attached on their respective sides to the small palatines, and the maxillopalatines are abortive. The salivary glands are highly developed, and the hyoidean apparatus is peculiar (less so in one or two genera of *Picina*). There is no urohyal bone, the ceratohyals are small and fused or fusible together, the basihyal is slender, and as a rule the enormously developed thyrohyals are jointed in two pieces which curl up over the skull; this is the mechanism, by which as actuated by correspondingly specialized hyoidean muscles, the long lumbriciform tongue can be thrust far out of the mouth. Only the left earotid is present; the oil-gland is tufted and there are no eeca. The whole pterylosis exhibits passerine affinities unmistakably; thus, the secondary coverts are short, as in *Passeres*; the first primary is short or spurious, leaving only 9 functionally well developed; and the rectrices are 12, though one pair be spurious. The bill varies to a considerable extent in the different subfamilies and genera, without losing its distinctive character as a hammer, chisel, or gouge. The family is well divided, according to the structure of the tail and other characters, into three subfamilies, so well marked that I reluctantly now relegate them to one family. The Old World *Iyugina* or Wrynecks, of one genus and about 6 species, have the tail soft, and other peculiarities. The *Picomnina* or Picnlets are also soft tailed, and in general superficialities resemble Nuthatches quite curiously. Most of these diminutive birds are Neotropical, there being about 20 species in South America; a few are Oriental, among them the 3-toed species of *Sasia*; one is Ethiopian (*Verreauxia africana*); one Antillean (*Nesoctites micromegas*); the total of the species is about 40, mostly of the genus *Picumnus*. All the North American *Picidæ* belong to the

Subfamily PICINÆ: Woodpeckers.

Tail-feathers rigid, acuminate: bill a chisel. This expression will serve for the recognition of any Woodpecker. Wing of 10 primaries; 1st short or even spurious, the wing-formula being quite as in most passerine birds — a Crow or Thrush, for example. Greater row of secondary coverts short, as in passerine birds at large. Tail of 12 rectrices, but outermost pair rudimentary, lying concealed at base of tail between the penultimate (now exterior) and next pair, so that there appear to be but 10, as usual in picarian birds (a strong peculiarity). Tail-feathers very stiff and strong, with enlarged elastic shafts, and acuminate at end. Tarsi scutellate in front, on sides and behind variously reticulate. Toes strongly scutellate on top. The usual ratio of toes is: 1st (inner posterior) shortest; 2d (inner anterior) next longer; 3d (outer anterior) longer; 4th (outer posterior) longest of all (in most typical species; in some, however, scarcely or not equalling 3d in length). The basal joints of the toes are abbreviated.

These birds have been specially studied, with more or less gratifying success, by Malherbe, Sundevall, Cabanis, Cassin, and more recently E. Hargitt. The latter makes out 45 genera and 308 well-determined species, of all parts of the world except Madagascar, Australia, and Polynesia, especially numerous in the Neotropical and Oriental regions, less so in Ethiopian, least so in the Palearctic and Nearctic. Their separation into minor groups has not been agreed upon; our species have been thrown into three divisions, which, however, I shall not present, as consideration of exotic forms shows how the genera are interrelated, and how nice is the gradation in form between the Ivory-bill and the Flicker, which stand nearly at

extremes of the subfamily; the little diversity of which is thereby evident. One of our genera, without very obvious external peculiarities, stands apart from the rest in the character of the tongue. In ordinary *Picinae* the "horns" of the tongue are extraordinarily produced backward, as slender jointed bony rods curling up over the skull behind, between the skin and the bone, to the eyes or even farther; these rods are enwrapped in highly developed, specialized muscles, by means of which the birds thrust out the tongue sometimes several inches beyond the bill (figs. 73, 74). This is not the case in *Sphyrapicus*, where the hyoid cornua do not extend beyond the base of the skull, and the tongue, consequently, is but little more extensible than in ordinary birds. The tongue of *Sphyrapicus* is beset at the end by numerous brushy filaments, instead of the few acute barbs commonly observed in the family. The same or a similar condition of the parts is observed in *Xenopicus*. In most of our species the bill is perfectly straight, wide and stout at the base, tapering regularly to a compressed and vertically truncate tip, chisel-like, and strengthened by sharp ridges on the side of the upper mandible — an admirable tool for cutting into trees; and in all such, the nostrils are hidden by dense tufts of antrorse feathers. In others, like the Flicker, the bill is smooth and barely curved; the tip is acute and the nostrils are exposed. There is a regular gradation in form between those with the most and the least chisel-like bills. The former are more stocky-bodied birds, with larger head in comparison with the constricted neck, as any one may satisfy himself by skinning a Pileated or Hairy Woodpecker, and trying to pull the skin over the head — an operation which may be performed on a Flicker. The ridges of the bill, the bevelling of the end, the nasal tufts, and usually the length of the outer hind toe, are characters which diminish or are lost together as we pass from the Ivory-bill extreme to the Flicker end of the series. The claws are always large, strong, sharp, and much curved; the feet do not present striking generic modifications, except in the three-toed genus *Picoides*: the length of the outer hind toe is the most variable factor. The wings are specially noteworthy for the shortness of the coverts, in exception to the picarian rule; and the shortness of the first primary, which may fairly be called spurious; but these points and the remarkable character of the tail have been already mentioned. This member offers indispensable assistance in climbing, when the stiff strong quills are pressed against the tree, and form a secure support. To this end, the muscles are highly developed, and the last bone (*romer* or *pygostyle*) is large and peculiar in shape. Woodpeckers rarely if ever climb head downward, like Nuthatches, nor are the tarsi applied to their support.

Species are abundant in all the wooded portion of this country, and wherever found are nearly resident. For, although insectivorous, they feed principally upon dormant or at least stationary insects, and therefore need not migrate; they are, moreover, hardy birds. They dig insects and their larvæ out of trees, and are eminently beneficial to the agriculturist and fruit-grower. Contrary to a prevalent impression, their boring does not seem to injure fruit-trees, which may be riddled with holes without harmful result. The number of noxious insects these birds destroy is simply incalculable; what little fruit some of them steal is not to be mentioned in the same connection, and they deserve the good-will of all. The birds of the genus *Sphyrapicus* are probably an exception to most of these statements. But Woodpeckers also feed largely upon nuts, berries, and other fruits; and those which thus vary their fare to the greatest extent are apt to be more or less migratory, like the common Red-head for example. Woodpeckers nest in holes in trees, which they excavate for themselves, sometimes to a great depth, and lay numerous rounded pure white eggs, of which the shell has a smooth crystalline texture like porcelain, on the chips and dust at the bottom of the hole. The voice is loud and harsh, susceptible of little modulation. The plumage as a rule presents bright colors in large areas or in striking contrasts, and is sometimes highly lustrous. The sexes are ordinarily distinguishable by color-markings; the young either show sexual characters from the nest, or have special markings of their own.

Artificial Analysis of N. A. Genera of Picidæ.

Toes 3	<i>Picoides</i>
Toes 4	
Tongue not decidedly extensible.	
Body entirely black; head white	<i>Xenopicus</i>
Body variegated; head not white	<i>Sphyrapicus</i>
Tongue very extensible.	
Conspicuously crested; much over a foot long.	
Bill white; outer hind toe longer than outer front toe	<i>Campephilus</i>
Bill dark; outer hind toe not longer than outer front toe	<i>Ceophloeus</i>
Not crested; a foot long or less.	
Sides of upper mandible distinctly ridged; wings spotted	<i>Dryobates</i>
Sides of upper mandible indistinctly or not ridged.	
Back lustrous green; belly carmine	<i>Aspizelusus</i>
Back blue-black; belly white	<i>Melanerpes</i>
Back black-barred; belly not spotted	<i>Centurus</i>
Back black-barred; belly black-spotted	<i>Colaptes</i>

CAMPEPHILUS. (Gr. *κάμπη*, *kampe*, a caterpillar; *φίλος*, *phîlos*, loving.) **IVORY-BILLS.**
Of largest size, with very strict neck, conspicuously crested head, and white bill; color black,



FIG. 391. — Ivory-billed Woodpecker, $\frac{1}{2}$ nat. size. (From Brehm.)

with white on wings and neck, and scarlet crest. Bill longer than head, perfectly straight, with truncate tip, bevelled sides, with strong ridges; broader than high at base. Gouys very

long; more than half the commissure. Nostrils concealed by large nasal tufts; antrorse feathers also at base of lower mandible. Outer hind toe much the longest. Wings pointed; 4th, 3d, and 5th quills longest; 2d much shorter; 1st very short and narrow. Tail very cuneate. Containing the largest and most magnificent known Woodpeckers, of several species, peculiar to America. The Imperial Woodpecker, *C. imperialis*, comes in Chibnabua within 50 miles of our border, and will no doubt be found in the mountains of S. Arizona or New Mexico. It is larger than the Ivory-bill, with no white stripe on the neck, and black nasal tufts. It has been attributed to the U. S., but I have never felt at liberty to use the Key on the lock of futurity.

C. principalis. (Lat. *principalis*, principal; *princeps*, chief. Figs. 391, 392, 393.) **IVORY-BILLED WOODPECKER. WHITE-BILLED LOGCOCK.** ♂ ♀: Glossy blue-black; a stripe down



FIG. 392. — Ivory-billed Woodpecker.

side of neck, one at base of bill, the scapulars, under wing-coverts, ends of secondaries and of inner primaries, the bill, and nasal feathers white; feet grayish-blue; iris yellow. A long pointed crest, in ♂ scarlet faced with black, in ♀ black. Length 19.00–21.00; extent 30.00–33.00; wing 9.75–10.75; tail 7.00–8.00; bill 2.50–2.75; tarsus 2.00. Varies much in size; ♀ smaller than ♂. A large powerful bird of the S. Atlantic and Gulf States, formerly N. to No. Carolina along the coast, to the Ohio river in the interior; range restricted of late years, almost coincident with maritime regions, N. and W. only to portions of S. Car., Ga., Ala., Miss., Ark., and very small part of Texas; still locally common in the dark heavily-wooded swamps, but very wild and wary, difficult to secure. Nests high in the most inaccessible trees; hole deep, with oval opening; eggs 3–5, 1.35×1.00 , on an average, varying moderately, somewhat pointed, highly porcellanous; they are laid early, sometimes even in February, oftenest in March, April, and early in May.

CEOPHLE'US. (Gr. *κέω* or *κείω*, *keo* or *keio*, I split, cleave; and *φλοιός*, *phloios*, bark of trees.) **PILEATED WOODPECKERS.** General form as in *Campephilus*. Bill as in that genus, but not white, with shorter gonys only about half as long as commissure; nasal plumes as before, but no antrorse feathers on sides of lower mandible. Wings and tail substantially as in *Campephilus*. Feet peculiar: outer posterior shorter than outer anterior toe, and tarsus shorter than inner anterior toe and claw; inner posterior toe very short (fig. 395). Bill dark; general color black, relieved by white; ♂ with a pointed scarlet crest; ♀ crested, but with black only. Our single



FIG. 393. — Ivory-billed Woodpecker, Left foot. (L. A. Furtés.)

species is the representative of the famous Black Woodpecker of Europe, *Picus martius* — a classic bird, by some considered type of the Linnæan genus *Picus*. There are several typical American species. (*Hylotomus* BAIRD, 1858, emended *Hylotomus* by CABANIS, 1862, and so in all former eds. of the Key, preoccupied by *Hylotoma* LATREILLE, 1804, a genus of hymenopterous insects; *Ceophloeus* CAB. J. f. O. 1862, p. 176, type *Picus lineatus*, strictly congeneric with our species; and *Phloxotomus* CAB. Mus. Hein. IV, 1863, p. 102, type *Picus pileatus*: see Auk, Jan. 1885, p. 52.)

C. pileatus. (Lat. *pileatus*, capped, *i. e.* crested; *pileum*, a cap. Fig. 394.) PILEATED WOODPECKER. BLACK-BILLED LOG-CK. General color dull black; throat, postocular line, a long stripe from nostrils along side of head and neck, spreading on side of breast, lining of wing, and a great white space at bases of wing-quills, white, more or less tinged with sulphury-yellow. Feathers



FIG. 394. — Florida Pileated Woodpecker.

of flanks and belly often skirted, and some of the quills often tipped with the same. ♂: Top of head, including whole crest, and a cheek-patch, scarlet. ♀: Posterior part of crest only scarlet, and no cheek-patch. ♂ ♀: Bill dark horn-color, paler below; feet blackish-plumbeous; iris yellow. Quite constant in coloration; very variable in size. Length 15.00–19.00

inches, usually 17.00–18.00; extent 25.00–30.00, usually 26.00–28.00; wing 8.00–10.00, usually 8.50–9.00; tail 6.00–7.00; bill 1.50–2.00! ♀ averaging about 2 inches less in length than ♂, and other dimensions proportionally smaller. Northern individuals averaging much larger than southern ones. N. Am. at large, common, resident anywhere in heavy timber; but this is a very wild, wary, and solitary bird — one which grows scarce or



FIG. 395. — Right foot of Pileated Woodpecker, nat. size. (Ad. nat. del. E. C.)

disappears among the first with the clearing away of forests in advance of civilization. It extends nearly or quite to the limit of large trees in the interior, but apparently not so far coastwise in Canada, or in Alaska: and is practically absent from the S. Rocky Mt. region of the U. S. Nests in remote and secluded woods and swamps, usually at a great height; the taking of eggs is something of an exploit. The eggs are laid from April to June in different parts of the country; they are 3 to 5 or more, and measure about 1.25×0.95 on an average, but range from 1.20 to 1.40 in length by 0.90 to 1.00 in breadth. Eggs of Woodpeckers are proportioned rather to the bird's bulk of body than its linear dimensions; those of *Campylurus* and *Ceophloeus* are relatively smaller than a Flicker's, for instance. Among the curious names one hears for this bird are Woodchuck, Woodcock, Cock of the Woods, Johnny Cock, and Good God!

C. p. abieticola. (Lat. *abies*, gen. *abietis*, the fir-tree; *colere*, to inhabit, cultivate; *incola*, an inhabitant.) NORTHERN PILEATED WOODPECKER. This name designates northerly specimens, at or near the maximum dimensions above given. Range said to include heavily wooded regions of N. Am. from the southern Alleghanies northward. BANGS, Auk, Apr. 1898, p. 176; A. O. U. Suppl. List, Jan. 1899, p. 110, No. 405 a.

DRYOBATES. (Gr. *δρῦς*, *drus*, a tree, especially an oak, gen. *δρῦός*, *druos*, in combining form *dryo-*, and *βάρης*, *bates*, one that treads, a goer; *βαίνω*, *baíno*, I go, walk.) BLACK-AND-WHITE-SPOTTED WOODPECKERS. Bill more or less nearly equal to head in length, stout, straight, truncate at tip, bevelled toward end, with sharp culmen and distinct lateral ridges on upper mandible; at base rather broader than high, with large nasal tufts hiding nostrils; culmen, commissure, and gonyes straight or nearly so (fig. 399). Feet with outer posterior longer than outer anterior toe; inner anterior intermediate between these. Wing long, pointed by 4th, 3d, and 5th quills; 2d decidedly shorter (shorter than 7th, except in *borealis*); 1st fairly spurious. Species of medium and small size, all black-and-white (one brown-backed), the back striped or barred, the wings with numerous small round white spots on the quills; ♂ with red on head. (Genus *Picus* of all previous eds. of the Key, as of most writers; but as the old Linnaean *Picus* is now restricted to an entirely different European genus of Woodpeckers, we select for the American genus, of which our familiar Downy Woodpecker is the type, the name *Dryobates* of BOIE, Isis, 1826, p. 977.)

Analysis of Species and Varieties.

- Back dark brown, neither striped nor fully barred with white *arizonæ*
- Back black, not striped lengthwise, but barred crosswise with white: "ladder-backs" (as in fig. 407).
- One large white space on side of head *borealis*
- Two white stripes on sides of head
- Nasal feathers white; ♂ crown black, nape red, both white-spotted *nuttalli*
- Nasal feathers brown; ♂ crown and nape red, both white-spotted.
- Outer web of outer tail-feather entirely black-barred *scalaris bairdi*
- Outer web of outer tail-feather partly black-barred *scalaris lucasanus*
- Back black, not barred crosswise, but striped lengthwise with white: "pole-backs."
- Outer tail-feathers wholly white. Length usually 9-10 inches.
- Greater coverts and inner secondaries profusely white-spotted. Eastern.
- Of major size: length 10.00-11.00 *villosus leucomelas*
- Of medium size: length 9.00-10.00 *villosus proper*
- Of minor size: length 8.00-9.00 *villosus auduboni*
- Greater coverts and inner secondaries sparsely or not white-spotted. Western.
- White-bellied. Rocky mountain region *villosus hyloscopus*
- Smoky-bellied. Pacific coast region *villosus harrisi*
- Outer tail-feathers barred with black. Length usually 6-7 inches.
- Greater coverts and inner secondaries profusely white-spotted. Eastern *pubescens*
- Greater coverts and inner secondaries sparingly or not white-spotted.
- White-bellied. Rocky mountain region *pubescens homorus*
- Smoky-bellied. Pacific coast region *pubescens gardneri*

D. borealis. (Lat. *borealis*, northern; inappropriate for a U. S. species. Fig. 396.) RED-COCKADED WOODPECKER. Body spotted and crosswise banded, but not streaked. Head black on top, with a large silky white auricular patch embracing eye and extending on side of neck, bordered above in ♂ by a scarlet stripe *not* meeting its fellow on nape; nasal feathers and those on side of under jaw white; black of crown connected across lores with a black stripe running from corner of bill down side of throat and neck to be dissipated on side of breast in black spots continued less thickly along whole side and on crissum; under parts otherwise soiled white. Central tail-feathers black; others white, black-barred. Back and wings barred with black and white; larger quills and many coverts with the white bars resolved into paired spots. ♀ lacking red cockade. A peculiar isolated species; wings longer and more pointed than usual in this genus; 2d quill

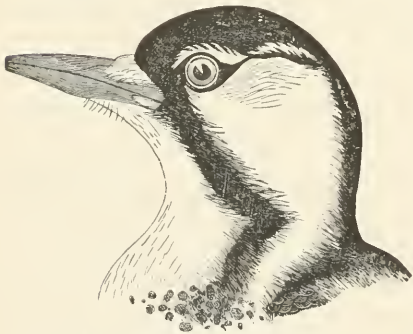


FIG. 396. — Red-cockaded Woodpecker, nat. size. (Ad. nat. del. E. C.)

longer than 7th; spurious primary very short; bill smaller than usual, decidedly shorter than head. Length 8.00–8.50; extent 14.00–15.00; wing 4.50–4.90; tail 3.25–3.75. Pine swamps and barrens of the S. Atlantic and Gulf States; N. to Pennsylvania and New Jersey occasionally; W. to Kentucky, Tennessee, Arkansas, Indian Territory, and a small part of Texas. Eggs 3–6, 0.95×0.70 on an average, ranging in length from 0.90 to 1.05.

D. scalaris baird'i. (Lat. *scalaris*, ladder-like; *scala*, a scale, flight of stairs, etc.; alluding to the black and white cross-bars on the back. To S. F. Baird.) TEXAN WOODPECKER. LADDER-BACKED WOODPECKER. Entire back, from nape to upper tail-coverts, barred across in black and white stripes of equal width; a narrow space on back of neck, upper tail-coverts, and 4 middle tail-feathers, entirely black; wing-coverts with a round white spot at end of each feather, and a hidden spot or pair of spots farther along the feather. Primaries regularly marked with white spots in pairs on edges of webs, those on outer webs small and angular, on inner webs larger and more rounded; on secondaries these spots changing to broken bars; so that the primaries and coverts are spotted alike, the secondaries and back barred alike. Crown black, speckled with white, in ♂ extensively crimson; the feathers being black, speckled with white, finally tipped with red, which becomes continuous on hind head, where the white specks cease. Side of head white, with a long black stripe from bill under eye, widening behind, there joining a black postocular stripe and spreading over side of neck. Nasal feathers smoky-brown. Under parts ranging from soiled white to smoky-gray, with numerous black spots on sides, flanks, and crissum; lateral tail-feathers perfectly barred with black and white in equal amounts. ♀ lacking red on crown. Small: length 7.00–7.50; extent 13.00; wing 3.50–4.00; tail 2.75–3.00; bill 0.66–0.87. Southwestern U. S., Texas to California, N. to Utah, Nevada, and S. Colorado, and southward to the table lands of Mexico. Eggs 0.80×0.65 . It is obviously impossible, in the cases of these profusely spotted Woodpeckers, to frame a description which will meet every case, without being too vague, or going into tedious particulars. The foregoing, taken from Rio Grande specimens, covers the usual style of the species as found along our southern border; but the student must not be surprised if I fail to account for every spot of the particular specimen he has in hand. *P. scalaris* of former eds. of the Key, now subspecifically distinguished from typical Mexican *scalaris*, which is smaller. *P. baird'i* SCL. in Malherbe's Monog. Pic. i, 1861, p. 118, pl. 27, figs. 7, 8; *D. scalaris baird'i* RIDGW. Man. 1887, p. 285; COUES, Key, 4th ed. 1890, p. 903; A. O. U. List, 2d ed. 1895, No. 396. The difference is so slight that the two are united by the latest monographer of the family (HARGITT, Cat. Pic. Brit. Mus. 1890, p. 216) under the name of *Deudrocopus scalaris*.

D. s. lucasanus. (Of Cape St. Lucas.) ST. LUCAS WOODPECKER. A local race of *scalaris*. Smoky-brown nasal tufts and style of head and back as in that species. Lateral tail-feathers imperfectly barred and only toward end, as in *nuttalli*. Red of crown of ♂ broken up anteriorly. Peculiar in disproportionate size of bill and feet: bill 1.10; tarsus 0.75. Lower California. *Picus lucasanus* XANTUS, 1859; *P. scalaris lucasanus* COUES, of all previous eds. of the Key; *Dryobates scalaris lucasanus* RIDGW. 1885; A. O. U. Lists, 1886–95, No. 396 a.

D. nuttalli. (To Thos. Nuttall. Fig. 397.)

NUTTALL'S WOODPECKER. Similar, but more white, this prevailing on back over the black bars; nape chiefly white; nasal tufts buffish or white; lateral tail-feathers, especially, sparsely



FIG. 397. — Nuttall's Woodpecker, nat. size. (From Elliot.)



FIG. 398. — Hairy Woodpecker. (From *The Osprey*.)

or imperfectly barred. The Californian coast form, N. to Oregon, differing decidedly in some respects, and constantly. Barring restricted to back proper; hind neck black, succeeded anteriorly by a white space adjoining the red, wanting in *scalaris*, where red joins black. Red chiefly confined to occiput: rest of crown black, sprinkled with white. Lateral tail-feathers white, not barred throughout, having but 1-3 black bars, all beyond their middles, all but the terminal one of these broken. White postocular stripe running into white nuchal area, but cut off from white of shoulders. White maxillary stripe enclosed in black as in *scalaris*, but this black continuous with the cervical black patch, which is not the case in *scalaris*. No smoky-brown state of under parts observed. *Picus scalaris nuttalli* of all previous eds. of Key, now raised to specific rank: *Dryobates nuttalli* RIDGW. Proc. U. S. Nat. Mus. viii, 1885, p. 355; A. O. U. List, 2d ed. 1895, No. 397.

D. arizo'næ. (Lat. of Arizona.) ARIZONA WOODPECKER. Entirely different from any of the foregoing or following species. Adult ♂: Upper parts dark brown, immaculate; top of head, rump, and 4 middle tail-feathers darker; occiput with scarlet band. Sides of head with white postocular and maxillary bands, expanded and more or less confluent on sides of neck. Wing-quills like back, their outer webs with a few small white spots, inner webs with more numerous larger white spots or broken bars. Outermost tail-feathers evenly barred throughout with blackish-brown and white: intermediate feathers partly so banded, but mostly blackish. Entire under parts sordid whitish, thickly spotted with dusky; the markings few and somewhat linear on throat, crowded and cordate on breast, widening and tending to become bars on lower belly, flanks, and crissum. Bill and feet blackish-plumbeous. Size of a small *villosus*: wing 4.50; tail 3.00; bill 1.12; tarsus 0.75; middle toe and claw 0.90. ♀ similar: no red on nape: color of upper parts duller, and some feathers of middle of back barred with white. Young: Like adults of the respective sexes: but top of head brown like back, and spotted with red. A Mexican species, occurring in the mountains of S. W. New Mexico and S. Arizona. Eggs 3 or more, indistinguishable from those of related species; size about 0.84×0.62 . *P. stricklandi* of the Key, 2d and 3d eds. 1884, 1887, p. 482, and *Dryobates stricklandi* of the A. O. U. List, 1st ed. 1886, No. 398, but not the true *P. stricklandi* of MALLERBE, Rev. Zool. 1845, p. 373, with which erroneously identified by RIDGW. Proc. U. S. Nat. Mus. viii, 1885, p. 355; *P. arizonæ* HARGITT, Ibis, Apr. 1886, p. 115; *Dryobates arizonæ* RIDGW. Man. 1887, p. 286; COUES, Key, 4th ed. 1890, p. 903; A. O. U. List, 2d ed. 1895, No. 398; *Dendrocopos arizonæ* HARGITT, Cat. Pic. Brit. Mus. 1890, p. 228, where Mallerbe's plate (pl. 28, fig. 4, of his Monog. Pic.) and descr. of the ad. ♂ of *P. stricklandi* is said to have been taken from a specimen of *D. arizonæ* in the British Museum: so that our misidentification was quite an easy mistake.

D. villo'sus. (Lat. *villosus*, hairy, shaggy, villous. Figs. 398, 399.) HAIRY WOODPECKER. GREAT GUINEA WOODPECKER. Spotted and lengthwise streaked, but



FIG. 399. — Hairy Woodpecker, nat. size. (5d. nat. del. E. C.)

usually 9-10 long; outer tail-feathers wholly white. Back black, with a long white stripe down the middle. Quills and wing-coverts with a profusion of white spots: usu-

ally 6-7 pairs on primaries, several on all secondaries, and one or more on each covert. Four middle tail-feathers black; next pair black and white; next two pairs white, as stated. Under parts white. Crown and sides of head black, with a white stripe over and behind eye; another from nasal feathers running below eye to spread on side of neck; a scarlet nuchal band in ♂, sometimes broken in two, wanting in ♀. Young with crown mostly red or bronzy, or even yellowish. Eastern N. Am., common; accidental in England. Length usually 9.00-10.00; extent 15.50-17.50; wing 4.50-5.00; tail 3.50; bill 1.12; whole foot 1.66. Varies greatly in size, mainly according to latitude; birds of the dimensions just given constitute typical *villosus* of most parts of the U. S., directly connected on the one hand with the larger northern *D. v. leucomelas*, on the other with the smaller *D. v. auduboni*. These facts have long been known, and have been recognized in former editions of the Key by presenting the species under the three phases called *a. major*, *b. medius*, and *c. minor* — terms now replaced by more formal nomenclature of the two extremes, leaving the mean to stand as *D. villosus* proper. This species in the West shades directly into *D. v. hyloscopus* and *D. v. harrisi*, by disappearance of the spots from the coverts and inner secondaries; the change occurs on the eastern slopes of the Rocky Mts. One of the common eastern U. S. Woodpeckers, but not so often noticed as the little *pubescens*, as it is less familiar, and keeps more in the woods. Resident wherever occurring. Eggs 3-6, or 7, 1.00×0.75 to 0.85×0.65 , Apr.-June.

D. v. leucom'elas. (Gr. λευκός, *leukos*, white, and μέλας, *melas*, black.) NORTHERN HAIRY WOODPECKER. BOBDAERT'S WOODPECKER. Very large and hoary. Length up to 11.00; wing over 5.00; tail nearly 4.00; whole foot 1.90; bill 1.50! Northern N. Am., from the northern tier of the U. S. through British America to the Pacific in Alaska.

D. v. aud'uboni. (To J. J. Audubon.) SOUTHERN HAIRY WOODPECKER. AUDUBON'S WOODPECKER. Very small and dark. Grading down to 8.00, thus within an inch of the maximum of *D. pubescens*. South Atlantic and Gulf States, from N. Carolina and Tennessee to Louisiana and S. E. Texas.

D. v. hylos'copus. (Gr. ἵλοσκοπός, *huloscopos*, watching over woodland, as the god Pan was said to do, or as any forester does; ὄλη, *hule*, woods, and σκοπός, a watchman.) ROCKY MOUNTAIN HAIRY WOODPECKER. CABANIS' WOODPECKER. Exactly like *villosus*, excepting fewer wing-spots and white lores; generally none on coverts and inner quills; with specimens enough we can see the spots disappear one by one. Generally white below, but in some regions less pure and immaculate, thus grading into *D. v. harrisi*, from which it was not separated in the 1st-3d editions of the Key. Size of average *villosus*. Western U. S. from the Rocky Mts. to the Pacific, excepting the special range of *D. v. harrisi*, and southward into Mexico. This is the ordinary white-bellied "hairy" Woodpecker of wooded regions in most parts of the Western U. S., as distinguished from the smoky-bellied *harrisi* of the N. W. coast region. *Dryobates hyloscopus*, Cab. and Heine, Mus. Hein. iv, Pt. ii, 1863, p. 69; *D. v. hyloscopus* BREWST. Auk, July, 1888, p. 252; A. O. U. List, 2d ed. 1895, No. 393 d. *P. v. hyloscopus* COUES, Key, 4th ed. 1890, p. 903.

D. v. montic'ola. (Lat. *monticola*, inhabitant of a mountain; *mons*, gen. *montis*, a mountain; *colere*, to cultivate, inhabit; *incola*, an inhabitant.) ROCKY MOUNTAIN HAIRY WOODPECKER. Said to differ from *D. v. hyloscopus* in larger size, whiter under parts, and chiefly or entirely black lores as in *villosus*. Wing 5.20; tail 4.20. Alleged range in the Rocky Mts. from New Mexico to Montana, and Uintah Mts. of Utah. *D. v. montanus* ANTHONY, Auk, Jan. 1896, p. 32, changed to *D. v. monticola* ANTHONY, Auk, Jan. 1898, p. 54; A. O. U. Suppl. List, Auk, Jan. 1899, p. 110, No. 393 e.

D. v. har'risi. (To Edward Harris, friend of Audubon, and his companion on the memorable Missouri River voyage of 1843.) COLUMBIAN HAIRY WOODPECKER. HARRIS' WOODPECKER. Exactly like *hyloscopus*, in fewness or entire lack of white spots on the wing-coverts and inner quills, but smoky-gray instead of white below, and sometimes acquiring a few thin

black streaks on the sides. Size of *hyloscopus* or average *villosus*. Pacific coast region, N. California to S. Alaska, especially well marked in the Columbia River region and in British Columbia. *Picus harrisi* AUD. 1839; *P. c. harrisi* COUES, Key, orig. ed. 1872, p. 194 (including *hyloscopus*), and of most later writers; *Dryobates v. harrisi* RIDGW. MAN. 1887, p. 283 (including *hyloscopus*; A. O. U. List, 2d ed. 1895, No. 393 *c* (excluding *hyloscopus*)).

D. pubescens. (Lat. *pubescens*, coming to puberty; *i. e.* hairy. Figs. 400, 401.) DOWNY WOODPECKER. LITTLE GUINEA WOODPECKER.

“CHECKERBOARD.” Usually 6-7 long; outer tail-feathers barred with black and white. Exactly like *D. villosus*, except in these respects. Length 6.00-7.00; extent 11.00-12.00; wing 3.50-4.00; tail under 3.00; bill about 0.66; whole foot 1.25. Eastern N. Am., common in orchards, and all wooded places; accidental in England. Range substantially the same as that of the Hairy Woodpecker, but in most U. S. localities the more abundant of the two; on the whole rather more southerly; the most typical form from the S. Atlantic and Gulf states, at or near minimum dimensions here given. To the average bird of the eastern United States the A. O. U. now gives the name *D. p. medianus*, restricting *pubescens* proper to the small southern form (see Sw. F. B. A. ii, 1831, p. 308; BREWSTER, Auk, Jan. 1897, p. 82; A. O. U. List, *ibid.*, p. 120, No. 394 *c*).

This is the little spotted bird that bores the apple-trees so persistently: but it does not appear to hurt them. There is no such difference in the character of the plumage as the terms “downy” and “hairy” imply. Both these species are commonly called Sapsuckers, a name that should be restricted to the species of *Sphyrapicus*, and also Guinea Woodpeckers, from the profusion of white spots as on the Guinea-hen (*Numida meleagris*). The nest of the little Checkerboard may be found in a dead limb or trunk of any tree. Eggs 3-6, 0.85×0.65 to 0.70×0.55 , April-June.

D. p. nelsoni. (To E. W. Nelson.) NORTHERN DOWNY WOODPECKER. NELSON'S WOODPECKER. Bearing same relation to *D. pubescens medianus* that *leucomelas* does to *villosus*, being large and hoary. Alaska and northern British America. OBERHOLSER, Pr. U. S. Nat. Mus. xviii, 1895, p. 549; A. O. U. Suppl. List, Auk, Jan. 1897, p. 120, No. 394 *d*. (Included under *pubescens* in all former eds. of the Key.)

D. p. homorus. (Gr. ὄμος, *homoros*, neighboring, bordering on; ὄμος, *homos*, same, common, joint, and ὄρος, *horos*, boundary, limit.) ROCKY MOUNTAIN DOWNY WOODPECKER. BATCHELDER'S WOODPECKER. Bearing same relation to *D. pubescens* that *hyloscopus* does to *villosus*, having few or no spots on coverts and inner quills; belly white, as in *pubescens*. Rocky Mt. region of U. S. and British Columbia and westward, but rarer than *pubescens* in the East and not found in some places where *hyloscopus* abounds; types of the subspecies from



FIG. 400. — Downy Woodpecker.



FIG. 401. — Downy Woodpecker, nat. size. (Ad. nat. del. E. C.)

southern California; others from New Mexico and Colorado. This form has until lately been included in the Key and other works under *gairdneri*; but it offers a case precisely parallel with that of *hyloscopus* as compared with *harrisi*. *Picus gairdneri* AUCT. in part, of former eds. of the Key. *P. meridionalis* HEERM. nec SW. *D. homorus* CAB. & HEINE, Mus. Hein. iv, pt. 2, 1863, p. 65. *D. p. homorus* RIDGW. Man. 2d ed. 1896, p. 597; A. O. U. Suppl. List, Auk, Jan. 1897, p. 126; *Dryobates p. oreaceus* BATCH. Auk, July, 1889, p. 253; A. O. U. List, 2d ed. 1895, No. 394 b. *Picus p. oreaceus* COUES, Key, 4th ed. 1890, p. 903.

D. p. gairdneri. (To Dr. Meredith Gairdner, a Scotch naturalist.) COLUMBIAN DOWNY WOODPECKER. GAIRDNER'S WOODPECKER. Bearing the same relation to *D. pubescens* that *harrisi* does to *villosus*; wing-spots few or wanting on inner quills and coverts; belly smoky-gray. Pacific Coast region of the United States and British Columbia. *Picus gairdnerii* Aud. 1839; *P. pubescens gairdnerii* COUES, Key, orig. ed. 1872, p. 194 (including *homorus*), and of most later writers; *Dryobates p. gairdnerii* RIDGW. Man. 1887, p. 283 (including *homorus*); A. O. U. List, 2d ed. 1895, No. 394 a (excluding *homorus*); also, *D. p. fumidus* MAYNARD, Orn. and Ool. Apr. 1889, p. 58.

XENOPICUS. (Gr. *ξένος*, *xenos*, rare, foreign.) MASKED WOODPECKERS. Form as in *Dryobates*. Body uniformly black. Head white. Tongue but little more extensible than in *Sphyrapicus*; its tip can be protruded less than an inch.

X. albolarvatus. (Lat. *albo*, with white; *larvatus*, masked.) WHITE-HEADED WOODPECKER. Body not banded, streaked, nor spotted. Uniform black; whole head white, in ♂



FIG. 402. — European Three-toed Woodpecker (*Picoides tridactylus*), $\frac{2}{3}$ nat. size; hardly distinguishable in the cut from *P. americanus*. (From Brehm.)

with a scarlet nuchal band; a large patch of white on wing, formed by white spaces on both webs of primaries, divided only by their black shafts; on secondaries commonly resolved into a number of blotches. Bill and feet plumbeous-blackish. Iris red. ♀ without red on nape. Length 8.75–9.50; extent 15.75–16.25; wing 5.00–5.25; tail 3.50. Mountains of California, Oregon, Washington, and southern British Columbia; E. to some portions of Idaho and Utah, common in pine woods, ranging up to 9,000 feet or more, resident or imperfectly migratory. A remarkable species, unique in coloration, and still more peculiar in the little extensibility of the tongue, which can be pulled out scarcely an inch; that of *D. villosus*, on the contrary, extending 2 inches or more beyond end of bill. This species nests chiefly in June, but from May to July, seldom at any considerable height, often quite near the ground; eggs 3–7, oftenest 4, averaging 0.95×0.70 , with a variation of 0.15 in length.

PICOIDES. (Lat. *picus*, a woodpecker; Gr. *είδος*, *eidos*, resemblance.

Fig. 402.) THREE-TOED WOODPECKERS. Three-toed: hallux (1st toe) absent, 4th toe reversed as usual in the family. Bill about as long as head, stout, straight, with bevelled end

and lateral ridges, and nasal tufts hiding nostrils; very broad and much depressed at base, with lateral ridges very low down, in most of their length close to and parallel with commissure; nostrils very near commissure; gouys about as long as from nostrils to end of bill. Wings very long and pointed; 1st quill spurious; 2d between 6th and 7th in length. Crown with a square yellow patch in ♂: sides of head striped, of body barred, with black and white; under parts otherwise white; quills but not coverts with white spots; tail-feathers unbarred, outer white, central black. All the species of this genus are unquestionably modified derivatives of one circumpolar stock; the American seem to have become completely differentiated from the Asiatic and European, and further divergence has perfectly separated *arcticus* from *americanus*; but *dorsalis*, *alascensis*, and *americanus* are still linked together.

Analysis of Species and Subspecies.

Back uniform black	<i>arcticus</i>
Back with entirely interrupted lengthwise white stripe	<i>americanus</i>
Back with nearly or quite uninterrupted lengthwise white stripe. Rocky Mts., U. S.	<i>a. dorsalis</i>
Back intermediate between the two foregoing. Alaska	<i>a. alascensis</i>

P. arcticus. (Lat. *arcticus*, arctic. Fig. 403.) BLACK-BACKED THREE-TOED WOOD-

PECKER. Entire upper parts glossy blue-black, with only a few white spots paired on wing-quills. Below, white from bill to tail; sides, flanks, and lining of wings barred with black. A slight or concealed white postocular stripe (often wanting) and a side-stripe on head from across forehead to neck, cut off by black from white of under parts. Four middle tail-feathers black, rest white, but the intermediate one usually touched with black. ♂ with a square yellow patch on crown, wanting in ♀. Bill and feet blackish-plumbeous; iris brown. Length 9.00-10.00; extent 15.00-17.00; wing 5.00-5.50; tail 4.00; bill 1.25 or more. Northern N. Am., S. in winter through most of New England and generally along the northern tier of U. S., casually to Connecticut, Pennsylvania, and Illinois, in the mountains of the West to about 39° in Nevada and California. Breeds all through its regular range, which includes the Adirondacks of New York, and is not specially marked in habits, but mainly affects coniferous forests. Eggs oftenest 4, in May and June, averaging 0.95×0.72 .



FIG 403 — Arctic Three-toed Woodpecker. (From The Osprey)

P. americana'us. (Of America.) LADDER-BACKED THREE-TOED WOODPECKER. Upper parts black, middle line white, more or less completely barred across with black; general effect thus of a "ladder-back." All primaries and secondaries with paired

white spots or bars. Four middle tail-feathers black, others white, the intermediate one usually touched with black. Below, white from bill to tail; sides, flanks, and lining of wings black-barred. A white postocular stripe to nape, and a larger white stripe from lore to side of neck. ♂ with a yellow square on crown, wanting in ♀; in both, crown seldom uniform black. Bill and feet blackish-plumbeous; iris brown. Smaller than the last; length 8.00–9.00; extent 14.00–16.00; wing 4.50–5.00; tail under 4.00; bill 1.25 or less; whole foot 1.50. Northern N. Am. to the limit of large conifers, S. to Massachusetts and along northern tier of states, less frequently than the foregoing, but breeds with it in the Adirondacks; general habits the same; eggs indistinguishable, averaging a trifle smaller, 0.92×0.70 .

P. a. alascensis. (Lat. of Alaska.) ALASKAN THREE-TOED WOODPECKER. Resembling the last; back more broadly barred with white, the bars more or less confluent; white postocular stripe more distinct; dark bars of the sides narrower. Alaska, British Columbia, and Washington. *P. tridactylus alascensis* NELSON, Auk, Apr. 1884, p. 165; *P. americanus alascensis* RIDGW. Pr. U. S. Nat. Mus. viii, 1885, p. 355; COUES, Key, 3d ed. 1887, p. 880; A. O. U. List, 2d ed. 1895, p. 162, No. 401 a.

P. a. dorsalis. (Lat. *dorsalis*, relating to *dorsum*, the back.) POLE-BACKED THREE-TOED WOODPECKER. In extreme case, back with an uninterrupted white lengthwise stripe, producing the effect of a “pole-back,” as in *D. villosus* for instance; this is produced by such increase of white on ends of individual feathers that their black bases do not show, the subterminal black bars of *P. americanus* disappearing. Usually partly banded black and white, and grading bar by bar into *americanus*. The amount of spotting on wings is about as in *D. harrisi* — on primaries and secondaries, not on coverts. Size of *americanus*. Rocky Mt. region, S. to New Mexico and Arizona, where it breeds, N. and N. W. indefinitely, mosaiculating with other forms. Eggs 5 or fewer, indistinguishable, April–June.

SPHYROPICUS. (Gr. *σφύρα*, *sphura*, a hammer; and Lat. *picus*.) SAP-SUCKING WOODPECKERS. Bill about as long as head, not so stout and chisel-like as in the foregoing genera; pointed, with little bevelling at extreme end only, and lateral ridges running obliquely into the commissure at about its middle; culmen and gonyes both a little curved; nasal tufts moderate. Wing pointed by 4th primary; 3d and 5th nearly as long; 2d between 6th and 7th; spurious 1st very short. Tail-feathers long-aeminate. Outer hind toe little longer than outer front one; inner hind toe extremely short. Plumage highly variegated with yellow and red. Sexes unlike in *S. varius*, extremely so in *S. thyroideus*, alike in *S. ruber*; such variation in this respect among congeneric species being highly exceptional in the family. Tongue scarcely extensile; tip obtuse, brushy; hyoid bones short. Birds of this remarkable genus feed much upon fruits, as well as insects, and also upon sap and soft inner bark (cambium); they injure fruit-trees by stripping off the bark, sometimes in large areas, instead of simply boring holes. Of the several small species commonly called “sapsuckers,” they alone deserve the name. In declaring war against Woodpeckers, the agriculturist will do well to discriminate between these somewhat injurious and the highly beneficial species.

Analysis of Species and Subspecies (adults).

- Sexes sub-similar. Belly yellowish or whitish. Rump black and white. Oblique white wing-bar.
 - Head fully striped. Breast with black patch. Crown crimson; ♂ throat crimson, ♀ white.
 - Crimson of ♂ throat strict; no red band on nape. Belly yellowish. Eastern *varius*
 - Crimson of ♂ throat spreading; additional red on nape. Belly whitish. Western *v. nuchalis*
- Sexes similar. Whole head, neck, and breast, crimson or carmine. Pacific Coast *ruber*
- Sexes very dissimilar. Belly clear yellow. Rump immaculate white.
 - Oblique white wing-bar. Head glossy black, striped with white. Throat crimson. No circumscribed black breast-plate *thyroideus* ♂
 - No white wing-bar. Head brown, without definite white or red. An isolated black breast-plate. Most of the body barred *thyroideus* ♀

S. varius. (Lat. *varius*, variegated. Fig. 404.) YELLOW-BELLIED WOODPECKER. RED-THROATED SAPSUCKER. SQUEALER. Crown crimson, bordered all around with black; chin, throat, and breast black, enclosing a large crimson patch on the former (in ♂; in ♀ this patch white); sides of head with a white line starting from nasal feathers and dividing black of throat from a transocular black stripe, this separated from black of crown by a white postocular stripe; all these stripes frequently yellowish. Under parts dingy yellow, brownish and with sagittate dusky marks on sides. Back variegated with black and yellowish. Wings black with a large oblique white bar on coverts; quills with numerous paired white spots on edges of both webs. Tail black, most of the feathers white-edged: inner webs of the middle pair, and upper coverts, mostly white. Bill brownish; feet greenish-plumbeous; iris brown. Young birds lack definite black areas of head and breast, and crimson throat-patch, these parts being mottled gray: but in any plumage the bird is recognized by its *yellowness*, different from what is seen in any other eastern species, and broad white wing-bar, to say nothing of generic characters. Length 8.25-8.75; extent 15.00-16.00; wing 4.80-5.20; tail 3.25. Eastern N. Am., common in most U. S. localities, as either summer resident or migratory: in the interior N. to 61° or farther, N. W. to the borders of British Columbia; in the U. S. west to the Dakotas, Nebraska, Kansas, Indian Territory, and Texas; S. in winter from Virginia to Central Am. and the West Indies: accidental in Greenland. The Sapsucker breeds throughout the greater part of its N. Am. range, S. in the mountains of North Carolina and Tennessee: eggs 5-7, about 0.57×0.67 , varying at least 0.10 in length: they are mostly laid late in May and early in June. The hyoid bones are the shortest of those of any N. Am. species: the tongue is protrusible only about $\frac{1}{3}$ inch beyond bill. This is the true Sapsucker, which injures the orchardist, and brings the beneficial species of *Dryobates* into disrepute.

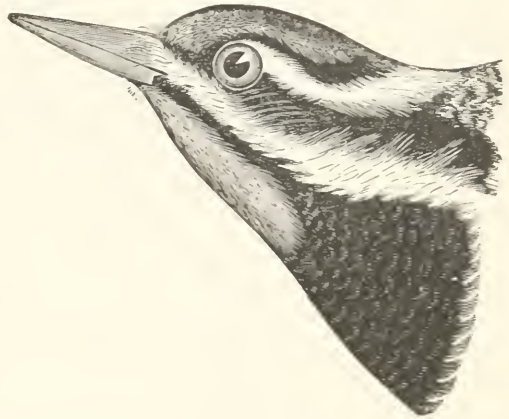


FIG. 404. — Yellow-bellied Woodpecker, nat. size. (Ad. nat. del. E. C.)

S. v. nuchalis. (Lat. *nuchalis*, pertaining to *nucha*, the nape: not classic.) NUCHAL WOODPECKER. RED-NAPED SAPSUCKER. Like the last; with an additional band of scarlet on nape (where the white is seldom even tinged with red in *S. varius*): red throat-patch invading the surrounding black, and ♀ with this patch at least in part red: all the yellowish variegation very pale, almost white on belly (where *varius* is yellowest): bill slaty-black (not brownish). Rocky Mt. region, U. S., and British Provinces, W. to Sierras and Cascades: S. into Mexico and Lower California: casually to Kansas and southern California. In *S. varius* red rarely spreads on nape, and ♀ seldom has any on throat. In *S. v. nuchalis* this extension of red is a step which culminates in *S. ruber*. The general habits, nest, and eggs are the same as those of *S. varius*.

S. ruber. (Lat. *ruber*, red.) RED-BREADED WOODPECKER. Adult ♂ ♀: Like the last, but whole head, neck, and breast carmine or crimson, in which the markings of *varius* are more or less completely dissolved, though usually traceable: in the young, gray with a dull reddish suffusion, as if the head had been dipped in claret wine. Size of the last. Pacific Coast region, from S. Alaska to N. Lower California, and E. of the Cascade range in Oregon, Washington, and British Columbia, resident southerly, migratory northerly, abundant, especially in coniferous woods. A remarkable extreme, long supposed to be perfectly distinct: the ♂ now

known to intergrade in every degree with that of *S. v. nuchalis*. On the strength of this fact the bird was rated as a subspecies, *S. v. ruber*, in the 2d–4th eds. of the Key. But the sexes are alike; consequently there is no intergradation in the ♀, and specific distinctness may be formally declared on this score. The red of the head is only less complete than in *Melanerpes erythrocephalus*, in full-feathered adults; its tint, and extent on the breast, vary much. Nests in deciduous trees, as well as conifers, and preferably live ones, excavating a hole 6 to 12 inches deep, with a small round opening, usually at considerable height; eggs 5 or 6, averaging 0.92×0.69 , laid from the latter half of April to the middle of June in different latitudes or at different altitudes.

S. thyroideus. (Gr. *θυροειδής*, *thureocides*, Lat. *thyroideus*, shield-like; *θυρεός*, *thureos*, a shield; *εἶδος*, resemblance; alluding to black plastron of ♀. Figs. 405, 406.) BROWN-HEADED WOODPECKER (♀). BLACK-BREASTED WOODPECKER (♀). RED-THROATED WOODPECKER (♂). WILLIAMSON'S WOODPECKER (♂). Adult ♂: Glossy black, including all the tail-

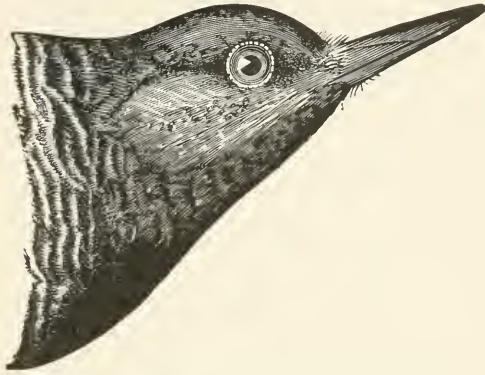


FIG. 405. — Brown-headed Woodpecker (♀), nat. size. (Ad. nat. del. E. C.)

feathers. Belly gamboge yellow. A narrow scarlet patch on throat. Upper tail-coverts, broad oblique bar on wing-coverts, postocular stripe, stripe from nostrils below eye and ear, and small, in part paired, spots on quills, white. Lining of wings, sides of body, flanks, and crissum varied with white, leaving the black in bars and cordate spots. Bill slate-color; mouth pinkish, feet greenish-gray, claws black, iris dark reddish-brown. Length 9.00–9.50; extent 16.00–17.00; wing 5.00–5.50; tail 3.75; bill 0.90; whole foot 1.67. Adult ♀: Altogether different; only upper tail-coverts white and belly yellow as in ♂; only continuously black in a shield-shaped area of varying extent on breast. Coverts, inner secondaries and most tail-feathers, closely and regularly barred crosswise with black and white, or brownish-white (most brownish on body, quite white on wings and tail). Whole head uniform hair-brown, invaded more or less with the variegation of the body, sometimes with traces of the postocular stripe of ♂, and sometimes touched with red on throat. Quills more heavily white-spotted than in ♂, the spots paired on all the feathers, changing to bars on the inner ones. Two or three intermediate tail-feathers black, but middle and one or two outer pairs barred. Size of the ♂. The extraordinary sexual differences long kept *thyroideus* and “*williamsoni*” apart in the books as perfectly distinct species; especially as they begin with the first featherings, fledg-

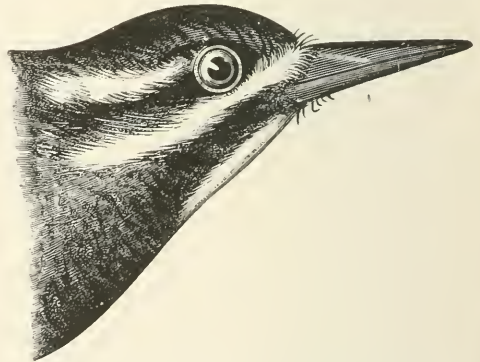


FIG. 406. — Red-throated Woodpecker (♂), nat. size (Ad. nat. del. E. C.)

lings in the nest showing the opposite patterns perfectly. Young ♂: Like adult; no red in white throat-patch; belly merely yellowish; tail varied with white. Young ♀: Like adult, but whole head, neck, and breast banded with dusky and gray, conformable with the general

variegation of body. The best ♀♀ are those with cleanest brown head and most black breast. Though the general effect of this beautiful Woodpecker is so peculiar, in each sex, the coloration is referable to the *pattern* of *S. varius*. In both, yellow belly, red throat (♂), white upper tail-coverts, spotted quills, varied flanks and crissum, stripes on head, black breast (only circumscribed in ♀), white oblique wing-bar (only developed in ♂), variegation of inner web of middle tail-feather (♀ and young ♂); general variegation of back of *varius* repeated in ♀, while gray head of young *varius* is met by brown head of ♀ *thyroideus*. The identity of the sexes was not established till 1873; the ♀ was first discovered, and named *thyroideus* in 1851; the ♂ was described as *williamsoni* in 1857, as *rubrigularis* in 1858. Rocky Mts. to the Pacific, U. S. and British Columbia, S. into Mexico, migratory northerly, resident southerly, chiefly in the pine-belt, of which it is one of the characteristic species, like Lewis' Woodpecker, Clark's Crow, Steller's Jay, and other birds; abundant in favorable localities up to 10,000 feet. Nest in dead wood, usually coniferous, at little or great height indifferently; eggs 3-7, oftenest 5 or 6, averaging 0.97×0.67 , with a range of 0.12 difference in length. This extremely interesting bird has been referred to no fewer than 6 genera — *Picus*, *Pilumnus*, *Centurus*, *Colaptes*, *Melanerpes*, and *Chaloscopus* — besides its own. It is strictly a *Sphyrapicus*, with little extensible, brushy, and obtuse tongue, and feeds on juices of trees, as well as insects and berries.

CENTURUS. (Gr. κέντρον, *kentron*, a prickle; ὄψα, *oura*, tail; but the species not sharper-tailed than other Woodpeckers.) ZEBRA WOODPECKERS. Bill about as long as head, compressed, little bevelled or truncate at end, with decidedly curved culmen; lateral ridges near culmen, subsiding before reaching end of bill; nasal tufts moderate, partly concealing nostrils. Outer hind toe shorter than outer anterior one. Wings and tail ordinary. Sexes alike, except less or no red on head of ♀. "Ladder-backed;" back and wings, except larger quills, closely banded with black and white; primaries with large white blotches near base, and usually a few smaller spots; below, immaculate, except sagittate black marks on flanks and crissum; belly tinged with red or yellow; 9-10 long; wing about 5.00; tail about 3.50. In these characters, exhibited by our species, the genus only differs from *Melanerpes* in pattern of coloration, and is reduced to a subgenus thereof by the A. O. U. This is technically defensible; but for my purposes the two genera are most conveniently kept apart. (For A. O. U. nomenclature substitute *Melanerpes* for *Centurus* for three following species.)

Analysis of Species.

- Belly reddening; no yellow about head, ♂ whole crown red; ♀ nape red. Eastern U. S. *carolinus*
- Belly yellowing; ♂ crown-spot red; ♀ no red on head.
- Front and nape yellow; rump entirely white; tail almost entirely black. Texas *aurifrons*
- No yellow on head; rump and tail much barred with black and white *uropygialis*

C. carolinus. (Of Carolina. Fig. 407.) RED-BELLIED WOODPECKER. ZEBRA-BIRD. Whole crown, nasal plumules, and nape scarlet in ♂; nape scarlet in ♀, the crown being ashy-gray. Sides of head, and under parts, grayish-white, usually with a yellow shade, *reddening* on the belly; tail black, one or two outer feathers white-banded; inner web of central feathers white with black spots, outer web of the same black with a white space next the shaft for most of its length; white predominating on rump. Bill and feet dusky plumbeous. Iris red. Large; length nearer 10.00 than 9.00; extent 16.50-17.50; wing 5.00-5.50; tail 3.50-4.00; bill over 1.00; ♀ smaller. Varies much in size; southern specimens smaller than northern. Young of each sex resemble the adults sufficiently to be unmistakable, though the markings are not well defined; red of head indistinct; belly rather buffy than reddish. Eastern U. S., somewhat southerly, rarely N. to Massachusetts and Ontario, but regularly reaching some portions of New York, Michigan, Wisconsin, Minnesota, and S. Dakota; W. to Iowa, Kansas, Nebraska, Indian Territory, some parts of Texas, and base of Rocky Mts.; southerly

resident, less so northerly, where migratory for the most part, though occasionally seen in winter throughout its regular range; breeds throughout, from late April to early June; nest high or low, in dead wood, preferably of deciduous trees, sometimes conifers; eggs 3-6, usually 4 or 5, 1.00×0.72 , ranging in length from 0.90 to 1.05, and in breadth from 0.66 to 0.76.

C. aurifrons. (Lat. *aurum*, gold; *frons*, forehead.) **YELLOW-FRONTED WOODPECKER.** Somewhat similar to the last: belly *yellowish*, not reddish; red of head in ♂ confined to a

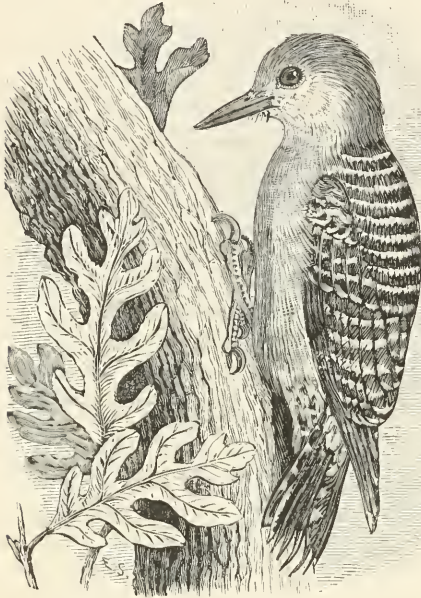


FIG. 407. — Red-bellied Woodpecker, reduced (Sheppard del. Nichols sc.)

crown-patch, in ♀ wanting. Forehead and nasal plumes golden-yellow; nape with a golden, orange, or reddish band (in both sexes, besides the scarlet crown-patch of ♂). Ladder-rungs of back narrow, numerous, and distinct. Head and under parts clear ashy-gray, very different from the smoky-gray of *uropygialis*; belly yellowish; flanks and crissum whitish, varied with black. Upper tail-coverts white, not barred. Middle tail-feathers entirely black; outermost not entirely barred; next black or only touched with white. Bill and feet bluish-black. Iris red. Length 9.50-10.50; extent 16.50-17.50; wing 5.00-5.50; tail 3.25-3.75; bill 1.30. ♀ differs as said. Young ♂:

Distinctively like adult; nearly all the crown bronzy-red; nasal plumes not yellow, nape dull yellowish; a few thin streaks of dusky on breast. Texas and southward; resident and very abundant in suitable localities on the Lower Rio Grande. Habits not peculiar. Nest often in telegraph-poles. Eggs 4-7, usually 5 or 6, 1.00×0.75 , laid in April and May.

C. uropygia'lis. (Gr. *οὐροπύγιον*, *ouropugion*, Lat. *uropygium*, the rump; banded in this species, not white as in *aurifrons*.) **GILA WOODPECKER. SAGUARO WOODPECKER.** Head all around and entire under parts fulvous-gray; front and nape not notably different; middle of belly yellowish; flanks and crissum whitish with black bars and cordate spots; middle of crown crimson in ♂. Back, rump, upper tail-coverts, wing-coverts, and inner quills closely and regularly banded with black and white, latter not pure on dorsal region. Primaries blackish, not regularly barred or spotted like inner quills, but slightly white-tipped and edged, and with large white blotches at base, of irregular shapes and tending to resolve into sets of smaller spots. Middle pair of tail-feathers black, with long white shaft-space on outer web, on inner web white with black bars and spots; intermediate tail-feathers black; outermost regularly barred with black and white; next to outermost thus barred at end only. Bill blackish; feet plumbeous. Size of the others, or rather less. ♀ without red on head. A peculiar species, abounding in the valley of the Gila and Lower Colorado, and southward, where it nests usually in the giant cactuses or saguaros (*Cereus giganteus*). The range of these strange arborescent plants, so singularly suggestive of colossal candelabras, seems closely coincident with that of the bird which makes its home in them. It extends up the Colorado to Fort Mojave at least, doubtless reaching S. Nevada, and probably touching the S. W. corner of Utah; up the Gila to S. W. New Mexico; is common also in some parts

of Lower California, and extends in W. Mexico to Aguas Calientes and Jalisco. Eggs 3-5, 0.97×0.70 on an average, with the usual range of variation, thus indistinguishable from those of several other species; laid April and May.

MELANERPES. (Gr. μέλας, *melas*, black; ἕρπης, *herpes*, a creeper.) **TRICOLOR WOODPECKERS.** Bill about as long as head, depressed at base, compressed beyond, culmen and gonyes ridged but curved throughout, sides of upper mandible distinctly ridged but a little way, end of bill pointed with little bevelling; nasal tufts small, not concealing nostrils. Outer posterior and anterior toes of equal lengths. Wings pointed by 3d, 4th, and 5th quills; 2d shorter than 6th; 1st spurious. Plumage lustrous and "broad" in coloration, with black, white, and red in masses, little or not spotty or streaky. Sexes alike and young different, or sexes unlike and young similar. Our two species are very different, requiring no analysis of their characters.

M. erythrocephalus. (Gr. ἐρυθρός, *eruthros*, red; κεφαλή, *kephale*, head. Fig. 408.) **RED-HEADED WOODPECKER.** **TRICOLOR.** Adult ♂ ♀: Beautifully tricolor with "the red, white, and blue." Back, wings, and tail glossy blue-black; secondaries, upper tail-coverts, under wing-coverts, under parts from breast, and ends of some outer tail-feathers, white. Whole head, neck, and fore breast crimson, usually black-bordered where adjoining the white. The white of wings and rump is pure; that of belly usually tinged with ochraceous or reddish; the white quills have black shafts. The red feathers are stiffish and somewhat bristly in their colored portions. The gloss is sometimes green instead of blue. Bill and feet dusky horn-color. Iris brown. Length 8.50-9.50; extent 16.00-18.00; wing 5.00-5.50; tail 3.50; bill 1.00-1.12; whole foot 1.67. Young ♂ ♀: Red parts of adult, gray, streaked with dusky; the red appears in irregular patches. Feathers of back and wing-coverts skirted with light gray, and mixed with concealed whitish, in bars. Primaries and tail-feathers tipped and edged with white. White of secondaries broken with black bars or spots. At a very early age, whole under parts streaked with dusky much like the head, but these parts whiten before the head reddens. Eastern U. S. and British Provinces, irregularly rare or common northerly, abounding in most U. S. localities except New England; common N. to 49° along Red River of the North; W. to Rocky Mts., sometimes to Utah, Arizona, and California; migratory in most sections, yet also resident to some extent throughout its range, being seen in the depth of winter even along our northern border — it is a bundle of contradictions in this and most other respects. A very familiar bird, in orchards and gardens as well as in woods, conspicuous as a gay tricolor banner, and a great genius, no less brilliant and versatile in character than in plumage — very accomplished, of endless resources, with tricks and manners enough to fill the rest of this volume with good reading matter! Feeds much on acorns, nuts, berries, and various fruits as well as upon insects; sometimes lays up a store, like the Californian Woodpecker, and to some extent is cannibalistic. Nest anywhere in wood, preferably the blasted top of a tree, dug to a depth of a few inches or two feet, with a round hole too small to admit the hand. Eggs 4-8, usually 5 or 6, averaging 1.00×0.75 , but very variable, glossy and roundish as usual in the family, in most of its range laid late in May and early in June. Two broods southerly.

M. formicivorus. (Lat. *formica*, an ant; *voro*, I devour. Fig. 409.) **ANT-EATING WOODPECKER.** **ARIZONA ACORN WOODPECKER.** Adult ♂ ♀: Glossy blue-black; rump, bases



FIG. 408. — Red-headed Woodpecker, reduced. (Sheppard del. Nichols sc.)

of all quills, edge of wing, and under parts from breast, white; sides with sparse black streaks; forehead squarely white, continuous with a stripe down in front of eyes and thence broadly encircling throat, there becoming yellowish; this cuts off completely the black around base of bill and on chin; crown in ♂ crimson from the white front, in ♀ separated from the white by a black interval; frequently a few red feathers in the black breast-patch, which is not sharply defined behind, but changes by streaks into the white of belly (in this respect approaching the S. Mexican form called *striatipectus*, in which the black area is entirely broken up into streaks). Bill black; eyes white, often rosy, creamy, yellowish, milky, bluish, or brown. Young not particularly different, but have the head-markings less defined, the red bronzy, and at an early age over the whole crown of both sexes; black parts less pure; black streaks of sides blurred. In ♀, the succession of white, black, and red on crown is very sharp and square; the white frontlet and black coronal areas, taken together, are broader lengthwise



FIG. 409. — Californian Woodpecker, nat. size. (Ad. nat. del. E. C. (Bill at a minimum.)

than the red occipital bar. In some specimens of either sex, the secondaries are edged and tipped with white. The gloss is sometimes rather green than blue. Length (average of ♂ ♀) 9.50; extent 18.00; wing about 5.50; tail 3.75. My measurements of many Arizona specimens in the flesh show no adult under 8.80 long \times 17.00 in extent, ranging thence up to ♂ 9.90 \times 18.70, with no constant difference between the sexes; the bill ranges from 0.87 to 1.12, averaging 1.00 for both sexes and all ages. Southwestern U. S., from W. Texas through New Mexico

and Arizona, to contiguous parts of California E. of the Sierras Nevadas, and S. into Mexico, common resident. This is not particularly a bird of oak woods; I found it abundant in the pineries about Fort Whipple, where it breeds. Eggs about 1.00 \times 0.75. *M. formicivorus* of the Key, orig. ed. 1872, p. 197, reverted to by the A. O. U. in Auk, Jan. 1897, p. 120, No. 407. *M. formicivorus bairdi* of the Key, 2d-4th eds., 1884-90, p. 489, and of A. O. U. Lists, 1886-95, No. 407, in part (includes this form and the next). *M. f. aculeatus* MEARN, Auk, July, 1890, p. 249; see Auk, Jan. 1891, p. 88, and RIDGW. Man. 2d ed. 1896, p. 597. This means that all the U. S. birds combined were wrongly separated from the typical Mexican bird; whereas the distinction is to be made between the latter and the California Coast bird, as follows:

M. f. bairdi. (To S. F. BAIRD.) BAIRD'S WOODPECKER. CALIFORNIAN ACORN WOODPECKER. Like the last, throat more decidedly yellowish; black breastplate more solid for a considerable area; averaging slightly larger, the bill especially longer and stouter. Length averaging over 9.50 and extent over 18.00; wing nearly 6.00; tail 4.00; bill 1.12-1.40. Pacific Coast region, abundant in California and N. to 44° in Oregon, mostly confined to areas W. of Sierras Nevadas and Cascade Range, but occasionally E. of latter in Oregon; N. Lower Cal. Particularly a bird of the oak belt; acorns are its principal food, and it is noted for the habit of sticking them in little holes that it digs for the purpose, till whole branches are often studded in this curious manner. It nests preferably in oaks but also in other trees; eggs 4, 5 or more, April-June, averaging 1.10 \times 0.90, and thus rather larger than those of *formicivorus* proper, but indistinguishable. The general manners and bearing of all the forms of this species are most like those of our common Red-headed Woodpecker. (Synonymy as above indicated; also *M. f. melanopogon* TEMM., of HARGITT.)

M. f. angustifrons. (Lat. *angustus*, narrow, straitened; *frons*, forehead.) **NARROW-FRONTED WOODPECKER.** The white frontal bar narrower; bill somewhat differently shaped. In the ♀ the white frontal bar is narrower than the succeeding black coronal bar, and both together are narrower than the red occipital bar; in both sexes the frontal bar is hardly over 0.25 in length. Throat decidedly yellowish, and this color also tingeing the forehead in some cases; pectoral black plate more broken up in streaks than in *bairdi*, about as in *formicivorus* proper. Rather small, like *formicivorus*; wing averaging under 5.50, but bill relatively large, about 1.20. Cape region of Lower California.

ASYNDESMUS. (Gr. a privative, *σύν*, *sun*, together; *δεσμός*, *desmos*, a bond; alluding to loosened texture of feathers of certain parts.) **BRISTLE-BELLIED WOODPECKERS.** Bill

almost colaptime in general aspect, but with short distinct lateral ridges as in *Melanerpes*: as long as head, rather longer than tarsus, not broader than high at base, compressed and somewhat curved toward end; pointed with scarcely any lateral bevelling, culmen curved and scarcely ridged; gonys straight. Wings of excessive length, folding nearly to end of tail, and peculiar in proportion of primaries: 4th quill longest, 3d and 5th about equal and shorter than 2d. Inner anterior claw reaching little beyond base of outer anterior. Feathers of under

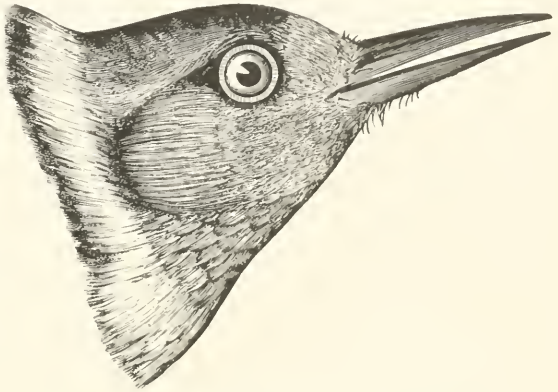


FIG. 410. — Lewis' Woodpecker, nat. size. (Ad. nat. del. E. C.)

parts and of a nuchal collar with the fibrille of their colored portions enlarged in calibre, bristly, of silicious hardness, loosened and disconnected, being devoid of barbicels and hook-

lets. Dorsal plumage compact, of intense metallic lustre. Feathers of face soft and velvety. Sexes alike, young distinct. I named this genus in 1866; it is a good one, as genera go now; I continue to uphold it, as in former eds. of the Key, 1872-90; so does the latest monographer of the *Picidae* (HARGITT, Cat. B. Brit. Mus. xviii, 1890, p. 137), who disallows even subgeneric difference of *Centurus* from *Melanerpes*. (Subgenus of *Melanerpes*, A. O. U. Lists.)

A. torquatus. (Lat. *torquatus*, collared. Figs. 410, 411.) **LEWIS' WOODPECKER. COLLARED WOODPECKER.** Adult ♂ ♀: Upper parts, including wings and tail, flanks and crissum, green-black with intense bronzy lustre, especially on back — this iridescence almost like that of *Quiscalus arvensis*. Face dark crimson, in a patch of velvety feathers around bill and eyes.

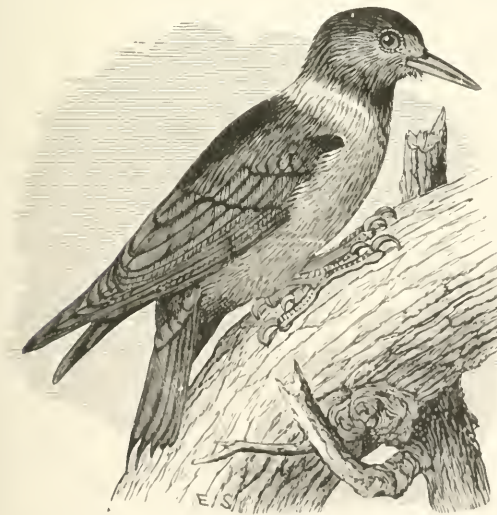


FIG. 411. — Lewis' Woodpecker, reduced. (Sheppard del. Nichols ac)

A narrow distinct collar around back of neck, and breast, hoary bluish-gray, gradually bright-

ening behind on under parts to intense rose-red or lake, delicately pencilled in hair lines with hoary-gray. No white on wings or tail, their under surfaces simply black. Bill blackish; feet greenish-plumbeous. Iris brown. Length 10.00–11.00; extent 20.00–22.00; wing 6.50–7.00; tail 4.50; bill 1.20. Young: Little lustre at first, but this soon appears, before any red. Little or no trace of hoary collar or crimson mask; face sooty-black; throat and breast mixed fuscous and gray, changing on belly to sooty-black, tinged or slashed here and there with red. The hoary and lake-red are established with the feathers that are of the bristly character above described. A remarkable bird, inhabiting wooded mountainous parts of the West, especially the pine-belt, Rocky Mts. to the Pacific, U. S. and adjoining British Provinces of Alberta and British Columbia; E. regularly to the Black Hills of S. Dakota, casually to Kansas; it was discovered by the Lewis and Clark Expedition near Helena, Mont., Sat., July 20, 1805. It is found with Clark's Crow and Steller's Jay; is wild and wary like the Pileated Woodpecker, but a much less noisy and more sedate bird than most of the tribe; keeps high up in trees, and in flying looks more like a Crow than a Woodpecker. Its aerial excursions are very conspicuous, especially when it is foraging for insects like a Flycatcher; in ordinary flight it winnows the air steadily, in direct courses, unlike the cycloidal curves made by most Woodpeckers, which almost close the wings as they loop along. It is resident, or only migratory from extremes of its range in latitude or altitude; I have observed it in summer from Montana to Arizona. Nidification is not peculiar; coniferous trees are commonly selected for excavation, which may be made to a depth of two feet or more, with a hole that hardly admits the hand. The eggs are laid in May and June, 5–9 in number, usually 6–8, averaging about 1.05×0.80 , but ranging in length from 0.95 to 1.15, and in breadth from 0.65 to 0.85. *M. torquatus*, A. O. U. Lists.

COLAPTES. (Gr. *κολαπτής*, *kolaptes*, a chisel, hammer.) GILDED WOODPECKERS. FLICKERS. Bill about as long as head, slender and weak for this family, without any lateral ridges

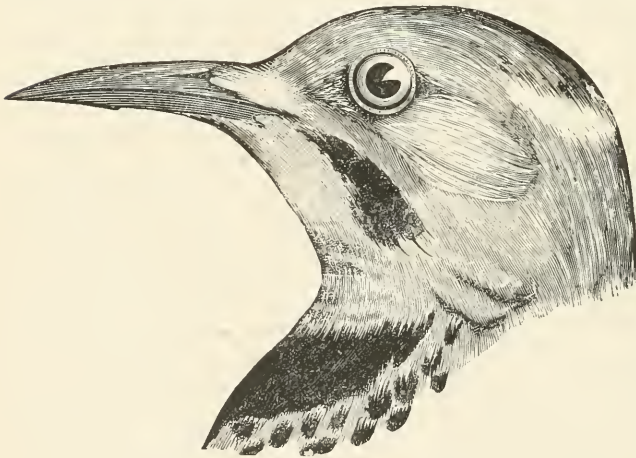


FIG. 412. — Flicker, nat. size. (Ad. nat. del. E. C.)

or bevelling, pointed without truncation; culmen and commissure curved, gonys nearly straight, only about half as long as culmen; nostrils not concealed by the slight nasal tufts; culmen and gonys, however, both ridged. Outer posterior toe shorter than outer anterior; inner posterior toe very short. Wings long, pointed by 3d to 6th quills; 2d shorter than 7th; 1st about $\frac{2}{3}$ the 2d. Tail lengthened. Sexes generally alike, but distinguishable by positive marks about head.

Plumage highly variegated and very showy. Under parts with numerous circular black spots on a pale ground. A large black pectoral crescent. Rump snowy-white. Back, wing-coverts, and innermost quills brown with an olive or lilac shade, and thickly barred with black; quills and tail black, excepting as below stated; red or black cheek patches in ♂, wanting in ♀. About 12.00 long; wing about 6.00; tail 4.50. A beautiful genus, of several American species, besides those of North America.

Analysis of Species and Subspecies or Variations.

- ♂ Black moustaches and red nape. Rump snowy-white.
 Wings and tail golden-yellow underneath; belly yellowish; back olivaceous-brown; throat lilac-brown; cap ash.
 Eastern N. A. *auratus* and *luteus*
 [Characters mixed in every degree between the foregoing and next following. Upper Missouri and Rocky Mt.
 regions *ayresi*]
 - ♂ Red moustaches and no red on nape. Rump snowy or slightly pinkish white
 Wings and tail orange-red underneath; belly not yellowish; back brownish; throat ash; cap lilac-brown. Wing
 6.50; bill 1.50.
 Back lighter brown. The stock form of Western N. A. *mexicanus*
 Back darker brown. The dark form of the N. W. coast region *m. saturator*
 - Wings and tail brick-red underneath; rump soiled whitish; belly not yellowish; back brownish; throat ash; cap
 cinnamon-brown. Wing 6.00; bill 1.60. Guadalupe Island *rufipileus*
 - Wings and tail golden-yellow; belly hardly yellowish; back umber-brown; throat ash; cap cinnamon-brown. Wing
 hardly 6.00; bill 1.40.
 Back lighter brown. The stock form of Southwestern N. A. *chrysoides*
 Back darker brown. The dark form of some parts of Lower California *c. brunnescens*
- Obs. It will be noted how curiously these species are distinguished mainly by different combinations of common characters.

C. auratus. (Lat. *auratus*, golden, gilded. Figs. 412, 413.) GOLDEN-WINGED WOODPECKER. YELLOW-SHAFTED WOODPECKER. PIGEON WOODPECKER. FLICKER. YUCKER. YARUP. WAKE-UP. CLAPE. HIGH-HOLE. HIGH-HOLDER. YELLOW-HAMMER. Back and exposed surfaces of wing-coverts and secondaries olive-brown with numerous black bars. Rump snowy-white; upper tail-coverts white, mixed with black. Primaries blackish, with golden shafts, and glossed with golden underneath, at their bases paler and more tawny yellow. Tail-feathers above black, their shafts and under surfaces golden, blackened at ends, the outermost with a few touches of yellow or white. Top of head, with back and sides of neck, ash, with a scarlet nuchal band (in both sexes). Sides of head, whole chin, throat, and fore-breast lilac-brown, with broad black cheek-patches, these "moustaches" wanting usually in the ♀, exceptionally showing red touches in the ♂. A broad black pectoral semilune. Other under parts shading from a lighter shade of color of breast into creamy-yellow, marked with numerous circular black spots. Bill and feet dark plumbeous. Iris brown. Length 12.00-13.00; extent 18.00-21.00, usually about 20.00; wing 5.75-6.25; tail 4.50; bill 1.25-1.50; whole foot 2.33. Young similar: more red on head. Eastern N. Am.; N. to Labrador, Hudson's Bay, etc., and farther N. W. to the Arctic circle; casual in California; accidental in Greenland and Europe; in the West regularly to the Great Plains, but in the easternmost foothills of the Rocky Mts. meeting and mixing with *C. mexicanus* (see next article). The species keeps pretty pure to the Upper Missouri, where adulterated with *mexicanus*; pure to the Pacific in Alaska. The first deviation is appearance of red feathers in black maxillary patches; these increase till they prevail, finally to exclusion of black, resulting in the wholly red patch of *mexicanus*. With this change occurs diminution and final extinction of the scarlet nuchal crescent; when, coincidentally, we find the characteristic golden-yellow on wings and tail passing through an intermediate orange into the red



FIG. 113. — Golden-winged Woodpecker, 1 nat. size. (From Brehm.)

of *C. mexicanus*, a change accompanied with another affecting the peculiar lilac-brown of throat and olive-brown of back, which become respectively ashen and purplish-gray. One of the most abundant and best-known species of the family, in any woodland, sometimes foraging for food in open country far from trees; a great ant-eater and berry-picker. A lively bird, of sunny temperament, like its feathers, faithful and devoted, assiduous and successful in domestic affairs, and a good housekeeper. The bill of the Flicker is not so strong a "hammer and tongs" as that of most Woodpeckers, and the bird excavates sound wood for a nest less extensively than those of other genera; it generally takes advantage of natural holes in decayed trees, stumps, posts, etc., and sometimes selects very odd nooks — it is known to have burrowed even a haystack, and has nested within buildings. Eggs 5-9, usually 6 or 7; under exceptional circumstances 18 to 23 have been taken from one hole; a case is recorded of 19 young birds in good order in one nest; and another in which systematic robbery induced one bird to lay 71 eggs in 73 days! The eggs average 1.10×0.85 , with extremes of 1.20×0.90 and 0.97×0.82 in a series of 196 measurements (BENDIRE).

C. a. luteus. (Lat. *luteus*, yellowish, luteous.) NORTHERN FLICKER. This name designates northerly specimens of the common Flicker, with those who wish to restrict the name *auratus* to S. Atlantic and Gulf Coast specimens. Range given as from N. Carolina northward, west to the Rocky Mts., and occasional on the Pacific slope from California northward. BANGS, Auk, Apr. 1898, p. 177; A. O. U. Suppl. List, Auk, Jan. 1899, p. 111, No. 412 a. [*C. ayresi* (AUD.). *C. hybridus* (BD.). *C. aurato-mexicanus* (SUND.). AYRES' WOODPECKER. HYBRID FLICKER. YELLOW-AND-RED-SHAFTED FLICKER. A species, subspecies, variety, race, strain, hybrid, or transitional form, in which the respective characters of *C. auratus* and *C. mexicanus* are blended in every conceivable degree in different specimens. Moustaches red or black, or partly both, on one or both sides of the body, and present or absent in the ♀; red moustaches present with yellow wings and tail, or black ones with red wings and tail. Red nuchal crescent present or absent; present in connection with red wings and tail. Either of the foregoing features concurrent with ashy or with lilac brown throat; either color of throat coincident with yellow or with red wings and tail. Wings and tail gilded on some of the feathers, rubricated on others on one or both sides. Such Flickers prevail widely in the Rocky Mountain region, in some parts to the exclusion of birds showing the proper characters of either species. The case is unique in ornithology, and has proved refractory to the machinery of zoological classification — *tot homines, tot sententiæ*. It was first brought to light in 1843, when Audubon found the birds he subsequently named *C. ayresii* at old Fort Union, at the mouth of the Yellowstone river, on the Missouri, at the present border between North Dakota and Montana; I have read in his manuscript, penned on the spot, his naive expressions of amazement at a phenomenon which has served to pique curiosity and complete perplexity from that day to this. But to me it seems a simple case of hybridization on a grand scale, with reproduction of fertile offspring sharing the characters of both parents, and perpetuating their mixed kind, no doubt with repeated or continuous infusion of pure blood from each side of the house. But so remarkable a result of interbreeding or intergradation should not be ignored, as it is in the A. O. U. List; and I see no objection to giving it a name. No one objects to the term *Canis familiaris* for the domestic dog, which is certainly a composite product of various canine ancestry.]

C. mexicanus. (Of Mexico.) RED-SHAFTED WOODPECKER. MEXICAN FLICKER. Back, rump, and upper surfaces of wings and tail as in *C. auratus*, but a different shade of color, a faintly reddish replacing the olivaceous tinge of the common brownish ground-color. Wings and tail of the same pattern, but the auration replaced by rubefaction, the under surfaces being thus orange-red or even vermilion, instead of golden-yellow. Top of head like the throat of *C. auratus*, but more cinnamon than lilac-brown, especially on the forehead; no occipital red crescent in either sex. Throat and sides of head and neck clear ash, with scarlet maxillary

patches in ♂, the position of which may be indicated in the ♀ by brown patches. A black pectoral semilune, as in others of this genus. Under parts very pale lilac-brown, fading to whitish on the belly, marked with numerous round black spots. Bill blackish-slate; feet dark plumbeous. Iris brown. Size of *auratus*, or rather larger; length sometimes up to 14.00; wing up to 7.00; tail to 5.00; bill about 1.50. Western N. Am., mostly replacing *C. auratus* from the Rocky Mts. to the Pacific, but mixed therewith over the extensive region in which *C. ayresi* prevails; replaced by *C. saturator* on the N. W. coast; S. in Lower California to the San Pedro Mts., whence yielding to *C. chrysoides*; S. in Mexico to Tehuantepec. In habits a perfect counterpart of the common Flicker, with all of its vagaries, and even more irregular in residence or migration, as the character of the country inhabited is much more diverse. Ranges in mountains up to 10,000 feet, and thence down to sea level, in all kinds of woods, also sometimes far from any trees. It nests not only in holes in trees, as usual, but also in odd nooks about buildings, and has been known to burrow under ground. Eggs April-June, 5-10 or more, usually 6 or 8, indistinguishable from those of *C. auratus*, averaging a trifle larger, about 1.12×0.85 , running up to 1.25 and down to 1.00 in length. *C. mexicanus* Key, 1884-90; *C. cafer* A. O. U. Lists. With every disposition to follow the dogma and ritual of the A. O. U., I cannot bring myself to call this bird *C. cafer*, for no better reason than because *Picus cafer* GM. 1788 was mistaken for a bird of the Cape of Good Hope! Say what we please in our canons, there is something in a name after all, and "the letter of the law killeth" when wrenched from its spirit, in defiance of science and common sense. Individually I cannot incur the penalty of deliberately using for a North American bird a name only applicable to one from South Africa. The fact that "*Cafer*" is a sort of Latin for Caffraria or Caffrarian makes its use in this connection as bad as "Hottentot Woodpecker" or "Zulu Flicker" would be; and how would such a combination sound in plain English?

C. m. saturator. (Lat. comparative degree of *saturatus*, saturated, *sc.* with color; dark in color.) NORTHWESTERN RED-SHAFTED WOODPECKER. NORTHWESTERN FLICKER. The dark phase of *mexicanus*. Back deeper brown, approaching burnt umber; belly of a deeper color; throat dark ash or plumbeous; cap dark. No difference in size as a whole, or in any part. Pacific coast region from N. California to Sitka, Alaska. *C. m. saturator* RIDGW. Pr. Biol. Soc. Washn. Apr. 1884, p. 90; *C. cafer saturator*, A. O. U. Lists, 1st ed. 1886, 2d ed. 1895, No. 413*a*; RIDGW. Man. 1887, p. 296. Not admitted in previous eds. of the Key, not recognized in Brit. Mus. Cat. 1890.

C. rufipileus. (Lat. *rufus*, rufous; *pileum* or *pileus*, top of the head, crown, cap.) INSULAR RED-SHAFTED WOODPECKER. GUADALUPE FLICKER. Resembling *C. mexicanus*: smaller, wings and tail shorter, bill longer. Terminal black of the tail longer, occupying 2.50 instead of about 2 inches. Red parts of a dull brickly tone, like red-lead. Rump of a pale pinkish, or slightly soiled tint instead of pure white; crown cinnamon-brown, becoming deeper rufous anteriorly. Wing 5.90-6.25; tail 4.75-5.25; bill 1.60-1.85, slender, with decided curvature. An insular form, approaching *C. chrysoides* in some respects, especially the color of the crown, but distinctively red-shafted, not yellow-shafted. Guadalupe Island, Lower California, resident; nest in March and April; eggs about 6, 1.14×0.87 , indistinguishable from those of other species. *C. mexicanus rufipileus* RIDGW. Bull. U. S. Geol. Surv. Terr. ii. No. 2, 1876, p. 191; COUES, Key, 3d and 4th eds. 1887-90, p. 881; *C. rufipileus* RIDGW. Bull. Natl. Orn. Club, July, 1887, p. 60; A. O. U. Lists, 1st ed. 1886, 2d ed. 1895, No. 415; RIDGW. Man. 1887, p. 296.

C. chrysoides. (Gr. χρυσός, *chrysos*, gold; εἶδος, *eidos*, *eidos*, like.) GILDED WOODPECKER. GILA FLICKER. Body, wings, and tail substantially as in *C. auratus*; head as in *C. mexicanus*; ♂ with scarlet moustaches; no red on nape in either sex; crown cinnamon-brown; chin, throat, and fore-breast ash; sides tinged with creamy-brown, belly with yellowish. There are, however, some specialties. Golden of wings and tail less vivid than in *C. auratus*, that on the tail inclining to waxy-yellow; tail-feathers black for about half their length, their

shafts entirely black on top, though yellow in part underneath. General tone of under parts pale grayish-white, without the decided tints of either of the other species, the round black spots large and crowded. Top of head purer and more cinnamon-brown than in *C. mexicanus*; more nearly as in *C. rufipileus*. Small; length 11.00–12.00; wing 5.50–6.00; tail about 4.00; bill 1.50 or less. Gradation between this form and *C. mexicanus* has not yet been observed, but very likely does occur. Valley of the Gila and Lower Colorado rivers, Arizona, and contiguous portions of California, probably also reaching southern Nevada and the S. W. corner of Utah; Sonora; Lower California S. of Lat. 30°. Like the Gila species of *Centurus*, the Gila Flicker ranges in the region of the giant cactus, in which it nests in April, May, and June, laying 5 or fewer eggs, indistinguishable from those of other Flickers.

C. c. brunneiceps. (Lat. brownish, growing brown.) VENEERED WOODPECKER. Quite like *C. chrysoides*; upper parts darker; size slightly smaller. Terminal black of tail one-third its length, its yellow dull waxy contrasting with chrome yellow of the wings underneath; back bistre-brown; throat dark ash; cap cinnamon-brown; ground of lower parts grayish-white, with numerous round and cordate black spots; upper tail-coverts white, with large round black spots. San Fernando, Lower California. ANTHONY, Auk, Oct. 1895, p. 347; A. O. U. Suppl. List, Auk, Jan. 1897, p. 120, No. 414 a.

SUBORDER COCCYGES: CUCULIFORM BIRDS.

See p. 542 for analytical characters of the suborder, as now restricted to the two families *Cuculidæ* and *Musophagidæ*. Thus purged of its non-conformable elements, the group may be defined with precision, and must not be mistaken for the heterogeneous *Coccygomorphæ* or *Cuculiformes* of various writers, and of former editions of the Key. The *Coccyges* in the strict sense have lately been called *Zygoductyli*, a term expressive of a principal external characteristic, as the *Coccyges* are yoke-toed by permanent reversion or versatility of the 4th toe, but one which is not distinctive and therefore ineligible; for the Woodpeckers and several other families of Piciform birds share this character. The fundamental feature of *Coccyges* is the presence of the ambiens muscle, here only among *Picariæ*; the true Cuculiform birds are therefore homalognatous, all other Picarians being anomalognatous. They are furthermore the only ones with an accessory femorocaudal, as throughout the *Musophagidæ* and in several but not all the subfamilies of *Cuculidæ*. The flexor longus hallucis supplies the hallux; the flexor digitorum perforans has three tendons for the other three digits. The palate is desmognathous, without basipterygoids. The spinal pteryla forks in the scapular region. The two families are readily distinguished by the combination, in *Musophagidæ*, of the constant formula A B X Y, tufted oil-gland, no cæca, aftershafted plumage, versatile 4th digit, and 10 rectrices, as contrasted with the inconstant formula A B X Y or A X Y, nude oil-gland, two cæca, no aftershafts, permanently reversed 4th digit, and 10 or 8 rectrices, in *Cuculidæ*. The former family is exclusively Ethiopian; the latter is cosmopolitan.

Family CUCULIDÆ: Cuckoos.

Homalognatous Picariæ zygodactylous by reversion of the fourth toe. The only other North American birds with toes yoked in the same combination are *Picidæ* and *Psittaci*, whose numerous specialties will prevent any misconception regarding *Cuculidæ*. The latter are desmognathous in palatal structure, and homalognatous, having the ambiens and three or all four of the other leg-muscles used for classificatory purposes; in these important respects differing from all birds previously treated in this work. There are two carotids. The syringes vary from tracheobronchial through pseudobronchial to bronchial, paired. The oil-gland is nude, but cæca are present, and the plumage is not aftershafted. The family is a large and

important one. It comprehends quite a number of leading forms showing certain modifications of the syrinx or syringes, of the pterylosis, of the hind claw, and even of the myological formula. These correspond in great measure with certain geographical areas of faunal distribution, and are generally held to constitute subfamilies. But the subdivision of the family is still in such an unsatisfactory state, that I am fortunate in being required to treat critically of only the North American forms, which include representatives of three indisputably distinct subfamilies; among them are *Cuculina*, or typical Cuckoos allied to the European *C. canorus* (fig. 414), famous, like our Cowbird, for their parasitism. None of the *Cuculina* proper have an accessory femoro-caudal, their syrinx is tracheobronchial, and the

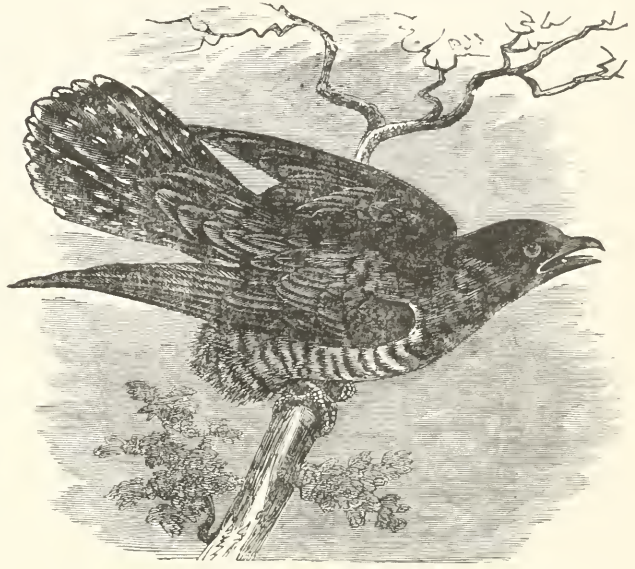


FIG. 414. — European Cuckoo, *Cuculus canorus*. (From Dixon.)

ventral pteryla gives off no lateral branches, though it is more or less split in two lateral halves by a median space. The Old World genera *Eudynamis* and *Phanicophaes* represent a group in which the muscle just named is present, the syrinx tracheobronchial, and the ventral pteryla branched on each side. The very large Old World genus *Centropus* represents yet another group, whose characters are much the same as the last said, but they are terrestrial, with long straight hind claws, being the so-called "Lark-heeled" or Spurred Cuckoos, or Coucals. In these the syringes are pseudo-bronchial. The Neotropical genera *Diplopterus* and *Dromococcyx* have peculiarly elongated upper tail-coverts; the *Couina* are a peculiar Madagasean type. Each one of the groups thus indicated may possibly be regarded as a subfamily, as is certainly the case with the groups represented by *Gococcyx* and *Crotophaga* respectively (see below). There are altogether over 40 genera and some 150 good species of the family. Many of them, besides the one instanced, lay eggs in other birds' nests. The American Cuckoos have been declared free of suspicion of such domestic irregularities; but, though pretty well behaved, their record is not quite clean: they do sometimes slip into the wrong nest. The curious infelicity seems to be connected in some way with the inability of the ♀ to complete her clutch of eggs with the rapidity and regularity usual among birds, and so incubate them in one batch. The nests of our species of *Coccyzus* commonly contain young by the time the last egg of the lot is laid.

We have four very distinct genera, representing three subfamilies.

Analysis of Subfamilies and Genera.

CROTOPHAGINÆ. Terrestrial. Tail of eight feathers.		
Bill compressed, crested. Plumage lustrous black		<i>Crotophaga</i>
NEOMORPHINÆ. Terrestrial. Tail of 10 feathers. Feet ambulatorial, with long tarsi. Wings short, concavo-convex.		
Bill long, slender. Plumage highly variegated		<i>Gococcyx</i>
CUCULINÆ. Arboreal. Tail of 10 feathers. Feet insessorial, with short tarsi. Wings long, flat.		
Plumage plain. Properly American (<i>Coccyzinæ</i>)		<i>Coccyzus</i>
Plumage variegated. Properly Old World		<i>Cuculus</i>

Subfamily CROTOPHACINÆ: Anis; Guiras.

Syringes bronchial. Myological formula including an accessory femoro-caudal. Ventral pterygia forked on each side. Tail of eight feathers, graduated, longer than rounded wings. Bill and externals of plumage differing in the two genera, *Crotophaga* and *Guira*, of which this small American subfamily is composed.

CROTO'PHAGA. (Gr. κροτών, *kroton*, a bug; φάγος, *phagos*, eating.) ANIS. Bill about as long as head, extremely compressed, cultrate with regularly convex or angulated culmen rising into a thin vertical crest, its sides smooth, wrinkled, or sulcate; tip of upper mandible decurved over end of lower; gonys straight. Wings rounded; 4th or 5th primary longest, 1st quite short. Tail-feathers broad, widening to very obtuse ends. Tarsus longer than middle toe, anteriorly broadly scutellate, the sides with large plates meeting in a ridge behind. Plumage uniform (black), lustrous; feathers of head and neck lengthened, lanceolate, distinct, with scale-like margins; face naked. Terrestrial. Nest in trees and bushes. According to the concurrent testimony of various independent observers, the euculie irregularity of nesting is expressed in a very curious manner, in the case of *C. ani* at least; several birds forming a sort of colony of Communists uniting to build a large nest to be used in common. The indefi-



FIG. 415.—Ani, $\frac{1}{2}$ nat. size. (From Brehm.)

nitely numerous eggs are greenish-blue, overlaid with a white chalky substance, easily rubbed off when fresh.

C. a'ni. (The Brazilian name. Fig. 415.) ANI. BLACK WITCH. TICK-BIRD. SAVANNA BLACKBIRD. Bill smooth or with a few transverse wrinkles; culmen regularly curved. Adult ♂ ♀: Black, with violet and steel-blue reflections, duller below; lanceolate feathers of head and neck with bronze borders. Iris brown. Length 13.00–15.00; wing 6.00; tail 8.00; tarsus 1.50.

Young simply dull blackish. Eggs very variable in size and shape, about 1.35×1.00 . Tropical America; West Indies; Florida and Louisiana; accidental near Philadelphia.

C. sulciros'tris. (Lat. *sulcus*, a groove; *rostris*, pertaining to the beak.) GROOVE-BILLED ANI. JEW-BIRD. Bill with 3 distinct grooves on upper mandible, parallel with the regularly curved culmen. Adult ♂ ♀: Black, with steel-blue and violet reflections, more olive-brown on belly; scaly feathers of head and neck bronzy, of breast, back, and wings metallic-greenish. Wings with 4th and 5th quills longest, 3d little shorter, 2d nearly an inch, 1st nearly 2 inches from point of wing. Bill more than twice as high as broad at the base; 0.85 high, 0.37 broad, 1.20 long. Bill and feet black, scaling grayish in some places. Iris brown. Length 14.50;

extent 17.00; wing 5.50-6.00; tail 7.50-8.00, graduated 2 inches; tarsus, or middle toe and claw, 1.50. Young dull sooty blackish. Tropical America; N. along the U. S. border, locally or irregularly; common in Texas in the lower Rio Grande valley, where it breeds. Eggs said to be usually five, but indefinitely numerous and no peculiarity of nesting noted in comparison with *C. ani*, both species being irregular; nest of twigs, lined with fibrous roots, leaves, etc., in a tree or bush; eggs averaging 1.25×0.95 .

Subfamily NEOMORPHINÆ: Ground Cuckoos.

Syringes pseudobronchial; myological formula and pterylosis as in *Crotophaginæ*. Tail of ten feathers, graduated, longer than the short, rounded, concavo-convex wings, which hug the body snugly when folded, and whose long inner secondaries reach nearly or quite to the ends of the primaries; upper tail-coverts also lengthened. Bill not peculiar. Feet large and strong, in adaptation to terrestrial habits, but hind claw not peculiar (as it is in *Centropodinæ*). This subfamily has a certain gallinaceous suggestiveness, the birds being more or less pheasant-like in external appearance. With the possible or probable exception of the genus *Carpococcyx* of Borneo and Sumatra, brought to this connection by some writers, the *Neomorphinæ* are exclusively American, and especially *Neotropical*. Three genera belonging to this group are *Neomorphus*, *Geococcyx*, and *Morococcyx*; from these the genera *Diplopterus* and *Dromococcyx* appear to differ little, in externals at any rate; though they have been put in a separate subfamily *Diplopterinæ*, characterized by the greater elongation of the upper tail-coverts, which reach to the end of the tail in *Dromococcyx*. Should the two last-named genera prove to agree with the *Neomorphinæ* proper in structural characters, and should *Carpococcyx* be referable elsewhere, the present would become a compact and well-characterized subfamily of American Ground Cuckoos. (Subfamily *Saurotherinæ* of former editions of the Key; but the uncertainty regarding the systematic position of the West Indian *Saurothera* makes it ineligible as the name-giving genus. In the most important respects *Saurothera* is said by Beddard to agree with *Piaya*, *Coccyzus*, etc., and thus to belong to the *Cuculina*. On external indications alone it is arranged by SHELLEY with *Piaya*, *Hyetornis*, etc., under a subfamily *Phanicocephalinæ*. As the name-giving genus of the present subfamily *Neomorphus* GLOGER, 1827, antedates *Geococcyx* WAGLER, 1831. See COUES, Auk, Jan. 1897, p. 90; A. O. U. Suppl. List, Auk, Jan. 1899, p. 110.)

GEOCOC'CYX. (Gr. γῆ, *ge*, the ground; κόκκυξ, *kokkuw*, a cuckoo. GROUND CUCKOOS. Head crested; most feathers of head and neck bristle-tipped; eyelids lashed; whole plumage coarse. A bare colored space around eye. Bill about as long as head, nearly straight, but with culmen and commissure much decurved toward end, gonys if anything a little concave, and rictus ample. Wings very short and concavo-convex, with long inner secondaries folding entirely over primaries; 4th, 5th, and succeeding primaries longer than 3d, 2d, and 1st, which rapidly shorten. Tail of 10 long tapering feathers, much graduated, making more than $\frac{1}{2}$ total length of the bird. Feet large and strong, in adaptation to terrestrial life; tarsus longer than toes, scutellate before and behind. Plumage lustrous and variegated above. Sexes substantially alike. Eminently terrestrial; nest in bushes; eggs numerous. Two species: *G. affinis* of Mexico, and the following.

G. californianus. (Of California. Figs. 416, 417.) GROUND CUCKOO. CHAPARRAL COCK. ROAD RUNNER. SNAKE KILLER. LIZARD BIRD. CURCA. PAISANO. CORRECAMINO. Most feathers of head and neck bristle-tipped; a naked area around eye; crown



FIG. 416. — Head of *Geococcyx*. (After Cassin.)

crested; plumage coarse. Adult ♂ ♀: Above, lustrous bronzy or coppery-green, changing to dark steel-blue on head and neck, to purplish-violet on middle tail-feathers; everywhere except on rump conspicuously streaked with white, mixed with tawny on head, neck, and wings — this white and buff streaking consisting of edges of the feathers, which are frayed out, fringe-like, producing a peculiar effect. Breast, throat, and sides of neck mixed tawny-white and black; other under parts dull soiled whitish. Primaries white-tipped and with oblique white space on outer webs. Lateral tail-feathers steel-blue with green and violet reflections, their outer webs fringed part way with white, their tips broadly white. Lower back and rump, where covered by the folded wings, dark-colored and unmarked; under surface of wings sooty-brown. Bare space around eye blue, bluish-white, and orange; iris red. Bill dark horn-color; feet the same, the larger scales yellowish. Young birds are very similar, the iridescence developing with the first growth of the feathers, as in a Magpie; more white and less tawny

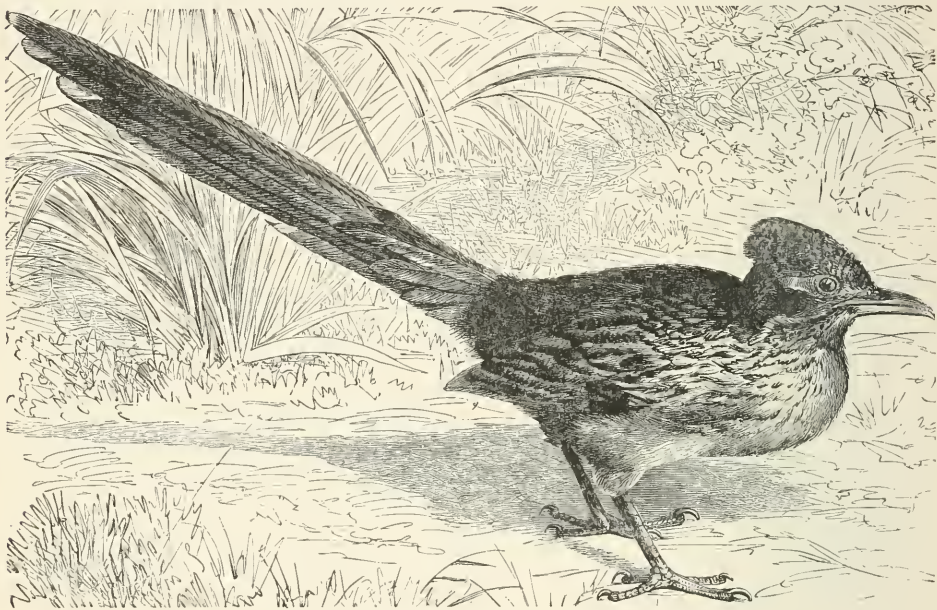


FIG. 417. — Ground Cuckoo, $\frac{1}{4}$ nat. size. (From Brehm.)

in the streaking. Nearly two feet long; tail a foot or less; wing 6-7 inches; tarsus 2.00; bill 1.66-2.00. Western U. S., southerly; N. in the Pacific coast region through California to Oregon, and in the interior to Nevada, Utah, Colorado, and southwestern Kansas; E. to portions of Oklahoma and western and southeastern Texas; S. through much of Mexico, including Lower California; a common resident in most of its U. S. range. A bird of remarkable aspect, noted for its swiftness of foot; aided by its wings held as outriggers, it taxes the horse in a race; feeds on fruits, reptiles, insects, land mollusks, sometimes small mammals and birds. Nest in bushes or low trees; a rather slight structure of twigs, with or without lining of various finer materials, as if the birds were just learning how to build, with a diameter of about a foot, and a depth of half as much; occasionally, an old nest of some other bird is appropriated. Eggs indefinitely few or many, 2 to 12 in a nest, perhaps not all laid by the same ♀, ordinarily 4 to 6, 7, 8, or 9, ovate or elliptical, white in ground color with an overlying chalky film which may take a slight yellowish tint, ranging in length from 1.45 to 1.75, averaging 1.55×1.20 . They are laid at considerable intervals; incubation begins as soon as a few are deposited, and

is believed to last 18 days for each egg. The development of the chicks is rapid; perfectly fresh eggs and newly-hatched young may be found together; and by the time the last young are breaking the shell the others may be graded up to half the size of the adult. The birds are sometimes domesticated, making amusing pets. They are singular birds — cuckoos compounded of a chicken and a Magpie!

Subfamily CUCULINÆ: Tree Cuckoos.

Syrinx tracheobronchial. Myological formula A X Y (no accessory femoro-caudal). Ventral pteryla unbranched on either side, but more or less extensively divided by a median space into right and left halves, this division extending throughout in sundry American genera, but not on the neck in Old World genera like *Cuculus*. Tail invariably of 10 soft feathers, usually rounded or graduated, rarely square or forked, and more or less nearly equalling the wings in length. Wings long and flat, not hugging the body closely when folded, and the point of the primaries extending decidedly beyond the end of the longest secondaries in the folded wing. Feet moderate, in adaptation to arboreal life; no peculiarity of the hind claws. These characters easily serve to distinguish the present subfamily from the two foregoing; but the full extent of their applicability, and therefore the content of the subfamily *Cuculina*, remains uncertain for lack of evidence in the cases of several genera. Regarding external characters alone, there are 17 genera which have the long flat wing, all but two of them exclusively Old World, and one of these two (*Cuculus* itself) only a straggler in America. It is probable that a subfamily *Coccyzina* can be maintained for the American Tree Cuckoos, as distinguished from those of the Old World, as given in former editions of the Key and in the A. O. U. Suppl. List, Auk, Jan. 1899, p. 110.



FIG. 418. — American Tree Cuckoo (*Coccyzus americanus*), reduced. (From Tenney, after Wilson.)

COC'CYZUS. (Gr. κοκκύζω, *kokkuzo*, to cry "cuckoo!" κόκκυξ, *kokkuix*, a cuckoo.) **AMERICAN TREE CUCKOOS. RAIN-CROWS.** Head not crested; all the feathers soft. Bill about equalling or rather shorter than head, stout at base, then much compressed, curved throughout, tapering to a rather acute tip; nostrils basal, inferior, exposed, elliptical. Wings pointed, but not longer than tail; inner quills not folding over much of the primaries; 3d and 4th primaries longest, 2d and 5th shorter, 1st much shorter still. Tail of soft rather tapering feathers, with very obtuse ends; much graduated. Tibial feathers flowing; tarsi naked, shorter than middle toe. Our species are strictly arboricole birds of lithe form, blended plumage and subdued colors: the head is not crested; the tibial feathers are full, as in a hawk; the sexes are alike, and the young scarcely different; the upper parts are uniform satiny olive-gray, or "quaker-color," with bronzy reflections. Lay numerous plain greenish elliptical eggs, in a rude nest of twigs saddled on a branch or in a fork. Though not habitually parasitic, they may slip an egg in other birds' nests, or in each other's, but they are rarely guilty of egg-sucking. Oviposition is tardy or irregular; the nests usually contain eggs in different stages of development, or eggs and young together. They are well-known inhabitants of our streets and parks as well as of woodland, noted for their loud, jerky cries, which they are supposed to utter most frequently in falling weather, whence their popular name, "Rain-crow." Migratory, insectivorous, and

frugivorous. They include in their insect fare enormous numbers of canker-worms and other caterpillars of the most noxious kinds, and are thus highly beneficial birds to man.

Analysis of Species and Subspecies.

Bill black and bluish.	
White below. Wings with little or no cinnamon. Tail-feathers not broadly white-ended . . .	<i>erythrophthalmus</i>
Bill black and yellow. Tail-feathers broadly white-ended.	
White below. Ears not dusky. Wings extensively cinnamon.	
Eastern form	<i>americanus</i>
Western form	<i>occidentalis</i>
Tawny below. Ears dusky.	
Tawny tint uniform	<i>minor</i>
Tawny tint bleaching anteriorly	<i>maynardi</i>

C. erythrophthalmus. (Gr. ἐρυθρός, *eruthros*, reddish; ὀφθαλμός, *ophthalmos*, eye. Fig. 420.) BLACK-BILLED CUCKOO. RAIN-CROW. Adult ♂ ♀: Bill blackish except occasionally



FIG. 419. — Yellow-billed Cuckoo, $\frac{1}{2}$ nat. size. (From Brehm.)

a trace of yellowish, usually bluish at base below. Above, satiny olive-gray. Below, pure white, sometimes with a faint tawny tinge on the fore-parts. Wings with little or no rufous. Lateral tail-feathers not contrasting with the central, their tips for a short distance blackish, then obscurely white; no bold contrast of black with large white spaces. Bare circumocular space livid; edges of eyelids red. Length 11.00–12.00; extent about 15.50; wing 5.00–5.50; tail 6.00–6.50; bill under an inch. Very young birds have the feathers of upper parts skirted with whitish; bill and feet pale bluish. Eastern U. S. and Canada, west to the Rocky Mts., N. to Labrador, common; rather more northerly than *americanus*, being the commoner species in New England; winters sparingly in Florida and on the Gulf Coast, but known to reach South America; accidental in Europe; migrates in the U. S. mainly in Apr., May, Sept., Oct.,

and breeds throughout about half of its N. Am. range in June and July, sometimes in May and August. I have found it nesting in Assiniboia near the Dakotan border. Nest preferably in bushes and small trees, often quite near the ground, rarely on it, a frail flat structure of twigs, with miscellaneous softer materials for lining; eggs 1.10×0.80 , pale bluish or greenish, usually



FIG. 420. — Black-billed Cuckoo.

deeper-colored, less elliptical and averaging smaller than those of the Yellow-billed Cuckoo, though probably not to be distinguished with certainty. They vary in length from 0.88 to 1.18, and in breadth from 0.75 to 0.90; the number found in nest is usually 3, 4, or 5, but exceptionally 2 to 7, almost invariably in different stages of incubation; they are occasionally dropped in the nest of the yellow-billed species, but only exceptionally slipped in nests of other birds, as a Dove's, Robin's, Catbird's, Flycatcher's, Warbler's, or Sparrow's. Eggs variously advanced in incubation are ordinarily found in the same nest with fledglings of different ages.

C. americanaus. (Lat. American. Figs. 418, 419, 421.) YELLOW-BILLED CUCKOO. RAIN-CROW. RAIN-DOVE. STORM-CROW. CHOW-CHOW. Adult ♂ ♀: Bill black, extensively yellow below and on sides of upper mandible. Feet dark plumbeous. Above, satiny olive-gray. Below, pure white. Wings extensively cinnamon-rufous on inner webs of the quills. Central tail-feathers like back; rest black with large white tips, outermost usually also edged with white. Very constant in color, the chief variation being in extent and intensity of cinnamon on wings, which sometimes shows through when the wings are closed, and even tinges the coverts. Young differ chiefly in having the white ends of the tail-feathers less trenchant and extensive, the black not so pure; this state approaches the condition of *erythrophthalmus*, but does not match it. Length 11.00-12.00; extent 15.50-16.50; wing about 5.50; tail about 6.00; bill a short inch; tarsus 1.00; middle toe and claw rather more. Eastern U. S., rather more southerly than the last species, but N. to Canada; W. to the limit of trees on the Plains, S. in winter to Costa Rica and the West Indies; accidental in Greenland, Europe; breeds throughout its N. A. range. Nest a slight structure of twigs, leaves, and catkins, on a bough or in fork of a tree rather than in a bush, seldom so low as that of the Black-billed usually is, and up to 25 feet or



FIG. 421. — Yellow-billed Cuckoo.

more; it is flat, about 5 inches in diameter by 2 or less deep; eggs 2 to 8, oftenest 3, 4, or 5, averaging 1.20×0.90 , ranging in length from 1.10 to 1.30, quite elliptical, pale fugacious bluish-green, fading paler still. In the South they may be taken in May, but in most parts in June, July, August. This species is a later spring migrant than the other, on the whole a later breeder, and rather earlier to leave in the fall; a few linger in winter on our Gulf border, but most pass on. Its eggs are not seldom dropped in nests of the other species, but rarely in those of other birds.

C. a. occidentalis. (Lat. pertaining to the setting sun, *i. e.* western.) WESTERN YELLOW-BILLED CUCKOO. Rather larger than the last, with stouter bill; length about 12.50; wing averaging nearly 6.00; tail over 6.00; bill a long inch, and 0.35 deep at base. Western U. S., Rocky Mts. to the Pacific, N. to British Columbia, S. through much of Mexico. RIDGW. Man. 1887, p. 273; COUES, Key, 4th ed. 1890, p. 903; A. O. U. List, 2d ed. 1895, No. 387 a. (Included under the foregoing in 2d and 3d eds. of the Key.)

C. minor. (Lat. of less size, smaller; used to express the comparative degree of the different word *parvus*, small.) MANGROVE CUCKOO. BLACK-EARED CUCKOO. Bill much as in *americanus*. Above, the same quaker-color, but more decidedly ashy-gray toward and on head. Below, pale orange-brown. Wings suffused with color of belly. Auriculars dark, in contrast. Tail as in *americanus*, but outer feather not white-edged. Size of the others, or rather less, but tail relatively longer, nearly 7.00. West Indies; Florida, Louisiana, and S. to Central and South America. Eggs as in *americanus*. (*C. seniculus* of all former eds. of the Key.)

C. m. maynardi. (To C. J. Maynard, author of a valuable work on the Birds of Florida.)

MAYNARD'S MANGROVE CUCKOO. Rather smaller than the last; wing 5.25; tail 6.50. Below, pale buff, bleaching anteriorly. The Bahaman form, which has also occurred on the Florida Keys. *Coccyzus maynardi* RIDGW. Man. 1887, p. 274; *C. minor maynardi* A. O. U. Suppl. List, 1889, p. 10; List, 2d ed. 1895, No. [386 a.]. *Coccygus seniculus maynardi* COUES, Key, 4th ed. 1890, p. 903; included under *seniculus* proper in earlier eds.

CU'culus. (Lat. *cuculus*, the European Cuckoo, *C. canorus*.) OLD WORLD TREE CUCKOOS. Head not crested. Bill moderate, not longer than head or tarsus. Nostrils rounded, pierced in a swollen membrane. Wings well pointed, longer than tail, reaching when folded beyond the upper coverts; the primaries barred crosswise. Tail graduated. Contains numerous species of nearly all parts of the Old World, one of them accidentally occurring within our limits.

C. cano'rus telepho'nus. (Lat. *canorus*, tuneful; *canor*, song, melody; *cano*, I sing: not well applied to a songless Picarian bird with non-oscine syrinx! Gr. $\tau\eta\lambda\epsilon$, *tele*, afar, far off, $\phi\acute{o}\nu\epsilon$, *phone*, voice, sound.) KAMSCHATKAN or SIBERIAN CUCKOO. TELEPHONE CUCKOO. General color above gray, below white, the wings and tail much barred, notched, or spotted with white, the under parts barred with black. Length about 14.00; wing 9.00 or more; tail 7.00 or more. A subspecies of the common Cuckoo, inhabiting Siberia, of accidental occurrence on the Pribiloff Islands (St. Paul, July 4, 1890: W. PALMER, Auk, Oct. 1894, p. 325). *Cuculus telephonus* HEINE, J. f. O. 1863, p. 352. *C. canorus telephonus* STEJ. Bull. U. S. Nat. Mus. No. 29, 1885, p. 224; A. O. U. List, 2d ed. 1895, No. [388. 1.].

Order PSITTACI: Parrots.

Feet zygodactylous by reversion of 4th toe, covered with rugose granular scales or plates; bill strongly epignathous, furnished with a (frequently feathered) cere, as in Birds of Prey,

short and extremely stout (except in *Nestor*); wings and tail variable in form; developed primaries 10; secondaries aquin-toeubital; rectrices 12 (14 only in *Orcopsittacus*). Parrots, including Macaws, Cockatoos, Lories, Paroquets, etc., form one of the most strongly marked groups of birds, as easily recognized by their peculiar external aspect as defined by anatomical structure. They were formerly included in an "order" *Scansores*, on account of the paired toes, but this is a comparatively trivial character, indicating no special affinity with other yoke-toed birds (see under *Picariæ*).

It is agreed by common consent that their peculiarities entitle them to rank with groups called orders in the present volume. They might not inaptly be styled *Frugivorus Raptores*; and in some respects exhibit a vague analogy to *Quadrumana* (monkeys) among mammals.

The tongue is thick and fleshy, in some genera peculiarly brushy; it has a horny nail on the under side at the end, like a human finger, and with this and its papilla or fringe on the

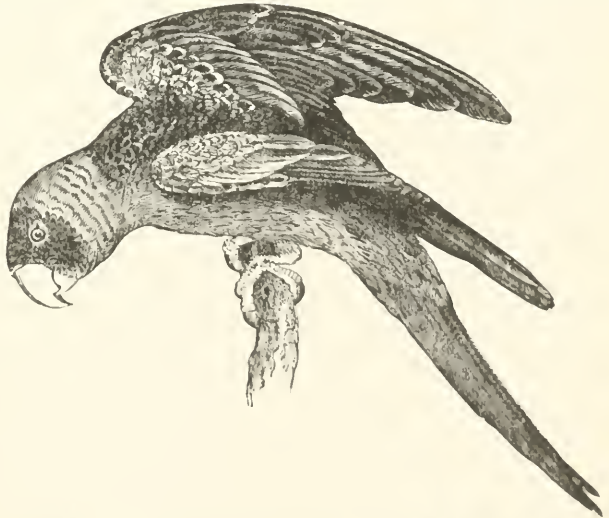


FIG. 422. — Carolina Parroquet, reduced. (From Tenney, after Wilson.)

other side forms a delicate tactile organ. It is used to some extent in prehension, objects being handled between itself and the upper mandible, and the palatal surface of the hook of the bill is furnished in most genera with a set of parallel ridges forming a sort of file or rasp. The tongue is borne upon a well-developed hyoidean skeleton, among the parts of which the large entoglossal or glossohyal is highly characteristic, being foraminiferous, or consisting of paired halves connected at the end by cartilage; the basihyal develops a pair of parahyal processes besides the usual urohyal, and the cornua are composed of long hypobranchials bearing jointed ceratobranchials. Ability to articulate human speech is one of the most notorious faculties of certain Parrots. This seems to be due to the lingual peculiarities just noticed, in connection with certain syringeal formations, for the syrinx is peculiarly constructed, in several different ways. The bronchial half rings may be weak and separate cartilages, or several of them consolidated into a bony box; there are three pairs of intrinsic muscles, and the extrinsic are inserted sometimes into the pleural membrane, instead of the sternum. Finally it may be noted in this connection that the bill is used in *climbing*, like a hand; the upper mandible being much more freely movable upon the skull than is usual among birds. This mobility is secured by the articulation instead of suture of the maxillæ, premaxillæ, and nasals with the frontal, palatals, and jugals. The mandibular symphysis is strong, short, and obtuse; the lower jaw is like a thumb as opposed to the finger-like upper jaw, and the jaws as a prehensile organ may be likened to the claw of a lobster.

Other osteological characters are: Palate desmognathous; nasals holorrhinal; nasal septum much ossified; bony orbits of eyes frequently completed ring-like by union of lacrymals with postorbital processes of the squamosal; no basipterygoids. Cervical vertebræ as a rule 14, rarely 13 or 15; atlas either notched or completely perforated by odontoid process of axis. Sternal ribs 5 or 6; sternum entire behind, or there fenestrate, more rarely with one pair of notches. Furculum variable; weak, or without symphysis, or so defective as to be reduced to its coracoid end, or wanting entirely. Tarsometatarsus short and thick, its lower end modified to suit the position of 4th toe. There are 3 decided modifications of the carotids — right and left present, both running deep in the vertebrarterial canal; or both present and the left superficial; or only the left developed. In the digestive system: a well-developed œsophageal crop and zonary proventriculus; gall bladder usually wanting (present in *Cacatua*); intestines extremely variable in length in different genera (at a maximum in *Eclectus*). Oil-gland absent from certain genera, present and tufted in others. Plumage aftershafted, in many cases including powder-down feathers, either aggregated in a pair of lumbar patches, or scattered indefinitely; spinal pterygia forked. Leg-muscles singularly variable: ambiens present and normal, present and incomplete, or absent, hence the order is indifferently homalognatous or anomalognatous; femorocaudal, semitendinosus and its accessory, present; accessory femorocaudal absent, hence the normal formula AXY, as usual in Picarian birds. Plantar tendons desmopelmeous in an ordinary way, in spite of the zygodactylism.

Thus, though the order is so definitely circumscribed that no one doubts of any bird whether it be psittacine or not, Parrots differ remarkably among themselves in certain structural characters which in most birds have a high classificatory value. The systematic position of *Psittaci* between *Picaria* and *Accipitres* is probably the best that can be assigned in any linear arrangement.

The eggs of Parrots are plural, white, and almost invariably laid in holes with little or no nidification; the young hatch naked and helpless, but acquire down before fledging. The order is mainly developed in tropical regions of both hemispheres, but has some representatives in both temperate zones, extending from lat. 42° N. to lat. 55° S. "Parrots abound in all tropical countries, but, except in Australia and New Zealand, rarely extend into the temperate zone. The Indian and Æthiopian regions are poor in parrots, while the Australian is the richest, containing many genera and even whole families peculiar to it" (NEWTON). A

recent monographer, FINSCH, recognised only 354 species as well determined, distributing them in 26 genera; 142 species are American, 23 African, and 18 Asiatic; the Moluccas and New Guinea have 83, Australia 59, and Polynesia 29. A later systematist, REICHENOW, admits 430 species, assigned to 45 genera; but the latest, SALVADORI, finds 499 species of 80 genera, besides about 50 more described species he has not succeeded in identifying.

Division of *Psittaci* into families has taxed the ingenuity of ornithologists; for, so variously interrelated are the numerous genera, that their grouping fluctuates with almost every character or set of characters selected for use in classification. Garrod's curious anatomical

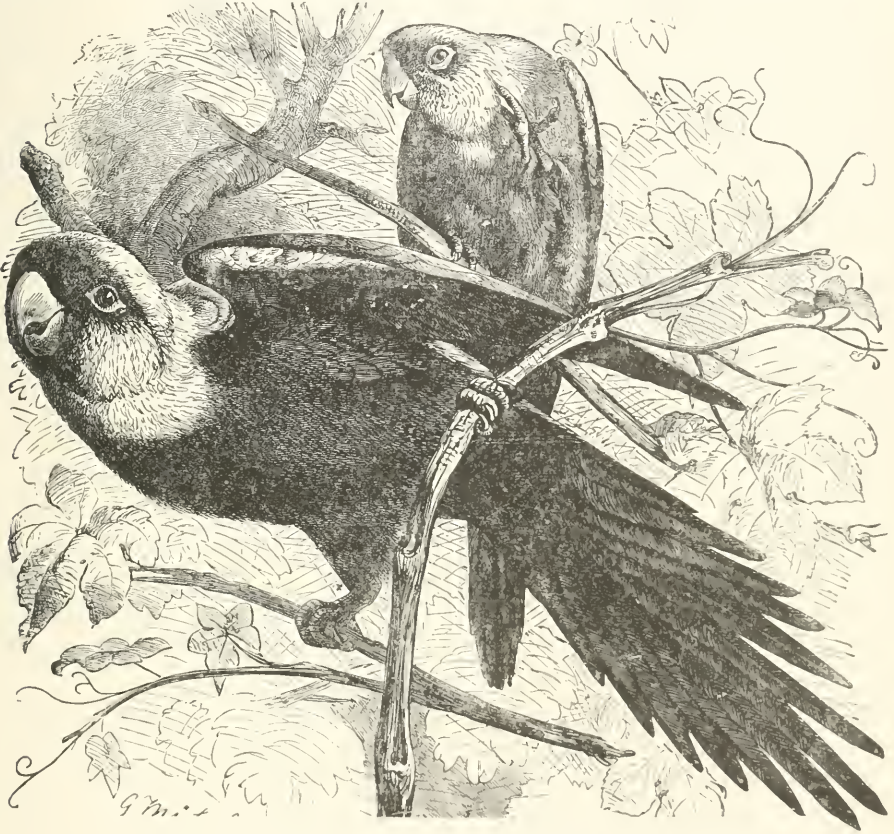


FIG. 423. — Carolina Parroquet, $\frac{1}{2}$ nat. size (From Brehm, after Audubon.)

investigations, amplified and endorsed by Beddard, show that Psittaci may be arranged in two series, according to characters afforded by the carotids and ambiens: I. PALAEORNITHIDÆ: Carotids 2 (except in *Cucatus*), left normal, no ambiens. II. PSITTACIDÆ: Carotids 2, left superficial, ambiens present in one series of genera, absent in others. In the subfamily (1) *Palaeornithinae*, there is no further deviation; in (2) *Cucatinae*, besides lack of right carotid in *Cucatus* itself, the orbital ring is completely ossified, and develops a bony process bridging the temporal fossa; in (3) *Stringopinae*, which includes the curious flightless Ground Parrot or Owl Parrot of New Zealand (*Stringops habroptilus*), the furculum and sternal keel are deficient or defective. *Psittacidae* include (4) *Arinae*, in which the ambiens is present; (5) *Pyrhaurinae*, in which it is absent, without further modification; (6) *Platyercinae*, no

ambiens, no furculum; (7) *Chrysotinae*, no ambiens, a furculum, no oil-gland. There are thus 7 subfamilies of 2 families of *Psittaci*, as based solely upon the particular set of anatomical characters utilized by GARROD for his purposes. But this surprising result is "far from being satisfactory;" it violates some obvious evidences of affinity in other respects, and in particular makes the geographical distribution of the order unintelligible; it has therefore been rejected by common consent of the later monographers, as FINSCH, REICHENOW, and SALVADORI. Reichenow's arrangement (1881) presents 9 families, as follows: (1) PIONIDÆ, American (except the African genus *Pæocephalus*), short-tailed; (2) CONURIDÆ, all American, long-tailed; (3) PSITTACIDÆ, restricted to the African genera *Psittacus* and *Coracopsis*, or the Jakos and Vasas; (4) PALÆORNITHIDÆ, Old World; (5) TRICHOGLOSSIDÆ (or *Loriidæ*), the Lories and Brush-tongued Paroquets, of Australia, Polynesia, etc.; (6) MICROPSITTIDÆ, a small family of diminutive Paroquets of the 3 genera *Psittacella*, *Cyclopsittacus*, and *Nasiterna*, Austro-Malayan and Papuan; (7) PLATYCERCIDÆ, Old World; (8) PLECTOLOPHIDÆ (or *Cacatuidæ*), Austro-Malayan and Papuan, with the New Zealand genus *Nestor* forced into this connection; (9) STRINGOPIDÆ, with the New Zealand genus *Stringops* and the Australian *Geopsittacus* and *Pezoporus*. In the British Museum Catalogue of 1891, Salvadori arranges the *Psittaci* as follows: (1) NESTORIDÆ, one genus, New Zealand; (2) LORIIDÆ, 14 genera, Austro-Malayan and Polynesian; (3) CYCLOPSITTACIDÆ, 2 genera, *Cyclopsittacus* and *Ncopsittacus*, both Papuan; the group thus not coincident with *Micropsittidæ* as just given; (4) CACATUIDÆ: (a) *Cacatuidæ*, 5 genera, Austro-Malayan and Papuan, and (b) *Calopsittacinae*, one Australian genus; (5) PSITTACIDÆ, with 6 subfamilies: (a) *Nasiterninae*, one genus, Papuan; (b) *Conurinae*, 15 genera, all American; (c) *Pioninae*, 10 genera, all American except the African *Pæocephalus*; (d) *Psittacinae*, 2 African genera, *Psittacus* and *Coracopsis*, with the Papuan genus *Dasyptilus*; (e) *Palæornithinae*, 15 genera, widely distributed in the Old World; (f) *Platycercinae*, 11 genera, Australian and Polynesian; and (6) STRINGOPIDÆ, one New Zealand genus. This arrangement is an improvement upon all earlier ones, although my distinguished friend confesses that it "does not bring us nearer to an understanding of the mutual or phylogenetic relations of the families."

It seems to me probable that certain genera of *Psittaci* will prove refractory to any scheme which may be devised. Thus, the African *Pæocephalus* and the Papuan *Dasyptilus* are inexplicable in geographical distribution, if they be really members of the respective subfamilies to which they are assigned by Professor Salvadori. A number of genera of chiefly pygmy Paroquets are particularly troublesome; such are *Psittacella*, *Psittinus*, *Psittacula*, *Agapornis*, *Cyclopsittacus*, *Bolbopsittacus*, *Nasiterna*, *Nymphicus*, and *Nanodes*. Nevertheless, if we duly correlate anatomical with external characters, and both of these with certain faunal considerations, we may arrive at a classification of the Parrots which probably requires a minimum of exceptions to be taken or anomalies to be further provided for. Without prejudice to a few questions of fact which remain open, from lack of information on some structural points as correlated with geographical distribution, one way out of our present difficulties may be found by recognizing a greater number of families and subfamilies, primarily divided into two subordinal or superfamily series. Thus, if we make the genus *Stringops* a family STRINGOPIDÆ of a suborder STRINGOPES, characterized as ecarinate and efurculate, with an ambiens, complete bony orbits, two carotids, tufted oil-gland, soft plumage with a facial disc as in Owls, wings unfit for flight, etc., the remaining Parrots may form the

SUBORDER EUPSITTACI, CARINATE PARROTS,

with the furculum normally complete, exceptionally defective. With a single possible exception, that of the genus *Pæocephalus*, the *Eupsittaci* may conveniently and not unnaturally be considered in two series, Palæogæan and Neogæan. 1. PALÆOGÆI. 1. The PLATYCER-

CIDÆ are a large family, of wide distribution in the Old World, without complete furculum, and in some other respects related to the *Stringops*, especially through such genera as *Pezoporopus*, *Gcopsittacus*, and *Melopsittacus*. The family includes terrestrial genera, as does no other of this suborder; the orbits are incomplete, the tongue is ordinary, and the bill has the usual rasp-like palatal surface; the tail is long, as a rule. Other genera than the three named are *Neophema*, *Cyanoramphus*, *Psephotus*, *Barnardius*, *Porphyrocephalus*, and *Platycercus* (for *Nymphicus* and *Nanodes* see below). 2. The PALÆORNITHIDÆ are likewise a large, widely-distributed family, sharing the incomplete orbits of the preceding family, but having the furculum complete; bill with the rasp and tongue simple; two carotids; an oil-gland; no ambiens. Unquestionable genera of this family, besides *Palacornis*, are *Electus*, *Geoffroyus*, *Tanygnathus*, *Prioniturus*, *Polytelis*, *Ptistes*, *Pyrrhulopsis*, *Aprosmictus*, and *Loriculus*. 3. AGAPORNITHIDÆ? The Ethiopian genus *Agapornis* lacks a completed furculum (in this respect agreeing with the genus *Psittacula*, of the Neogæan series), and appears to represent a tenable family type. With this genus appear to be related a number of Palæogæan pygmy Parrots, such as *Psittinus*, *Psittacella*, *Cyclopsittacus*, *Bolbopsittacus*, which have a furculum, and even *Micropsitta* (or *Nasiterua*). But at present neither the families *Micropsittidæ* nor *Cyclopsittacidæ* can be satisfactorily diagnosticated. Among these equivocal genera it seems possible that three families may be implicated. *Bolbopsittacus* approaches the next family in the longitudinal instead of transverse striation of the palatal surface of the hook of the bill; the bill is unnotched; in *Cyclopsittacus* and *Psittinus* the hook is notched; in *Micropsitta* the tail is mucronate. 4. NESTORIDÆ. The isolated New Zealand genus *Nestor* is the only living representative of this family, in which there are an ambiens, an oil-gland, two carotids with the left superficial, a furculum, and incomplete orbital ring. The bill is notably elongate, without transverse striæ under the hook; in which latter respect, as well as in the fringed tongue, this family approaches the next. 5. LORIDÆ or TRICHOGLOSSIDÆ. In the Lories or Brush-tongued Parrots, highly characteristic of Australia, Papua, and Polynesia, but absent from New Zealand, the tongue has the peculiarity indicated by the name, the papillæ being highly developed and reversible when the tongue is protruded; the bill has no transverse rugæ, and is short and stout, with simple culmen; the ambiens is lost (always?); the furculum is complete; there are two carotids, and a tufted oil-gland. Among the undoubted genera of this family (which does not include the genus *Loriculus*, however), there is much variation in external form, and probably several subfamilies are implicated; I only name the *Orcopsittacinæ*, with one Papuan genus and species, unique in the whole order in having 14 rectrices. The equivocal Australian genus *Nanodes* (or *Lathamus*) may belong here, rather than in *Platycercidæ*, as it is brush-tongued, with a furculum, orbital ring, no ambiens, etc. 6. CACATUIDÆ. This Austro-Malayan and Papuan family is well-marked by the bony temporal bar, in addition to the completed bony orbits; there is no ambiens, and great variability in the carotids and oil-gland; carotid single and sinistral as a rule. The bill is transversely rugose under the hook, and the tongue is simple; the head is conspicuously crested. There are several subfamilies. The *Cacatuinæ* have feathered cheeks and short tails; in *Microglossinæ* the cheeks are naked and the tail is short; in *Calopsittacinæ* the tail is pointed with narrow feathers. The curious genus *Nymphicus* seems to be more nearly related to the Cockatoos than to any others, and may represent a fourth subfamily, *Nymphicinæ*. 7. PSITTACIDÆ, in a restricted sense, are definable by exclusion of the particular combinations of characters of other Palæogæan families. There are two carotids, the left superficial; a complete furculum; incomplete orbits; the ambiens equivocal. The tail is short; the cheeks are more or less denuded, as a rule; there is no crest, and the sexes are alike. The bill has the usual rasp, as in all groups except the Lories, *Nestors*, and allies. This family is characteristically Ethiopian, with an outlying Papuan representative, and may include three subfamilies: *Psittacinæ*, type *Psittacus erithacus*, the common gray red-tailed Jako of Africa, and subtype *Coracopsis*, the black

Madagascan Vasas; *Pæcephalina*, the ordinary green or brown African Parrots, so similar to the American Amazons; and the Papuan black Parrot, *Dasyptiline*, of one genus and species. II. NEOGÆI. 8. PIONIDÆ are the short-tailed green Amazons and some other Parrots of tropical America, agreeing in a complete furculum, two carotids, no ambiens (except *Caica*); the cere always naked. Leading genera of this family are *Chrysotis*, *Pionus*, *Pachymus*, and *Protogerys*, without oil-gland, and forming the true *Pionina*; more special types are *Deropytus*, *Pionopsittacus*, *Triclarina*, *Urochroma*, *Caica* (?) and *Gypopsittacus*, with an oil-gland, probably representing another subfamily, *Pionopsittacina*. 9. PSITTACULIDÆ. Certain short-tailed pygmy American Parrots differ notably from the other Neogæan forms in the absence of a complete furculum, as well as of an ambiens, in which respects they agree with the Palæogæan genus *Agapornis*; and if the distinction of New World from Old World forms does not break down in this case, they must be regarded as a different family. They differ from the *Pionida* in possessing an oil-gland. The orbital ring is incomplete. There are numerous species of the single genus *Psittacula*, in which the sexes differ in color. All remaining American Parrots constitute the

Family ARIDÆ: Macaws, etc.,

being the long-tailed Neogæan forms commonly rated as a subfamily *Arina* or *Conurina* of *Psittacida*. It is characteristic of these birds to possess a complete furculum, an ambiens (wanting in *Pyrrhura*), an oil-gland, and two carotids, the left superficial; in which respects they represent an ancestral type. In one subfamily, the *Arina* proper or Macaws, the orbital ring varies in completeuess; the face is more or less denuded; the size is great, with long graduated tail, and the colors are very showy, as red, blue, yellow, green. The genera are *Ara*, *Anodorhynchus*, and *Cyanopsittacus*. The other genera of *Arida* form the

Subfamily CONURINÆ: Wedge-tailed American Parrots,

of medium and small size and mostly green color, with or without red or yellow; the cheeks and usually also the cere feathered; the tail wedged. The orbital ring is generally complete (incomplete in *Myopsittacus* and *Bolborhynchus*). The chief exception to the compactness of this group is afforded by the genus *Pyrrhura*, which lacks an ambiens and has the cere naked. Several genera, the largest of which is the following:

CONURUS. (Gr. *κωνος*. *konos*, a cone; *οὐρά*, *oura*, tail; euneate-tail.) CONURES. PARROQUETS. Tail lengthened, nearly equalling wings, euneate, with tapering feathers, graduated nearly half its length. Face entirely feathered excepting a slight space about eye. Nostrils in feathered cere (in our species). Bill very stout, with bulging lateral outline, broadly rounded culmen and gonys, and toothed or lobed commissure. Tarsi very short, much less than inner anterior toe; outer anterior longer than outer posterior toe. Feet granular-reticulate, becoming scutellate on toes. Wings pointed; in our species 2d and 3d primaries longest, 1st and 4th subequal and shorter. A large genus of tropical America, of about 30 species, with one U. S. species, which differs from the rest in having the nostrils hidden in feathers and 4th primary not attenuated; it is type of *Conuropsis* SALVAD. 1891.

C. carolinensis. (Lat. Carolinian. Figs. 422, 423.) CAROLINA CONURE. PARROQUET or PARRAKEET. KELINKY. Green; head yellow; face red; bill white; feet flesh-color; wings more or less variegated with blue and yellow. Sexes alike. *Young* simply green. Length 12.50–13.50; extent 21.00–22.50; wing 7.00–8.00; tail 6.00–7.00. Southern States; up the Mississippi Valley to the Missouri region; W. to Arkansas and the Indian Territory; in 1806 found in midwinter in the mountains of Colorado by Pike's Expedition; recently Kansas, Nebraska, Iowa; formerly strayed to Pennsylvania, New York, and Michigan, but of late has receded even from the Carolinas; still locally abundant only in Florida, less so in Arkansas

and the Indian Territory. But it would seem that if the cruel and wanton slaughter to which the gentle creatures are subjected by idlers goes on, they must before long be exterminated. Gregarious, frugivorous, and granivorous; not regularly migratory, but roving and sporadic. Said to breed in companies in hollow trees; also to build open nests on horizontal boughs of cypress; eggs white, 1.40×1.05 , variable in shape, rough in texture; normal number and time of laying unknown; in captivity 3-5, June-September.

RHYNCHOPSITTA. (Gr. *ῥύγχος*, *hrugchos*, beak, and *ψιττα*, *psitta*, for *ψιττάκη*, *ψιττακός*, or *σιττάκη*, *psittace*, *psittakos*, or *sittace*, a parrot.) BEAKED PARROTS. Bill very large, compressed, with flat gonys and long hook of upper mandible. Cere densely feathered, as in the foregoing, the nostrils in the feathers. Tail cuneate, graduated one-third its length. Size large. One Mexican species.

R. pachyrhyn'cha. (Gr. *παχός*, *pachus*, thick; and *ῥύγχος*.) THICK-BILLED PARROT. Green, brightest on cheeks and ears; spot before eye and under surface of quills and tail-feathers blackish; primary under coverts yellow; forehead, lores, line over eye, edge and bend of wings, and thighs, dark red; bill black; feet dark. *Young* simply green, with little if any red or yellow, and the bill whitish for the most part. Length 16.00-17.00; wing about 10.00; tail about 7.00, graduated 2.50; bill 1.50 along chord of culmen, rather more in depth. Highlands of Mexico, north casually to the Chiricahua mountains, Arizona; specimen in Mus. Acad. Phila. labelled Rio Grande, J. W. Audubon, BAIRD, B. N. A. 1858, p. 66; supposed to have occurred in S. W. Texas and S. New Mexico, RIDGW. MAN. 1887, p. 269; not previously admitted in the Key; A. O. U. Hypothetical List, 1886, p. 354; 1895, p. 330, No. 16.

Order RAPTORES: Birds of Prey.

Bill epignathous, cered; feet not zygodactylous. Rapacious birds (*Raptores*, *Raptatores* or *Accipitres* of authors, *Aëtomorphæ* of Huxley) form a fairly natural assemblage, to which this expression furnishes a cluw.

(Parrots, probably the only other birds with strongly hooked and truly cered bill, are yoke-toed.)

Raptores present several osteological and other anatomical characters. Sternum ample and deep keeled, its posterior margin doubly or singly notched or fenestrate on each side, or entire with central emargination; furculum ankylosed or not. Angle of mandible not recurved; maxillo-palatines united to an ossified septum; rostrum arched and hooked; basipterygoids present or absent; skull desmognathous (after a fashion) and holorhinal. Hallux always present, usually valid and insistent; outer toe reversible in some cases, never permanently reversed. Ambiens present (except in *Striges*); biceps slip absent; all excepting



FIG. 424. — Death as a bird of prey. (From Michelet.)

Gypogercanides and some *Cathartides* possess the femorocaudal, but not its accessory, nor the

semitendinosus nor its accessory (excepting *Cathartides*, which have the two last named, and *Gypogeranides*, which have these and the accessory femorocaudal). Cæca present (except in *Cathartides*). Oil-gland present in all, nude in *Cathartides* and as a rule in *Striges*. Aftershafts present (usually), lacking in *Pandion* and nearly all *Striges*, and all *Cathartides*; wing aquintocubital. Powder down patches sometimes occur; there are two carotids; the syrinx, when developed, is of ordinary broncho-tracheal character, or bronchial (*Striges*). The nature is altricial, yet pilopædic, the young being downy when hatched, and long fed by the parents in the nest. The alimentary canal varies with the families, but differs from that of vegetarian birds, in adaptation to exclusively animal diet. In the higher types, of the whole structure betokens strength, activity, and ferocity, carnivorous propensities and predaceous nature. Most of the smaller, or weaker, species feed much upon insects; others more particularly upon reptiles, and fish; others upon carrion; but the majority prey upon other birds, and small mammals, captured in open warfare. To this end, the claws no less than the beak are specially adapted, by their development in the "talons" which we constantly associate with our ideas of Birds of Prey. These weapons of offence and defence are as a rule of great size, strength, crookedness, and acuteness; also peculiar in being convex on the sides, gradually narrowed to the point, and little or not excavated underneath. Inner claw larger than outer; hinder smaller than middle; all very flexibly jointed, so that they may be strongly bent underneath the toes, carrying to the extreme the grasping power of the feet. Legs muscular and largely free from the body, feathered to the suffrago or beyond; when unfeathered, the tarsal envelop varies in character. Wings ample, and, as usual in birds below *Passeres*, the coverts long and numerous, covering three-fourths or more of the folded wing. The tail, very variable in shape, has 12 rectrices (with rare exceptions as 14 in *Thalassoaëtus*, *Neophron*, etc.).

Representatives of this order are found in every part of the world. They are divisible into four primary groups, of more classificatory value than that attaching to average families in ornithology, and therefore to be held as superfamilies or suborders. One of these, *Gypogeranides*, consists of the single remarkable *Serpentarius serpentarius*, the Secretary-bird or Serpenteater of Africa; this shows a curious grallatorial analogy, being mounted on long legs like a Crane, and has several important structural modifications. The other three are *Striges* or Owls; *Accipitres* or Hawks, Eagles, etc., including Old World Vultures; and *Cathartides* or American Vultures—these last more different from the others collectively than the rest are from one another. All are well represented in this country. They are recognizable at a glance, but the following analysis will serve to place the characters of the suborders and their respective families in strong relief.

Analysis of Suborders and Families.

Feet scarcely raptorial, with weak, blunt, lengthened, little curved or contractile claws. Hind toe elevated, not more than half as long as outer toe, with small claw; middle toe lengthened; outer toe not versatile; front toes all webbed at base; basal joint of middle toe longer than either of the succeeding ones. Nostrils large, perforate. Bill little raptorial, lengthened and somewhat contracted in continuity, toms never lobed or toothed, tip blunt, little hooked. Head largely naked. Index digit with a large claw. No lower larynx, cæca, aftershafts, or tuft of oil-gland. Ambiens present; femorocaudal present or absent: semitendinosus and its accessory present. plantar tendons sympelmous, but flexors after fusion split into tendons for 2d-4th toes, and others for 1st-3d toes CATHARTIDES

Diurnal; gressorial; feed exclusively on carrion CATHARTIDÆ

Feet highly raptorial, with large, strong, sharp, curved, contractile claws. Hind toe not elevated, lengthened, more than half as long as outer toe, with large claw; outer toe often versatile; front toes with slight basal webbing between outer and middle, or none. Nostrils small, imperforate. Bill short, stout, very seldom contracted in its continuity, toms often once or twice lobed or toothed, tip sharp, much hooked. Head feathered completely or in greatest part. Cæca present, long or very small. Plumage with or without aftershafts. Ambiens present or absent. Femorocaudal present. Semitendinosus and its accessory absent. As a rule, saltatorial, and kill their prey.

Physiognomy not peculiar; no great lateral expansion of the cranium or thickening of its walls with diploë; eyes looking sideways; no facial disc or only an imperfect one; base of bill not hidden by appressed feathers. Nostrils wholly in the cere. Toms usually toothed or lobed. No external ear-conch. Outer

toe not shorter than inner, and rarely versatile. Basal joint of middle toe longer than the next. Feet with rare exceptions mostly or entirely naked of feathers, scutellate or reticulate, or both; toes always bare and scaly. Sternum commonly single-notched or -fenestrate on each side, sometimes entire. Oil-gland tufted. Plumage compact, usually aftershafted; flight audible. Ambiens present. Diurnal

ACCIPITRES

Outer toe not reversible, and plumage usually aftershafted. Feet sympelmous or desmopelmous: tendon of flexor perforans supplying 2d-4th toes, that of flexor hallucis going to 1st toe and by vinculum to 2d toe FALCONIDÆ

Outer toe reversible, and plumage without aftershafts. Feet sympelmous, but tendon of flexor perforans going to 2d-4th toes, that of flexor hallucis to all the toes PANDIONIDÆ

Physiognomy peculiar by reason of great lateral expansion, lengthwise contraction and diploïc thickening of the often unsymmetrical cranium; eyes looking forward, surrounded with a radiated disc of modified feathers, in front appressed, antrorse, hiding base of bill. Nostrils usually at edge of the cere. Tomia never lobed or toothed. A large external ear-conch often developed. Outer toe completely versatile, shorter than inner toe. Basal joint of middle toe not longer than second, much shorter than the penultimate one. Feet usually feathery or bristly to or on the toes. Oil-gland nude. Plumage usually without aftershafts, soft and lax; flight noiseless. Ambiens absent. Feet desmopelmous, tendon of flexor perforans to 2d-4th toes, that of flexor hallucis to hind toe, only by vinculum acting also on 2d-4th toes. Nocturnal STRIGES

Sternum entire behind, with central emargination: furculum ankylosed. Middle claw pectinate.

Facial disc complete, triangular ALCONIDÆ

Sternum notched or fenestrate; furculum free. Middle claw not pectinate. Facial disc circular when complete STRIGIDÆ

SUBORDER STRIGES: NOCTURNAL BIRDS OF PREY; OWLS.

(*Accipitres Nocturnæ*, or *Nyctarpages*.)

Head very large, and especially broad from side to side, but shortened lengthwise, the "face" thus formed further defined by a more or less complete "ruff," or circle of radiating feathers of peculiar texture, on each side. Eyes very large, looking more or less directly forward, set in a circle of radiating bristly feathers, and overarched by a superciliary shield. External ears extremely large, often provided with an operculum or movable flap, presenting the nearest approach, among birds, to the ear-conch of mammals. Bill shaped much as in ordinary *Accipitres*, but thickly beset at base with close-pressed antrorse bristly feathers, and never toothed. Nostrils large, commonly opening at edge of cere rather than entirely in its substance. Hallux of average length, never obviously elevated; outer toe more or less perfectly versatile (never permanently reversed), shorter than inner toe; its first three joints very short, altogether not as long as the succeeding one; basal joint of middle toe not longer than the next. Claws all very long, much curved, and extremely sharp, that of middle toe pectinate in some species. As a rule, tarsi more or less completely feathered, and whole foot often thus covered. Among numerous osteological characters may be mentioned frequent asymmetry of skull; wide separation of inner and outer tablets of brain-case by intervention of spongy diploë; spongy maxillo-palatines and lacrymals, which latter long persist distinct; desmognathous palate; holorhinal nostrils; basiptyergoid processes; commonly manubriated and 4-notched (if not entire) sternum; a peculiar structure of tarso-metatarsus; a particular arrangement of bones about the shoulder-joint, and weakness of furculum when not ankylosed with sternum. The cervical vertebrae appear to be constantly 14. Five pairs of ribs reach the sternum. Gullet capacious, but not dilated into a special crop; gizzard only moderately muscular; intestines short and wide; cæca extremely long, club-shaped, sometimes largely dilated at the ends. Syrinx wholly bronchial, with one pair of intrinsic and one of extrinsic muscles. Oil-gland nude or barely tufted. Ambiens absent, as also semitendinosus and accessory, accessory femoro-caudal, biceps slip, and expansor of secondaries; femoro-caudal present. Feet desmopelmous, in the peculiar way abovesaid. Wings aquincubital. The feathers have no aftershaft, or exceptionally a very small one, and the general plumage is very soft and blended.

The Nocturnal Birds of Prey will be immediately recognized by their peculiar physiognomy, independently of the technical characters that mark them as a natural, sharply-defined

group. They are highly monomorphic, without extremes of aberrant form; but the ease with which they are collectively defined is a measure of the difficulty of their rigid subdivision, which is not yet satisfactorily determined. Too much stress has been laid upon the trivial, although evident, circumstance of presence or absence of the peculiar "horns" that many species possess. These are tufts of lengthened feathers rising over the eyes from the forehead, commonly called "ear-tufts;" but they have nothing to do with the ears, and are more appropriately named "plumicorns," or feather-horns. More reliable characters may be drawn from the structure of the external ear and facial disc, the modifications of which appear to bear directly upon mode of life; these parts being as a rule most highly developed in the more nocturnal species; some points of internal structure have been found correspondent. Thus, one group,



FIG. 425. — "Est illis *Strigibus* nomen; sed nominis hujus
Causa quod horrendâ stridere nocte solent." — OVID, *Fasti*, vi. 139.
"Screech-owls they're called, because with dismal cry
In darkling night from place to place they fly."

of which the Barn Owl, *Aluco flammeus*, is type, is very distinct in the angular contour and high development of the facial disc, pectination of middle claw, and other characters upon which a family *Aluconidae* may be established. Probably the rest of the suborder fall in two subdivisions of a single family *Strigidae*, the essential characters of which have already been contrasted with those of *Aluconidae*.

The nearest relatives of *Striges*, outside their own order, are *Caprimulgi* — the relationship being really very close through the genus *Steatornis*. As is well known, Owls are eminently nocturnal birds; but to this rule there are numerous striking exceptions. This general habit is correspondent to the modification of the eyes, the size and structure of which enable the birds to see by night, and cause them to suffer from the glare of sunlight. Most species pass the daytime secreted in hollow trees, or dense foliage and other dusky retreats, resuming their

wanted activity after nightfall. Owing to the peculiar texture of the plumage, their flight is perfectly noiseless, like the mincing steps of a cat; and no entirely fanciful analogy has been drawn between these birds and the feline carnivora that chiefly prey stealthily in the dark. The nest is commonly a rude affair of sticks gathered in the various places of diurnal resort; the eggs are several (commonly 3-6), white, subspherical. The ♀, as a rule, is larger than ♂, but the sexes are alike in color; the coloration is commonly blended and diffuse, difficult of concise description. Owls feed entirely upon animal substances, and capture their prey alive—small quadrupeds and birds, reptiles and insects, and even fish. Like most other *Raptores*, they eject from the mouth, after a meal, bones, hair, feathers, and other indigestible substances, made up into a pellet. They are noted for their loud outcries, so strange and often so lugubrious, that it is no wonder traditional superstition places these dismal night-birds in the category of things ill-omened. Besides the well-known lines which are set beneath two of the accompanying figures, the reader may recall the Owl as among the 'portents weird' which foretell the fate of the unhappy queen of Carthage, when, deserted by 'pious' Æneas, she resolves to die.

"Solaque culminibus ferali carmine *bubo*

Sæpe queri, et longas in fletum ducere voces."—VERG, *Æn.*, iv. 462.

The hood-owl, brooding ominous above

Her fateful house, is wearing dismal night away

With wild vociferation. Portents weird, etc.

Owls are among the most completely cosmopolitan birds; with minor modifications according to circumstances, their general habits are much the same the world over. A difficulty of correctly estimating the number of species arises from the fact that many, especially of the more generalized types, have a wide geographical distribution, and, as in nearly all such cases, they split into more or less easily recognized races, the interpretation of which is at present a matter of opinion rather than a settled issue. About 200 species pass current; out of about 50 generic names now in vogue, probably less than one-half represent some structural peculiarity.

Family ALUCONIDÆ: Barn Owls.

(Fam. STRIGIDÆ of A. O. U. Lists.)

Two genera of Owls, *Aluco* and *Heliophilus*, differ so much from other *Striges* that they may properly constitute a family apart from *Strigida*. The prime character is ankylosis of foreulna with sternum, which latter bone has no manubrium in front and is entire behind (unusual; compare fig. 56). There is no bony canal for the passage of the extensor tendon of the toes. External characters are: facial disc and outer ear-parts highly developed, the former not circular, but rather triangular, the latter symmetrical; middle and inner toes of about equal lengths; inner edge of middle claw serrate or jagged, simulating the pectination seen in *Caprimulgida*, to which birds these Owls are curiously related through *Steatornis*. The pterylosis, as well as pattern of coloration, is peculiar: the plumage is very downy; the habits of the species are eminently nocturnal. The leading genus, *Aluco*, of several species or races, is nearly cosmopolitan, being absent only from high latitudes and some insular regions. The other genus, *Heliophilus*, is a Madagasean type. A third genus, *Phodilus* or *Photodilus*, of which one species, *P. badius*, inhabits portions of eastern Asia, Ceylon, Java, and Borneo, is the connecting link with the other family, and now removed thereto, though long kept in the present one. It has no manubrium sterni and no bony canal of the tarso-metatarsus, but the sternum is notched behind, and the incomplete clavicles do not reach its keel: the outer toe has only 4 phalanges. The general external aspect of *P. badius* resembles that of the Barn Owls.—N. B. Adoption of *Aluco* for Barn Owls, instead of *Strix*, requires the present

family to be called *Aluconidae*, instead of *Strigidae*; which latter name is to be applied to the succeeding family. The Linnæan genus *Strix*, 1758, which included all Owls, was first divided in 1760 by Brisson, who made *S. stridula* the type of his restricted genus; consequently, *Strix* cannot be used for the Barn Owls. The first tenable name for the genus of which the Barn Owl is type is *Aluco* FLEMING, Phil. Zool. ii, 1822, p. 236. *S. aluco* LINN. 1758, p. 93, No. 6, is the European Barn Owl, commonly called *S. flammea*, though *S. aluco* LINN. 1766,



FIG. 426. — Barn Owls, $\frac{1}{2}$ nat. size. (From Brehm.)

“From yonder ivy-mantled tower,
The moping owl does to the moon complain
Of such, as wand’ring near her secret bower,
Molest her ancient solitary reign.” — GRAY.

dle toe without claw, closely feathered, the plumage becoming scant and bristly below, like that on the nearly naked toes, and reversed in direction on the posterior aspect; claws extremely long and acute (see fig. 47). Bill lengthened, compressed; cere nearly as long as rest of culmen; nostrils oval; no plumicornis; eyes comparatively small, black; ears very large; bill light-colored; plumage flagrant, not dichromatic and of peculiarly delicate texture as well as special pattern of coloration; the subtriangular or somewhat cordate figure of the facial area variable in form at the pleasure of the bird; size medium. One North American species or subspecies, among several which inhabit collectively most parts of the world. Others, more distinct from the stock form, *A. flammeus*, are *A. nova-hollandiae*, and *A. tenebricosa*, both Australian; *A. castanops*, Tasmanian; *A. capensis*, S. African; *A. candida*, Indian. (Genus *Strix* of the A. O. U. Lists, by error: see above.)

p. 132, No. 7, is *S. stridula*: see NEWTON, Ibis, 1876, pp. 94–104, and Dict. B, 1894, p. 673. On reviewing the whole case, I find that Newton is indisputably right, according to A. O. U. canons of nomenclature; and the A. O. U. Check List violates its own rules in calling the present family *Strigidae*. *Aluconide* must stand as name of this family, as in 2d–4th eds. of Key.

ALUCO. (Ital. *alocco* or *aloch*, some kind of Owl, perhaps the European Barn Owl, *A. flammeus*. As a Latin word, *Aluco* dates 1503, in GAZA’S Aristotle; as a genus in ornithology it dates from FLEMING, 1828. Figs. 47, 426.) **BARN OWLS.** To above characters add: Wings very long, pointed, folding beyond tail; 1st or 2d primary longest, none emarginate. Tail short, nearly even or emarginate, about $\frac{1}{2}$ as long as wing. Tarsus nearly twice as long as mid-

A. pratincola. (Lat. *pratincola*, meadow-inhabiting.) AMERICAN BARN OWL. MONKEY-FACED OWL. Above, including upper surfaces of wings and tail, tawny, fulvous, or orange-brown, delicately clouded or marbled with ashy and white, and dotted with blackish, sometimes also with white; such marking resolved, or tending to resolve, into 4 or 5 bars of dark mottling on the wings and tail. Below, including lining of wings, varying from pure white to tawny, ochrey, or fulvous, but usually paler than upper parts and dotted with small but distinct blackish specks. Face varying from white to fulvous or purplish-brown, in some shades as if stained with claret, usually quite dark or even black. About eyes, and border of disc, dark brown. Thus extremely variable in tone of coloration, but the pattern more constant, while the generic characters render the bird unmistakable. Nestlings covered with fluffy white down. Length 15.00-17.00 or more; extent about 44.00; wing 13.00-14.00; tail 6.00-7.00; bill 0.95; tarsus 2.75. ♀ larger than ♂. The superior size is the chief distinction from the Old World *A. flammeus*, of which I have kept it as a subspecies in all previous editions of the Key, and now accord it full rank with much misgiving, in deference to the A. O. U. U. S. from Atlantic to Pacific; somewhat southerly, rarely known N. to Massachusetts, New York, southern Ontario, Michigan, Wisconsin, Minnesota, and Washington; S. into Mexico, West Indies and Central America; abundant in wooded, settled, and especially maritime regions; resident in most of its range, but only migratory or irregular northerly; gregarious at times; nests from January to May in different latitudes or localities; broods one or two a year. Breeds naturally in hollow trees, or holes in the ground, frequently in barn, belfry, tower, or other building; eggs 3-11 or indefinitely numerous, ordinarily 5-7 in number, dead white, or soiled yellowish-white, about 1.75×1.25 , nearly equal-ended or more ovate, laid with little or no preparation upon the debris of the hole, commonly bones and other refuse of food, which is chiefly small quadrupeds and insects. Eggs in different stages of incubation, even fresh eggs and young, may be found together in the nest. This is the bird which figures every now and then in the newspapers as the "monkey" or "monkey-faced" Owl. (*Strix flammea* var. *americana* COUES, Key, 1872, p. 201; *Aluco flammeus pratincola* of 2d-4th eds. of the Key, after *S. pratincola* BP. 1838.) The latter is the right specific name, but coupled with the wrong generic name, in the A. O. U. List, No. 365.

Family STRIGIDÆ: Other Owls.

(Fam. BUBONIDÆ of A. O. U. Lists.)

All other *Striges*, as far as known, have the sternum once or twice notched on each side behind, with a manubrium in front, and the furculum free or even defective, being represented by a pair of stylets, which do not join in one bone. There is a bony canal for passage of the common extensor tendon of the toes. The outer ear-parts are sometimes as highly developed as in *Aluco-nida*, or they may be quite small. When large, with a reversible



FIG. 427. — Mobbing an owl. (From Michelet.)

flap or operculum, the ear-parts tend to become unsymmetrical on right and left sides of the head; and this asymmetry is often carried so far as to affect the shape of the whole skull,

which is thus set askew. The facial disc varies in size and perfection, being largest, most circular, and most completely radiating from the eye as a centre in those species in which the ear-conch is best developed. These two characters would therefore seem to go together, and they are not correlated with presence or absence of plumicorns — an obvious but trivial difference, which carries little weight in classification. Inner toe shorter than middle, and middle claw not pectinate. The extent of feathering of the feet varies with almost every genus. It proves advisable to make the foregoing main characters the basis of a division of *Strigide* into two subfamilies, *Strigine* and *Bubonine*.

Analysis of Subfamilies and Genera.

STRIGINÆ. Eye centric in large complete circular disc, and ear-conch larger than eye, with well-developed operculum; ear-parts more or less unsymmetrical. Strictly nocturnal.

Plumicorns absent; cere short.

Ear-parts subsymmetrical. Large: length over 12 inches; wing 15 or less; tail under 10 *Strix*

Largest: length over 20 inches; wing 16 or more; tail over 10 *Scotiopteryx*

Ear-parts asymmetrical. Small: length under 12 inches *Nyctala*

Plumicorns present; cere longer than rest of culmen. Ear-parts asymmetrical *Asio*

BUBONINÆ. Eye eccentric, nearer top than bottom of more or less incomplete disc, and ear-conch not larger than eye, without developed operculum, symmetrical. Not strictly nocturnal.

Plumicorns present, well-developed.

Very large; length over 18 inches; tail about $\frac{3}{4}$ the wing *Bubo*

Small: length under 12 inches; tail about $\frac{1}{2}$ the wing *Megascops*

Plumicorns present, rudimentary. Very large: length over 18 inches. White *Nyctea*

Plumicorns absent.

Tarsus full-feathered.

Tail graduated. Length over 12 inches. Hawk-like *Surnia*

Tail rounded. Length much under 12 inches. Arboreal *Glaucidium*

Tarsus naked or scant-feathered.

Length under 8 inches. Arboreal *Micropallus*

Length over 8 inches. Terrestrial *Speotyto*

A'SIO. (Lat. *asio*, a kind of horned owl.) **EARED OWLS.** **MARSH OWLS.** Skull and ear-parts more or less unsymmetrical; conch of immense size, about as long as skull is high, furnished with a movable operculum for its full length. Eyes centric in perfectly developed facial disc. Plumicorns more or less developed. Nostrils at edge of cere, which is somewhat inflated, and longer than chord of culmen beyond it; bill rather weak. Wings about twice as long as tail, pointed, 2d primary usually longest, only 1 or 2 primaries emarginate on inner webs. Feet closely feathered to ends of toes. Of medium size; our species 12.00–16.00 long. Embracing about 12 species, and nearly cosmopolitan. Our Long-eared Owl is decidedly different from that of Europe, *Asio otus*, but the Short-eared has not been satisfactorily distinguished from the almost cosmopolitan *A. accipitrinus*.

Analysis of Subgenera and Species.

Plumicorns long, many-feathered (*Asio* proper) *wilsonianus*

Plumicorns short, few-feathered (*Brachyotus*) *accipitrinus*

A. wilsonianus. (To A. Wilson. Figs. 56, 428.) **AMERICAN LONG-EARED OWL.** Ear-tufts conspicuous, about as long as middle toe and claw, of 8–12 feathers. First primary only emarginate on inner web. Upper parts brownish-black, minutely mottled with grayish-white, and variegated with the tawny of basal portions of the feathers which comes to the surface here and there; general effect dark, quite different from the tawny streaking of *A. otus* of Europe. Under parts confused blackish-brown, grayish-white and tawny; on breast marbled in large pattern, for the rest with dusky shaft-lines throwing off dusky cross-bars (several on each feather) on a whitish ground, and the tawny bases of the feathers showing more or less; feet and crissum mostly immaculate, tawny or whitish. Quills blackish-brown, regularly

barred with mottled gray, and towards their bases with tawny, which latter forms a conspicuous area on outer webs of several primaries. Lining of wings tawny, separated by a dusky area from similar bases of inner webs of primaries. Tail like secondaries, dusky with gray marbled bars, and more or less tawny toward base; but from below presenting quite light, with numerous firm narrow dusky bars. Facial disc mostly tawny, framed all around in a blackish border speckled with whitish, and more or less blackened about eye; usually a whitish superciliary line; bristles at base of bill mixed whitish and blackish; plumbeous-blackish, basally tawny, edged on one side with whitish. Bill and claws blackish; iris yellow. Length 14.00-16.00; extent about 39.00; wing 11.00-12.00; tail 5.50-6.50; tarsus 1.25-1.50; chord of whole culmen about 1.00. Less variable than many Owls, and always easy to recognize. Temperate N. Am., common, generally distributed, resident as a rule, irregularly migratory or roving to some extent, then generally in flocks; perfectly nocturnal, and thus screened from casual observation, even where it is numerous, but often surprised in the daytime in shady resorts, as thick bushes along streams, cañons, caves, etc. Nesting various, in a hollow tree or stump, rift of rock, or on the ground, but mainly in deserted nests of other birds, as Hawks, Crows, Magpies, or even Herons; usually constructed with little art, as when in a hollow or on the ground, sometimes better built or refitted in branches of a bush or tree, at a varying height of 10 to 40 feet. Eggs 3-7, oftener 4 or 5, white, subspherical, 1.50 to 1.60 \times 1.30 to 1.40, laid from February to May in different latitudes, usually found in varying stages of incubation of the same set, or with young birds in the nest before all the eggs are hatched; incubation supposed to take about 21 days; nestlings covered with grayish-white down. The food of this Owl is mostly small rodents; it also eats small birds, frogs, and insects. It is one of our handsomest species, with its trim form, showy plumage, pricked-up ears, and general jaunty air; it has the trick of drawing itself up tall, stiff, and slim, with close-shut feathers, like a soldier on dress parade, and again of swelling up and fluffing out the plumage, to make itself look big and fierce.



FIG. 428. — Long-eared Owl.

A. accipitrinus. (Lat. *accipitrinus*, hawk-like. Figs. 429, 430.) **SHORT-EARED OWL.** **MARSH OWL.** Ear-tufts inconspicuous, much shorter than middle toe and claw, few-feathered. First and second primaries emarginate on inner webs. Above, completely variegated, chiefly in streaks, with fulvous or tawny, and dark brown: breast much the same, but other under parts paler ochrey, usually bleaching on belly, which is sparsely but sharply streaked (never barred) with dark brown; feet pale tawny or whitish, usually immaculate; lining of wings interruptedly whitish. Wing-quills varied, mostly in large pattern, and tail pretty regularly barred (about 5 bars) with the two colors of upper parts. Facial area white or nearly so, but with a large black eye-patch; disc minutely speckled with fulvous and blackish, bordered with white internally and usually having a blackish patch behind ear; radiating feathers of operculum streaked with blackish and fulvous. Iris bright yellow; bill and claws dusky-bluish; naked granular

soles yellowish. The ear-opening is extremely large, being 2.00 or more across the longest



FIG. 429. — Short-eared Owl, reduced. (Sheppard del. Nichols sc.)

way. Length of a ♂ 14.50; extent 41.00; wing 12.00; tail 6.00; tarsus to end of middle claw 3.50; chord of culmen, cere included, 1.12; ♀ averaging larger than ♂. Young birds are much darker colored than the adults; the face quite uniformly blackish, the upper parts dark brown with broad pale buff tips of the feathers, the lower parts dingy grayish-buff, with few if any markings. In any plumage it is rather a plain, plebeian Owl, whose appearance corresponds with its lowly, unpretentious habits. Inhabits N. Am. at large, and most other parts of the world; migratory with us, and sometimes seen in considerable flocks, especially in marshy places, which are its favorite hunting-grounds for the small quadrupeds and other animals upon which it preys. It is a great destroyer of shrews and field-mice, deserving on this account to be protected in the interests of agriculture. The breeding range is nearly coincident with the general distribution of the species in this country, but most of the birds nest in the northern parts of the U. S. and thence within the Arctic Circle, retiring from these high latitudes in winter; the season for eggs ranges from March in the South to July in the North, but is mostly April and May for ordinary latitudes. The nest is commonly built on the ground, sometimes in an underground burrow, consisting of a little hay and feathers; eggs 4-7, dull white, roundish, about 1.55 × 1.25. This Owl, though a member of the most nocturnal division of its family, is one of those frequently abroad in the daytime, and in dull weather may be observed quartering low over the ground in open places, on its broad noiseless pinions, in search of its humble quarry; it is not a woodland bird, like most of its tribe, but lives in rank herbage.

STRIX. (Gr. *σπίγξ*, *strigx*, Lat. *strix*, a screech-owl.) GRAY OWLS. BROWN OWLS.

WOOD OWLS. Skull and ear-parts more or

less unsymmetrical, the latter large, furnished with a moderate operculum scarcely reaching

less unsymmetrical, the latter large, furnished with a moderate operculum scarcely reaching

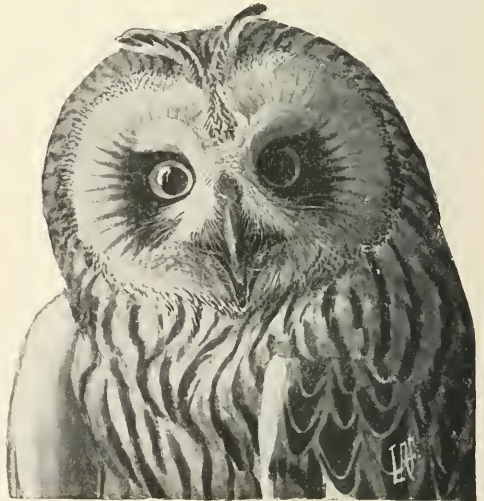


FIG. 430. — Short-eared Owl.



FIG. 431 — Barred Owl

the whole length of the opening. Head very large, appearing as broad as the body, and perfectly smooth, there being no plumicorns: facial disc complete and of great extent, the comparatively small eyes centric in the radiating feathers. Nostril in edge of cere, which is shorter than rest of culmen. Bill yellow; iris dark brown or black. Tail very long, $\frac{2}{3}$ to $\frac{3}{4}$ as long as wings. Wings much rounded; 5 primaries sinuate on inner webs; 1st quite short. Feathering of feet variable; tarsus always feathered, but toes wholly or partly feathered, or naked. Plumage of under parts barred on the breast at least, if not throughout. Nest in trees; eggs few. A large genus of "earless" Owls, chiefly of the northern hemisphere, of medium to large size; ours about $1\frac{1}{2}$ feet long. North America has at least two perfectly distinct species; the commonest one of these, *S. nebulosa*, represents the European Tawny Owl, *S. stridula*, badly miscalled "*Syrnium aluco*" by so many writers. As shown in my article on the genus *Aluco*, *Strix aluco* LINN. 1758, is the European Barn Owl, *Aluco flammeus*, belonging to the other family of Owls. Furthermore, the genus *Syrnium* SAVIG. 1809, has no standing whatever in ornithology, being a mere synonym of *Strix* in the strictest sense. Hence the A. O. U. is in error in using *Syrnium* as the name of the present genus, as I was similarly in error in the original edition of the Key, 1872.

Analysis of Species.

Under parts barred on the breast, elsewhere streaked. Length $1\frac{1}{2}$ feet or more.	
Toes fully feathered. Eastern U. S.	<i>nebulosa</i>
Toes mostly naked. Florida to Texas	<i>alleni</i>
Under parts barred everywhere. Length under $1\frac{1}{2}$ feet.	
Toes fully feathered. Western U. S.	<i>occidentalis</i>

S. nebulosa. (Lat. *nebulosa*, clouded. Figs. 431, 432.) BARRED OWL. HOOT OWL. RAIN OWL. AMERICAN WOOD OWL. Toes fully feathered, nearly or quite to claws, which are blackish; bill yellow; iris black. Of medium size in the genus: length 18.00–20.00; extent about 44.00; wing 12.50–13.50, rounded; tail 9.00–10.00, rounded. Markings of back and breast in cross-bars, of belly in lengthwise stripes. Above, umber-brown or liver-color, everywhere barred with white or tawny, or both; breast the same; on belly the pattern changing abruptly to heavy dusky shaft-stripes on a white or tawny ground; crissum the same; feet speckled with dusky; wings and tail like back or rather darker, regularly barred with gray, light brown or tawny, some of the bars usually making white spots at their ends, and marking of wing-coverts rather in spots than bars. Lining of wings tawny, with some dusky spotting. Facial disc set in a frame of black and white specks, with blackened eyelids, and obscurely watered with lighter and darker colors in rings around eye as a centre, the bristly feathers



FIG. 432. — Barred Owl, reduced.

about bill mixed black and white, or white at base, blackened terminally. A notably large and somewhat impressive Owl of eastern North America, common in woodland of the U. S., especially southerly (except the range of its subspecies *alleni*), west to Colorado; not ranging much north of the U. S., though occurring in some parts of the Dominion of Canada; replaced in Western U. S. by *S. occidentalis*, from the Rocky Mountains to the Pacific. It is the commonest "hooting" Owl, the strange outbursts of midnight discord which one may hear about the farm-house or camp-fire proceeding oftener from this species than from the Great Horned Owl. It is strong enough to prey upon poultry, quail, rabbits and squirrels, as well as humbler game, mostly mice, also frogs and other reptiles, insects, sometimes crustaceans and fish; occasionally it turns cannibal, and devours small Owls. It is thoroughly nocturnal, and very seldom seen abroad by day, even in the thickest woods, whose umbrage is so congenial

to this solitary and stubborn recluse. Nest usually in a hollow tree, sometimes a deserted Hawk's or Crow's nest; eggs 2, 3, or 4, white, subspherical, about 2.00×1.75 , laid from February to April.

S. n. al'leni. (To J. A. Allen.) FLORIDA BARRED OWL. Like *nebulosa* proper, but toes almost entirely naked. The feathering of the tarsus stops at the roots of the toes almost as abruptly as it does in *Megascops flammeola*, in comparison with *M. asio*, though a slight strip of bristly feathers runs a little way along outside of middle toe. The barring of the breast seems to be heavier, on an average. South Atlantic and Gulf States, from S. Carolina to Texas. Habits like those of the common Barred Owl, but nesting earlier on an average, Jan.-Mar., and eggs usually only 2 in number. (Probably *S. georgica* LATH. 1801.)

S. n. helve'olum. (Lat. *helveolus*, yellowish.) TEXAS BARRED OWL. Size of *nebulosum* proper; toes naked as in *aleni*; coloration pallid throughout in comparison with the type form; legs and feet buff or whitish, with few or none of the dusky markings of the other forms. Corpus Christi, Texas. (BANGS, Pr. N. Eugl. Zool. Club, i, Mar. 31, 1899, p. 31; Auk, Oct. 1899, p. 341.)

S. occidenta'lis. (Lat. *occidentalis*, western.) WESTERN BARRED OWL. SPOTTED OWL. XANTHUS OWL. Toes feathered as in *S. nebulosa*. Decidedly smaller than that species, and otherwise readily distinguished. Ground-color of upper parts much the same, but the barring broken up into spotting, for the most part: on back and wing-coverts resulting in irregular variegation, on head making small round white spots. Wings, tail, and facial disk much as in *nebulosa*. Under parts quite different, the markings being in bars everywhere, with little difference in pattern between the belly and the breast. The latter is closely and regularly barred with brown and white, as in *nebulosa*, and if the barring is at all different on belly, it is from separation of the white bars into pairs of spots, in any event very different in appearance from the firm lengthwise stripes of *nebulosa*. The difference between the two species in this regard is comparable to that between the Long- and Short-eared Owls. The lining of the wings is fully spotted with dusky on a tawny ground. The general brown color of the bird is on the whole warmer than that of *nebulosa*. Length 16.00 or more; wing 12.00-13.50; tail 8.00-9.00. Western U. S., southerly; has been found in Colorado, New Mexico, Arizona, California (original specimen from Fort Tejon), Lower California, and some parts of Mexico, and is probably not so rare as has been supposed. Habits as far as known not different from those of the Barred Owl; nest in the hollow of a tree, or built on a branch, of small sticks, bark, hay and feathers; eggs known to be 4 in one case, and to be laid in April; size about 2.05×1.80 , and shape thus well rounded, as usual in the genus.

S. o. cauri'nus. (Lat. *caurinus*, northwestern; *caurus*, the northwest wind.) NORTHERN SPOTTED OWL. MERRIAM'S OWL. Like the last, darker and richer in coloration; dark areas larger and darker; white markings smaller, especially on head and back, where the spotting is reduced to a minimum; primaries without whitish tips, with only an indistinct pale band mixed with a little whitish on outer side of the vanes, and faint terminal edging on some of the feathers; the 3 or 4 pale bars toward ends of the feathers also obsolescent. Coast region of Washington and British Columbia. New to the Key. *Syrnium o. caurinum* MERRIAM, Auk, Jan. 1898, p. 39; A. O. U. Suppl. List, Auk, Jan. 1899, p. 109, No. 369 a.

BU'BO. (Lat. *bubo*, the great horned owl or "grand duke" of Europe, *B. maximus*, *ignavus* or *bubo*.) GREAT HORNED OWLS. EAGLE OWLS. HOOT OWLS. GRAND DUKES. Skull and ear-parts symmetrical (of same size on both sides of head), the latter simply elliptical, non-operculate, not longer than the great yellow eye, which is eccentric in the moderately developed facial disc (nearer its top than bottom). Plumicorns highly developed. Nostrils oval, in edge of cere, which is not inflated, nor as long as rest of culmen: bill robust, black, not buried in frontal bristles. Wings rather short, folding short of end of tail, 3d or 4th primary

longest, first 2 or 3 emarginate near their ends. Tail rounded, more than $\frac{1}{2}$ as long as wing, its under coverts not reaching its end. Feet densely feathered to last joint of toes, but claws exposed. Of medium and very large size (some species are nearly the largest of Owls), and variegated, usually dark, colors; plumage not dichromatic. Embracing numerous species, of all America and nearly all of the Old World; only one, however, in North America, with several ill-defined subspecies.

B. virginianus. (Lat. *virginianus*, Virginian. Fig. 433.) GREAT HORNED OWL. HOOT OWL. CAT OWL. AMERICAN GRAND DUKE. Distinguished by large size and conspicuous ear-



FIG. 433. — Great Horned Owl. (From The Osprey.)

tufts, our other species of similar stature being tuftless or nearly so. Length nearly or about 2 feet; extent 4 or 5 feet; wing 14.00–16.00 inches; tail 8.00–10.00; tarsus 2.00–2.25; culmen without cere 1.10–1.20. ♀ averaging much larger than ♂. Plumage varying interminably, no concise description meeting all its phases. A white collar on throat is the most constant color-mark. On the upper parts, the under plumage tawny, but so overlaid with coarse mottling of blackish and white, that the tawny shows chiefly on head, nape, and scapulars; mottling chiefly transverse, resolving into 7 to 9 continuous or broken bars on wings and tail. Under parts white, indefinitely tawny-tinged, and for the most part barred crosswise with blackish, changing on fore breast to ragged and rather lengthwise blotches. Feathering of feet nearly plain tawny. Ear-tufts black and tawny; a dark mark over eye; border of facial disc black; face white or tawny, but the feathers mostly black-shafted. Bill and claws black; iris yellow; pupil always circular; when fully dilated as large as a finger-ring, contractile to size of a pea. Young covered at first with white down; first plumage more uniformly tawny and

lighter-colored than it becomes after the first moult, when the white collar and other distinctive markings are assumed. This powerful bird, only yielding to the Great Gray Owl in linear dimensions, but not in bulk of body, and inferior to none in spirit or prowess, is a common inhabitant of North America at large, representing *B. bubo* of Europe. The typical or ordinary form (*atlanticus* CASS.) occurs throughout Eastern N. Am., N. to Labrador, W. to the E. edge of the Great Plains. It is non-migratory; breeds in all winter and early spring months (sometimes in December, often in January, usually February or March), laying in hollows of trees or rifts of rocks, occasionally on the ground, often in a bulky nest of sticks on the branches of tall trees, then appropriating and renovating that of a Crow, large Hawk, or Eagle. Eggs usually 2 or 3, often 4, rarely more, and 2 the most frequent number, likely to hatch ♂ and ♀; they are thick-shelled, granular, unglorious, colorless, subspherical, about 2.15×1.90 in size; duration of incubation about three weeks. The young begin to hoot when about 4 months old. If taken early enough from the nest, they may become docile and even affectionate;

but captive adults generally prove intractable. This Owl preys upon birds and quadrupeds up to the size of domestic fowls and rabbits, and is more destructive to poultry than any Hawk whatever; it often kills more than it can devour, only eating off the heads of its victims. It is habitually abroad in the daytime, apparently not at all inconvenienced by sunlight. Runs into the following varieties, which, however, are *not* as strictly geographical as the names would indicate:—

B. v. arcticus. (Lat. *arcticus*, northern.) WHITE HORNED OWL. Very pale colored, frequently quite whitish, and not distantly resembling the Snowy Owl, from which, however, it is easily distinguished by the long plumicorns and other generic characters. (See Swainson's fig. in F. B. A., pl. 30.) Boreal and alpine North Am.; such specimens occasional in northern U. S. in winter, and Rocky Mt. region. This form has stood correctly in the Key since 1872; the attempt of the A. O. U. to subdivide it into *B. v. arcticus* and *B. v. subarcticus*, Lists, 1886-95, Nos. 375 *b* and 375 *a* (after RIDGW., Orn. 40th Par. 1877, p. 572) has been abandoned (see Auk, Apr. 1896, pp. 153-156, and Jan. 1897, p. 134).

B. v. pacificus. (Lat. *pacificus*, of the Pacific ocean.) PACIFIC HORNED OWL. Very dark colored, chiefly blackish and grayish, with little tawny, and what there is of it dull; facial disc quite ashy. Rather smaller than average *virginianus*; but the difference is slight. Western N. Am., but by no means confined to the Pacific coast region. The smallest specimens I have seen are from Lower California. CASS., Ill. B. Cal., etc., July, 1854, p. 178, and in BAIRD, B. N. A. 1858, p. 49; COUES, Key, orig. ed. 1872, p. 202, and 2d-4th eds. 1884-90, p. 504; ignored in A. O. U. Lists, 1886 and 1895; admitted in Eighth Suppl. Auk, Jan. 1897, p. 119, No. "375 *c*"; given as "375 *b*" in Ninth Suppl. Auk, Jan. 1899, p. 110.

B. v. saturatus? (Lat. *saturatus*, *sc.* with color.) DUSKY HORNED OWL. Extremely dark-colored with little or no tawny; facial disc sooty brown mixed with grayish-white. Size of ordinary *virginianus*. Pacific coast region, Upper California to Alaska; "Labrador," and also accredited to much of interior N. Am. Apparently a dark littoral form, in the extreme phase of which the tawny is extinct. RIDGW. Orn. 40th Par. 1877, p. 572; Man. 1887, p. 263; A. O. U. Lists, 1886 and 1895, No. 375 *c*; not separated from *pacificus* in 2d-4th eds. of the Key, and probably not separable.

Obs. *B. v. occidentalis* STONE, Auk, Apr. 1896, p. 155, is inadmissible, being simply the common species, somewhat lighter than usual, and insomuch tending toward *B. v. arcticus*; type from Mitchell Co., Iowa. See Auk, Jan. 1897, p. 132.

MEGASCOPS. (Gr. μέγας, *meγas*, large, and σκῶψ, Lat. *scops*, a small kind of owl; our species, though small, are larger than the typical *Scops giu* of Europe. Fig. 434.) LITTLE HORNED OWLS. SCREECH OWLS. DUKELETS. Like a miniature *Bubo* in form (all our species under a foot long). Skull and ear-parts symmetrical; latter small, simply elliptical, with rudimentary operculum; facial disc moderately developed; plumicorns evident; nostrils at edge of cere, which is not inflated, and shorter than rest of culmen. Wings rounded, but long, about twice the length of the short rounded tail, about to end of which they fold; in our species 4th and 5th primaries longest, 1st quite short; 3 or 4 outer primaries sinuate or emarginate on inner webs. Tarsus feathered (in our species), but toes only partly bristly (in the *M. asio* group) or quite naked (as in *M. flammeola*). Plumage dichromatic in some cases; *i. e.*, some individuals of the same species normally mottled gray, while others are reddish, the two phases very distinct when fully developed, but shading insensibly into each other, and entirely independent of age, season, sex, or locality; the same individual may be red or gray at different times, and may pass from one phase to the other by aptosochromatism—that is, by alteration in the pigments of the plumage, without loss of old or gain of new feathers (Auk, Jan. 1897, p. 38, pl. 1). In normal plumage, a white or whitish scapular stripe; lower parts with lengthwise blotches or shaft-

lines and crosswise bars or waves of blackish or dark color; upper parts with black or blackish shaft-lines on a finely-dappled brown or gray ground (more or less obliterated in the red phase); facial disc black-bordered nearly all around; wing-quills spotted or marbled on outer webs, barred on inner webs. Tail with light and dark bars. Young covered with white down. Nest in holes; eggs plural. A large and nearly cosmopolitan genus, especially rich in tropical species; but only three known to inhabit N. Am., one of them running into several local races very difficult to characterize satisfactorily. OBS. This is the genus *Scops*, Savigny, 1809, Type *S. giu* of Europe. KAUP, in founding his subgenus *Megascops*, Isis, 1848, p. 765 and p. 769, clearly intended, not to replace *Scops*, but to separate from *S. giu* certain larger species of the same genus, among them our *S. asio*, the first one he names on p. 765, therefore to be assumed as the



FIG. 434. — Screech Owl, reduced. (From Dall.)

type of *Megascops*. But his intention was frustrated by the mishap that BRUNNICH, in 1772, had used the word *Scops* wrongly instead of *Scopus*—whether by accident or design we shall never know. This miserable business of misusing the classic name of a certain Owl for a certain water bird (*Scopus umbretta*) throws out *Scops* of Savigny, 1809; and as *Ephialtes* KEYS. and BLAS. 1840, based on *S. giu*, is also preoccupied, having been before used in entomology, the next name in order is *Megascops* KAUP, for the whole genus *Scops*! See Auk, April, 1885, p. 183, where DR. STEJNEGER makes the point, from which I see no escape, under A. O. U. canons of nomenclature.

Analysis of Subgenera, Species, and Subspecies.

- Toes bristly or partly feathered. Plumicorns conspicuous. (*Megascops* proper) *asio*
- Face not fringed with filaments.
 - Dichromatic; red phase bright rusty. Eastern.
 - Medium in size; wing usually between 6.00 and 7.00; tail about 3.50. Markings of under parts coarse, irregular, and blotchy, usually wanting on middle of belly; of upper parts fine but irregular, without nuchal collar. Eastern U. S. and Canada *asio*
 - Small: wing usually 5.50-6.00; tail about 3.00. Markings as in *asio*, but rather heavier. S. Atlantic and Gulf States *floridanus*
 - Small: size of *floridanus*. Markings of under parts fine, regular, of upper parts coarse, but regular, with tendency to a nuchal collar. Texas *maccalli*
 - Dichromatic: red phase rusty-brown. Northwestern.
 - Large: wing usually over 7.00. In the gray phase like *asio*, but markings of under parts finer, more regular and continuous. Northwest coast region *kennicotti*
 - Large: size of *kennicotti*; coloration of *bendirei* (monochromatic). Interior *macfarlanei*
 - Dichromatism not known to occur. Western.
 - Medium; size of average *asio*. Markings of under parts thick, regular, continuous over the whole surface; of upper parts exactly as in *asio*. California *bendirei*
 - Medium; size of average *asio*. Ground color ashy; dark markings coarse and heavy. Plains *atkeni*

Medium: size of average <i>asio</i> .	Ashy-gray above, etc.	New Mexico and Arizona	<i>cineraceus</i>
Large: size over average <i>asio</i> .	Markings of all parts	very light, the gray pale, with much white, especially on wings and under parts.	Rocky Mts.
Face fringed with filaments.	Mexico and Arizona		<i>mexicellus</i>
Toes perfectly naked.	Plumicorns short. (<i>Psiloscops</i> .)	Larger.	Southwestern
		Smaller.	Idaho
			<i>flumincola</i>
			<i>idahoensis</i>

M. a'sio. (Lat. *asio*, a kind of horned owl. Fig. 435.) **LITTLE HORNED OWL. SCREECH OWL. MOTTLED OWL. GRAY OWL. RED OWL. AMERICAN DUKELET.** Of medium size in the genus. ♂ ♀: Length 8.00-10.00; extent about 22.00; wing 6.00-7.00, usually between these numbers; tail 3.00-3.50; ♀ larger than ♂. — *Gray or normal phase*, adult ♂ ♀: Upper parts brownish-gray in minutely dappled pattern of lighter and darker shades, everywhere finely but irregularly streaked with black or blackish shaft-lines, usually most evident on the crown. A conspicuous oblique scapular bar formed by white or creamy outer webs of several scapulars, each usually touched with black at its end; a second similar bar on outer webs of several outer wing-coverts. Wing-quills dusky; outer webs of primaries with several distinct conspicuous white or buff spots; inner webs of primaries and both webs of secondaries with numerous alternating lighter and darker bars; lining of wings mostly yellowish-white. Tail like secondaries, but the light bars mostly ragged or dissipated in marbling. Facial disc set in a blackish frame nearly all around; mostly finely mottled, but lores and chin usually whitish, immaculate. Taking white as ground color of the under parts, this is coarsely and irregularly blotched and streaked with thick shaft-lines giving off numberless finer curved or wavy cross-bars; general aspect patchy; markings usually wanting on middle of belly. Iris yellow; bill livid or slate-gray, pale horn-color at tip; claws blackish. From this stage the "mottled owl" passes by insensible degrees, through wood-brown, hazel-brown, and tawny into the "red owl." *Red or erythrisimal phase*: Bright rust-red, sometimes even bronzed; most of the special markings dissipated or absorbed in red, continuous and uniform above, showing only traces if any of black shaft-stripes; below, black stripes and blotches usually preserved, and red also mixed with much white. The dark rim of the disc, and white scapular stripes, are usually preserved. The two phases are distinct from the first feathering, which, in the normal phase, is almost everywhere closely and regularly barred or waved crosswise with dark gray and pale gray or whitish. Nestlings are covered with white down. Eastern U. S. and Canada (except the range of *M. a. floridanus*), W. to the Great Plains, on confines of its range shading into the several varieties noted beyond; resident, and on the whole the most abundant Owl, breeding about buildings as well as in hollow trees or stumps, and feeding on small quadrupeds, as mice and shrews, insects and less frequently small birds and reptiles; nest a slight accumulation of rubbish in the hollow selected for a residence, which is often a Woodpecker's hole; eggs ordinarily 5 or 6, but from 4 to 7, 8, or 9, white, subspherical, 1.30 to 1.40 × 1.15 to 1.20, laid from the latter half of March to early in May, according to latitude. This interesting little Owl, of the quaint and curious cries, so persistent in uttering its doleful ditty, is the best known and most familiar of its uncanny tribe: it belongs to the group



FIG. 435. — Screech Owl, Gray Plumage.

which is only semi-nocturnal, and can see quite well by day, but seldom flies abroad except at night. It is easily tamed, and makes an amusing pet.

M. a. florida'nis. (Lat. of Florida.) FLORIDA SCREECH OWL. A small southern form; wing 5.50-6.00; tail about 3.00. Coloration as in *asio*, but heavier; a rich red phase frequent if not the usual one. In its full development the rusty makes quite firm crossbars on the under parts, which is not the rule in *asio*, though very evident in specimens of *asio* from southern Illinois, for example, where the red is by far the most frequent plumage. In the "gray" phase, rather brown than gray, sometimes quite umber-brown, the feet dark brown, heavily barred with dusky. South Atlantic and Gulf States, chiefly coastwise; best marked in Florida, thence fading insensibly into *asio*, both in size and color.

M. a. kennicot'ti. (To Robert Kennicott.) KENNICOTT'S SCREECH OWL. The large dark northwest coast form. Length about 11.00; wing usually 7.00-7.50, but grading down in some cases below 7.00; tail about 4.00. In gray phase, similar to *asio* proper, and still more so to *bendirei*, the upper parts in fact indistinguishable, but markings below finer, more regular and continuous over the whole surface than in *asio*; in "red" phase dusky umber-brown, quite unlike the bright rust color of *asio*. This state was long supposed to be the only one, and is characteristic of the bird which occurs coastwise from Oregon to Sitka, shading southward into *bendirei*, and eastward into *macfarlanei* of the interior. But the dichromatism of *kennicotti* is established by means of the form called *saturatus* by BREWSTER, Auk, April, 1891, p. 141, which proves to be inseparable, and thus substantiates the view maintained in the Key, 2d-4th eds. 1884-90: see Auk, Jan. 1894, p. 49.

M. a. macfar'lanei. (To Robert Macfarlane of the Hudson's Bay Co., in former years an energetic collector of birds in British America, in association with Kennicott.) MACFARLANE'S SCREECH OWL. Size of *kennicotti*, with the coloration of *bendirei*. Northwestern U. S., in the interior, Montana to Oregon and Washington E. of the Cascade range, thence N. in British Columbia. This is simply the connecting link between *kennicotti* and *bendirei*, covered by my description of the former in previous editions of the Key, later named and recognized by the A. O. U. BREWSTER, Auk, Apr. 1891, p. 140, described from Fort Walla Walla, Wash., and Hellgate (Missoula), Mont. A. O. U. List, 2d ed. 1895, No. 373h.

M. a. bend'irei. (To Capt. Chas. Bendire, U. S. A.) CALIFORNIA SCREECH OWL. Size of *asio*, and extremely like it, differing chiefly in finer, more numerous and continuous cross-bars of under parts, which cross middle of belly as elsewhere; the shaft-stripes also appear less blotchy. It is thus quite like the gray phase of *kennicotti*, and indistinguishable from *macfarlanei* in color, but averaging smaller than either. No rich "red" phase has been observed, but specimens run from the normal gray into more brownish shades. The plume-coverts are said to be shorter. Coast region of California, common. I have gone carefully over a large series, and appreciate the points made by Mr. Brewster and Mr. Ridgway. If these fine shades are to be recognized by name, the present seems entitled to be ranked with the rest.

M. a. maxwel'liæ. (To Mrs. M. A. Maxwell, of Boulder, Col., a noted huntress and taxidermist.) ROCKY MOUNTAIN SCREECH OWL. Size averaging over that of *asio*; wing up to 7.50; tail up to 4.00. No red phase observed; but, on the contrary, the whole plumage very pale, almost as if bleached, the difference evident in nestlings even. Upper parts paler gray, with reduced black lines; lower whiter with reduced dark shaft-lines and cross-bars; the scapular bar very conspicuous; much white on wing-coverts; white spots on outer webs of several primaries running into continuous areas only indented with small dark spaces. An alpine form approaching *kennicotti* and especially *macfarlanei* in size, but as much lighter-colored as *kennicotti* is darker than normal *asio*. Mountains of Colorado, Wyoming, and Montana.

M. a. aiken'i. (To Chas. E. Aiken, of Colorado Springs, Col.) AIKEN'S SCREECH OWL. Size of average *asio* (♀: wing 6.56; tail 3.80; tarsus 1.37; bill from nostril 0.47). No red

phase known. "Ground color more ashy; the dark markings coarser, and more numerous and conspicuous, than in any other North American member of the genus;" resembling *M. aspersus* of Mexico. El Paso Co., Colorado, in the plains (*maxwellia* in the alpine region). BREWSTER, Auk, Apr. 1891, p. 139; A. O. U. List, 2d ed. 1895, No. 373 g.

M. a. maccalli. (To Col. Geo. A. McCall.) TEXAS SCREECH OWL. A small southern form; size of *floridanus*; gray and red phases, as in *asio* proper. Very similar to *asio*: in gray phase, markings of under parts finer, firmer, more regular and continuous; shaft-lines strict, not blotchy; cross-lines sharp; stripes of upper parts coarse, but regular, and nape with a tendency to present a light nuchal collar. Texas and southward. *Scops maccalli* CASS. B. Cal. and Tex., July, 1854, p. 180, and in BAIRD, B. N. A. 1858, p. 52; ed. 1859, p. 52, pl. 39; Baird, U. S. Mex. B. Surv. 1859, pl. 1. *S. asio* var. *maccalli* COUES, Key, 1st ed. 1872, p. 203, here first reduced to a subspecies; COUES, B. N. W. 1874, p. 303. *S. asio maccalli* COUES, Key, 2d-4th eds. 1884-90, p. 506. *Megascops asio maccalli* STEJ. Auk, Apr. 1885, p. 184. *M. a. maccalli* A. O. U. List, 1st ed. 1886, No. 373 b; A. O. U. Suppl. List, Auk, Jan. 1899, p. 109. ? *Scops asio* var. *evano* LAWR. MS., RIDGW. in B. B. and R., Hist. N. A. B. iii, 1874, p. 48; COUES, B. N. W. 1874, p. 304. ? *Scops asio*, subsp. γ . *evano* SHARPE, Cat. B. Brit. Mus. ii, 1875, p. 118. *Megascops asio trichopsis* RIDGW. Auk, Oct. 1895, p. 389, by error (not *trichopsis* of WAGLER); A. O. U. List, 2d ed. 1895, No. 373 b, by error.

M. a. cineraceus. (Lat. *cinereus*, ashy.) MEXICAN SCREECH OWL. Described by Ridgway as having the bars of the lower surface fine, closer than in *asio*, and much more uniformly distributed; general aspect paler than in *asio*, with much finer vermiculations. Later described by Ridgway as "nearly pure ashy-gray above, the usually broad black mesial streaks in conspicuous contrast; blackish bars on lower parts very numerous, narrow; black border to face without admixture of brown, and black spots on breast usually without distinct brown exterior suffusion; length about 6.50-8.00; wing 6.10-7.00; tail 3.10-3.70." Lower California, Arizona, New Mexico, and southward in western Mexico. *Scops asio maccalli* RIDGW. in B. B. and R. Hist. N. A. B. iii, 1874, p. 49 and p. 52, by error. *Scops asio* subsp. δ , *trichopsis* SHARPE, Cat. B. Brit. Mus. ii, p. 119, excl. syn. *Scops trichopsis* RIDGW. Pr. U. S. Nat. Mus. 1878, p. 114, by error. Queried as *Scops trichopsis*? COUES, Key, 2d-4th eds. 1884-90, p. 506. *Megascops trichopsis* STEJ. Auk, Apr. 1885, p. 184, by error. *Megascops asio trichopsis* RIDGW. Pr. U. S. Nat. Mus. viii, 1885, p. 355; A. O. U. List, 1st ed. 1886, No. 373 f; RIDGW. Man. 1887, p. 261—all in error. *Megascops asio cineraceus* RIDGW. Auk, Oct. 1895, p. 390; A. O. U. List, 2d ed. 1895, No. 373 f. The status of this form is dubious; but as I suspected in 1884, it is *not Scops trichopsis* of WAGLER.

M. trichopsis. (Gr. $\theta\rho\acute{\iota}\xi$, *thrix*, gen. $\tau\rho\acute{\iota}\chi\acute{o}s$, *trichos*, hair; $\acute{\omicron}\psi\upsilon$, *opsis*, aspect.) WAGLER'S OWL. SPOTTED SCREECH OWL OF BREWSTER. Distinct from any of the foregoing to which the name has been misapplied. Adult ♀: "Sides of head conspicuously fringed with black bristles, longest on auriculars and superciliary ruffs; tarsi densely feathered on all sides to the toes, the latter sparsely feathered above; throat and sides of neck pale rusty chestnut; remainder of plumage coarsely spotted and barred almost everywhere with dull black" (Brewster). A red phase. Chihuahua and some other states of Mexico, south to Guatemala. Huachuca Mts. of Arizona. Length of the Chihuahua type 7.50; extent 16.25; wing 5.66; tail 2.89; tarsus 1.17; middle toe 0.67; culmen from nostril 0.40; depth of bill 0.41; longest feathers of ear-tufts 1.00; Huachuca specimens smaller; wing about 5.25, etc. The fringing filaments of the face give this species an unmistakable aspect and the name *trichopsis*: it was unknown to U. S. ornithologists till described as *aspersus* by BREWSTER. *S. trichopsis* WAGLER, Isis, 1832, p. 276. *Megascops trichopsis* KAUP, Trans. Zool. Soc. Lond. iv, 1862, p. 227; A. O. U. Suppl. List, Auk, Jan. 1899, p. 109, No. 373. 1. *Megascops aspersus* BREWST. Auk, Jan. 1888, p. 87; Auk, Oct. 1891, p. 400, pl. 3, upper fig.: Auk, Apr. 1898, p. 186. Also figured

in Biol. Centr. Amer. Aves, iii, Nov. 1897, p. 16. The slight feathering of the toes indicates an approach to the following section of the genus.

(Subgenus *PSILOSCOPS*.)

M. (P.) flamme'ola. (Lat. *flammeola*, here signifying a little reddish thing.) FLAMMULATED SCREECH OWL. A small species, with much the general aspect of an ungrown *asio*; but subgenerically distinct from any form of *asio*. The close feathering of the tarsus stops abruptly at bases of toes, which are naked, and the plumicorns are quite short (affording characters of subgenus *Psilosops*). Length 6.50–7.00; wing 5.25–5.50; tail 2.75; tarsus 0.90; culmen, without cere, 0.35; middle toe, without claw, 0.55. Adult ♂ ♀: Facial disc, sometimes whole head, rusty-rufous, or light chestnut, speckled with black, on top of head also with white, tending to form a superciliary stripe. Ground of under parts white, but heavily overlaid with shaft-stripes or blotches of black giving off irregular cross-waves, on the breast tinged with rusty-rufous here and there; tarsi white, speckled with dusky. Upper parts minutely dappled with dark brown and hoary-gray, and with ragged dark shaft-stripes; a conspicuous whitish or tawny and white scapular bar, as in *asio*. Tail like back, but with numerous narrow and ragged cross-bars of pale rusty or whitish. Wing-quills "bitten in" on outer webs with white or buff, conspicuously so on several primaries, their inner webs with regular but narrow, distant and weak bars, strengthening, however, toward bases of secondaries. Young birds, like those of *asio*, tend to a uniform cross-barring of the whole plumage, but especially of the under parts, with light and dark; top of head finely vermiculated in this manner; chestnut first appears on ear-coverts and about eyes. The species is dichromatic, and in the red phase parts which are brown or gray in the other phase are rich buff or orange-rufous; but the peculiar pattern of coloration persists, and in any color-variation this interesting little scops, only about as large as a *Glaucidium*, is unmistakable. This is our nearest representative of the European "petit due" or "dukelet," commonly called *Scops giu*. From the highlands of Guatemala and Mexico it extends northward to the mountains of Colorado, and in California to Fort Crook; resident, breeding up to 10,000 feet, in Woodpeckers' holes in trees, May and June; eggs 3–4, 1.15 × 0.95.

M. f. idahoensis. (Lat. of Idaho.) DWARF SCREECH OWL. Like the last, but still smaller; wing about 5.00. Coloration paler, especially on the under parts, where the ground is white, with fine and distant dark vermiculation, and the heavier lengthwise black markings are mainly restricted to a single series on each side; chin white; facial disc bright tawny ochraceous, with much less conspicuous dark markings than in *flammeola*. Upper parts nearly as in the last. Type specimen adult ♂ from Ketchum, Alturus Co., Idaho, Sept. 22, 1890. Idaho and eastern Washington. If the characters hold true, when specimens enough shall have been examined, it will rank as a good species. MERRIAM, North American Fauna, No. 5, July, 1891, p. 96, pl. 1; Auk, Apr. 1892, p. 169, pl. 2; A. O. U. List, 2d ed. 1895, No. 374 a.

SCOTIAPT'EX. (Gr. *σκοτία*, *skotia*, darkness, gloom; rest of word uncertain, probably perverted from *ptynx*, Gr. *πτινξ*, *ptynx*, the eagle-owl. If so, the correct form of the word would be *Scotiptynx*, and its grammatical gender feminine.) GREAT GRAY OWLS. LAPP OWLS. General characters of *Strix* proper (from which not separated till the 4th ed. of the Key, p. 904, 1890.) Size very great; but the apparent dimensions are in part due to the remarkably copious lax plumage, the bird being notably small-bodied in comparison with its linear measurements; length 2 feet or more. Coloration diffuse, of blended brown, gray, and whitish, the dark markings in excess of the light ones, and forming streaks lengthwise on the breast, but cross-bars on the flanks. Bill and feet small, the former almost buried in the facial disk, the latter densely clothed with shaggy feathers; eyes also small, for an Owl, with yellow irides. Six primaries emarginate. One species, of circumpolar distribution. (*Scotiaptex* SWAINS. Class B, ii, 1837, p. 217, usually considered a synonym of "*Syrnium*," i. e. of *Strix* proper.)

S. cine'rea. (Lat. *cinerea*, ashy.) GREAT GRAY OWL. SPECTRAL OWL. Feet completely feathered to claws; bill and eyes yellow; 6 primaries cut on inner webs. Entire upper parts dark brown, mottled with grayish-white in confused and intricate pattern, reducible in general to dissipation of bars. Wings and tail similar, broken-banded with grayish-white marbling. Under parts of the same dark brown and pale gray, the pattern in streaks on breast, in cross-bars on belly and flanks, in spots on feet. The great facial disc watered with dark brown and light gray in regular rings concentric with each eye, the outermost ring dark brown and stronger than the rest, bounded below with a ragged white collar. Length 2 feet or more; extent about 5 feet; wing 16.00-18.00 inches; tail 11.00-12.50; culmen 1.00 without cere. An immense Owl, one of the largest of all, inhabiting Northern N. Am., straying irregularly south into the U. S. in winter, to southern New England, New York, New Jersey, Ohio, Illinois, Dakota, Montana, Wyoming, Idaho, Oregon, and northern California; common in wooded regions of the fur countries and Alaska, but not frequenting the barren grounds. Nest in trees, of sticks, mosses, and feathers; eggs 2, 3, or 4, not equal-ended and rather small for the bird's apparent dimensions, about 2.15×1.70 , laid from April to July. Like others of the genus it is a wood Owl; while its prowess enables it to prey upon creatures up to the size of Grouse and Hares.

S. e. lapponica. (Lat. *lapponica*, of Lapland.) LAPP OWL. Specimens from Alaska, lighter colored than typical *cinerea*, and with a basal whitish patch on inner webs of the remiges, have been referred to the European rather than the American variety, the Norton Sound examples being regarded as Old World stragglers of *Strix lapponica* RETZIUS, Fn. Suecica, 1800, p. 79; *Scotiaptex cinereum lapponicum* RIDGW. Man. 1887, p. 260; *Scotiaptex cinerea lapponica* COUES, Key, 4th ed. 1890, p. 904; A. O. U. List, 2d ed. 1895 [No. 370 a].

NYCTALA. (Gr. *νύκταλος*, *nyktalos*, sleepy.) SAW-WHET OWLS. Skull and ear-parts highly unsymmetrical, latter of great size, fully operculate. Head very large (as in *Strix*), without plumicornis; facial disc complete, with centric eye. Nostril at edge of cere, which is inflated or not. Tail from $\frac{1}{2}$ to $\frac{2}{3}$ as long as wing, rounded. Third and 4th primaries longest; 1st quite short; 2 or 3 emarginate on inner webs. Feet thickly and closely feathered to claws. In this interesting genus the ear-parts reach extreme asymmetry, the whole skull seeming misshapen. Two species are known, both of small size; one of circumpolar distribution, with a subspecies peculiar to North America, the other, American. They are notable for the unusual degree of difference between old and young; and our species are readily distinguished by stronger characters than are ordinarily found between congeneric owls. Eyes yellow in both; bill yellowish in one, black in the other. Adults amber or chocolate-brown above, spotted with white, below white, striped with brown. Young more uniformly brown, with plain dark face and white eyebrows. Nestlings covered with sooty down; eggs numerous. Nest in trees; habits strictly nocturnal.

Analysis of Species.

Larger: wing about 7.00; tail 4.50. Bill yellow; cere not tumid; nostrils presenting laterally, and obliquely oval.

Arctic *tengmalmi richardsoni*

Smaller: wing 5.50; tail 2.67. Bill black; cere tumid; nostrils presenting anteriorly, and about circular. U. S.

acutica

N. tengmalmi richardsoni. (To P. G. Tengmalm and J. Richardson. Fig. 436.) ARCTIC AMERICAN SAW-WHET OWL. RICHARDSON'S OWL. Adult: Upper parts, including wings and tail, uniform chocolate-brown, spotted with white; on top of head the spots small and profuse, on nape larger and blended into a nuchal collar, on back and wing-coverts large and sparse but tending to form a scapular bar, on wing-quills and tail-feathers in pairs, at opposite edges of the webs, on inner webs larger, more like bars, and more or less run together, especially on inner secondaries. Under parts white, thickly and confusedly streaked lengthwise with color of back. Facial disc mostly white, but with blackish eyelids and loreal spot, set in a frame of

dark brown speckled with white. The general tone of the brown is oftenest ruddy, nearly as in *acadica*, but sometimes dark and pure. Length 10.00–12.00; extent 24.00; wing 7.00; tail 4.50; tarsus 1.00; middle toe without claw 0.67; culmen without cere 0.60. Young: Upper parts plain brown, lacking the white spots of the adults, except on the wings and tail; facial area dark, unmarked, except by a white superciliary streak; lower parts plain brownish, fading posteriorly into buff, unmarked; difference from the adult thus as in *acadica*. Distinguished from the European conspecific (fig. 436) by its darker coloration, ochrey feet spotted with brown instead of being nearly immaculate white, and more heavily streaked under tail-coverts; the difference in coloration from *tengmalmi* proper being thus closely correspondent with that between the American and European Hawk Owls. This fine species inhabits Northern N. Am., being seldom seen in the U. S., where only known in winter and not farther south than New England, Wisconsin, northern Ohio, Colorado, and Oregon, though it is possibly resident in northern Maine, like the Hawk Owl; breeding range from just beyond our N. border northward to the limit of trees. The nest is in a tree, usually in a hole, sometimes among the branches; eggs 2 to 6 or 7 in number; size 1.20 × 1.05, thus very round; laid from late in April to early in June. The bird feeds mostly upon very small mammals and insects.

N. acadica. (Lat. *acadica*, of Acadia.) ACADIAN OWL. SAW-WHET OWL. WHITE-FRONTED OWL. KIRTLAND'S OWL. Adult: Upper parts, including wings and tail, very



FIG. 436. — Tengmal's European Saw-whet Owl, very near *richardsoni*. $\frac{1}{2}$ nat. size. (From Brehm.)

similar to those of the last species, but usually ruddier brown, the spotting less extensive, the marks on top of head pencilled in delicate shaft-lines instead of round spots, those of wings and tail exactly as in *richardsoni*. Under parts white, diffusely streaked or dappled with a peculiar light brown, almost pinkish-brown. Feet immaculate whitish, tinged with buff. Facial disc mostly white, but blackened immediately about eye and on loreal bristles, and pencilled with dusky on auriculars; set in a frame of color of back, touched with white points behind ear; this frame distinct on throat, where it separates white of the disc from a white jugular collar, before the pectoral streaks begin. Bill black; claws dark; eyes yellow. Young quite different (*N. albifrons*): Above, ruddy chocolate-brown, without any spots; wings and tail more fuscous brown, marked substantially as in the adults. Below, color of back extending over all fore parts, the rest brownish-yellow; no streaks whatever. Facial disc sooty-brown, with

whitish eyebrow; some white touches on the rim behind ear curving forward to chin. Bill black. Length 7.50–8.00; extent 17.00–18.00; wing 5.25–5.75; tail 2.60–2.90; tarsus 0.75; bill without cere 0.50; middle toe without claw 0.60. This curious little Owl, the most diminutive species found in Eastern N. Am., inhabits the U. S. from Atlantic to Pacific, goes N. to lat. 52° in British Am., and S. into Mexico. Though common and generally distributed, it is not very well known, as it is shy and retiring, perfectly nocturnal in habits, and does not often come under casual observation; in regions E. of the Mississippi Valley it is most frequently found in the N. half of the U. S., but in the Rocky Mts. ranges throughout; it is a wood Owl, seldom if ever occurring in open country. It is chiefly noted for its shrill notes, which, being likened to filing a saw, have occasioned its name. The nest is usually made in the hollow of a tree or stump, as a Woodpecker's or squirrel's hole, but sometimes the bird has

occupied artificial retreats set up for its accommodation, like the Purple Martin; the eggs are 3-6 or 7 in number, white, subglobular, about 1.18×1.00 ; the largest ones about equal those of the preceding species in length, but are both relatively and absolutely narrower. They are laid mostly in April, but from late in March to early in June.

NYCTEA. (Gr. *νυκτεῦς*, *nykteus*, Lat. *nycteus*, nocturnal.) **SNOW OWLS.** Much the same generic characters as *Bubo*, but plumicorus rudimentary, generally considered wanting; facial disc quite incomplete, eyes not centric to it; bill nearly buried in frontal feathers; feet densely clothed in long shaggy feathers which even hide claws; 4 outer quills emarginate on inner webs; under tail-coverts reaching end of tail, which is rounded, and rather more than $\frac{1}{2}$ as long as wing. One circumpolar species of great size, and mostly white color; young covered with sooty down; nest on ground; eggs many.

N. nyctea. (Fig. 437.) **GREAT WHITE OWL. SNOWY OWL. ERMINE OWL. WAPACUTHU. HÅRFANG.** Pure white, spotted and barred with brownish-black markings, wholly indeterminate in size and number;

but entirely white specimens are very rare. There is often more blackish than white; in darkest birds, the markings tend to bar the plumage with rows of spots, such pattern specially evident on wings and tail. A common average plumage is spotted over all upper parts, broken-banded on quills and tail-feathers, regularly banded on under parts, with white face and paws. The face, throat, and feet are usually whitest. Bill and claws black; iris yellow.

♂ nearly or about two feet long; extent 4.50-5.00 feet; wing 16.00-18.00 inches; tail 9.00-10.00; culmen 1.00 without cere; tarsus 2.00; middle toe without claw 1.25. ♀ larger, often over two feet long; wing up to 19.00, etc. She is also as a rule darker colored than he is; our very large heavily blackened specimens are mostly of the "fair" sex. This remarkable Owl, conspicuous in size and color, abounds in boreal regions of both hemispheres, far within the Arctic Circle, as near the North Pole even as any explorers have gone. It is capable of enduring the rigors of six months' nights under polar stars, and only comes southward irregularly in winter, sometimes raiding in large numbers. With us, it is of every winter occurrence in the Northern and Middle States, sometimes pushing its way even to the Carolinas and Texas; there being no part of the U. S. where it may not appear at that season. It is far from being exclusively nocturnal, but hunts abroad in the daytime as readily as any Hawk, with eyes undimmed by the glare of the sun from boundless sheets of snow, so dazzling and painful to human vision. It preys upon hares, spermophiles and smaller mammals, especially lemmings and voles, which swarm in the sphagnum of hyperborean tundras or barren grounds, upon Ptarmigan, Ducks and smaller birds, and often proves itself as



FIG. 437. — Snowy Owl.

good a fisherman as it is bold a fowler. It has never been ascertained to breed in the U. S., though it may have done so in Maine, as it certainly does a little farther north in Nova Scotia, New Brunswick, Newfoundland, Labrador, Manitoba, and thence N. to the Arctic Ocean. The nest is built upon the ground or rocks, of mosses lined with feathers; the eggs are 3 to 10, usually 5, 6 or 7, laid at intervals (as is the case with various other Owls), so that the nest may contain fresh and incubated eggs and young birds at once; they are lustreless, roughly granular, even faintly corrugated lengthwise, equal-ended, but not much rounded, being about 2.25×1.75 . Only one clutch is deposited annually, mostly in May or June. (*Nyctea nivea* and *N. scandiaca* of authors, as of previous editions of the Key; but our rules require us now to use the inelegant and displeasing tautonym, *Nyctea nyctea*.)

SURNIA. (Etymology of *Surnia* or *Syrnium*, unknown. There is no recognized classic Greek or Latin word from which the name can be derived, but I find *σύρμιον*, *surnion*, cited by Brisson as a modern Greek name of *Strix stridula*, and this is obviously the source of both *Surnia* and *Syrnium*. The former dates in systematic zoölogy from Duméril, Zoöl. Anal. 1806, p. 34.) **HAWK OWLS.** Skull and ear-parts much as in *Bubo* or *Nyctea*; latter non-operculate, the opening of small size; facial disc very little developed, and eyes not centric to it; no plumicorns. Wings folding far short of end of tail; 3d primary longest; first 4 emarginate on inner webs. Tail remarkably long, little shorter than wing, much graduated, with lanceolate feathers. Feet thickly and completely feathered to the claws; tarsus scarcely or not longer than middle toe. Of medium size, with a peculiarly neat and dressy appearance for an Owl, the whole plumage being more strict than in other members of this family. There is but one species, common to northern portions of both hemispheres, as Hawk-like in habits as in mien.

S. ulula. (Lat. *ulula*, a kind of Owl, so called from its outcry; *ululare*, to cry out, howl, as with pain or grief. As the name of an Owl, the word goes back in ornithology to Gesner, 1555, and still farther to Pliny. Use as a technical name, both generic and specific, is of course very recent: *Strix ulula* LINN. 1758, is the European Hawk Owl; *Ulula* CUV. 1817, is a genus of Owls, which has been variously used. *Ulula* as a Latin word is obviously onomatopoeitic; compare Gr. ἀλαλά or ἀλαλή, *alala* or *alale*, an outcry, ἀλαλάζω, *alalazo*, I cry out; also δολολυγή, *ololuge*, an outcry; δολολυγών, *ololugon*, the croaking of frogs; δολολυζω, *ololuzo*, I call on the gods; compare also our interjection *hallelujah!* which we get from the Hebrew; Sanskrit *ulūkās*, an owl; English *owl*, *owlet*, *howlet*, *howl*, *halloo*, *hullo*, *hullabaloo*, etc.) **EUROPEAN HAWK OWL.** Lighter in color than the American *caparoch* next described; the white markings more prominent on the crown, cervix and scapulars; lighter brown, narrower bars on the under parts; dark markings of the disc rather brown than blackish. Size the same. N. Europe and Asia; similar specimens from St. Michael's, Alaska. (*S. funerea ulula* of 2d-4th eds. of the Key: see next article.)

S. u. caparoch. The word *caparoch*, applied to the American Hawk Owl, as *Strix caparoch*, by P. L. S. MÜLLER, in his Suppl. to LINN. Syst. Nat. 1776, p. 69 (after BODD, Kortb. 1772, p. 112), is the same as *caparacoch* or *coparacoch*, given in BRISSON, Orn. 1760, I, p. 520, as the name applied by the natives of Hudson's Bay to this very bird, the *Strix Freti Hudsonis* of BRISSON (the Little Hawk Owl of EDWARDS, ii, pl. 62), and also the *Strix canadensis* BRISS. i, p. 518, pl. 37, fig. 2; which latter is one of the two bases of *Strix funerea* LINN. S. N. I. ed. 12, 1766, p. 133, No. 11. Our bird has commonly been called *Surnia funerea* (LINN. 1766), as in the 2d-4th eds. of the Key, 1884-90, p. 511; but unluckily Linnæus mixed it up with the European one, which he had called *Strix funerea* in his Fn. Suec. 2d ed. 1761, p. 75; and furthermore, his *S. funerea* of the 10th ed. 1758, p. 93, No. 7, is based solely on the European bird (Fn. Suec. 1st ed. 1746, p. 51). Thus it appears that *ulula* LINN. 1758 and 1766, belonging exclusively to the European form; *funerea* LINN. 1758, exclusively European; and *funerea* LINN. 1766, European and American, are none of them available for our bird: and



FIG. 438. — American Hawk Owl.

caparoch Müll. 1776, comes next in order for the latter. See Auk, Oct. 1884, p. 362. Another name for our bird is *Strix hudsonia* GM. 1788, obviously based on Edwards, as above; this is the origin of *Surnia ulula* var. *hudsonica* COUES, Key, orig. ed. 1872, p. 205. Figs. 438, 439.) AMERICAN HAWK OWL. CANADIAN or HUDSONIAN OWL. DAY OWL. CAPAROCH. Bill

and eyes yellow; claws brownish-black. Upper parts bistre-brown, darkest and almost blackish on head, where profusely spotted with small round white marks, to which succeeds a nuchal interval less spotted or free from spots, then an area of larger and lengthened spots; scapulars profusely spotted with white in large pattern, forming a scapular bar as in *Megascops*; back and wing-coverts more or less spotted with white also; primaries and secondaries with white spots in pairs on opposite edges of the feathers. Tail broken-barred with white or pale gray, usually narrowly and distinctly, on one or both webs, and tipped with the same; but there is great individual variation in this respect, as may also be said of the amount and character of the spotting of the whole upper parts. Under parts from breast backward, including crissum, closely and regularly cross-banded with rich reddish-brown, or even reddish-black, upon a white ground, the alternating bars of color usually of about equal widths — if anything, the white the broadest. The lining of the wings shares the same character, but is more spotty; the paws are mottled with brown and whitish, in different pattern. On the breast the regular barring gives way, the tendency being to form a dark pectoral band on a white or spotted ground, but this disposition is seldom perfected. Facial disc mostly whitish, bounded by a conspicuous blackish crescent behind ear. When the dark nuchal collar is perfected, a second bar curves down behind the first on side of neck, separated by a whitish interval; edges of eyelids, many of the loreal bristles, a line just in front of eye, and a chin-spot, are black or dusky; the lower part of disc below ears has also dusky streaks. Exposed part of bill bright yellow, but most of that hidden by bristles is of a dark livid color. However variable in detail, the markings of this species are unmistakable; those about the head are better defined than in most Owls, and quite peculiar. Length 15.00 or more; extent 33.00; wing about 9.00; tail about 7.00; tarsus, or middle toe without claw, 1.00 or less; culmen without cere 0.75. A handsome and spirited Owl, abundant in northern portions of N. Am., S. into northern U. S. in winter, frequently and regularly; is possibly resident in Maine and in the mountains of Montana and Idaho; also accredited to Great Britain, on the strength of the dark coloration of some British specimens. Like the Snowy Owl, it endures the rigors of Arctic winters. Nest usually in trees, either in a natural hollow or among the thick branches of a conifer, sometimes on rocks or stumps, of sticks, mosses, grasses, and feathers; eggs 3-7, April, May, about 1.55×1.25 , white. The food of this bird is chiefly field-mice, lemmings, and other small rodents, hawked for in broad daylight, this owl being the least nocturnal of its tribe.



FIG. 439. — Hawk Owl, reduced. (Sheppard del. Nichols sc.)

GLAUCIDIUM. (Gr. γλαυκίδιον, *glaukidion*, dimin. of γλαῦκος or γλαυκός, *glaukos*, gleaming or glaring, as an Owl's eyes are; hence γλαύξ, *glauξ*, an Owl. Cf. the well-known epithet, γλαυκῶπις Ἀθήνη, *glaukopis Athene*, gleaming-eyed Athena, Pallas, or Minerva, goddess of war and wisdom, to whom the γλαύξ was sacred.) GNOME OWLS. SPARROW OWLS. PYGMY OWLS. Size very small. Head perfectly smooth; no plumicorns; ear-parts small, unoperculate; facial disc very incomplete; eye not centric. Nostrils circular, opening in the tumid cere; bill robust. Tarsus fully and closely feathered, but toes only bristly for the most part. Wings short and much rounded; 4th primary longest, 1st quite short, 3 outer ones emarginate, next 1 or 2 sinuate. Tail long, about $\frac{3}{4}$ as long as wing, even or nearly so. Claws strong, much curved. A large genus of very small Owls, mostly of tropical countries. The numerous species, chiefly of warm parts of America, are in dire confusion, but those known to inhabit North America are now well determined. The plumage of many or most species is dichromatic, as in *Scops*, there being a red and a gray phase independently of age, season, or sex; but the red is not known to occur in our *G. gnoma*. The upper parts are marked with spots or lines; bars, or rows of spots, cross wings and tail; under parts streaked; a cervical collar. Notwithstanding their slight stature, the Gnome Owls are bold and predaceous, sometimes attacking birds quite as large as themselves. They are not specially nocturnal. The eggs are laid in holes in trees.

Analysis of Species.

Markings of upper parts in dots and round spots. Tail dark brown, with rows of white spots *gnoma*
 Markings of upper parts in sharp lines. Tail reddish, with dark brown bars *phalenoïdes*

G. gnóma. (Lat. *gnoma*, a spirit of the mines.) GNOME OWL. PYGMY OWL. Adult ♂ ♀: Tail concolor with back, and markings of upper parts, as well as those crossing wings and tail, in form of dots or round spots, not lines or bars. Upper parts one shade of dark brown, everywhere dotted with small circular spots of white; a collar of mixed blackish-brown and white around back of neck; breast with a band of mottled brown, separating the white throat from white of rest of under parts, which have irregular lengthwise streaks of reddish-brown. Wings and tail dusky-brown, the feathers marked on both webs with rows of round white spots, largest on the inner; under wing-coverts white, crossed obliquely by a blackish bar. Bill, cere, and feet dull greenish-yellow; soles chrome-yellow; claws black; iris bright yellow; mouth livid flesh-color. Length of ♂ 7.00 or a little less; extent 14.50; wing 3.75; tail 3.00. Length of ♀ 7.50; extent 15.50, etc. In ♀ the upper parts are rather lighter, with fewer larger spots, and a nearly obsolete nuchal collar; but both sexes vary in the tint of the upper parts, which ranges from pure deep brown to pale grayish, almost olivaceous, brown, probably according to age and season, the newer feathers being darker than they are when old and worn. Erythrisms, so well known in *phalenoïdes*, has not been observed in the present one, which is closely related to the Sparrow Owl of Europe (*G. passerinum*). Rocky Mts. and others of Western N. Am. from British Columbia S. to the tablelands of Mexico, common in wooded regions; an interesting little owl, crepuscular and rather diurnal than strictly nocturnal, preying chiefly upon insects, but also upon birds and quadrupeds sometimes about as large as itself, as Robins, Grosbeaks, Towhees, Chipmunks, Gophers, etc. The bird is usually found in coniferous forests, has low cooing notes, and nests in holes of trees or stumps, mostly those made by Woodpeckers; eggs 3-4, 1.02 × 0.91, white or whitish, minutely punctulate, laid in May or early June.

G. g. californicum. (Lat. Californian.) CALIFORNIAN GNOME OWL. CALIFORNIA PYGMY OWL. Like the last; darker colored. The Pacific coast form of the foregoing, occurring in California, Oregon, Washington, and British Columbia. *G. passerinum* var. *californicum* of the Key, orig. ed. 1872, p. 206, which is *G. gnoma* of the 2d and 3d eds. 1884 and 1887, p. 514, includes this subspecies. The two forms were not then discriminated, and their reference to their European relative was erroneous. The present subspecies is *G. califor-*

nicum SCLATER, P. Z. S. 1857; *G. gnoma californicum* A. O. U. Committee's List, 1st Suppl., 1889, p. 9; COUES, Key, 4th ed. 1890, p. 904; A. O. U. List, 2d ed. 1895, No. 379 a.

G. hos'kinsi. (To Francis Hoskins, of Triunfo, L. Cala.) HOSKINS' PYGMY OWL. Similar to the preceding, but smaller and grayer; upper parts less distinctly spotted; forehead and facial disc with more white. Wing 3.30; tail 2.50; tarsus 0.75; chord of culmen 0.50. Lower California. *G. gnoma hoskinsii* BREWSTER, Auk, April, 1888, p. 136, accorded specific rank by its describer with approval of the A. O. U. Committee, in 1st Suppl. 1889, p. 9; COUES, Key, 4th ed. 1890, p. 904; A. O. U. List, 2d ed. 1895, No. 379.1. I have inspected the type specimens, which appear to be those of a distinct species.

G. phalænoi'des. (Gr. φάλανα, *phalaina*, Lat. *phalena*, a moth, and εἶδος, *eidos*, form, figure, appearance; from the resemblance of the plumage in coloration to that of certain moths. Fig. 440.) FERRUGINOUS PYGMY OWL. Adult ♂ ♀, *normal plumage*: Tail entirely ferruginous, or light chestnut-red, crossed with 7 to 9 bars of blackish-brown,



FIG. 440. — Ferruginous Owl. (From The Osprey.)

of same width as the rufous interspaces, both sets of markings quite regular. (These tail-marks distinguish the species in any plumage from *G. gnoma*.) Entire top of head, above superciliary ridges, and sides of head behind auriculars, olivaceous-brown, streaked with small distinct lines of white or fulvous-whitish; these markings being on forehead and most of crown like pin-scratches in their sharpness, and though a little less so behind ears, everywhere retaining their narrow linear character. (In *G. gnoma*, the head-markings are dots and spots, not lines.) Back like head, olivaceous-brown, but without markings, except on scapulars, most of which have a large round white spot on outer web near end, and more or fewer pairs of fulvous spots on both webs. Color of back and head divided by an obvious cervical collar, consisting of a series of diffuse whitish, and another of fulvous, spots, separated by a nearly continuous line of black. Upper tail-coverts usually more or less rufescent, approximating to color of tail. Remiges olivaceous-fuscous, like back; primaries imperfectly and indistinctly, secondaries completely and decidedly, cross-banded with numerous rufescent bands, narrower than the dark intervals; besides which markings some of the primaries have an incomplete series of small whitish or very pale fulvous spots along outer edge, and all have large and deep indentations of white or whitish along inner web, increasing in size from the ends toward the bases of all the feathers, and also on individual feathers from outer primaries to inner secondaries, on which last they reach quite across inner webs. Lining of wings white, with an oblique dark bar, and another curved dark bar, latter across ends of under coverts. Under parts white, heavily streaked along sides with color of back; this color extending quite across breast, where, however, the feathers have di-

lated shaft-lines of whitish; chin and throat white, divided into two areas by a blackish or dark gular collar, which curves across from one post-auricular region to the other. The markings all diffuse. Auriculars dark, sharply scratched with white shaft-lines, bounded below by pure white. Eyebrows white, pretty definitely bounded above by color of crown. Region immediately about the bill whitish, but mixed with long, heavy, black bristles that project far beyond bill, which latter is greenish at base, growing dull yellowish at end; sparsely-haired toes somewhat like bill; claws brownish-black; iris lemon-yellow. Length of ♂ about 6.50; extent 14.50; wing 3.50; tail 2.50; tarsus 0.75; middle toe without claw about the same, its claw 0.40. ♀ larger: length 7.00 or more; wing 4.00; tail nearly 3.00. *Red phase*: Entire upper parts deep rufous-red, with lighter markings of head, etc., obsolete or obliterated; tail the same, with dark bars scarcely traceable. Dark cervical collar, however, conspicuous. White of under parts tinged with yellowish or fulvous; markings of under parts similar in color to ground of upper parts, but duller and paler; tibiæ rufous, without markings. Gular collar blackish. Various intermediate stages have been observed, and the species is to be found in every degree of transition, from the slightest departure from the normal state to completely erythritic condition. These color-conditions are common to both sexes. In extreme cases, the rufous becomes intense and almost uniform, a light rufous replacing even the white of under parts, and there being no traces left of bars on wings or tail. Texas to Arizona and Southern California, and southward. Habits like those of the Gnome Owl; eggs of the same size and shape, granulated, 3-4 in number, laid in holes in trees, April, May. *G. ferrugineum* of all previous editions of the Key, 1872-1890, as I hesitated to make any change of nomenclature in a case the synonymy of which was so extensive and intricate; but the species is now identified with the old *Strix phalacroides* of DAUDIN'S *Traité*, ii, 1800, p. 106; *Glaucidium phalacroides* CABANIS, J. f. O. 1869, p. 208; A. O. U. Lists, 1st and 2d eds. 1886-95, No. 380.

MICRO/PALLAS. (Gr. μικρός, *mikros*, small; Παλλάς, *Pallas*, goddess of wisdom, to whom the Owl was sacred.) **ELF OWLS.** Related to *Glaucidium*; of very diminutive size, including the smallest known species of Owl, and one of the least of all raptorial birds. Head perfectly smooth; no plumicornus; ear-parts small, non-operculate; facial disc incomplete, with eye not centric. Nostril circular, opening in tumid cere. Tarsi scarcely feathered below suffrago, being almost entirely naked and bristly, like the toes; this is as in *Speotyto*, though other characters are quite different. Claws remarkably small and weak; middle toe and claw about as long as tarsus; outer claw reaching a little beyond base of middle claw; inner intermediate between middle and outer. Wings very long, rather more than $\frac{2}{3}$ the total length of the bird, but much rounded; 1st primary only $\frac{2}{3}$ as long as longest one; 3d and 4th longest, 5th but little shorter, 2d about equal to 6th; outer 4 sinuate on inner webs. Tail of moderate length, $\frac{1}{2}$ as long as wing, the feathers not graduated, broad to their very tips. Bill small and weak, compressed at base, where hidden in dense antrorse bristly feathers; culmen and gonys only moderately convex; lower mandible obsoletely notched. One species known. Genus *Micrathene* COUES, 1866, and 1st-3d eds. of the Key, 1872-87: name changed to *Micropallas* COUES, Auk, Jan. 1889, p. 71, and Key, 4th ed. 1890, p. 904, the generic name originally bestowed being antedated by *Micrathene* of Sundevall, a genus of arachnids.

M. whitneyi. (To Prof. J. D. Whitney.) **ELF OWL.** Adult ♂: Above, light amber-brown, thickly marked with irregular angular pale brownish dots, one on every feather, and minutely undulated with lighter and darker color. A concealed white cervical collar, this color occupying the middle of the feathers, which are brown at end and plumbeous at base. A white scapular stripe; outer webs of scapulars almost entirely of this color. Wings like back: lesser coverts with two pale brownish spots on each feather; middle and greater coverts boldly spotted with white at end of outer web of each feather, and with pale brown spots near end. Quills with 3 to 6 pale brown spots on each web, forming broken bars, mostly passing to white on edge of the feathers, those on a few intermediate primaries almost white. Tail-feathers like

wing-quills, with 5 broken bars and one terminal, of pale brownish, whitening on inner webs. Lining of wings white, interrupted with dark brown. Face and region about eye white, below it barred with light and dark brown; bristles at base of bill black on terminal half. Chin and throat white, forming a broad mark from side to side. General color of under parts whitish; breast blotched and imperfectly barred with brown, forming toward abdomen large patches, sides more grayish, flanks plumbeous, tibiae narrowly barred with light brown and dusky. Tarsal bristles whitish; those of toes yellowish; bill pale greenish; iris bright yellow. Length

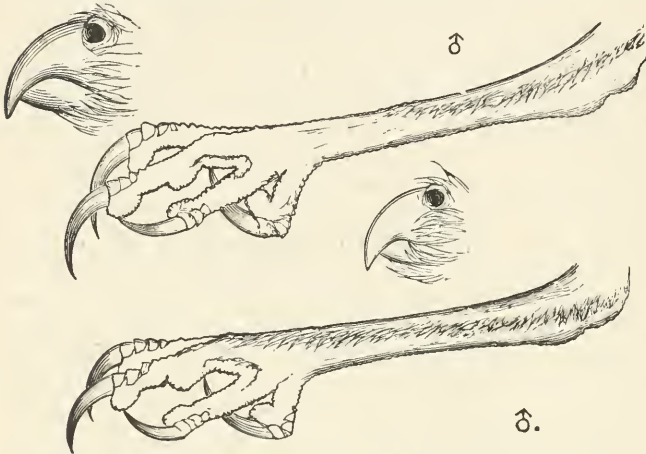


FIG. 441.—Bills and feet of *Speotyto*, nat. size. Lower, *S. hypogaea*; upper, *S. floridana*. (Ad. nat. del. R. R.)

5.75–6.25; extent 14.25–15.25; wing 4.25–4.50; tail 2.00–2.25; tarsus 0.80–0.90. Southern and Lower California, Arizona, New Mexico, southern Texas, and S. through most of Mexico; a very curious little Owl, whose general habits, nesting, and food are similar to those of the Gnome Owls; but it appears to be more nocturnal, and feeds more exclusively on insects. It is common in the giant cactus region, and nests usually in the Woodpecker holes of those strange

forms of arborescence; eggs 2–5, oftenest 3 or 4, 1.02×0.92 , thus very rounded, pure white, minutely granular, laid in May and June.

SPEOTYTO. (Gr. *σπέος*, *speos*, a cave; *τυτώ*, *tuto*, a kind of Owl.) **BURROWING OWLS.** Of medium and rather small size. Head smooth; no plumicorns; ear-parts small, non-operculate; facial disc incomplete. Nostril opening in the tumid cere. Wings of moderate length; 2d to 4th quills longest; 1st about equal to 5th; 2 or 3 sinuate on inner webs near end. Tail very short, only about half as long as wing, even or scarcely rounded. Tarsi extremely long; about twice as long as middle toe without its claw, very scant-feathered in front, bare behind; toes bristly. The long sliu legs are quite peculiar (fig. 441), in comparison with any other N. Am. Owls, though the bareness of the feet is shared to a greater or less extent by the Antillean genus *Gymnasio*, the Old World *Ninox*, and some other genera. *Speotyto* is a genus confined to America, where there are several subspecies.



FIG. 442.—Burrowing Owl, reduced. (Sheppard del. Nichols sc.)

of one or two species, of diurnal and terrestrial habits, noted for inhabiting underground burrows.

S. cunicularia hypogæa. (Lat. *cunicularia*, a burrower; Gr. ὑπόγειος, *hypogæios*, underground. Fig. 442.) BURROWING OWL. Adult ♂ ♀: Above, dull grayish-brown, profusely spotted with whitish; the markings mostly rounded and paired on each feather, but anteriorly lengthened. Quills with 4 to 6 whitish bars, entire or broken into cross-rows of spots; tail-feathers similarly marked. There is much individual variation in the tone of the ground-color, and size and number of spots, which may also be rather ochrey than whitish. Superciliary line, chin, and throat white, the two latter separated by a dark brown jugular collar; auriculars brown; facial bristles black-shafted. Under parts white or pale ochrey; breast, belly, and sides barred with transverse spots of brown, in a pretty regular manner; legs and under tail-coverts unmarked. Lining of wings tawny-white, dusky-spotted on primary coverts. Sexes indistinguishable in size or color: Length 9.50; extent 23.00; wing 6.50-7.00; tail 3.00-3.25; tarsus 1.50-1.75; middle toe without claw 0.80; chord of culmen without cere 0.50-0.60. Young differ in much less spotting, or even uniformity, of the body above, and whitish under parts, excepting the jugular collar; wing- and tail-coverts largely white. A remarkable Owl, abounding in suitable places in Western N. Am., from the Plains to the Pacific, in treeless regions inhabited by "prairie-dogs" (*Cynomys ludovicianus*, etc.) and other burrowing rodents, such as *Spermophilus richardsoni* in the north, and *S. becheyi* in California. I have found colonies in Kansas, Nebraska, Wyoming, N. and S. Dakota, Montana N. to 49°, Colorado, New Mexico, and California, in all cases occupying the deserted burrows of the quadrupeds, not living in common with them as usually supposed; others have found these Owls burrowing in the rest of our Western States and Territories, in western Minnesota, and British Columbia. They no doubt occur also in portions of Alberta, Assiniboia, and Manitoba; stray individuals have been taken in New York city and Massachusetts, and the species extends S. to Guatemala. Besides prairie-dog holes the birds also occupy the holes made by badgers, skunks, and foxes. The eggs are laid from 5 or 6 to 10 feet from the entrance of the burrow in an enlarged chamber at the end of the variously curved or crooked passage-way, upon a mass of miscellaneous materials, often including dried dung and feathers, and infested with fleas; they vary in number from 6 to 11, being oftenest 7, 8, or 9; are white, subspherical, 1.30×1.10 to 1.10×0.98 , averaging 1.25



FIG. 443. — Florida Burrowing Owl.

× 1.00; they are laid from April to July. The bird's food is chiefly insects, small reptiles, and quadrupeds, birds being apparently rarely taken. It is easily able to prey upon mammals up to the size of gophers, chipmunks, and even rabbits, and habitually does so upon the young at least of the various rodents, formerly supposed to be its hosts, with which it associates, thus being by no means the friendly and welcome guest of those fairy-tales I was among the first to discredit. As a whole, the species is resident, being able to endure extremely cold weather; but migration is of regular occurrence in some regions.

S. c. florid'ana. (Of Florida. Fig. 443.) FLORIDA BURROWING OWL. Like the last; rather smaller; wing 6.00–6.50; tail 3.00; shanks more extensively denuded, only feathered about half-way down in front; feet and bill relatively longer. Upper parts darker, rather bistre-brown, more profusely and confusedly spotted with smaller and whiter marks; under parts more heavily and regularly barred with darker brown. Florida; an isolated local race, small colonies of which are common in suitable open places in various parts of the State; it is also ascribed to the Bahamas. But the Burrowing Owls of some other Antillean islands are a different species or subspecies (*quadeloupensis*). The burrows are excavated by the birds themselves to the extent of 3 to 8 feet or more, generally quite near the surface of the ground; eggs indistinguishable from those of *hypogaea*, but only 4–8, usually 6, laid March–May.

SUBORDER ACCIPITRES: DIURNAL BIRDS OF PREY.

This large group, comprising the great majority of *Raptores*, may be most readily defined by exclusion of the particular characters of other suborders. There is nothing of the grallatorial analogy shown by the singular *Gypogeranides*. The nostrils are not completely pervious, nor is the hallux elevated, as in *Cathartides*; while other peculiarities of American Vultures are wanting. Comparing *Accipitres* with *Striges*, we miss the peculiar physiognomy of Owls, the eyes looking laterally as in ordinary birds, and the facial disc being absent (rudimentary in



FIG. 444. — Shoulder-joint of *Accipitres*; after Ridgway. *a*, anterior end of coracoid; *b*, upper end of clavicle; *c*, scapular process of coracoid, reaching *b* in the middle fig. (*Falco peregrinus*), but not in the left-hand fig. (*Buteo borealis*), nor in the right-hand fig. (*Pandion haliaëtus*); *d*, lower end of scapula. The figs. nat. size, left side, viewed from opposite side.

Circinae); aftershafes are usually present; the outer toe is not shorter than inner one, nor versatile (except *Pandionidae*). The external ears are moderate and non-operculate. The eye is usually sunken beneath a much projecting superciliary shield, conferring a decided and threatening gaze. The bill shows the raptorial type perfectly, and is always provided with a cere *in* which (not at its edge as in most Owls) the nostrils open; the cutting edges are usually lobed, or toothed (see any figs.). The lores, with occasional exceptions, due to nakedness or dense soft featherings, are scantily clothed with radiating bristly feathers, which, however, do not form, as usual in Owls, a dense appressed ruff hiding base of bill. Wings of 10 primaries, and tail of 12 rectrices (with rare exceptions); both extremely variable in shape and relative

and absolute lengths. The feet are usually strong and efficient instruments of prehension and weapons of offence or defence, with widely separable and strongly contractile toes, cleft to the base or there only united by small movable webs, and generally scabrous underneath with wart-like pads or tylari to prevent slipping, as shown in fig. 46. The claws are developed into large sharp curved talons. The tarsal envelop (podotheca) varies; sometimes the whole tarsus is feathered, and it is usually so in part; the horny covering takes the form of scutella, or reticulations, or rugous granulations, and is occasionally fused. The capacious gullet dilates into a crop; gizzard moderately muscular; cœca extremely small; oil-gland tufted; syrinx of ordinary broncho-tracheal form; ambiens and femorocaudal muscles are present; accessory femorocaudal, semitendinosus, and its accessory are absent. There are good osteological characters: Phalanges of hind toe are more than half as long as those of outer toe; basal joint of middle or outer toe is longer than next one. No basipterygoid processes. Sternum manubriated, and when not entire behind is single-notched or fenestrated on each side (doubly so in most Owls). Huxley has called attention to a character of the shoulder-girdle, afterward well elaborated by others (fig. 444): In certain genera, as *Falco*, *Micrastur*, *Herpetotheres*, and in *Polyborina*, the scapular process of the coracoid (fig. 444, c) is prolonged beneath the scapula, d, to meet the clavicle, b; which is not the case in other groups of genera of *Falconidæ*, nor in *Pandionidæ*. This distinction has been made the basis of a primary division of diurnal *Accipitres* into two subfamilies, *Falconinæ* and *Buteoninæ*, the former including *Polyborus* and its allies, the latter including *Pandion*; but some modification of this scheme is advisable, I think. It seems to me that the primary division should be made as on p. 619, by excluding *Pandionidæ* as a family distinct from *Falconidæ* proper, on ground of its many peculiarities. This being done, the character of the shoulder-joint may properly be considered in dividing *Falconidæ* into subfamilies. I am perfectly willing to approximate *Polyborus* to *Falco* on this technical ground, notwithstanding the great outward dissimilarity of these two forms; but it is unlikely that ornithologists will allow the construction of the shoulder-joint to outweigh all other characters combined. The feet are sympelous, but in two different ways in the two families, *Falconidæ* and *Pandionidæ*.

Diurnal Birds of Prey abound in all parts of the world, holding the relation to the rest of their class that carnivorous beasts do to other mammals. With many exceptions, the sexes are alike in color, but the ♀ is almost invariably larger than the ♂. Changes of plumage with age are great, and render determination of species perplexing—the more so since purely individual, and somewhat climatic, color-variations, and such special conditions as melanism, are very frequent. Modes of nesting are various: the eggs as a rule are blotched, and not so nearly spherical as those of Owls. The food is exclusively of an animal nature, though endlessly varied; refuse of the stomach is ejected in a pellet by the mouth. The voice is loud and harsh. As a rule, Birds of Prey are not strictly migratory, though many of them change their abode with much regularity. Their mode of life renders them usually non-gregarious, excepting, however, Vultures and vulture-like Hawks, which congregate where carrion is plentiful, quite like American *Cathartides*. There are upward of 350 species or good geographical races, referable to about 75 genera, and divisible into two families—*Falconidæ* and *Pandionidæ*.

Family FALCONIDÆ: Vultures, Falcons, Hawks, Eagles, etc.

Characters as above, exclusive of those marking the Fish-hawks, *Pandionidæ*, beyond. No unexceptionable division of the family having been proposed, and the subfamilies being still at issue, it may be best not to materially modify the arrangement presented in the earliest edition of this work, further than to separate *Pandionidæ* from *Falconidæ* proper, as was done in the 2d edition.

Old World Vultures form a group somewhat apart from the rest in many points of superficial structure and habits, though so closely correspondent with ordinary *Falconidæ*, and especially with *Buteoninæ*, in all essential respects, that they can form at most a subfamily *Vulturinæ* (fig. 445). They have nothing to do with *American Vultures* (suborder *Cathartides*), with which they used to be wrongly united in a family *Vulturidæ*. They are a small group of some

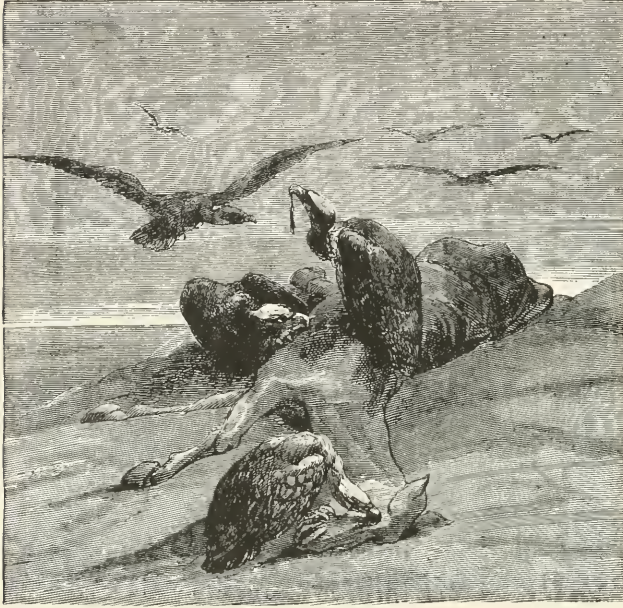


FIG. 445.—The Vulture's Banquet: illustrating subfamily *Vulturinæ* of family *Falconidæ*, not represented in America. (From Michelet.)

9 genera and about 20 species, mainly subsisting upon carrion; the most decidedly raptorial is the Bearded Griffin, *Gypaëtus barbatus*; other characteristically "vulturine" forms being *Vultur monachus*, *Pseudogyps bengalensis*, *Otogyps auricularis*, *Lophogyps occipitalis*, *Gyps fulvus*, *Gypiscus pileatus*, *Neophron percnopterus*, and *Gypohierax angolensis*; of these, some authors make the genera *Gypaëtus* and *Gypohierax*, respectively, types of two other subfamilies, *Gypaëtinae* and *Gypohieracinae*.

The South American genera, *Micrastur* and *Herpetotheres*, are each described as being so peculiar as to form a group of supergeneric value, comparable with those

termed subfamilies in the present work. Their relationships are with *Falconinæ* (Ridgway). But Sundevall associates *Spilornis* with *Herpetotherinae*, and places *Micrastur* among the numerous genera of his *Asturinae*.

The foregoing are the principal if not the only supergeneric types of *Falconidæ* which have no representatives in our country.

The North American *Falconidæ* fall in several groups, which I shall call subfamilies, without insisting upon their taxonomic rank, or raising the question whether the family at large is divisible in this manner. These groups are six in number: 1. *Circinæ*, Harriers; 2. *Milvinae*, Kites; 3. *Accipitrinae*, Hawks; 4. *Falconinae*, Falcons; 5. *Polyborinae*, Caracaras; 6. *Buteoninae*, Buzzards and Eagles. If it be urged that these groups grade into one another, it may be replied that most large groups of like grade in ornithology do the same; and that "typical" or central genera of each of them offer practical distinctions which have been recognized from time out of mind, in popular opinion and vernacular language, as well as by the consensus of most ornithological experts. The A. O. U., however, recognizes only two subfamilies — *Falconinae* for the Falcons proper, and *Accipitrinae* for all the rest, except the genus *Pandion*, made a third subfamily of *Falconidæ*, instead of a separate family. There is much to be said in favor of this conservatism.

In my 1884 revision of North American *Falconidæ*, made to check and amplify the descriptions in the original edition of this work, an interesting relation between shape of wings and their pattern of coloration presented itself. (a) If we take a "noble" Falcon, such as a Peregrine or a Lanner, we find a strong, yet sharp wing, with the 2d primary longest, supported nearly to

the end by the 1st and 3d; the nicking of the quills confined to a few, if occurring on more than one, and situated near the tip. Such a wing is as potent in its feathers as in the construction of its shoulder-joint, and indicates the acme of raptorial power in its possessor, a Falcon being able to dash down upon its quarry with almost incredible velocity and violence. The markings of a Falcon's wing are no less characteristic, consisting of clean-cut, distinct *spots* of light color on both webs of primaries and secondaries, throughout their whole extent, or almost so. (b) Any true "Hawk," as an *Astur* or *Accipiter*, has a rounded concavo-convex wing, conferring a rapid, almost whirring, flight, like that of a Partridge at full speed; and such a bird captures its prey by chasing after it with a wonderful impetuosity, but not at a single plunge like a Falcon. Such a wing has more primaries cut, farther from their ends, and the markings are pretty regular and distinct *bars*. (c) Any "Buzzard," as a *Buteo*, a heavy and comparatively slow or even lumbering bird in flight, taking its prey by surprise and merely dropping on it without special address, has many or most of the primaries cut, far from their ends, and the tendency of the markings is to fuse and blend in large irregular masses of color, the sharp markings of *Falco* or *Accipiter* being thus done away with. Of course there are exceptions, as well as every possible gradation, in the case; but if one will compare the wing of *Circus* or *Archibuteo* with that of *Accipiter* or *Falco*, he cannot fail to perceive the point I raise. The tail is in somewhat like case. In the most noble Birds of Prey it is very stiff and strong, with almost lanceolate feathers, sharply spotted as a rule; in a Hawk, longer and weaker, still regularly barred; in a Buzzard *generally* (there are marked exceptions) of medium length and strength, with the markings tending to merge in large areas of color, just as those of the wings do. Furthermore, in large and difficult genera, as *Buteo* for example, the best specific characters may be afforded by the markings of the tail. These are usually quite different in young and old birds; but are among a Hawk's most specific credentials, after the mature plumage is assumed, even when the rest of the plumage varies greatly, or is subject to melanism, erythrisism, etc. In fine, many Hawks are best known by their tails. Melanism is frequent in *Falconidæ*; erythrisism is not (just the reverse of the case of *Strigidæ*). The further generalization may be made, that the coloration of under parts of *Falconidæ* is more distinctive of species than that of upper parts; and that when these parts are barred crosswise in the adult they are streaked lengthwise in the young. Sexual differences are rather in size than in color, such a case as that of *Circus* being exceptional.

Analysis of Subfamilies.

Scapular process of coracoid reaching clavicle.	
Upper mandible toothed, lower mandible notched	FALCONINÆ
Mandibles without tooth or notch	POLYBORINÆ
Scapular process of coracoid not reaching clavicle.	
Face with a ruff somewhat as in Owls	CIRCINÆ
Face without ruff.	
Tarsus approximately equal to tibia in length; rounded wings little longer than tail	ACCIPITRINÆ
Tarsus decidedly shorter than tibia.	
Tail forked, or much shorter than the long pointed wings	MILVINÆ
Tail not forked, moderately shorter than the obtuse wings	BUTEONINÆ

Subfamily CIRCINÆ: Harriers.

Face surrounded with an incomplete ruff (as in most Owls;) orifice of ear about as large as eye, and in some cases at least with a decided notch (fig. 446). Bill rather weak, not toothed or notched. Legs lengthened; tarsus approximately equalling tibia in length (as in *Accipitrinæ*). Wings and tail lengthened. Form light and lithe; plumage loose; general organization of the buteonine rather than of the falconine division of the family. Thus, scapular process of coracoid not produced to clavicle; no median ridge on palate anteriorly; septum nasi less complete than in *Falco*, and nostrils not circular with a central tubercle.

The Harriers constitute a small group, of the single genus *Circus* and its subdivisions (to which some add the African *Polyboroides*), containing some 15 or 20 species of various parts of the world.

CIRCUS. (Gr. *κίρκος*, *kirkos*, Lat. *circus*, a kind of hawk; from its circling in the air. Fig. 446.) **HARRIERS.** Bill thickly beset with many curved radiating bristles surpassing in length

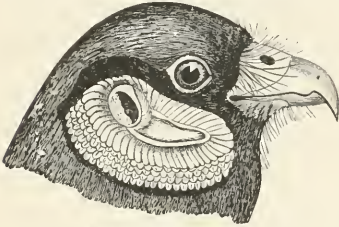


FIG. 446. — Ear-parts of *Circus*. (After Macgillivray.)

the cere, which is large and tumid; tomia lobed or festooned, but neither toothed nor notched. Nostrils ovate-oblong, nearly horizontal. Superciliary shield prominent. Tarsus long and slender, scutellate before and mostly so behind, reticulate laterally; toes slender, the middle with its claw much shorter than tarsus; a basal web between outer and middle; all tuberculate underneath; claws very large and sharp, much curved. Wings

very long and ample; 3d and 4th quills longest; 1st shorter than 6th; outer 3-5 (in our species 4) emarginate on inner webs; 2d-5th emarginate on outer webs. Tail very long, about $\frac{2}{3}$ as long as wing, nearly even or rounded; folded wings falling short of its end. In our species, which differs little from the European *C. cyaneus*, the sexes are extremely unlike in color and size; old ♂ chiefly bluish-gray and white; ♀ and young of both sexes dark brown and reddish-brown or tawny, with white rump; ♀ is much larger than ♂. Nest placed upon the ground; eggs colorless or nearly so. Harriers are among the most "ignoble" of Hawks, preying upon humble quarry, chiefly small quadrupeds, reptiles, and insects, for which they hunt by quartering low over the ground with an easy gliding flight. They are "light-weights" in proportion to their linear dimensions, all the members being lengthened, the wings especially ample. The plumage is also loose and fluffy, somewhat like that of Owls, to which the Harriers are related in several respects.

C. hudson'ius. (Lat. *hudsonius*, of Hudson's Bay. Fig. 447.) **AMERICAN MARSH HAWK, or HARRIER. BLUE HAWK. MOUSE HAWK.** Adult ♂: In perfect plumage pale pearly-bluish, or bluish-ash, above, with the upper tail-coverts entirely white; but most specimens have a dusky wash obscuring the bluish, and retain traces of brown or rufous. Five outer primaries mostly blackish, all of them and the secondaries with large white basal areas on inner webs; tail-feathers banded with 5 or 6 obscure dusky bars, the terminal one strongest and most distinct, and marbled with white toward their bases. The bluish cast invades the fore under parts, the rest of which are white, with sparse drop-shaped rufous spots; lining of wings white. From this blue-and-white state the bird is found grading by degrees into the very different plumage of the ♀ and young: Above, dark umber-brown, everywhere more or less varied with reddish-brown or yellowish-brown; upper tail-coverts, however, *white*, forming a very conspicuous mark; under parts a variable shade of brownish-yellow, or ochraceous, streaked with umber-brown, at least on breast and sides; tail crossed with 6-7 blackish bars. The



FIG. 447. — Marsh Hawk, nat. size. (Ad. nat. del. E. C.)

younger the bird the heavier the coloration, which is sometimes quite blackish and reddish, excepting the white upper tail-coverts. Nestlings are covered with tawny or buff down, paler or whitish below, overcast with gray above. ♂ ♀: Iris, tarsi, and toes bright yellow; cere yellow or yellowish; bill blackish; claws black. ♂: Length 17.50-19.00; extent 40.00-44.00; wing 13.00-14.00; tail 9.00-10.00; tarsus 3.00 or less; middle toe without claw 1.20. ♀: Length 19.00-21.50; extent 45.00-50.00; wing 14.00-16.00; tail 9.50-10.50; tarsus 3.00 or more; middle toe without claw 1.40. N. Am. at large, S. to Panama and Cuba, one of the most abundant and widely-diffused of its family, especially in meadowy and marshy places, and easily recognized by its generic characters, in all its variation of size and color; resident S. from about 40°; breeds throughout range. The nest is placed upon the ground, and rather neatly built of hay, a foot in diameter, 3 inches high; eggs 2-9, commonly 4-6, broad and nearly equal-ended, or quite ovate, averaging 1.80×1.40 , with moderate variability either way, dull white, with more or less greenish or bluish shade; no *decided* markings, but frequently small spots and large blotches of very pale brownish on the surface, and some neutral-tint shell-spots; they are laid from April to June, but mostly in May. Commonly regarded as a subspecies of *C. cyaneus* of Europe; averaging a little larger; old ♂ retaining a few rufous spots in white of under parts, and more evident barring of wings and tail. (*C. cyaneus hudsonius* of former eds. of the Key.)

Subfamily MILVINÆ: Kites.

No ruff or ear-conch. Loral bristles moderate, scanty or quite wanting, the head being then closely and softly feathered to the bill. Superciliary shield evident or not. Bill usually weak, sometimes extremely slender; cutting edge of upper mandible straight to the curve, or lobed or festooned, but not toothed, nor under mandible truncate and notched. Nostrils not circular, nor with central bony tubercle. Wings very long, more or less narrowed and pointed, with several (in our genera 2 to 5) primaries emarginate on inner webs. Tail very variable in length and shape, in our genera nearly even or deeply forked. Feet very small: tarsus much shorter than tibia, approximately equal to middle toe without claw, — usually feathered above, the rest



FIG. 448. — A typical Kite (*Elanoides forficatus*). (From Michelet.)

mostly or entirely reticulate in small pattern (with few or no large transverse scutella). General organization is buteonine; the scapular process of coracoid does not meet the clavicle, septum nasi incompletely ossified, anterior ridge of palate little developed, if at all; superciliary shield in one or two pieces. Kites form a rather extensive group of Hawks of no

great strength and less than average size, though very active, generally of lithe and graceful shape, with long thin wings and often forked tail. They are "ignoble" birds, subsisting upon small game, especially insects and reptiles. In *Pernis apivorus*, the Bee-eating Hawk of Europe, the whole head is densely and softly feathered to the bill. The group is less homogeneous than the others here presented, and might be dismembered, or merged in *Buteoninae*. The genera assigned differ with nearly every writer who recognizes the group. The type is *Milvus*, near which stands our *Elanoides* (fig. 448), and with which it may not be improper to associate *Elanus*, *Ictinia*, and *Rostrhamus*.

Analysis of Genera.

Tail nearly as long as the wings, deeply forked; head closely feathered	<i>Elanoides</i>
Tail short, nearly or about even.	
Five outer primaries emarginate on inner webs; bill and claws extremely slender	<i>Rostrhamus</i>
Two outer primaries emarginate; tarsus scutellate in front	<i>Ictinia</i>
—entirely reticulate	<i>Elanus</i>

ROSTRHAMUS. (Lat. *rostrum*, a beak; *hamus*, a hook.) SICKLE-BILLED KITES. Bill extremely long and slender; upper mandible hooked almost into a sickle-shape, the curvature also impressed to some extent upon the under mandible; cutting edges entirely without tooth or lobe, but simply curved like culmen; gonys straight. Cere contracted; nostrils narrowly oval, horizontal. Loral bristles slight. Space between bill and eye nearly naked and colored, as if a continuation of the cere. Wings long; 3d and 4th quills longest; 5th next; 1st shorter than 6th; outer 5 emarginate on inner webs. Tail about half as long as wing, slightly emarginate or nearly even. Feet small; tarsus feathered about $\frac{1}{2}$ way down in front, then scutellate, for the rest reticulate; middle toe and claw about as long as tarsus. Inner toe without claw shorter than outer; inner toe and claw longer than outer; no evident webbing between toes; soles granular, but little tuberculate. Claws very long and acute, but slender and comparatively little curved; inner edge of middle one dilated and jagged. A genus marked by extreme hooking of the slender bill, otherwise near *Elanus*; containing two or three species of the warmer parts of America.

R. sociabilis. (Lat. *sociabilis*, sociable, gregarious.) EVERGLADE KITE. SNAIL HAWK. Adult ♂ ♀: General color slate, or blackish-plumbeous, blackening on wings and tail, overlaid on head and neck with a chalky cast. Base of tail, with longer upper coverts and all under coverts white, increasing in extent on tail from middle to lateral feathers; tail also with a pale gray or whitish terminal zone. Bill and claws black; base of bill, cere, and feet bright orange, drying dingy yellow; iris red. Length 16.00–18.00; extent about 44.00; wing 13.50–15.50; tail 6.50–7.50; bill 0.90–1.00; tarsus 1.75–2.25; middle toe without claw, rather less. Young birds are much varied with brown, yellowish, and white, but the species is unmistakable in any plumage. Florida, some of the West Indies, Mexico, and S. through most of S. America. Common in the "everglades" of Florida; and resembling the Marsh Hawk in habits; food largely a kind of snail (*Pomus depressus*); nest in a bush or amidst rank herbage, often over water, built of sticks, leaves, and grasses, a foot or more in diameter by 6 or 8 inches deep, with a shallow cavity; eggs 2 or 3, greenish-white or whitish, irregularly spotted, scrawled, blotched, or smirched with brown, about 1.72×1.45 , laid in March and April, rarely late in February. (*R. sociabilis* of orig. ed. of Key, p. 211; *R. s. plumbeus* of 2d–4th eds. p. 523, by error.)

ICTYNIA. (Gr. *ἰκτύος*, *iktinos*, a kite.) LEAD KITES. Bill rather small, but robust, very deep and wide for its length; tip of upper mandible much overhanging, its cutting edge very prominently lobed, sometimes almost toothed like a Falcon's, sometimes irregularly sinuate-serrate; the nick just in front of the lobe usually permitting the median ridge of the palate to be visible from the side; culmen very strongly arched in nearly a quadrant of a circle; gonys convex, ascending; cere short; nostrils small, subcircular; loral bristling slight; super-

ciliary shield small, in one piece. Wings of moderate length, ample; 3d quill longest; 2d but little shorter; 1st quite short, about equal to 6th; outer 2 emarginate on inner web, and next 2 somewhat sinuate. Tail moderate, even or emarginate, the feathers broad to their obtusely rounded ends. Feet short and stout; tarsus scantily feathered about $\frac{1}{2}$ way down in front, then scutellate, for the rest reticulate; middle toe without claw about as long as tarsus; outer and middle toes connected by a basal web for whole length of basal joint of the latter; inner toe without claw shorter than the outer, with claw longer, its claw being much larger than that of outer toe, reaching beyond base of middle claw. Soles broad, especially under the hind toe, which is widely margined; claws short, stout, much curved. A genus of two species,

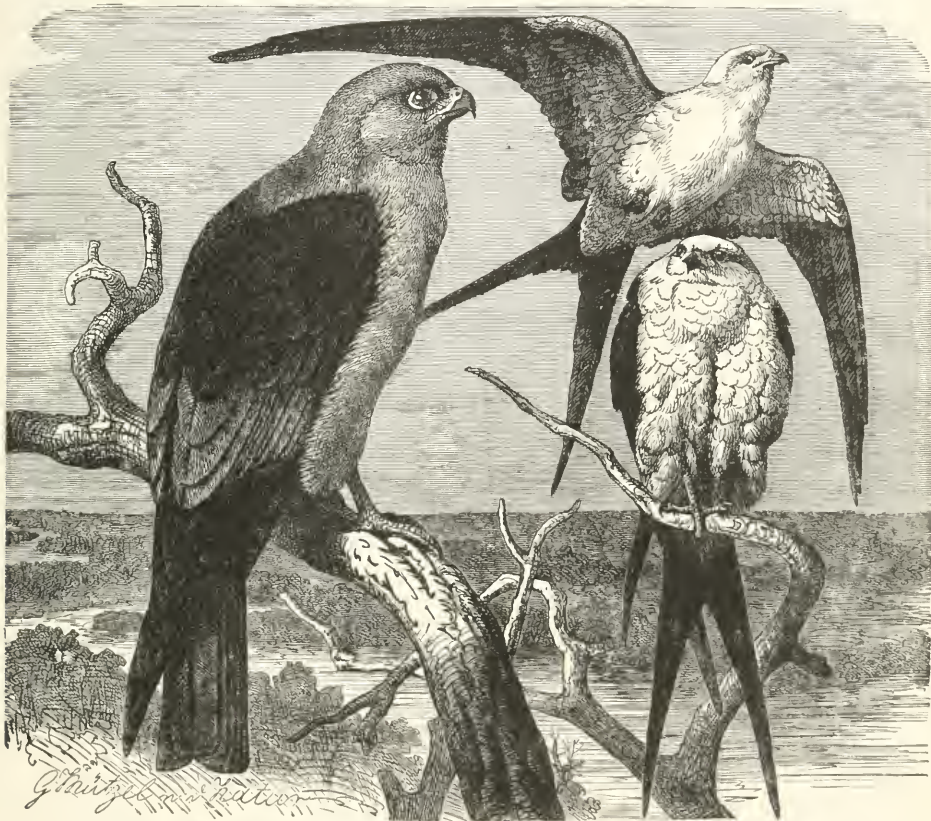


FIG. 449. — Left, Mississippi Kite, $\frac{1}{2}$ nat. size; right, Swallow-tailed Kite, $\frac{1}{2}$ nat. size. (From Brehm.)

confined to temperate and tropical America; of great volitional power, spending much of their time on the wing in aerial gyrations; somewhat gregarious like other *Milvina*, and preying upon the humblest quarry, especially insects and small reptiles, often feeding from their talons as they sail through the air, after sweeping down upon their prey and seizing it as they pass without staying their flight.

I. mississippiensis. (Lat. of Mississippi. Fig. 449.) MISSISSIPPI KITE. Adult ♂ ♀: General plumage plumbeous or dark ashy-gray, bleaching on head and secondaries, blackening on tail and wings, several primaries more (♂) or less (♀) suffused with chestnut-red on inner web or on both webs. Forehead and tips of secondaries usually silvery-whitish; concealed white spots on scapulars; bases of feathers of head and under parts fleecy-white. Lores, eye-

lids, and bill, including cere, black; gape of mouth and feet orange, the latter obscured on front of tarsus, and along tops of toes; iris lake-red. Feet and cere drying to a nameless dingy color. Length of ♂ about 14.00; extent 36.00; wing 10.50–11.50; tail 6.00–6.50; tarsus 1.45; ♀ about 15.00; wing 11.00–12.50; tail 6.50–7.00. Young: Head, neck, and under parts whitish, spotted with dark brown or reddish-brown, excepting on throat and along superciliary line; lining of wings tawny, spotted with rusty-brown; upper parts blackish, most feathers edged with tawny-white; quills tipped with white; tail black, with about 3 pale ashy bands, and as many rows of white spots on inner webs. Southern U. S., regularly N. to South Carolina, Illinois, and Kansas, casually to Pennsylvania, Iowa, and Wisconsin; W. to the Indian Terr. and Texas; S. through Mexico to Guatemala; replaced in Central and South America by the related but quite distinct *I. plumbea*. Nest of sticks, etc., in trees, either deciduous or coniferous, at various heights, 20–60 feet; eggs 2–3, 1.65 × 1.35, pale glaucous, normally unmarked, but often with some faint spots or stains; laid in April, May, or June. (*Ictinia subcaerulea* (BARTR.) COUES, 2d–4th eds. 1884–90, p. 524.)

E'LANUS. (Lat. *clanus*, a kite.) PEARL KITES. Related to the last; general form and aspect similar. Pattern of coloration entirely different. Bill rather weak and compressed; tonia of upper mandible devoid of lobe or festoon, but slightly sinuate to the overhanging tip; gonys about straight; culmen less strongly convex than in *Ictinia*; nostrils subcircular, near middle of the moderate cere. Feet very small; tarsus feathered half-way down in front, for the rest finely reticulate, like tops of toes to near their ends; hind toe very short; claws small, little curved, not scooped out underneath; basal web between middle and outer toes slight (compare feet of *Ictinia*). Wings nearly or about twice as long as tail; pointed, 2d and 3d quills longest, 1st about equal to 4th, 1st and 2d emarginate on inner webs. Tail emarginate, but outer feather shorter than the next, all the feathers broad to their obtusely-rounded ends. A small genus of 4 or 5 species inhabiting the warmer parts of the world.

E. glaucus. (Lat. *glaucus*, bluish.) BLACK-SHOULDERED KITE. WHITE-TAILED KITE. Adult ♂ ♀: Upper parts pale bluish-ash; most of the head, whole tail, and entire under parts, including lining of wings, pure white; lesser and middle wing-coverts black, forming a great black area; a patch on under wing-coverts, shafts of most tail-feathers, and loreal spot, also black; white of under parts and middle tail-feathers often with a pearly bluish cast. Bill and claws black; cere and feet yellow or orange; iris red or reddish. Length 15.50–17.00; extent 39.00–41.50; wing 11.50–13.50; tail 7.00–8.00; tarsus 1.30; middle toe without claw about the same; ♀ averaging larger than ♂. Young: Marked with dusky and reddish-brown; wing-feathers white-tipped, tail-feathers with a subterminal ashy bar. In this species the tail is emarginate to a depth of about 0.50; outer tail-feather also about as much shorter than the next, which is the longest one. Southern U. S. from Atlantic to Pacific; N. to South Carolina, Illinois, Indian Territory, and Middle California, casually to Michigan; S. through Central and most of South America; common in many localities and resident, but of irregular distribution, especially in the breeding season, March–May. With habits in general like those of the last species, this elegant Kite is stronger and more predaceous, preying upon small birds and quadrupeds as well as insects and reptiles; its favorite haunts are near streams or marshes. It nests in trees, preferably the tops of low oaks; eggs 3–5, oftenest 4, subspherical, about 1.66 × 1.33, whitish, blotched and smirched with mahogany color, usually to the extent of mostly hiding the ground color with these rich and heavy reddish and blackish browns. (*E. glaucus* COUES, 2d–4th eds. 1884–90, p. 525, holds good; for those who will not accept *Falco glaucus* from BARTRAM, 1791, must take it from BARTON, N. H. Penn. 1799, p. 11: see COUES, Birds Coll. Vall. 1878, p. 593, and Auk, Apr. 1897, p. 216. *E. leucurus* of A. O. U. Lists, 1886–95, by error.)

ELANOÍDES. (Lat. *clanus*, and Gr. εἶδος, *eidos*, resemblance.) SWALLOW-TAILED KITES. Prominently characterized by the extremely elongated and deeply forficcate tail, length of which

nearly equals that of wing, the narrow, acuminate lateral feathers being more than twice as long as middle pair when full grown. Wings also very long, thin, and acute; 2d and 3d quills forming the point; 1st about equal to 4th; 1st and 2d emarginate on inner webs. Feet very short, but stout; tarsus feathered about $\frac{1}{2}$ way down in front, elsewhere irregularly reticulate; toes mostly scutellate on top, but reticulate toward their bases, granular and padded underneath; claws short, stout, strongly areolate, scooped out underneath, with sharp edges, that of the middle dilated. Bill rather weak, with moderately convex culmen and small cere; the cutting edge festooned. Nostrils oval, oblique. Head closely feathered on sides; a small superorbital shield of a single bone. A beautiful genus, of a single species, related to Old World *Milvus* (typical Kites) and especially to *Nauclerus*, with which latter it has usually been associated.

E. forficatus. (Lat. *forficatus*, deeply forked. Figs. 448, 449.) SWALLOW-TAILED KITE. SNAKE HAWK. Adult ♂ ♀: Head, neck, band on rump, and entire under parts, including lining of wings, snow-white; back, wings, and tail, glossy black, with various lustre, chiefly green and violet. Bill bluish-black; cere, edges of mandibles, and feet pale bluish, the latter tinged with greenish; claws light-colored. Length about 24.00, but very variable; extent 50.00; wing 15.50–17.50; tail up to 14.50, cleft more than $\frac{1}{2}$ its length; tarsus about 1.25; middle toe without claw rather less. Young: Similar; less lustrous; wing- and tail-feathers white-tipped; feathers of head and neck pencilled with delicate shaft-lines of blackish. This most elegant Kite, superlative in ease and grace of wing, floats, soars, and dashes over the greater part of America, and even crosses the Atlantic on its buoyant pinions (Great Britain, more than once, see Zool. June 15th, 1897, p. 270). It is abundant in the Southern U. S., sometimes winging its way to the Middle States, even to New England, and regularly up the whole Mississippi valley, to that of the Red River of the North. While I was collecting on the northern Boundary Survey, in North Dakota, Manitoba, and Assiniboia, in 1873, and during my exploration of the source of the Mississippi in Minnesota, in 1894, I was repeatedly gratified by the spectacle of this impetuous bird, so like a colossal swallow in its flight, build, and coloration. Its breeding range is irregularly coextensive with its general distribution in North America: the laying season is March–May in the South, but May and June in the Upper Mississippi and Red River valleys. The nest is placed on a tree, preferably atop a tall one, and is constructed of sticks, hay, moss, etc.; eggs 1–1, oftener 2 or 3, averaging nearly 1.90×1.50 , with the usual range of variation in size and shape, white or whitish, irregularly blotched and speckled with rusty and rich dark chestnut-brown, in most cases in bold, handsome patterns.

Subfamily ACCIPITRINÆ: Hawks.

General form strict, with small head, shortened wings, and lengthened tail and legs. Tarsi approximately equal to tibia in length. Bill short, robust, high at base; toothless, but usually with a prominent festoon; no central tubercle in the broadly oval nostril, nor keel of palato anteriorly. Superciliary shield prominent. Coracoid arrangement as in *Buteo*, into which group the present one grades. Wings concavo-convex; 3d to 6th quills longest, 1st very short and more or less bowed inward, outer 3 to 5 emarginate or sinuate on inner webs. Tail quite long, square or rounded, sometimes emarginate, nearly equalling wing in length. Tarsi slender, longer than middle toe without claw, usually extensively if not completely denuded of feathers, and scutellate before and behind: but in some cases the scales fuse in a continuous boot, like that of a Thrush. This is an extensive group of medium-sized and small Hawks, little if at all inferior in spirit of audacity to the true Falcons, though less powerfully organized, and in fact conforming in anatomical characters with *Buteo* rather than with *Falco*. In the technic of falconry, *Accipitrinae* are styled "ignoble," because these short-winged Hawks rake after the quarry, instead of plunging upon it like the "noble" long-

winged Falcons. Their flight is swift and dashing; they capture their prey in open chase with amazing celerity and address, always killing for themselves and disdaining refuse. Their quarry is chiefly birds and quadrupeds. *Astur* and *Accipiter* are the typical and principal genera, of which some 50 species (chiefly of the former genus) are known, inhabiting most parts of the world. Our representatives of these genera are easily discriminated, but some exotic species connect them so closely that the A. O. U. makes *Astur* a subgenus of *Accipiter*.

Analysis of Genera or Subgenera.

- Small and medium-sized; length 20.00 or less. Tarsus more extensively denuded, and scutellate, sometimes booted. *Accipiter*
- Large; length over 20.00. Tarsus less extensively denuded, and scutellate, never booted *Astur*

ACCIPITER. (Lat. *accipiter*, a hawk. Fig. 450.) SHARP-SHINNED HAWKS. Tarsi feathered about $\frac{1}{2}$ way down in front, or less (in *Astur* about $\frac{1}{2}$ way), and quite slender (whence the term “sharp-shinned”); in one of our two species prominently and continuously scutellate before and behind, the scutellation continued on to the toes; in the other the same, or finally fused in a continuous “boot.” Toes long, slender, the outer much webbed at base and padded underneath; inner claw much larger than middle one, approximately equalling hind claw; height of bill at base greater than chord of culmen; 4th and 5th quills longest, 3d and 6th next, 2d shorter than 6th, 1st very short. The two following species are exactly alike in color; one is a miniature of the other. The ordinary plumage is dark brown above (deepest on head, the occipital feathers showing white when disturbed), with an ashy or plumbeous shade which increases with age, till the general cast is quite bluish-ash; below, white or whitish, variously streaked with dark brown and rusty, finally changing to brownish-red (palest behind and slightly ashy across breast), the white then only showing in narrow cross-bars; chin, throat, and crissum white, with blackish pencilling, the crissum, however, usually immaculate; wings and tail barred with ashy and brown or blackish, quills white-barred basally, tail whitish-tipped; bill dark; claws black; iris, cere, and feet yellow. Sexes alike in color; ♀ much larger than ♂.

Analysis of Species.

- Feet extremely slender; bare portion of tarsus longer than middle toe; scutella frequently fused; tail square. ♂ 10.00–12.00; extent about 21.00; wing 6.00–7.00; tail 5.00–6.00. ♀ 12.00–14.00; extent about 25.50; wing 7.00–8.00; tail 6.00–8.00; whole foot 3.50 or less *velox*
- Feet moderately stout; bare portion of tarsus shorter than middle toe; scutella always distinct; tail rounded. ♂ 16.00–18.00; extent about 30.00; wing 9.00–10.00; tail 7.00–8.00. ♀ 18.00–20.00; extent about 35.00; wing 10.00–11.00; tail 8.00–9.00; whole foot 4.00 or more *cooperi*

A. ve'lox. (Lat. *velox*, swift, moving with velocity or rapidity. Fig. 451.) SHARP-SHINNED HAWK. “PIGEON” HAWK (so called, but not to be confounded with *Falco columbarius*). LITTLE BLUE DARTER. Adult ♂ ♀: Above, dark plumbeous, slate-color, or bluish-gray, somewhat more fuscous on wings and tail than on the body; feathers of hind-head with fleecy white bases, scapulars with concealed white spots. Tail crossed by about 4 blackish bars, the first under the coverts, the last subterminal and broadest; extreme tips of the feathers white. Primaries also marked with blackish bars or spots, and whitening at their bases, in bars or indents of the inner webs. Under parts barred crosswise with rufous on a white ground, the bars on some parts cordate and connected along shafts of the feathers, which are blackish; ear-coverts rufous; rufous mostly or entirely wanting on cheeks, throat, and crissum, which are more or less finely pencilled with black shafts of the feathers; crissum, however, often pure white. Axillars barred like other under parts; lining of wings white, with dusky spots. Dimensions as above. Young: Above, umber-brown, varied with rusty-brown edgings of most of the feathers; white spots of scapulars exposed. Below, white more or less tawny-tinged, striped lengthwise with dark brown or reddish-brown on most parts, the feathers mostly black-shafted. This

state is oftener seen than the perfected plumage; every intermediate stage is seen; but there can be no misunderstanding the species, as our only other Hawks (*Fulco columbarius* and *F. sparverius*) of similar slight dimensions belong to a different genus and subfamily. N. Am. at large, one of our most abundant Hawks, and one which, notwithstanding its smallness, sustains the reputation of *Accipitrinæ* for nerve and prowess. It preys almost entirely upon birds, up to the size of a Robin, even of a Pigeon or pullet. The nest is built at a fair height in a tree, preferably a conifer, sometimes in a hollow or on a ledge of rocks, being a shallow platform of small sticks with or without a lining of leaves or bark; of remarkably large dimensions for the size of the bird; the eggs are generally laid in May, sometimes not till June, to the number of 4 or 5, rarely more. The white ground-color has often a livid bluish or greenish



FIG. 450. — *Accipiter nisus* of Europe, adult ♂, $\frac{1}{2}$ nat. size; not distinguishable in a cut from our Sharp-shinned Hawk; taken as of $\frac{1}{2}$ nat. size it would represent Cooper's Hawk just as well; at $\frac{1}{4}$ it would do duty for a Goshawk. (From Brehm.)

tint, and is marked, often so thickly as to be obscured, with large, irregular splashes of various shades of brown, interminably changeable in number, size, and pattern, sometimes inclining to form masses or a wreath, sometimes more evenly distributed, sometimes reduced to spots, in rare cases to a few mere specks sparsely scattered over the whole surface. The egg is of nearly equal size at both ends, and measures about 1.45×1.15 , ranging in length from 1.40 to 1.54. It is not always distinguishable with certainty from that of *Falco columbarius*. The eggs of this species are usually beautiful objects. (*A. fuscus* of previous eds. of the Key, a name preoccupied; *velox* WILSON is next in order of date, and now used by the A. O. U.)

A. cooperi. (To Wm. Cooper. Figs. 452, 453.) COOPER'S HAWK. CHICKEN HAWK (a name shared by species of *Buteo*.) BIG BLUE DARTER. The colors and changes of plumage of this species being practically the same as those of *velox*, need not be repeated. The chief differences are: crown of adult usually appreciably darker slate than back; white scapular spots smaller, fewer, or wanting; in high plumage the upper parts clearer bluish, while the breast has a fine glaucous bloom overlying the rufous and white ground-color; tail more decidedly

white-tipped. A small ♂ *cooperi* grades in size nearly down to a large ♀ *velox*, but there appears to be constantly a difference of 200 at least in total length; and in any event, the other characters above given will suffice for their discrimination. In either species, the yellow of the



FIG. 451. — Sharp-shinned Hawk.

cere and feet is often or usually obscured with greenish. In *cooperi*, the tarsal scutella are sometimes indistinct, but are not known to fuse into a boot. A large ♀ not distantly resembles

a young ♂ Goshawk; but difference in feathering of tarsus is distinctive. Temperate N. Am. at large, and southward; one of the common "chicken" Hawks, and a fellow of great audacity and prowess, preying on birds up to the size of Grouse and domestic poultry. Nesting substantially as described for *velox*, but the choice of a site is more variable in height and kind of tree, and the structure is relatively smaller; also, the nest of some other Hawk, or of a Crow, is often utilized. Eggs I have examined measure from 1.80×1.45 to 2.00×1.65 (figures showing the variation both in size and

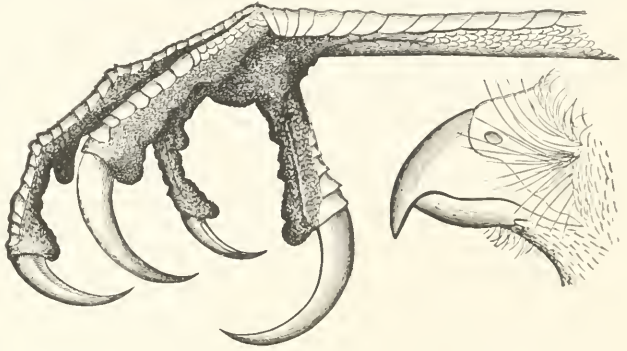


FIG. 452. — Beak and talons of *Accipiter* (*A. cooperi*, nat. size). (Ad. nat. del. E. C.)

shape), averaging about 1.90×1.50 . They resemble those of the Marsh Hawk so closely as not to be certainly distinguishable, but are usually more globular, and with a more granulated shell. The greatest diameter is at or very near the middle; difference in shape of the two ends is rarely appreciable. All are more uniform in color than those of most Hawks, resembling the pale, scarcely-marked examples occasionally laid by most kinds; none are conspicuously dark-marked. The ground is bluish-white, faintly tinted with livid or greenish-gray, rarely quite greenish; if marked, it is usually with faint, sometimes almost obsolete, blotches of drab, liable to be overlooked without close inspection; but a good many specimens are found with decided, though still dull and sparse, spots and serawls of pale brown. Three or four eggs are the usual nest-complement, but the number ranges from 2 to 6; in the Northern and Middle States they are laid in May, in the Southern also in the latter part of April, and in some localities they are found fresh in June.



FIG. 453. — Cooper's Hawk.

ASTUR. (Lat. *astur*, a hawk.) GOSHAWKS. Characters in general as above given for *Accipiter*: size superior, organization more robust; feet stronger; tarsus feathered about $\frac{1}{2}$ way down in front and on sides, leaving only a narrow bare strip behind; scutellation discontinuous at bases of toes, which are finely reticulate; resumed beyond; never fused. These "goose-hawks" or "star-hawks" are a small genus of five or six "ignoble" species,

held in high estimation by falconers for their prowess in the chase. Ours appears to be quite distinct from European *palumbarius*, though closely related. (Subgenus *Astur*, A. O. U.)

A. atricapillus. (Lat. *atricapillus*, black-haired. Figs. 454, 455.) AMERICAN GOSHAWK. BLUE HEX HAWK (adult). CHICKEN HAWK (young). Adult ♂ ♀: Above, dark bluish-slate color, each feather black-shafted; top of head blackish, conspicuously different from other upper parts, the feathers there with fleecy white bases; a long white superciliary or rather post-ocular stripe; auriculars blackish. Ground color of under parts, including lining of wings,

white, closely barred or vermiculated in narrow zigzag lines with slaty-brown, except on throat, and crissum, and everywhere sharply pencilled with blackish shaft-lines, one on each feather.



FIG. 454. — European Goshawk, young ♂ $\frac{1}{4}$ nat. size, not distinguishable in the cut from the young American Goshawk; change of scale to $\frac{1}{2}$ or $\frac{3}{4}$ would make it represent the young ♂ Cooper's or Sharp-shinned Hawk. (From Brehm.)

The barring is largest and most regular on belly, flanks, and tibiae, but is for the most part much dissipated in fine mottling. It varies greatly in coarseness in different specimens, some of which approach *palumbarius* in this respect. Tail like back, banded with 4 or 5 blackish bars, the terminal one much the broadest. Wing-quills in similar pattern; both these and tail showing tendency to some whitish mottling of inner webs of the feathers. Bill dark bluish; iris reddish; feet yellow, claws black. Young: Difference substantially as in *Accipiter*: above, dark brown, varied with rusty-brown and whitish; below, white, more or less tawny-tinged, with oblong, lance-linear, clubbed or drop-shaped dark brown markings. Tail more distinctly barred than in the adult, and with white tip. Iris yellowish. But in any equivocal plumage, the Goshawk may be recognized by its size, which is that of an average *Buteo*, together with the short rounded wings, very long fan-shaped tail, and other generic characters. Length of ♂ 20.00–22.00; extent about 42.00; wing 12.00–13.00; tail 9.00–10.00; tarsus 2.75; middle toe without claw 1.75; chord of culmen without cere 0.90; ♀, length 22.00–24.00; extent 45.00 or more; wing 13.00–14.00; tail 11.50–12.50.

A large, powerful, and in perfect plumage, a very handsome Hawk, of splendid spirit, combining ferocity with audacity in the highest degree, and the terror of the poultry-yard, where it does more damage than any other Hawk, or than the great Horned Owl; it habitually preys upon birds up to the size of Grouse and Ptarmigan, and mammals as large as hares. It is a larger, and altogether "better" bird than the European Goshawk. It inhabits northern N. Am.; the northern half of the U. S. chiefly in winter, but is also resident in some parts, and breeds in mountainous regions S. to Colorado, where I have seen it in summer, and New Mexico; it occurs sometimes on the Pacific Coast of the U. S., as in Oregon, and has been taken in England. The nesting and eggs are like those of *Accipiter cooperi*; eggs only

distinguishable by their superior size, measuring about 2.30×1.85 , are 2–5 in number, white with a faint bluish tint, normally immaculate, sometimes showing faint brownish or neutral tint discolorations. They are laid in April and May.

A. a. striatulus. (Lat. *striatulus*, finely striped.) WESTERN GOSHAWK. Described as having markings of under parts so fine and dense as to present a nearly uniform bluish-ashy nebulation, pencilled with fine black-shafted lines, and the upper parts dark plumbeous, inclining to blackish on the back; the young brownish-black above, with broad black streaks becoming often cordate spots on the thighs. Rocky Mts. to the Pacific, especially the Coast region, breeding from Sitka, Alaska, to the Sierras Nevadas of California in lat. 39° .

Subfamily FALCONINÆ: Falcons.

Bill furnished with a sharp tooth and notch near end of cutting edge of upper mandible (sometimes two such teeth); end of under mandible truncated, with notch near tip (figs. 456, 458). Nostrils circular, high in the cere, with a prominent central tubercle (fig. 456). Inter-

nasal septum extensively ossified. Palate with a median keel anteriorly. Superciliary shield prominent, in one large piece. Shoulder-joint strengthened by union of scapular process of coracoid with clavicle (fig. 444) as in *Micrastur*, *Herpetotheres*, and *Polyborine* alone of *Falconidae*. Wings strong, long, and pointed, with rigid and usually straight and tapering flight-feathers; tip formed by 2d and 3d quills, supported nearly to their ends by 1st and 4th, both of which are longer than 5th; only one or two outer primaries emarginate on inner webs near end. Tail short and stiff, with more or less tapering rectrices. Feet strong, rather short; tarsus of less length than tibia, feathered more or less extensively, elsewhere irregularly reticulate in small pattern varying with the genera or subgenera; never scutellate in single series



FIG. 455. — American Goshawk, nat. size.

before or behind. Middle toe very long; talons very strong. True *falcons* are thus eminently distinguished from other members of the family; a glance at the toothed beak suffices for their recognition. They are birds of medium and small size, some kinds being not larger than a Sparrow, but extremely sturdy organization, vigorous physique, and temerarious disposition. They capture their quarry with sudden and violent onslaught, and exhibit raptorial nature in its highest degree. The typical and principal genus is *Falco*, of which there are several subdivisions corresponding to minor modifications. Upwards of 50 species are recognized. Our rather numerous species represent the several grades of Gyrfalcons, Lamers, Peregrines, Merlins, and Kestrels. These I shall consider under one genus, *Falco*, with indication of the subgenera.

FALCO. (Lat. *falco*, a falcion or faucion.) Characters as above, with minor modifications as follows:—

Analysis of Subgenera, Species, and Subspecies.

Tarsus more or less feathered above, elsewhere irregularly reticulate in small pattern (no large plates like scutella); 2d primary longest; 1st longer than 4th, and alone decidedly emarginate on inner web. (*Gyrfalcons* and *Lamers*.) (HEROPALCO.)

Gyrfalcons: Tarsus feathered fully $\frac{1}{2}$ way down in front and on sides, leaving but a narrow strip bare behind; longer than middle toe without claw; 1st quill shorter than 3d. Sexes alike. Very large; about 2 feet long.

- Prevailing color white. Arctic *islandus*
- Prevailing color dark; head and neck lighter than back. Arctic and Subarctic *rusticolus*
- Prevailing color dark; head and neck darker than back. Arctic and Subarctic *r. gyrfalco*
- Prevailing color blackish. Labrador and Southward *r. obsoletus*

Lanners: Tarsus feathered $\frac{1}{2}$ way down in front, broadly bare behind; longer than middle toe without claw; 1st quill shorter than 3d. Medium; grayish-brown above; sexes alike *mexicanus*

Peregrines: Tarsus feathered but a little way down in front, broadly bare behind; not longer than middle toe without claw; 1st quill not shorter than 3d. Medium; slaty-bluish above; sexes alike. (RHYNCHODON.)

- The ordinary Duck Hawk of N. Am. *peregrinus anatum*
- The dark N. W. Coast form *p. pealei*

Tarsus scarcely feathered above, with the plates in front enlarged, like a double row of alternating scutella (and often with a few true scutella at base); 2d or 3d primary longest; 1st not longer than 4th; 1st and 2d emarginate on inner webs. (*Mertins, Kestrels, and Hobbies.*)

Mertins: Tarsus scarcely longer than middle toe without claw. Sexes unlike; young of both like adult ♀. Small; wing 7.50-8.50. (ÆSALON.)

Tail of ♂ with not more than 4 dark bands, the subterminal one broad, or 5 light ones.

- The ordinary Pigeon Hawk of N. Am. *columbarius*
- The dark N. W. Coast form *c. suckleyi*

Tail of ♂ with 5 dark and 6 light bands. Interior N. Am. *richardsoni*

Tail of ♂ with more numerous bands. Straggler from Europe *regulus*

Kestrels: Tarsus decidedly longer than middle toe without claw. Sexes very unlike at all ages. Smallest: wing 7.00-7.50. (TINNUNCULUS.)

Under parts white or tawny, back rufous, barred ♀ or plain ♂.

- The ordinary Sparrow Hawk of N. Am. *sparverius*
- The pale desert form from the Southwest *s. deserticolus*
- The depauperate peninsular form of Lower California *s. pennsularis*

Under parts buff; back rufous, barred ♀ or spotted ♂ with black. Straggler from Europe *tinnunculus*

Under parts rufous. Florida, a straggler from the West Indies *dominicensis*

Hobbies: Tarsus longer than middle toe without claw. Sexes alike; young little different Medium; wing 10.00 or more. (RHYNCHOFALCO.) *fuscicarrulescens*

(Subgenus HIEROFALCO: *Gyrfalcons* or *Jerfalcons.*)

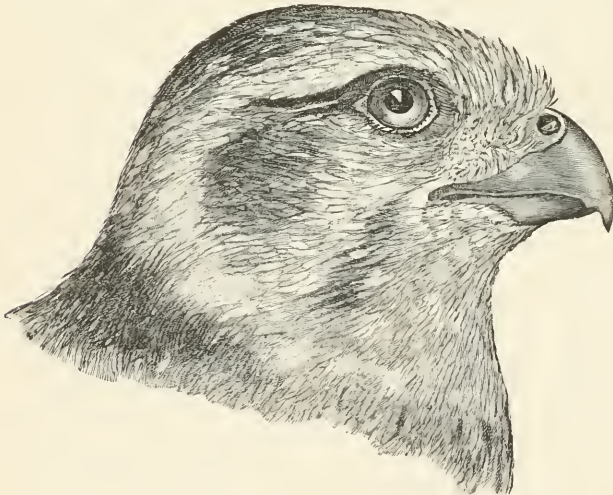


FIG. 456. — Prairie Falcon, $\frac{2}{3}$ nat. size. (From life, by H. W. Elliott.)

F. (H.) islandus. (Lat. also *islandicus*, Icelandic or Icelandic; the word does not mean "of an island, insular," but "of Iceland," in Skandinavian *Islandsk*, in Icelandic *Islenskr*; from the name of the island, in Skandinavian and German called *Island*, in Dutch *Ijsland*, from *iss*, ice, and *land*, land.) WHITE GYRFALCON. ICELAND GYRFALCON (in part). GREENLAND GYRFALCON. One of the largest and most powerful of the *Falconinæ*. Feet very stout; tarsus rather longer than middle toe and claw, feathered fully half-way down

in front and on the sides, with only a narrow bare strip behind overlaid by the feathers; the bare parts reticulate (not scutellate). Lateral toes of about equal lengths, without the claws, one of which is larger than the other. Wing pointed by 2d quill, supported nearly to the end by

the 3d, the 1st rather shorter than 3d, and alone decidedly emarginate on inner web. *Adult* ♂ ♀: *White* — white as a Snowy Owl. Head and all under parts immaculate white, or with only a few dark touches on the top and sides of the head, and on the flanks and flags. Back, wings, and tail white, more or less profusely marked with dusky (slaty-black) bars, crescents, arrow-heads, or transverse spots; amount of these dark markings about as in an average Snowy Owl. Bill bluish, darker at tip; cere, edges of eyelids, and feet chrome-yellow; claws blue-black; iris brown. Bill and claws finally growing whitish. Length of ♂ about 22.00; wing 14.00–15.00; tail 9.00; bill 0.95; tarsus 2.40; middle toe without claw 2.00. ♀: Length about 23.50; wing 15.50–16.50; tail 10.00. Young: Not very different from the adults; prevailing color still white, but more heavily marked with dark brown, tending to lengthwise spots on both upper and under parts. The extreme form in the subgenus *Hierofalco*, seeming to be specifically distinct from the next, in general recognizable at a glance, though some puzzling specimens occur: of circumpolar distribution, breeding only in very high latitudes; range in America from Greenland to Behring Sea, S. irregularly in winter: in the U. S. (except Alaska) only known to reach northern Maine; in Europe reaching Iceland frequently, the British Islands rarely. Nest on cliffs: eggs 3–4, about 2.30 × 1.80, with the whitish ground so heavily overlaid with different shades of reddish-brown as to appear almost uniformly of that color, with some bolder spots of darker brown. It is unfortunate that the white polar Gyrfalcon was first described from and named for the island of Iceland, which is not its home: but so it happened, and the rectification of synonymy, which was



FIG. 457. — A "noble" Falcon. (From Michelet.)

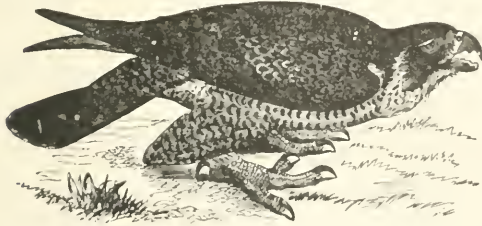


FIG. 458. — Peregrine Falcon, greatly reduced. (From Temney, after Wilson.)

in a state of dire confusion in the subgenus *Hierofalco*, involves an entirely "new deal" in the names of the two species (one of them with two subspecies) which were correctly discriminated under other names in the 2d–4th eds. of the Key: see Auk, Apr. 1885, pp. 184–188. The principal synonymy of the present species is: *Gerfault gyrfalco* BRUSS. i. 1760, p. 370, pl. 30, fig. 2. *F. islandus* BRÜNN. Orn. Bor. 1764, p. 2, including this species and the next one. *F. islandus* FABRIC. Fn. Groenl. 1780, p. 58, properly restricted to the present species. *F. gyrfalco* BODD. Tabl. 1783, p. 26, based on Pl. Enlum. No. 146. *F. islandus*, vars. *albus* and *maculatus* GM. 1788, p. 271, and *F. caucasicus*, p. 275, the latter being the name which most authors have used, including myself. *F. islandicus* LATH. Ind. Orn. i. 1790, p. 32; figured under this name by AUDUBON, folio pl. 366, octavo pl. 49. *F. grandaenicus* TRPT. Syst. Nat. i. 1806, p. 147. *Falco (Hierofalco) gyrfalco* var. *caucasicus* RIDGW. in BAIRD, BREW. and RIDGW. Hist. N. A. B. iii. 1874, p. 108. *Hierofalco holboellii* SHARPE. Cat. B. Brit. Mus. i. 1874, pl. 13 — upper fig. only. It is RIDGW. No. 412. COUES, No. 501, A. O. U. No. 353. **F. (H.) rusticolus.** (Linnean Latin, meaning a countryman, a rustic; the proper Lat. would be *ruricola*, from *rus*, genitive *raris*, and *colere*, to inhabit; *nicola*, an inhabitant.) Linnaeus uses a like form of the word for the Woodcock, which he called *Scalopus rusticola*

instead of *rusticola*. There is, however, the good Lat. *rusticus*, rustic, rural, and *rusticari*, to rusticate, live in the country.) GRAY GYRFALCON. ICELAND GYRFALCON (in part). Form strictly as in the preceding. Adult ♂ ♀: Not white, but gray, with darker markings. Above, pale bluish-gray, with dark bars, crescents, or transverse spots in about equal amounts or rather in excess, on the back, wings and tail, but on the head and hind neck the light color prevailing; crown thus decidedly lighter than back, owing to amount of white or whitish streaking (reverse of the case in the next subspecies). Bars of tail well marked, the light ones gray or grayish-white, especially the terminal one, the dark ones slate-gray, each about as broad as the other. Under parts white, in tone decidedly lighter than the upper parts, being moderately striped, streaked, or spotted with the dark color of the back on the sides, flanks, legs, and crissum, the latter never immaculate; slight dark mustaches; cere, eyelids and feet yellowish; bill bluish, yellow at base; iris dark brown; bill and feet never whitening. Size not appreciably different from that of the foregoing; same difference between the sexes. Young: Lacking distinct cross-bars on the upper parts, where the color is dark, with merely lighter edgings of the feathers, and some spotting with whitish, often of a buffy shade, on the back, wing-coverts, and outer webs of the quills. No bars or transverse dark markings on the lower parts, where the dusky appears in lengthwise streaks of variable size and number, usually narrower than the light ground color. Bill, cere, eyelids, and feet colored much alike, not yellow or whitish. This is the stock-form of the subgenus *Hierofalco*; it cannot be mistaken for the foregoing, in any plumage, but is very near the next, often hardly distinguishable. The best mark is: Head and neck lighter than the back in this typical form; head and neck darker than the back in *gyrfalco*. True *rusticolus* inhabits the Arctic regions of Europe, Asia, and America, including Iceland and southern portions of Greenland, breeding throughout such range, and coming irregularly S. in winter to the N. border of the U. S.; it nests on cliffs, like the White Gyrfalcon, and the eggs are indistinguishable. Following is its synonymy, in part: *Gerfaukt d'Islande*, *Gyrfalco islandicus* BRISS. Orn. i, 1760, p. 733, pl. 31. *Falco rusticolus* LINN. S. N. 10th ed. x, 1758, p. 88; 12th ed. 1766, p. 125; FABRIC. Fn. Groenl. 1780, p. 55; GM. S. N. 1788, p. 268; LATH. Ind. Orn. i, 1790, p. 28. *F. islandus* BRÜNN. Orn. Bor. 1764, p. 2, including this species and the foregoing one; GM. S. N. i, 1788, p. 271; *Hierofalco islandus* SHARPE, Cat. B. Brit. Mus. i, 1874, p. 414. *F. fuscus* FABRIC. Fn. Groenl. 1780, p. 56. *F. gyrfalco* BODD. Tabl. 1783, p. 13, based on Pl. Enlum. No. 210. *F. candicans* var. *islandicus* GM. S. N. 1788, p. 275. *F. islandicus* DAUDIN, Orn. ii, 1800, p. 100, and of most authors, including myself. *F. groenlandicus* DAUDIN, Orn. ii, 1800, p. 127. *F. arcticus* Holböll. Zeitschr. Ges. Nat. iii, 1854, p. 426. *F. holboelli* SHARPE, P. Z. S. 1873, p. 415, and *Hierofalco holboelli* SHARPE, Cat. B. Brit. Mus. i, 1874, p. 415, at least in part. *F. sacer* var. *islandicus* COUES, Key, 1872, p. 213. *Falco* (*Hierofalco*) *gyrfalco* var. *islandicus* RIDGW. in Bd. BREW. and RIDGW. Hist. N. A. B. iii, 1874, p. 108. *F. gyrfalco-candicans* and *F. candicans-gyrfalco*, SEEBOHM, Brit. B. i, 1883, p. 16. — This species is RIDGW. No. 412 a, COUES, No. 500, A. O. U. No. 354.

F. (H.) r. gyrfalco. (*Gyrfalco* is the worst, *gerfalcon* the better, *jerfalcon* the best, spelling of the name, if we regard the etymology of the word, which was formerly in English also *gerfaulcon*, *gerfaucon*, *gerfaucon*, *jerfaucon*, *gierfalcon*, *gierfaucon*, *gyrfacoun*, *gerfauk*, etc., with many identical or similar forms in other European languages: see the list given under *gerfalcon* in the Century Dictionary, where it is stated that the first element of the word is not connected with Lat. *gyrus*, a gyration, circle, but with German *geier*, greedy. The whole word is identical with the Lat. *hierofalco*, now the technical subgeneric name, meaning literally "sacred falcon," from Gr. *ἱερός*, *hieros*, sacred, and Lat. *falco*, a falcon; adapted from Gr. *ἱεραξ*, *hierax*, a falcon, now the technical name of another genus of *Falconide*.) BROWN GYRFALCON. AMERICAN (and EUROPEAN) CONTINENTAL GYRFALCON. NORWEGIAN GYRFALCON. Closely resembling the last, and the distinction not very apparent; darker, age for age, than the foregoing;

top of head and back of neck darker instead of lighter than other upper parts, the crown often plain dusky; barring of back and wing-coverts indistinct, the dark there prevailing over the light markings; under parts never white throughout, much obscured with gray, and heavily marked with blackish on the sides, flanks, flags, and crissum; heavy blackish moustaches; tail closely barred with light and dark bands of about equal widths. ♂ wing 13.50–14.50; tail 8.50–9.50; ♀ wing 15.00–16.00; tail 9.00–10.00; dimensions thus not distinctive. Young darker than the adults; at an early stage, some of the light markings tinged with ochraceous. This is the ordinary Gyr Falcon of continental America, also found in Greenland, and inseparable from that of continental Europe; it inhabits Arctic America from Labrador to Alaska (probably never reaching as high latitudes as *islandus*) in the breeding season, and ranges freely S. in winter over the border of the U. S., sometimes reaching southern New England, the Middle States, Kansas, etc. It abounds in its summer home, mostly N. of lat. 65°, where it breeds, and preys on hares, Grouse, Ptarmigan, Ducks, Auks, etc. The nest is built in a tree or on a cliff, indifferently, of sticks, twigs, mosses, grasses, feathers, etc., and the eggs are laid from the middle of May to that of June; eggs 3–4, with the usual variation in size, shape, and color, indistinguishable from those of other Gyr Falcons; they range from 2.25 to 2.50 long × 1.70 to 1.90 broad, and are usually heavily colored with reddish and brownish pigments in interminable variation, to an extent which almost entirely hides the ground color. Principal synonyms: *F. gyrfalco* LINN. S. N. 10th ed. 1758, p. 91; 12th ed. 1766, p. 130, and of most authors. *F. sacer* FORSTER, Philos. Trans. lxii, 1772, p. 382. *F. sacer*, var. *β*, Gm. S. N. 1788, p. 273 (from Forster). *F. sacer* CASSIN, B. Cal. 1853, p. 89, *in part* (includes *islandus*, as above, and *labradoria*, as below; excludes *rusticolus*, as above). *F. sacer* var. *gyrfalco* COUES, Key, 1872, p. 213. *Falco* (*Hierofalco*) *gyrfalco*, var. *sacer* and var. *gyrfalco* RIDGW. in Bd. BREW. and RIDGW. Hist. N. A. B. iii, 1874, pp. 108, 115. *F. sacer* COUES, Key, 2d ed. 1884, p. 532, name restricted to the present subspecies. *F. rusticolus gyrfalco* STEJ. Auk, Apr. 1885, p. 187. — This subspecies is RIDGW. No. 412 *b*, COUES No. 498, A. O. U. No. 354 *a*.

F. (II.) r. obsole'tus. (Lat. *obsoletus*, unwonted; obsolete, as the pattern of coloration is in this case.) BLACK GYRFALCON. LABRADOR GYRFALCON. A dark phase of the last, almost entirely dusky, the usual markings nearly obliterated; from the foggy coast of Labrador, where it breeds on cliffs, S. in winter to New England and New York. In extreme cases it is quite black, unmarked. There is no difference in measurements, and the eggs are indistinguishable. I suspect the truth to be, in respect to all the Gyr Falcons, that there is but a single circumpolar species; that with specimens enough an uninterrupted series could be established connecting the blackest "obsoletus" with the whitest "caudicans"; and that the races which most ornithologists recognize, are not coincident with geographical areas. *F. holboellii* of Mr. Sharpe appears to be somewhat of a connecting link between the two species now generally considered distinct. But I defer in this case to those who have formed the contrary opinion, upon further investigation of the subject than I have made. *F. obsoletus*, Gm. Syst. Nat. 1788, p. 268. *F. labradoria*, AUD. folio pl. 196, pub. about 1831. *Falco* (*Hierofalco*) *sacer*, var. *labradoria* RIDGW. in Bd. BREW. and RIDGW. Hist. N. A. B. iii, 1874, p. 108 and p. 117. *F. sacer obsoletus* COUES, Key, 2d ed. 1884, p. 532. *F. rusticolus obsoletus* STEJ. Auk, 1885, p. 187. RIDGW. No. 412 *c*, COUES, No. 499, A. O. U. No. 354 *b*.

F. (II.) mexicanus. (Lat. *mexicanus*, Mexican. Figs. 456, 459.) AMERICAN LANNER FALCON. PRAIRIE FALCON. A medium-sized species, distinguished from any Gyr Falcon by smaller size, different feathering of tarsus, etc.; from the Duck Hawk by much lighter color, which is dull brownish above instead of dark slate, etc. Adult ♂ ♀: Upper parts brownish drab, each feather with a paler border of brown, grayish, or whitish; top of head more uniform, occiput and nape showing more whitish. Under parts white, everywhere excepting on throat marked with firm spots of dark brown, most linear on breast, then more broadly oval on belly, enlarge-

ing and tending to merge into bars on flanks, very sparse or obsolete on erissum, in maxillary region forming a broad firm moustache; these markings corresponding with ground color of upper parts. Primaries ashy-brown, with narrow but firm pale edging of outer webs and ends;



FIG. 459. — Lanner Falcon, $\frac{1}{2}$ nat. size; not distinguishable in the cut from the Prairie Falcon. (From Brehm.)

inner webs regularly marked with white in form of barred indents or circumscribed spots, most numerous and regular on the outer few primaries; the white tinged with fulvous, next to the shafts; outer web of 1st primary either plain, or with whitish indents as in *lanarius*; outer webs of secondaries more or less marked with fulvous; axillars plain dark brown; lining of wings otherwise white, spotted with dark brown. Tail pale brownish-gray, nearly uniform, but with white tip, and more or less distinct barring or indenting with whitish, especially on lateral feathers, producing a pattern not unlike that of primaries. Bill mostly dark bluish horn-color, but its base, and much of under mandible, yellow; feet yellow. Young birds have more fulvous in the dark ground of the upper parts; are more heavily spotted below, and the white is there tinged with buff or ochrey; feet plumbeous. Size very variable: ♂ about 18.00; extent 40.00; wing 12.00-13.00; tail 7.00-8.00; tarsus about 2.00; middle toe without claw about the same; chord of culmen, including cere, 1.00. ♀ larger:

wing 13.00-14.00; tail 8.00-9.00. etc. A noble species, representing the Old World Lanner and Jagger, abundant in western U. S., especially on the Plains; E. occasionally to Illinois; S. into Mexico. I have traced it from Montana at lat. 49° to Arizona and S. California, and found it very numerous in Wyoming, where it is the characteristic species of its genus. In the region first named it was nesting on cliffs, and such is its wont everywhere, in the woodless regions it inhabits, where the faces of cut banks of streams, generally precipitous and often of great height, are the ordinary resorts for nidification for Eagles, Ferruginous and Swainson's Buzzards, and various other Birds of Prey; in forested country, however, the Lanner will sometimes take to a tree. The breeding season is mostly April and May, but extends from March to June. Eggs 3-5, from 2.05 to 2.25 × 1.55 to 1.65, white or creamy-whitish, irregularly but usually thickly clouded, mottled, and blotched with reddish-brown; often with a purplish shade; thus indistinguishable from those of related species. (*F. polyagrus* Cass.)

(Subgenus *RHYNCHODON*: *Peregrines*.)

F. (R.) peregrinus an'atum. (Lat. *peregrinus*, wandering; *anatum*, genitive plural of *anas*, a duck. Fig. 460.) AMERICAN PEREGRINE FALCON. DUCK HAWK. GREAT-FOOTED HAWK. A medium-sized Falcon, about as large as the foregoing, but known at a glance from any bird of N. Am. by slaty-plumbeous or dark bluish-ash of upper parts, black "moustache," and other marks, taken with its particular size and shape. Wings stiff, long, thin, pointed by 2d quill, supported nearly to its tip by 1st and 3d; 1st alone abruptly emarginate on inner web, about 2 inches from tip; none cut on outer webs. Tomium of upper mandible strongly toothed, of under mandible deeply notched. Tarsus feathered but a little way down in front, otherwise



FIG. 460. — Peregrine Falcon, or Duck Hawk, $\frac{1}{2}$ nat. size. (From Brehm.)

entirely reticulate; toes very long, giving great grasp to the talons. Adult ♂ ♀: Above, rich dark bluish-ash or slate-color, — very variable, sometimes quite slaty-blackish, again much lighter bluish-slate; the tint pretty uniform, whatever it may be, over all upper parts, but all the feathers with somewhat paler edges, and the larger ones for the most part obscurely barred with lighter and darker hues. Under parts at large varying from nearly pure white to a peculiar muddy buff color of different degrees of intensity; throat and breast usually free from markings (or only with a few sharp shaft-pencillings): this white or light color mounting on auriculars, so that it partly isolates a blackish moustache from blackish of side of head; under parts, except as said, including under wing- and tail-coverts, closely and regularly barred, or less closely and more irregularly spotted, with blackish; bars best pronounced on flanks, tibia, and crissum,

other parts tending to spotting, which may extend forward to invade breast (this is the rule in European birds, or true *peregrinus*; the exception, though not a rare one, in American birds, of the subspecies *anatum*). Tail and its upper coverts regularly and closely barred with blackish and ashy-gray, the interspacing best marked on inner webs, and all the feathers narrowly tipped with white or whitish. Primaries uniform blackish on their exposed surfaces, but on inner webs marked with numerous regular and close-set spots of white, whitish, or muddy buff, for the most part isolated within the webs, but on inner primaries and secondaries, and toward bases of all, becoming or tending to become bars reaching edge of feather. Bill blue-black; cere and much of base of bill yellow; feet yellow; claws blackish. Size very variable; length of a good-sized ♀ 19.00; extent 45.00; wing 14.50; tail 7.00. ♂ averaging smaller; wing 12.50; tail 6.00; a usual range, sex not considered, is, wing 11.50–14.00; tail 6.00–8.00; tarsus 1.75–2.10; middle toe without claw rather more. Young: Recognizably similar to adults in general characters; not barred below, but there more or less extensively and heavily streaked lengthwise; upper parts brownish or blackish, in either case without the glaucous bloom and appearance of transverse markings which the adults show, the variegation being chiefly in light gray or rusty edgings of individual feathers. This Falcon is the central figure in the whole genus, and in one or another of its geographical guises is cosmopolitan; it is universally but irregularly distributed in N. Am., scarcely to be considered common anywhere; breeds S. to S. Carolina on the Atlantic side, still farther S. in the West, usually in mountainous regions; nests on cliffs, niches of "cut banks," or in hollows in high trees; eggs usually 3–4, 2.00 to 2.25 × 1.50 to 1.70, averaging about 2.10 × 1.65; white or whitish, spotted, blotched, wreathed, clouded, etc., with reddish-browns, from chocolate or even purplish to the ochres; they are in general so heavily and uniformly pigmented as to hide the ground color, and average among the darkest eggs of our *Falconide*; they are mostly laid in April and May, but the season extends through June in high latitudes. The Peregrine is a bird of noted prowess, habitually striking a quarry as large as itself or larger, as Grouse, Ducks, Herons, hares, etc.

F. (R.) p. peal'ei. (To Titian R. Peale.) **PEALE'S PEREGRINE.** A dark form, described from the N. W. coast. Adults with upper parts dark slate-color; top of head like back; breast heavily spotted with blackish, and broad dusky bars on other upper parts. Young without rusty margins of upper parts, the lower sooty blackish, streaked with pale buff. Pacific Coast region from Oregon to the Aleutian and Commander islands, breeding throughout this range. Queried as a subspecies in 2d–4th eds. of the Key, p. 536, but probably entitled to recognition as such, like the dark local races of this region in many other cases. *Falco communis* var. *pealei* RIDGW. Bull. Essex Inst. v, Dec. 1873, p. 201; BD. BREW. and RIDGW. Hist. N. A. Birds, iii, 1874, p. 129; *F. peregrinus pealei* RIDGW. Proc. U. S. Nat. Mus. iii, Aug. 1880, p. 192; A. O. U. Lists, 1st and 2d eds. 1886 and 1895, No. 356 a.

(Subgenus *ÆSALON*: *Mertins*.)

F. (Æ.) columbar'ius. (Lat. *columbarius*, a pigeon-fancier. Fig. 461.) **PIGEON HAWK** (a name also applied to *Accipiter fuscus*). Smaller than any of the foregoing; about size of *Accipiter fuscus*, but much stouter and differently proportioned. Tarsus mostly with a double row of alternating scutella in front, feathered but a little way down; middle toe without claw nearly as long as tarsus. Tail about $\frac{2}{3}$ the wings, lightly rounded. Wings pointed by 2d and 3d quills, 1st about equal to 4th; 1st and 2d emarginate on inner webs near end; 2d and 3d sinuate on outer webs. Sexes unlike; old ♂ bluish above, ♀ and young dark there. Old ♂: Above, some shade of bluish, from pale bluish-gray or bluish-ash to dark bluish-slate, each feather pencilled with a fine black shaft-line. Tail banded with color of upper parts and black, the subterminal black band broadest, all subject to much variation; tail tipped with white. Primaries blackish, with lighter edges or tips, and numerous oval trans-

verse spots of white or whitish on inner webs; outer webs often showing traces of ashy markings; a similar pattern continued on secondaries. Under parts white, or whitish, generally pure and immaculate on throat, elsewhere tinged with tawny or ochraceous, almost everywhere longitudinally streaked with dark umber-brown; the individual streaks very variable in size and distinctness, generally blackish-shafted, as a rule heavy and thick on breast, more strict on flanks and vent, changing to spots or even bars on flanks; these latter markings sometimes involved in a bluish clouding. Side of head with fine dark pencilling on a light or whitish ground, not gathered into a maxillary stripe, but coalescing on ear-coverts; a pretty well-defined light superciliary streak; markings of side of head confluent on nape, forming a nuchal band which interrupts continuity of color of upper parts. Iris brown; feet yellow; claws and most of bill bluish-black; cere and base of bill greenish-yellow. This plumage is comparatively seldom seen. Length about 11.00; extent about 23.50; wing 7.50-8.00; tail

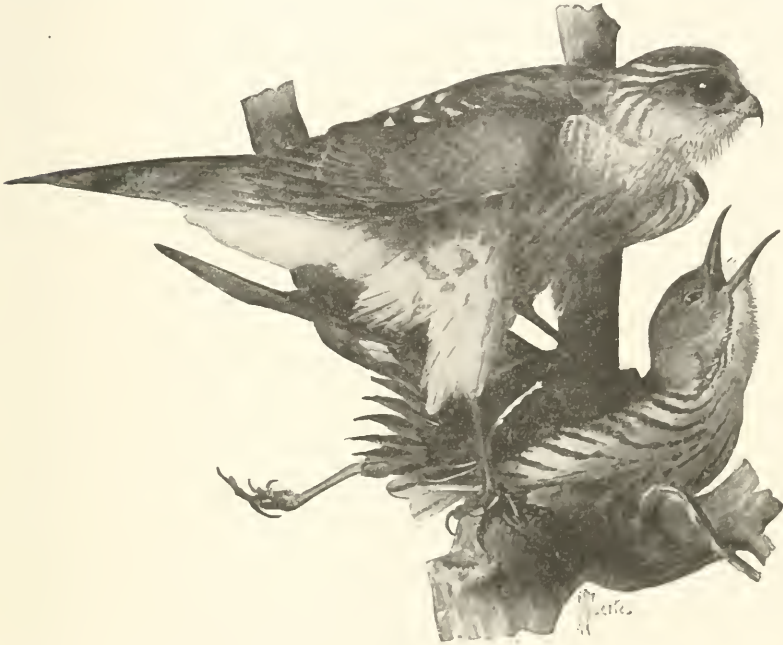


FIG. 461. — Pigeon Hawk.

5.00-5.50; tarsus 1.35; middle toe without claw 1.25. Adult ♀, and specimens of either sex, as usually observed: Pattern of coloration as before, but upper parts and tail quite different. Above, the bluish shade replaced by dark umber-brown, nearly uniform, or only interrupted by the nuchal band of streaks, but feathers usually with appreciably paler edges and black shaft-lines, the latter especially on head. Tail like back, and tipped with white, and crossed by about 4 other narrow whitish or light ochraceous bands, formed of bars or transverse spots on both webs of the feathers; uppermost of these bands lying under the coverts; generally only 3 exposed ones, besides the terminal one; intervening dark zones all of about the same width, say 1.00, but subterminal one usually rather wider than the others. Pattern of quill feathers as in ♂, but spots rather tawny or fulvous than whitish. Under parts as before, but ground color ranging from nearly white to quite rich buff or even fulvous, and showing a wide range of variation in heaviness of streaking. Length of ♀ about 12.50; extent about 26.50; wing 8.00-8.50; tail 5.50-6.00. In quite young birds, edgings of feathers of upper parts may

be tawny or rufous. A spirited little Falcon, generally distributed in N. Am., common, representing the Merlin of Europe, *F. regulus*. Nests chiefly northerly, on branches or in holes in trees, or on rocks, April-June; eggs commonly 4 or 5, ranging in size and shape from 1.50 to 1.80 × 1.25, some being subspherical, others elongate-oval. The coloration ranges from



FIG. 462. — American Sparrow Hawk.

nearly uniform deep rich brown (chestnut or burnt sienna) to whitish or white, only marked with a few indistinct dots of dull grayish or drab. Such extremes are connected by every degree; a yellowish-brown ground-color, irregularly splashed with rich ruddy brown, is the usual style. The markings may be very evenly distributed, or mostly gathered in a wreath

around one or the other end, or even both ends. The quarry is chiefly birds, even up to the size of a Ptarmigan.

F. (Æ.) c. suckleyi. (To Dr. Geo. Suckley.) SUCKLEY'S PIGEON HAWK. BLACK MERLIN. Size of the last; general coloration blackish; throat of ♂ streaked with black, the rest of lower surface brownish-black with tawny and whitish markings; lower parts of adult ♀ and young ♂ heavily marked with dusky. Barring or spotting of wings indistinct or obsolete, also of tail in ♀, except the terminal light tail-bar. N. W. coast region, N. California to S. Alaska, and E. in Oregon and Washington. A dark form of *F. columbarius*, formerly queried in Key, but which has proved entitled to subspecific recognition. *Falco columbarius* var. *suckleyi* RIDGW. Bull. Essex Inst. v, Dec. 1873, p. 201; A. O. U. Lists. 1st and 2d eds. 1886 and 1895, No. 357 a; *F. lithofalco* var. *suckleyi*, BO. BREW. and RIDGW. Hist. N. A. B. iii, 1874, p. 143.

F. (Æ.) richardsoni. (To Sir J. Richardson.) RICHARDSON'S PIGEON HAWK. AMERICAN MERLIN. "Adult ♂: Upper plumage, dull earth-brown, each feather grayish-number centrally, and with a conspicuous black shaft-line. Head above, approaching ashy-white anteriorly, the black shaft-streaks being very conspicuous. Secondaries, primary-coverts, and primaries, margined terminally with dull white; the primary-coverts with two transverse series of pale ochraceous spots; primaries, with spots of the same, corresponding with those of the inner webs. Upper tail-coverts, tipped and spotted beneath the surface with white. Tail, clear drab, much lighter than the primaries, but growing darker terminally, having basally a slightly ashy cast, crossed with six sharply defined perfectly continuous bands (the last terminal) of ashy-white. Head frontally, laterally, and beneath — a collar round the nape (interrupting the brown above) — and entire lower parts, white, somewhat ochraceous, this most perceptible on the tibiæ; cheeks and ear-coverts with sparse, fine, hair-like streaks of black; nuchal collar, jugulum, breast, abdomen, sides, and flanks with a median linear stripe of clear ochre-brown on each feather; these stripes broadest on the flanks; each stripe with a conspicuous black shaft-streak; tibiæ and lower tail-coverts with fine shaft-streaks of brown, like the broader stripes of the other portions. Chin, and throat, only, immaculate. Lining of the wings spotted with ochraceous-white and brown, in about equal amount, the former in spots approaching the shaft. Inner webs of primaries with transverse broad bars of pale ochraceous — eight on the longest. Wing 7.70; tail 5.00; culmen 0.50; tarsus 1.30; middle toe 1.25; outer 0.85; inner 0.70; posterior 0.50. Adult ♀: Differing in coloration from the male only in the points of detail. Ground-color of the upper parts clear grayish-drab, the feathers with conspicuously black shafts; all the feathers with pairs of rather indistinct rounded ochraceous spots, these most conspicuous on the wings and scapulars. Secondaries crossed with three bands of deeper, more reddish-ochraceous. Bands of the tail, pure white. In other respects exactly like the male. Wing 9.00; tail 6.10; culmen 0.55; tarsus 1.40; middle toe 1.50; Young ♂: Differing from the adult only in degree. Upper surface with the rusty borders of the feathers more washed over the general surface; the rusty ochraceous forming the ground-color of the head, — paler anteriorly, where the black shaft-streaks are very conspicuous; spots on the primary coverts and primaries deep reddish ochraceous; tail-bands broader than in the adult and more reddish: the terminal one twice as broad as the rest (0.40 of an inch), and almost cream color. Beneath pale ochraceous, this deepest on the breast and sides; markings as in the adult, but anal region and lower tail-coverts immaculate; the shaft-streaks on the tibiæ, also, scarcely discernible. Wing 7.00; tail 4.60." (Ridgway.) Interior N. Am., especially from the Mississippi to the Rocky Mts., but also extending to the Pacific, and from the region of the Saskatchewan to the Mexican border; very near *columbarius*, both being closely related to *F. regulus*, the fewer bars on the wings and tail apparently the principal character; and in this respect *richardsoni* seems to be exactly intermediate between *columbarius* and *regulus*, with a tail-band more than the former, and with fewer than the latter. A ♀ I took in Dakota measures: length 12.75; extent 26.75; wing 8.50.

F. (Æ.) reg'ulus. (Lat. a little king, a kinglet, dim. of *rex*, king.) PALLAS' PIGEON HAWK. EUROPEAN MERLIN. Size and proportions of the species last described; markings of tail and wings more numerous and less firm. Adult ♂: Middle tail-feathers crossed by about six imperfect dark bars, in addition to the broad subterminal band. Adult ♀ and young ♂: These tail-feathers crossed by about eight light bars, including the terminal one. (*F. regulus* PALLAS, *Reise Russich. Reichs.* ii, 1773, p. 707; *F. asalon* TUNSTALL, *Orn. Brit.* 1771, p. 1, and of most authors. *Accipiter merillus* GERINI, *Orn.* 1767, i, p. 51, pls. xviii, xix.) This well-known European and Asiatic Falcon, belonging to the subgenus *Æsalon*, is recorded as accidental at sea off Greenland. See KUMLEIN, *Auk*, Oct. 1887, p. 345; COUES, *Key*, 4th ed. 1890, p. 904; A. O. U. List, 2d ed. 1895, No. [358. 1.].

(Subgenus TINNUNCULUS: Kestrels.)

F. (T.) tinnun'culus. (Lat. a small kind of Hawk, perhaps this species.) EUROPEAN KESTREL or WINDHOVER. The type of this section of the genus, and in general resembling our Sparrow Hawk as next described. Adult ♂: Above, slate-gray, including the tail, the latter with a broad black subterminal band and white tip, the head with dusky shaft-lines, the back rufous, spotted with black: quills dusky with light edgings; below, fawn-colored or buff, more rufous on the flanks and crissum, spotted on the belly and streaked on the breast with dusky; tail viewed from below grayish-white. Bill bluish; cere, orbits, and feet yellow; claws black; iris brown. ♀ and young above reddish-brown, barred with black. ♂ ♀: Length about 12.50; wing 9.00; tail 6.50. This well-known bird of Europe and Asia has been detected as a straggler in Massachusetts. See CORY, *Auk*, Jan. 1888, p. 110, and April, 1888, p. 205; COUES, *Key*, 4th ed. 1890, p. 904; A. O. U. List, 2d ed. 1895, No. [359. 1.].

F. (T.) sparve'rius. (Lat. *sparverius*, a sparrow. Figs. 462, 463, 464.) AMERICAN KESTREL or WINDHOVER. RUSTY-CROWNED FALCON. SPARROW HAWK. Smallest of our *Falconinæ*; sexes unlike in color, but of nearly the same size, contrary to the rule in this family.

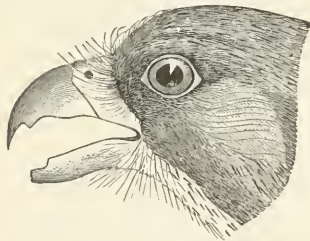


FIG. 463. — Sparrow Hawk, nat. size. (Ad. nat. del. E. C.)

Tail rounded, at least $\frac{2}{3}$ as long as the wing, usually more. Wings pointed by 2d and 3d quills; 1st about equal to 4th; 1st and 2d emarginate on inner webs near end; 2d and 3d sinuate on outer webs. Tarsus feathered but a little way down in front, decidedly longer than middle toe without claw, usually surpassing middle toe and claw. Young differing less than usual from adults of their respective sexes. Adult ♂ ♀: Crown ashy-blue, with a chestnut patch, sometimes small or altogether wanting, sometimes occupying nearly all the crown. Conspicuous black maxillary and auricular patches which, with 3 others around nape, make 7 places in all, usually evident, but some of them often obscure or wanting. Back cinnamon-rufous, or chestnut, like the crown-patch, in ♂ with a few black spots or none, in ♀ with numerous black bars. Wing-coverts of ♂ fine ashy-blue, like crown, with or without black spots; of ♀ cinnamon-rufous and black-barred, like back. Quill feathers in ♂ ♀ blackish, usually with pale edges and tips, and inner webs with numerous white indentations, or bars continuous along inner webs, leaving black chiefly in a series of dentations proceeding from shafts; ends of secondaries usually also slaty-blue like coverts. Tail bright chestnut, in ♂ with white tip, broad black subterminal zone, and outer feathers mostly white with several black bars; in ♀ whole tail with numerous imperfect black bars. Under parts white, variously tinged with buff or tawny, in ♂ with a few black spots or none, in ♀ with many dark brown streaks; throat and vent usually immaculate. Bill dark horn; cere and feet yellow or orange. Length, either sex, 10.00–11.00; extent 20.00–23.00; wing 6.50–8.00; tail 4.50–6.00; tarsus 1.35; middle toe

without claw 1.00. The young do not require to be separately described, as the species is a strongly marked one, and as the young speedily acquire recognizable sexual characters. They may be distinguished when just from the nest; their first covering is white down. Temperate N. Am., very abundant. Despite its great variation in markings, aside from the normal sexual differences, this elegant little Falcon will be immediately recognized by the subgeneric characters of *Tinnunculus*, its small size, and entirely peculiar coloration. Its characteristic habit is to hover or poise in the air over some object which seems to promise a meal, and then pounce down upon the prey; whence the name "Windhover" for the corresponding European species. The birds are very active and noisy during the breeding season. They build no nest, but lay in hollows of trees, often deserted Woodpeckers' holes, or similar nooks in rocks or about buildings, occasionally in a hole in the ground of a cut bank, but very rarely occupy the open nest of some other bird. Eggs 3-7, mostly 4 or 5, nearly spheroidal, about 1.33×1.12 ; ground-color usually buffy, or pale yellowish-brown; blotched all over with dark brown, the splashes of which are usually largest and most numerous toward the greater end, at or around which they may run into a crown or wreath. Some eggs are pale brown, minutely dotted all over with dark brown; some are white, with pale brown spots; few are whitish without any markings. They are laid from March to June in different localities, and have even been found fresh in July and August.



FIG. 364. — Sparrow Hawk, Florida, nat. size. (L. A. Fuertes.)

NOTE. *F. s. isabellinus*, queried in the 2d-4th eds. of the Key, p. 538, as "a middle American form of the last, occurring in the Gulf States, and shading directly into *sparverius* proper," has been found untenable and dismissed from all further consideration. In its stead we have now to admit two other subspecies of *sparverius* which have secured the approval of the A. O. U. Committee, but which may not impossibly hereafter follow *isabellinus* into the limbo of unidentifiable or unverifiable races of a single well-known species: see Auk, July, 1892, pp. 252-270.

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F. (T.) s. deserticolus. (Lat. *desertum*, a desert, and *colo*, I inhabit.) **DESERT SPARROW HAWK.** Larger than the average of *sparverius* proper, with relatively longer tail; paler, with more rufous, and a larger crown patch; black bars on inner webs of the quills not crossing the entire web, but forming serrations only; ♀ with the dark bars of the upper parts narrower, and those of the tail more often incomplete. Described as "a desert form from the treeless regions of the Southwest." MEARN'S, Auk, July, 1892, p. 263; range given as "Western U. S., N. to eastern British Columbia and western Montana, S. to Mazatlan in northwestern Mexico," in A. O. U. List, 2d ed. 1895, No. 360 *a*. It is a bird with which I was familiar thirty years ago in Arizona, but one which I did not suspect I should ever be called upon to recognize by name.

F. (T.) s. peninsularis. (Lat. *peninsularis*.) **ST. LUCAS SPARROW HAWK.** "A depauperate insular [read peninsular] form, in which a diminution of the general size is accompanied by an increase in the size of the bill; also characterized by pallor of coloration, and decrease in the extent of the black markings." Iris said to be yellow instead of hazel in the ♀. Lower California, Mearns, *l. c.* p. 267; A. O. U. List, 2d ed. 1895, No. 360 *b*.

F. (T.) dominicensis. (Lat. inhabiting the island of Dominique, or St. Domingo.) CUBAN SPARROW HAWK. Closely related to *F. sparverius*, and generally similar, but apparently a distinct species, in both of the two color-phases which it presents. *Light phase* (= *F. dominicensis* proper). Adult ♂: Above as in *sparverius*, but with little black spotting. Crown usually without a rusty spot, being bluish like the wings; forehead broadly white; a conspicuous white superciliary stripe; maxillary stripes indistinct or obsolete; under surfaces of quills white, with dusky serrations in parts of their extent only; under parts white, unmarked, shaded with pale rufous on the breast. *Dark phase* (= *F. sparverioides*). Adult ♂: Above, except tail (which is as in *sparverius*), entirely dark plumbeous, with a blackish nuchal collar, and dusky front and auriculars; primaries and edges and subterminal portion of tail-feathers, black. Beneath, deep rufous (like the back of *sparverius*) with a wash of plumbeous across jugulum; throat grayish-white. Inner webs of primaries slaty, with transverse cloudings of darker. The ♀ in either phase has the upper parts rufous brown, banded with blackish, the top of the head bluish-gray or slate-gray, with or without a rufous patch; the under parts ranging from pale buff, spotted or streaked with rusty brown, and white throat, to uniform chestnut-rufous, which also colors the linings of the wings; and dusky mottled inner webs of primaries. Cuba, Hayti (Santo Domingo), and Porto Rico; casual in Florida. Previous editions of the Key have described only the dark phase, which was supposed to be a different species from *F. dominicensis* GM., the light phase, which latter is also *F. leucophrys* RIDGWAY. The two are now united under the earliest name. (A. O. U. No. [361].)

(*Subgenus RHYNCIOPALCO.*)

F. (R.) fuscicærules'cens. (Lat. *fuscus*, dark; *cærulescens*, bluish.) FEMORAL FALCON. APLOMADO FALCON. Bill robust, with large cere; irregular scutellation of tarsus continuous on the toes; tarsus a little longer than middle toe without claw; 2d and 3d quills longest; 1st about equal to 4th; 1st and 2d emarginate on inner webs; 2d and 3d sinuate on outer webs. Size medium (among the smaller Falcons); form slender; sexes alike. Adult ♂ ♀: Above, uniform plumbeous; tail with about 8 narrow white bars, and tipped with white, as are the secondaries; primaries with numerous narrow white bars on inner webs, mostly being isolated transverse spots, reaching neither shaft nor inner edge of feathers; same pattern less definitely continued on to secondaries. Side of head with a broad white or tawny postocular stripe, continuous with narrowly white forehead, shading into orange-brown on nape, where confluent with its fellow; auriculars mostly white, set in black of side of head, but continuous with white of throat, so that a black supra-auricular stripe meets a black mystacial stripe under eye. Sides of body and a broad belly-band black, with or without numerous narrow white bars; extent of this black very variable; it usually leaves the breast white or tawny, but in younger specimens the whole breast is streaked with black on a tawny ground. Throat usually white. Lining of wings blackish, spotted with white, the border mostly white or tawny. Flanks, flags, and crissum uniform tawny or orange-brown. Young sufficiently similar, but upper parts rather dark brown than plumbeous. Length 15.00 or more; wing 10.00–11.00; tail 7.00–8.00; tarsus 1.75; middle toe without claw 1.50. A handsome Hawk, well-known and wide-ranging in South and Central America, reaching over our Mexican border in southern Texas, New Mexico, and Arizona. Nest in trees or bushes; eggs usually 3 in our country, 1.80 × 1.30, white, finely dotted with light brown, overlaid with blotches of dark brown, very variable in pattern, as usual in this genus, laid in April and May with us. (*F. femoralis* (TEMM. 1823) of the orig. ed. of the Key.)

Subfamily POLYBORINÆ: Caracaras.

Anatomical characters of *Falconina* proper, in the scapular arrangement by which a process of coracoid reaches clavicle, central tubercle of extensively ossified nasal bones, anterior keel of palate, and superorbital shield in a single piece; external characters very unlike those of *Falconina*, and general aspect vulturine. Bill toothless. Sternum single-notched on each side behind. Three or more primaries sinuate-emarginate on inner webs; 3d or 4th longest; 1st shorter than 5th. A small but remarkable group, combining some of the essential characters of Falcons with others more Vulture-like; the species are chiefly terrestrial, rather slug-gish, and feed much on carrion. The genera are *Polyborus*, *Phalcobanus*, *Senec*, *Milvago*, *Ibycter*, and *Daptrius*, all confined to America.

POLYBORUS. (Gr. πολυβόρος, *polyboros*, very voracious. Fig. 465.) CARACARAS. QUELELIS. Bill long, high, much compressed, little hooked, commissure nearly straight to

deflected end; cere ending anteriorly in a nearly straight vertical line; nostril high in front upper corner of cere, linear, oblique, its posterior end uppermost, its tubercle concealed. Chin and sides of head bristly, extensively denuded; a naked pectoral area; an occipital crest. Tibiæ shortly flagged. Tarsus nearly twice as long as middle toe without claw, almost entirely

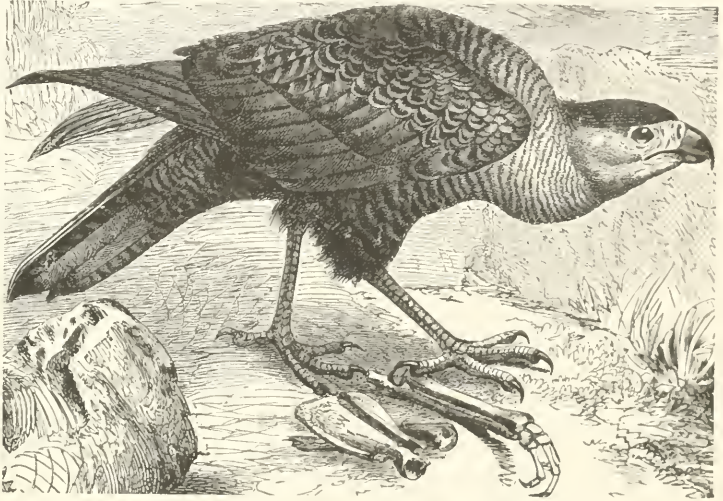


FIG. 465. — The Caracara, $\frac{1}{2}$ nat. size. (From Brehm.)

naked, chiefly reticulate, but in front broadly scutellate in single or double row; lateral toes of about equal lengths; hind toe much the shortest; claws long and little curved. Wings very long, with 3d and 4th quills longest, 2d and 5th next, 1st shorter than 6th or 7th; outer 4 or 5 emarginate. Tail rounded, about $\frac{2}{3}$ as long as wing. Comprising three species of large Vulture-like carrion Hawks, of terrestrial habits, and ambulatorial, not saltatorial, gait, of the warmer parts of America.

P. che'riway. (Probably the South American native name.) AUDUBON'S CARACARA. Adult ♂ ♀: General color blackish, throat, neck all around, and more or less of fore back and breast whitish, spotted, and chiefly barred with blackish; upper and under tail-coverts and most of tail white, the latter very numerous barred with blackish, of which color is the broad terminal zone; shafts white along white portion of each feather. Basal portion of primaries likewise barred with whitish. Bill variously pale colored; cere carmine; iris brown; feet yellow; claws black; soft parts drying to a dingy indefinable color. Young similar, but rather brownish; markings of body in lengthwise streaks, not cross-bars; tail, however, barred. Length (either sex) 21.00–25.00; extent about 48.00; wing 14.50–16.50; tail 8.00–10.00; tarsus about 3.60; middle toe without claw 2.00; culmen 1.35. I describe the North American bird, which is much less extensively barred than that of South America. (See Cassin, Tr. Phila. Acad. 1855, p. 2.) The difference in several specimens handled is striking, nearly the whole

body, wings, and tail of the South American bird being multitudinously rayed across, while in Texas and Florida specimens the body and wing-coverts are mostly uniform, the barring being restricted to neck and fore half of body, and to primaries and tail-feathers. The bird is certainly different from *P. thurus*. *P. lutosus* is barred throughout, and otherwise different again. S. border of U. S., Florida to Lower California and southward, common, in some places abundant, gregarious like a Turkey Buzzard where offal is exposed. Nest bulky, in trees and bushes, as palmettos, yuccas, mesquites, cactuses, etc., of sticks and leaves; eggs commonly 2, often 3, broadly oval or subspherical, heavily colored with blotches and clusters of rich reddish-brown and smaller blackish over-spots, usually obscuring the creamy white ground-color; size 2.20 to 2.40 by about 1.85; with us laid mostly in March and April, sometimes in February. The long neck and legs of this bird, its terrestrial habits and walking powers, give it peculiar character, almost suggesting *Gypogeronus*. Like our Vultures, it is a constant feature of the scene in some southerly localities. (*F. cheriway* JACQUIN, Beitr. 1784, p. 17, pl. 4. *P. cheriway* CAB. 1848; A. O. U. No. 362. *P. brasiliensis* AUD. folio pl. 161 and 8vo pl. 4; not of GM. 1788. *P. thurus* CASS. B. Cal. i, 1854, p. 113, and in Bd. B. N. A. 1858, p. 45; not of MOLINE, 1782. *P. auduboni* CASS. Pr. Phila. Acad. 1865, p. 2. *P. thurus* var. *audubonii* COUES, Key, 1872, p. 220. *P. auduboni* of 2d-4th eds. 1884-90, p. 540.)

P. luto'sus. (Lat. *lutosus*, dirty, muddy; so called from the sordid coloration.) GUADALUPE CARACARA. As stated in Key, 2d ed. p. 540, this species is quite distinct, nearly the whole plumage being barred. "Scapulars plain dusky brown. Tibiæ and flanks light isabella-color, barred with dark brown. Wing-coverts (middle and greater) marked with wide bars of brown and pale isabella-color, of equal width. Tail-coverts and rump with broad bars of light isabella-color and grayish-brown. Tail with broad bars of pale isabella-color and grayish-brown, separated by zigzag lines of dusky. Abdomen isabella-color, with small sagittate bars of dark-brown." Wing 15.00-16.50; tail 10.50-11-50; bill 1.25-1.35; tarsus 3.50-3.75. Guadalupe Island, Lower California. RIDGW. Bull. U. S. Geog. & Geol. Surv. 2d ser. No. 6, Feb. 1876, p. 459; Man. 1887, p. 254; COUES, Key, 3d ed. 1887, p. 882, Lower California and its islands having been meanwhile annexed ornithologically; A. O. U. No. 363.

Subfamily BUTEONINÆ: Buzzards and Eagles.

Bill variable in size and shape, but without the toothing and notching of that of *Falconinae* (with rare exceptions); cutting edge variously lobed or festooned, or simple. Nostrils not circular, nor with a central tubercle; nasal septum incompletely ossified. Superciliary shield more or less prominent, usually consisting of two pieces. Scapular process of coracoid not produced to meet clavicle. Wings and tail variable, but not presenting special characters noted under *Falconinae*, nor relative lengths of those of *Accipitrinae*. Tarsus obviously shorter than tibia, generally scutellate before and behind, sometimes feathered to toes. The Buzzards form a large group, not easy to define except by exclusion; though quite distinct from *Falconinae* and *Polyborinae*, they grade into each of the other subfamilies here presented. They are Hawks of medium and rather large size, heavy-bodied, of strong but measured flight, inferior in spirit to the true Hawks and Falcons, and as a rule feed upon humble game, which they rather snatch stealthily than capture in open piracy. The extensive genus *Buteo* with its subdivisions, and its companion *Archibuteo*, typify Buzzards; they include, however, a great variety of forms. With them must be associated Eagles; for popular estimate of these famous great birds as something remarkably different from ordinary Hawks is not confirmed by examination of their structure, which is the same as that of other Buzzards. Although usually of large size and powerful physique, they are far below the smallest Falcons in raptorial character, prey like Buzzards, and often stoop to carrion. The genus *Aquila* may stand as the type of an Eagle; its several species are confined to the Old World, with one exception. *Haliaëtus*

represents a decided modification, in adaptation to maritime and piscivorous habits. *Thalassæetus pelagicus* is the magnificent sea Eagle of northeastern Asia, whose emneate tail has 14 rectrices, contrary to the rule in *Falconidæ*. A celebrated bird of this group is the Harpy Eagle, *Thrasyaëtus harpyia*, with immense bill and feet, and one of the most powerful birds of the whole family. There are several other genera in each hemisphere.

Analysis of Genera.

- Tarsi feathered in front to the toes.
 - Buzzards not over 2 feet long *Archibuteo*
 - Eagles about 3 feet long *Aquila*
- Tarsi naked and scutellate or reticulate below.
 - Crested. Eagles about 4 feet long *Thrasyaëtus*
 - Not crested. No basal webbing of toes. Eagles about 3 feet long *Haliaëtus*
- A basal web between outer and middle toes. Buzzards not over two feet long.
 - Under parts of adult finely barred crosswise; wings rounded *Asturina*
 - otherwise; wings more pointed *Urubitinga, Parabuteo, and Buteo*

PARABUTEO. (Gr. παρά, *para*, by, near, beside, alongside of, etc. and Lat. *Buteo*, the genus to which it is so nearly related that I have hitherto allowed it only subgeneric rank in the Key.) **CARRION BUZZARDS.** In general nearly like *Buteo* (which see), with some resemblance to *Polyborus*. Tail more than $\frac{2}{3}$ as long as wing. Five outer primaries emarginate on inner webs. Bill high at base; nostrils oval, with eccentric tubercle. Tarsi lengthened and much denuded, not feathered $\frac{1}{2}$ way down in front, thence with a row of large scutella, different from the small plates on the sides and behind. Loral region extensively denuded to the eye, and beset with short radiating bristles. One species, American, with a subspecies over our border. *Antenor* and *Parabuteo* RIDGW. in *BD. BREW. and RIDGW. N. A. B.* iii, 1874, pp. 248 and 250. *Erythrocnema* SHARPE, *Cat. B. Brit. Mus.* i, 1874, p. 84.

P. uncinatus harrisi. (Lat. *uncus*, once; *cinctus*, girdled. To Edw. Harris.) **HARRIS' BUZZARD.** Adult ♂ ♀: General plumage blackish, more or less intense, sometimes rather dark chocolate-brown, blackening on wings and tail, but in any case pretty uniform over whole body; sides of head with some white touches. Lesser and part of middle wing-coverts, lining of wings, and tibiae, brownish-red, or rich chestnut. Tail-coverts and base of tail broadly white, thus girdling the whole figure; end of tail also white, 1.00 or more. ♂ about 20.00; extent 41.00–46.00; wing 12.50–13.50; tail 8.50–9.50; tarsus 3.00–3.25; middle toe without claw 2.00. ♀ larger; about 23.00; extent 43.00–47.00; wing 13.50–14.50; tail 9.50–10.50. Young: Less decidedly blackish, upper parts varied with rusty-brown, lower quite tawny with dusky spots or streaks, chestnut of wings not unbroken, white of tail less distinctly defined. Tibiæ tawny-white, distinctly barred with chestnut. But in any plumage the species is unmistakable. Nestlings are covered with white and buff down. In some respects it resembles *Polyborus*, being a sluggish, carrion-feeding bird, usually found associated with the Caracara, Turkey Buzzard, and Black Vulture. It is a common inhabitant of the warmer parts of America and over our Mexican border; abundant in some parts of Texas, extending E. to Louisiana, rarely to Mississippi, W. across New Mexico and Arizona to Lower California, and S. to Panama. Nest in a tree or bush, very variable in size and finish in different cases; eggs 2–4, commonly 3, 2.00–2.10 × 1.65, white or whitish, unmarked, or with faint brownish-yellow spots or stains, laid from the middle of February to early June in our country.

BU'FEO. (Lat. *buteo*, a Buzzard-hawk.) **BUZZARDS.** Size medium and large; form heavy, robust. Bill of moderate size and ordinary shape. Wings rather long and pointed, exceeding tail to a variable extent; 3d to 5th quills longest, 1st to 4th emarginate on inner webs, 1st not longer than 8th. Tail of moderate length, probably averaging $\frac{2}{3}$ of the wing, a little rounded. Feet more or less robust; tarsi scutellate in front at least, feathered in front for a varying distance; tibiæ flagged. This is the central or typical genus of its subfamily, as *Falco* is of

Falconinae, embracing numerous species of nearly all parts of the world excepting Australia; about half of them American. The type is *B. vulgaris* of Europe, to which the North American *B. swainsoni* is closely related. Four of our species (*BB. borealis*, *swainsoni*, *lineatus*, *latissimus*) are common "Hen Hawks" or "Chicken Hawks" of the U. S., the first named running into several varieties; the others are little known (*BB. harlani*, *cooperi*), or of very partial distribution in North America (*BB. sennetti*, *abbreviatus*, *brachyurus*), or questionable as a straggler from Europe (alleged *B. buteo*). In all cases, sexes alike or similar; ♀ larger than ♂; young different from adults; and melanism frequent.

Analysis of Subgenera and Species.

- Tail white, with a broad black subterminal zone and numerous very narrow, zig-zag, or broken, blackish cross-lines. Texas. (Type of subgenus *Tachytriorchis*) *albocaudatus sennetti*
- Four outer primaries emarginate or sinuate on inner webs.
- Tail mostly rufous, ashy-clouded; marked *lengthwise* with darker; and with dark subterminal zone; under parts mostly white. Cala., one specimen known; dubious *cooperi*?
- Tail mottled with dusky and white, and with subterminal blackish zone; showing also reddish touches. Plumage almost entirely blackish, with fleecy-white bases of feathers. Kas. to Tex., not well known, and status questionable *harlani*
- Tail of adult *chestnut-red*, with black subterminal bar, and others or not; no reddish on wing-coverts; white prevailing on under parts, especially breast. Tail of young closely barred with grayish and blackish. Robust and largest; wing usually 14.00 or more; tarsus stout. N. Am., common *borealis*
- Tail of adult *black*, crossed by about 6 white bars; primaries spotted with white; lesser wing-coverts reddish, like under parts. Tail of young dusky, numerous barred with whitish; under parts whitish, streaked with dusky. Less robust; wing usually under 14.00; tarsus slender. N. Am., common *lineatus*
- Tail of adult *black*, with 3 broad white zones on inner webs only of the feathers, ashy on outer webs; plumage black, spotted or not with white. Tail of young dusky, inner webs mostly white, black-barred. Southwestern U. S. *abbreviatus*
- Three outer primaries emarginate or sinuate on inner webs.
- Tail numerous and narrowly cross-barred with lighter and darker. Plumage extremely variable, but not extensively reddish underneath, nor cheeks with a dark mustache. Large; wing usually over 13.00. Chiefly western U. S., common *swainsoni*
- Tail of adult blackish with about 3 light gray bands exposed; under parts extensively rufous; a dark mustache. Small; wing under 12.00. Eastern U. S., common *latissimus*
- Tail crossed with light and dark bars; general color of upper parts fuliginous, little varied, frontlet more or less whitish. Southern U. S. *brachyurus*

(Subgenus TACHYTRIORCHIS.)

B. albocaudatus sennetti. (Lat. *albus*, white; *caudatus*, tailed. To Geo. B. Sennett.) WHITE-TAILED BUZZARD. SENNETT'S BUZZARD. Three outer primaries cut on inner webs. Wings very acute; tail short. Adult ♂ ♀: Tail and its coverts white, with a broad black subterminal zone, and numerous very fine zig-zag or broken blackish cross-lines. Upper parts (excepting rump, which is white like tail), definitely including sides of head and neck, ash-color or plumbeous, lighter or darker in different cases, the feathers fleecy-white at bases so extensively as to show with the least disturbance of the plumage, and on scapulars tinged with reddish. Most of the lesser wing-coverts (but not quite to bend of wing), chestnut, somewhat as in Harris' Buzzard. Entire under parts pure white, lightly touched with fine dusky cross-bars on sides, lining of wings, and usually tibiae. On surface of wings plumbeous of upper parts deepens to blackish of primaries, whose inner webs are lighter and more brownish, crossed with numerous darker bars, and toward base are cut, barred, or speckled with white, which increases in regularity, firmness, and extent on secondaries. Shafts of wing-feathers brown or black, those of tail white along white portion of the feathers. Bill mostly dark, in part light; feet yellow; claws black. Length of ♂ 23.00; extent 48.00; wing 16.00; tail 7.00; chord of culmen, including cere, 1.40; tarsus about 3.25; feathered about 1.00 down in front. ♀ larger: length 24.00; extent 54.00; wing 17.50; tail 8.00, etc. (Described from Sennett's and Merrill's Texas specimens.) Young: much darker than the adults; general plumage blackish brown, on the under parts much varied with white and buff; but recogniz-

able by the hoary gray tail, darker toward the end, with numerous obsolete dark bars, and whitish or buff tip. Nestlings covered with sooty brown down, quite blackish on the head, lighter on posterior upper parts, buffy white below. A fine large Hawk of the warmer parts of America, N. to Texas, and also known to breed in southern Arizona (Auk, Oct. 1899, p. 352, and Oct. 1897, p. 403). It is very unlike any other of this country. It abounds in the lower parts of Texas, where it breeds from February to July indifferently, placing the large bulky nest of sticks and grasses on low trees and bushes; eggs 2 or 3, about 2.35×1.90 , dull white, immaculate, or only very lightly marked with pale brownish and neutral tint, and thus differing from ordinary Buzzard eggs; they are also large for the size of the bird. *B. albicaudatus* of 2d-4th eds. of the Key, p. 542; *B. albicaudatus* A. O. U. List, 1st ed. 1886; *B. albicaudatus semetti* ALLEN, Bull. Amer. Mus. Nat. Hist. v, 1893, p. 144; A. O. U. List, 2d ed. 1895, No. 341. The species is type of the subgenus *Tachytriorchis* KALP, 1844; but it is an oversight in the arrangement of the A. O. U. List to bring *B. swainsoni* and *B. latissimus* under this subgenus, as they belong to *Buteo* proper. Sharpe raises *Tachytriorchis* to full generic rank, and restricts it to *albicaudatus* and *abbreviatus*, in Cat. B. Brit. Mus. i, 1874, p. 161.

(Subgenus BUTEO.)

? **B. buteo.** COMMON EUROPEAN BUZZARD. PUTTOCK. Type of this subgenus, as of the whole genus. A large species, having 4 primaries emarginate on the inner web, as in our *B. borealis* but in plumage extremely variable, most resembling *B. swainsoni* as described beyond, and sometimes almost identical in coloration with one of the dark phases of the latter. Wing 15.50-16.50; tail 8.00-9.00. Europe, etc. Said to have occurred once in Michigan. We have the specimen, unquestionably of this species, but the alleged occurrence is open to doubt. See the case as set forth at length in Bull. Nutt. Orn. Club, i, 1876, pp. 4-6, and pp. 32-39. (Not heretofore allowed in the Key. A. O. U. No. [336].)

B. coo'peri? (To Dr. J. G. Cooper.) COOPER'S BUZZARD = *Archibuteo ferrugineus*? Head, neck, and whole lower parts white; feathers of head and neck with medial longitudinal streaks of black, the white prevailing on occiput and superciliary region, the black predominating over cheeks, forming a mustache; throat with fine lanceolate blackish streaks; sides of breast with broader, more euneate markings of the same; flanks with narrow, lanceolate stripes, these extending sparsely across abdomen; tibiae and lower tail-coverts immaculate, inner face of the former with faint specks. Upper plumage in general dark plumbeous-brown, inclining to black on back; plumbeous clearest on primaries, which are uniformly of this color, the inner ones inclining to fine cinereous. Scapulars and wing-coverts spattered with white beneath the surface. Rump black; upper tail-coverts white, tinged with rufous, and with irregular, distant, transverse bars of blackish. Tail with light rufous prevailing, but this broken up by longitudinal daubs and washes of cinereous, and darker mottlings running longitudinally on both webs; basally, the ground-color approaches white; tip white, with a distinct but very irregular subterminal bar of black, into which the longitudinal mottlings melt; outer webs of lateral feathers entirely cinereous, and without the black band. Under side of wing white, with a large black space on lining near edge; under surfaces of primaries white anterior to their emargination, finely mottled with ashy and with indistinct transverse bands terminally. 4th quill longest; 3d shorter than 5th; 2d equal to 6th; 1st equal to 10th. Wing 15.75; tail 9.10; tarsus 3.25; middle toe 1.70. Santa Clara Co., California, one specimen known, probably the last as well as the first, for I suppose this to be *Archibuteo ferrugineus* (with or without a *misalliance* of *Buteo borealis*), with abnormally dumbed tarsi. I have carefully examined the type specimen, but condense Mr. Ridgway's description in preference to constructing a new one. (No new light has been thrown on the case since the above was penned for the 2d ed. of the Key; meanwhile, the alleged species has been relegated to the

limbo of the A. O. U. Hypothetical List as No. 14, "probably the light phase of *B. harlani*." See RIDGW. Auk, 1884, p. 253; 1885, p. 165.)

B. har'lani. (To Dr. R. Harlan.) HARLAN'S BUZZARD. "BLACK WARRIOR." Form strong and heavy, like *borealis*, but still more robust; tibial plumes unusually developed, long and loose, their ends reaching to or beyond base of toes; lateral toes nearly equal. Four outer primaries with inner webs cut. Wing 14.25-15.75; tail 8.80-10.00; culmen 1.00; tarsus 2.75-3.25; middle toe 1.50-1.70. Nearly uniform black, varying from a sooty to a carbonaceous tint, with more or less concealed pure white. Adult: Tail confusedly mottled longitudinally with grayish, dusky, and white, often tinged or mixed with rufous, the different shades varying in relative amount in different individuals; a subterminal band of black. Young: Tail grayish-brown, crossed by about 9 very regular and sharply defined broad bands of black about equal in width to gray ones. (Ridgway.) Louisiana and Texas to Kansas; an obscure species, variously interpreted by writers. Different "black hawks" have been called "*harlani*," such as the melanistic phases of both *borealis* and *swainsoni*, and *harlani* has been supposed to be not different from *borealis*. A few specimens in the Smithsonian Institution, identified with Audubon's bird by Mr. Ridgway, agree sufficiently with the plate and description, and the alleged species may continue to stand upon its own demerits, as in former editions of the Key. The latest theory on the subject extends the range of the bird from Pennsylvania to Central America, and makes it out to be a subspecies of *B. borealis*, with "*cooperi*" for a "light phase" of itself. *B. harlani* AUD. folio pl. 86, 1830, and of most authors; A. O. U. List, 1st ed. 1886, No. 338. *B. borealis harlani* RIDGW. Auk, Apr. 1890, p. 205; A. O. U. List, 2d ed. 1895, No. 337 d.

B. borea'lis. (Lat. *borealis*, northern. Figs. 466, 467, 468.) RED-TAILED BUZZARD. "HEN HAWK." Adult ♂ ♀: Upper surface of tail rich chestnut, with white tip and usually a



FIG. 466. — Red-tailed Buzzard.

black subterminal zone, with or without other narrower and more or less imperfect black bars; sometimes barred throughout. From below, the tail appears pearly whitish with a reddish tinge, either quite uniform, or barred throughout with whitish and blackish. In general, ♀ with most barred or completely barred tail, ♂ with uniform tail, only subterminally once-zoned. Upper parts blackish-brown, with indeterminate amount of light variegation, gray, fulvous,

and whitish; feathers of hind head and nape with cottony white bases, showing when disturbed; those of hind neck usually with fulvous edging; of scapular region showing most variegation with tawny or whitish, or both, the scapulars and adjoining feathers being largely barred, and only blackish on their exposed portions; upper tail-coverts showing much tawny and white. Ground color of under parts white, more or less buff-toned; dark color of upper parts reaching nearly or quite around throat, flanks and lower belly heavily marked with dark brown or blackish, but a large pectoral area, with tibiae and crissum, mostly free from mark-

ings — but no description will cover the latitude of coloration. Primaries blackening on exposed portions, for the rest lighter grayish-brown, dark-banded across both webs, and extensively white-areated on inner webs basally. ♂ 19.00–22.00; extent about 48.00; wing 13.50–16.50; tail 8.50–10.00; tarsus 2.50–3.00, feathered half-way down in front. ♀ larger, 21.00–24.00; extent about 56.00; wing 14.50–17.50; tail 9.50–10.00. ♂ ♀, young: General character of upper parts same as in adult, but less variegated, and that chiefly with whitish and buff, instead of grayish and fulvous; upper tail-coverts more regularly barred with dark and white. Tail entirely different, without any shade of red; light gray, with numerous (6–10) regular dark bars, and narrow white tips; the gray gradually yields to the chestnut shade with reduction, interruption, or extinction of all these bars except last one. Under parts somewhat as in adult, but, like the upper, without fulvous or rufous shades; usually white, unmarked in a large pectoral area, with circle of throat stripes, and pronounced abdominal zone of dark or blackish markings; tibiæ spotted or not; crissum immaculate. There should be no difficulty in recognizing this Hawk among those of the eastern U. S. and British Provinces in any



FIG. 467. — Red-tailed Buzzard, nat. size. (Ad. nat. del. E. C.)

plumage; the red tail of the adult is of course distinctive; a weakly young ♂ might raise a doubt with reference to *lineatus* (which also has 4 primaries cut); in that case, notice stout tarsi, feathered about $\frac{1}{2}$ down; decided white pectoral area, free from spots, circumscribed by dark markings, especially those of the abdominal zone; and absence of any reddishness on upper parts or wing-coverts. Such is the ordinary "Hen Hawk" so abundant in eastern North America, where it is subject to comparatively little variation. In the West, however, where it is equally numerous, it sports almost interminably in color, not always conformably with geographical distribution. Several of these phases have received special names, as given beyond. The tendency is to melanism and erythrism, the extreme case of which is *calurus* of Cassin. A pure *borealis*, exactly matching the normal eastern type, is seldom seen in the West. But in all its color-variation, the bird preserves its specific characters of size and robust proportions, being thus readily distinguishable from the smaller and weaker species, *swainsoni*, in any of the endless and somewhat parallel variations of the latter (which, moreover, has only 3 primaries cut). The Red-tail as a species is resident and breeds throughout its range, but there is much migration of individuals to and from its extremes. The nest is usually built high in a

tree, a bulky mass of sticks and smaller twigs, mixed toward the centre with grass, bark, leaves, moss, or other soft material, and often some feathers. Eggs 2, 3, or 4, about 2.40×1.90 , with a difference in length of fully 0.40, dull whitish, sometimes with only a few pale



FIG. 468. — Red-tailed Hawk.

markings, rarely none, oftenest blotched (sometimes richly) with shades of brown; they are laid March-June, but mostly April and May. The young are slow to acquire their perfect

plumage, being long full-grown before the red appears upon the tail, and this usually precedes the fulvous of the under parts. The quarry of the great Red-tail is humble, chiefly such small mammals as mice, moles, shrews, gophers, squirrels, or rabbits, much less often birds of any kind, or poultry; also many reptiles and batrachians, crustaceans, and a great variety of insects. The bird is thus highly beneficial to the agriculturist, like other species of its genus.

B. b. kri'deri. (To John Krider.) KRIDER'S RED-TAIL. A light-colored form, pure white below, or nearly so, with few markings or none on belly, and subterminal tail-bar reduced or obliterated; tail light rufous above; much white in plumage of upper parts. High central plains, U. S. and probably adjoining British provinces, E. to Minnesota, Iowa, and even Illinois, W. to Wyoming and the Black Hills of S. Dakota, where I have found it well developed. It is the opposite extreme from *calurus*.

B. b. calu'rus. (Gr. *καλός*, *kalos*, beautiful; *οὐρά*, *oura*, tail.) WESTERN RED-TAIL. BLACK RED-TAIL. The extreme case is chocolate-brown or even darker, quite unicolor, with rich red tail crossed by several black bars; from which erythro-melanism grading insensibly into ordinary *borealis*. The usual case is increase over *borealis* of dark rufous and dusky shades in bars and spots underneath, particularly on flanks, flags, and crissum, and presence of other than the subterminal black bar on tail. One case is chocolate-brown, with a great reddish blotch on breast corresponding in extent to the white area of *borealis* proper. Western N. Am. at large, particularly U. S. from Rocky Mts. to the Pacific. This bird is *Falco buteo* AUD. Orn. Biogr. iv, p. 508, as described in the text, but *not* his pl. 372, which is *B. swainsoni*. It is *B. montanus* CASS. 1856, and in Bd. B. N. A. 1858, p. 26, but not of NUTTALL, 1840. It is *B. swainsonii* CASS. Ill. 1853, p. 98, not of BONAPARTE. The first tenable name is *B. calurus* CASS. 1855 and 1858.

B. b. "lucasa'nus." (Of Cape St. Lucas.) ST. LUCAS RED-TAIL. A light-colored form, like *krideri*, white below, tinged with rufous on the tibiae, and no black subterminal bar on the tail. Lower California. No second specimen, matching the type, has been found in this region, where *calurus* abounds; the alleged characters are an individual peculiarity, and the bird should be dropped from our Lists.

B. linea'tus. (Lat. *lineatus*, striped.) RED-SHOULDERED BUZZARD. WINTER HAWK. "CHICKEN HAWK." "HEN HAWK." Adult ♂ ♀: Feet and cere chrome yellow; anterior tarsal scales tinged with greenish. General plumage of a rich *fulvous* cast. Above, reddish-brown, the feathers with dark brown centres, giving the prevailing tone, and black shafts; head, neck, and entire under parts orange-brown, mostly with dark shaft-lines and white bars, especially on the lower parts anteriorly; lesser wing-coverts rich orange-brown or chestnut, forming a conspicuous area on bend of wing. Quills and tail-feathers black, beautifully marked with white; primaries and secondaries with white spots or bars on both webs terminating on each edge of the feather, the light bars which cross the feather, and the darker intervening spaces, being more or less touched with reddish. The same style of marking on wing-coverts; tail crossed with several narrow white bars, and tip white. Young: Very different: little or no fulvous or orange-brown; above, plain dark brown; wing-patch indicated or not; head, neck, and under parts white or buffy-white, fully streaked or arrow-headed with dark brown. Tail brown, crossed with many lighter and darker bars, former mostly tawny on outer webs, whitish on inner webs; wing-quills extensively variegated in similar pattern. Length of ♂ 18.00-20.00; extent about 40.00; wing 11.50-13.50; tail 7.50-9.00; tarsus 2.75-3.25; ♀ 20.00-22.00; extent about 45.00; wing 12.00-14.00; tail 8.50-10.00. There is much variation in size: Florida and Gulf specimens are very small. Nearly as long as *borealis*, but not nearly so heavy; tarsi more extensively demided. The adult of this handsome Hawk is unmistakable; but the student may require to look closely after the young, in comparison with young Red-tails: observe smaller size and slighter "build," slenderer and less feathered feet, more extensive and regular streaking on the under parts, where there is no pectoral area free from

markings, and more pronounced spotting of wings on outer webs of primaries. Eastern N. Am., one of the commonest Hawks of the U. S., especially in winter, when it has retired from the extreme of its range in the adjoining British Provinces and along our northern border; S. into Mexico; breeds throughout range, from March to May, according to latitude; food, general habits, and nidification similar to those of *B. borealis*; eggs 2-6, oftenest 3, next oftenest 4, next 2, rarely 5, most rarely 6, averaging in size 2.25×1.70 , ranging from 2.05 to 2.35 in length, and in breadth from 1.65 to 1.85; they have the usual wide variation in markings, and are indistinguishable on the whole from those of *borealis*, though averaging smaller and more heavily marked.

B. l. al'teni. (To Dr. J. A. Allen.) FLORIDA RED-SHOULDERED BUZZARD. As stated above, and in the Key, 2d ed. 1884, p. 546, there is much variation in size, Florida and Gulf specimens, and generally those from the S. Atlantic States, being very small. Such examples, having the ♂ wing 12.50 or less, tail 8.00 or less, etc., have received the above name. Breeds early; eggs laid in February and March, averaging 2.00×1.67 . RIDGW. Pr. U. S. Nat. Mus. vii, Jan. 1885, p. 514, and Man. 1887, p. 235; COUES, Key, 3d and 4th eds. 1887-90, p. 882; A. O. U. Lists, 1886 and 1895, No. 339 a.

B. l. e'legans. (Lat. *elegans*, choice.) WESTERN RED-SHOULDERED BUZZARD. RED-BELLIED or RED-BREADED HAWK. The erythrism of *lineatus*. In extreme case, whole under plumage rich dark reddish, almost obliterating the usual markings; wings and tail, however, still elegantly barred with white. Rocky Mts. to Pacific, British Columbia to N. Mexico; best developed in coast region; no appreciable difference from *lineatus* proper in habits, nest, or eggs.

B. abbrevia'tus. (Lat. *abbreviatus*, shortened.) BAND-TAILED BUZZARD. ZONE-TAILED HAWK. Adult ♂ ♀: Coal-black, glossy and uniform over whole body. Tail black; viewed above, it seems to be crossed with 3 zones of ashy-gray or slate-color, increasing in width and firmness from proximal to distal one, and is narrowly tipped with white; from below, there appear 3 pure white zones, since the ashy is on outer webs only of the feathers (both webs of middle pair, however), and the white is on inner webs. Plumage of head snowy-white at the roots, and in some specimens, probably less mature, it is so extensive on head, neck, and breast as to appear in spots on the least disturbance of the feathers. The wing-feathers appear quite black in the folded wing, but their inner webs basally acquire the usual light and dark spacing, with more or less whitish nebulation, or white areation. The feet appear to be yellow, bill mostly dark. Young recognizably similar; but tail more numerous and less regularly banded, and the inner webs of the feathers mostly white. Length of ♂ 18.50-19.50; extent 47.50; wing 15.00-16.00; tail 8.50-9.00; tarsus 2.50; middle toe without claw 1.60. ♀ larger: Length about 21.00; extent 53.00; wing 16.50-17.50; tail 9.50-10.00; tarsus 2.75. A peculiar Hawk, very unlike any other of the U. S., slightly built with long wings and tail; it is one of the "light weights," yet has 4 primaries cut on the inner webs. South and Central America through Mexico to the U. S. border from Texas through New Mexico and Arizona to southern and Lower California, being usually observed as a summer visitor; first found within our limits by Dr. J. G. Cooper, in southern California, Feb. 23, 1862, next by myself on the Hassayampa River in Arizona, Sept. 24, 1864. Habits and food not peculiar; nest bulky and coarse, in a tree, often a cottonwood; eggs 1-3, about 2.17×1.72 , faintly bluish-white, normally unmarked, occasionally spotted. (*B. zonocereus* SCL. P. Z. S. 1858, p. 130; Tr. Z. S. 1858, p. 263, pl. 59; ELLIOT, B. N. A. 1869, pl. 33; COOP. B. Cal. 1870, p. 479; COUES, Key, orig. ed. 1872, p. 217; RIDGW. Hist. N. A. B. iii, 1874, p. 272. *B. albonotatus* GRAY, 1844. *B. abbreviatus* CAB. 1848; COUES, Key, 2d-4th eds. 1884-90, p. 546; RIDGW. Man. 1887, p. 234; A. O. U. Lists, 1886 and 1895, No. 340.)

B. swain'soni. (To Wm. Swainson.) COMMON AMERICAN BUZZARD. SWAINSON'S BUZZARD. A light-weight Hawk, with only 3 primaries cut — not 4, as in the foregoing species of *Buteo*. Adult ♂ ♀: Upper parts dark brown, very variable in shade according to season or wear

of feathers, varied with paler brown, or even reddish-brown edgings of feathers, but without the clear fawn-color of the young; feathers of crown showing whitish when disturbed, and usually sharp, dark shaft-lines; upper tail-coverts chestnut and white, with blackish bars. Quills and tail-feathers as below described, but inner webs of former showing more decided dark cross-bars upon a lighter marbled-whitish ground, and latter having broader and sharper, dark wavy bars. These large quills, and particularly those of tail, vary much in shade according to wear, new feathers being strongly slate-colored, old ones plain dark brown. The tail, however, never shows any trace of the rich chestnut that obtains in adult *borealis*; and neither wing nor tail ever has anything like the orange brown and pure white of *B. lineatus*. Iris brown, never yellow; feet, cere, gape, and base of under mandible rich chrome-yellow; rest of bill and claws bluish-black. Adult ♂: Under parts showing a broad pectoral area of bright chestnut, usually with a glaucous cast, and sharp, black shaft-lines: this area contrasting sharply with pure white throat. Other under parts white, more or less tinged and varied, in different specimens, with light chestnut. In some ♂♂, this chestnut is diminished to traces, chiefly in flank-bars and arrow-heads, and the white throat is immaculate; in others, the throat shows blackish pencilling, and the rest of the under parts are so much marked with chestnut, chiefly in cross-bars, that this color predominates over white, and appears in direct continuation of the pectoral area itself. Some feathers of this area are commonly dark brown. Length 19.00–20.00; extent about 49.00; wing 15.00 or a little more; tail 8.50; tarsus 2.50; middle toe without claw 1.50. Adult ♀: Much darker underneath than ♂; throat pure white, but other under parts probably never whitening decidedly. Pectoral area from rich dark chestnut or mahogany-color, mixed with still darker feathers, to brownish-black; other under parts heavily marked with chestnut, chiefly in cross-bars alternating with whitish, but on flanks, and sometimes across belly, these markings quite blackish. The general tone of the under parts may be quite as dark as the pectoral area of ♂, but lacks uniformity, and increased depth of color of pectoral area in this sex suffices to preserve the strong contrast already mentioned. Length 20.00–22.00; extent 50.00–54.00; wing 15.00–16.50; tail 9.00. Changes of plumage with age affect chiefly under parts; back, wings, and tail are more nearly alike at all times. In darkest phase plumage of a sooty-brown. Young ♂♀: Entire upper parts dark brown, everywhere varied with tawny edgings of individual feathers. The younger the bird, the more marked is the variegation; it corresponds in tints closely with color of under parts, being palest in very young examples. Under parts, including lining of wings, nearly uniform fawn-color (pale dull yellowish-brown), thickly and sharply marked with blackish-brown. These large dark spots, for the most part circular or guttiform, crowd across forebreast, scatter on middle belly, enlarge to cross-bars on flanks, become broad arrow-heads on lower belly and tibiae, and are wanting on throat, which is only marked with a sharp, narrow, blackish pencilling along the median line. Quills brownish-black, outer webs with an ashy shade, inner webs toward base grayish, paler, and marbled with white, and also showing obscure dark cross-bars; their shafts black on top, nearly white underneath. Tail-feathers like quills, but more decidedly shaded with ashy or slate-gray, and tipped with whitish; their numerous dark cross-bars show more plainly than those of the quills, but are not so evident as they are in old birds. Nestlings are covered with white fluffy down. Western N. Am., Mississippi Valley to the Pacific, abundant; in many regions the commonest and most characteristic of the large Hawks; occasionally E. through the northern States to New England; N. to Hudson's Bay and the Fur countries, including Alaska; S. to Central and South America. Habits nowise different from those of other large Hawks of this genus: food mainly small mammals, reptiles, and insects, especially the grasshoppers and large crickets which abound in the West. It is a resident bird in most localities, but migratory from extremes of its range: the breeding season is mostly May and June, extended to July in northerly regions, but includes April and part of March in southerly localities. Nests indifferently on the ground, cliffs, bushes, trees;

nest indistinguishable from that of other large Hawks; eggs usually 2 — I have never found more, sometimes only one, but there are many clutches of 3, and a few of 4 eggs; they are about 2.25×1.75 , resembling hen's eggs, being nearly colorless and unmarked, like those of the Marsh Hawk; sometimes stained or obsoletely spotted with rusty-brownish, or other dull shades, but seldom marked all over or boldly blotched anywhere. This Buzzard represents the European *B. vulgaris* (fig. 469) in N. Am., being, in fact, little different in plumage, though with only 3 instead of 4 primaries cut. (It is *Falco buteo* AUD. folio pl. 372, not of his text, which describes the Western Red-tail; *B. vulgaris* Sw. F. B. A. pl. 27; AUD. 8vo pl. 6, not of the text; *B. montanus* NUTT. 1840, not of authors; *B. bairdi* HOY (young); *B. oxypterus* CASS. (young); *B. insignatus* CASS. Ill. pl. 31 (melanistic); *B. gutturalis* MAXIM.; *B. obsoletus* SHARPE, 1874 (not *Falco obsoletus* GM.).

B. latis'simus. (Lat. very broad or wide, superlative degree of *latus*, wide; referring to the expanse of the wings.) BROAD-WINGED BUZZARD. Adult ♂ ♀: Above, dark brown, the



FIG. 469. — *Buteo vulgaris* of Europe, $\frac{1}{2}$ nat. size; not distinguishable in the cut from one of the plumages of *B. swainsoni*. (From Brehm.)

feathers with blackish shaft-lines, and pale grayish-brown or even lighter edgings, those of hind head and nape cottony-white basally; usually also some feathers with fulvous edgings, especially on hind neck; upper tail-coverts blackish on outer webs and at ends, most of the inner webs white in large area, more or less perfectly barred with dusky; concealed parts of scapulars thus barred on both webs. Exposed portion of tail with three blackish zones, terminal one broadest, alternating narrower pale gray or grayish-white zones, one of these terminal; from below these zones appear whitish, but from above grayish. Under parts mixed white and fulvous-brown, or dull chestnut, the latter nearly as pronounced as in *lineatus*, the pattern being rather that of *Accipiter fuscus* or *A. cooperi*; fulvous in excess anteriorly, white prevailing posteriorly and nearly or quite immaculate on crissum; middle regions with white in oval paired spots or incomplete bars on each feather, flanks and tibiae pretty regularly barred with the two colors; most of the feathers black-shafted, producing a fine pencilling, this black increasing to decided streaking on white throat, and forming noticeable maxillary patches. Lining of wings mostly white, but with some reddish and blackish spotting. Bill mostly dark; feet yellow; claws black. Length of ♂ about 14.00; extent 33.00; wing 10.00–11.00; tail 6.50–7.00; tarsus 2.30; middle toe without claw 1.20. ♀ larger; length up to 18.00; wing 11.00–11.50; tail 7.00–8.00. Young: Differs as usual in the genus, in lacking special coloration and pattern of under parts,

tail-pattern different, wing-pattern much the same. Upper parts blackish-brown, highly variegated with fulvous, tawny, or whitish edgings of all the feathers, on head and neck the light and dark colors in streaks about balancing each other. Under parts white, more or less buff-toned, with more or fewer linear or clubbed fuscous markings on breast and sides, changing to arrow-heads on flanks and sides, the amount of this marking wholly indeterminate. Tail crossed with numerous light and dark bars (six or eight of each exposed), on both webs of middle feathers and outer webs of the others; those on inner webs largely white, with con-

sequently better pronounced dark bars; all the feathers tipped with white; dark moustaches such as in the adults. Eastern N. Am., N. to New Brunswick on the coast, to the region of the Saskatchewan in the interior, W. to the Great Plains of the U. S., S. in winter through Middle America and in some of the West Indies in winter; common on the whole, especially in woodland, but irregularly distributed; migratory from the extremes of its range. A small but stout *Buteo*, with ample wings and tail, with only 3 primaries cut, very different from any of the foregoing, easily recognized by size and proportions, aside from color. A large ♀ resembles a small ♂ *lineatus* in some respects, but the difference is too great to require detailed comparison. The breeding range is coincident with the distribution of the bird in N. Am.; the season for eggs is May in most latitudes, but begins early in April at the South, and extends into June at the North. Nest in a tree, nowise peculiar in situation or construction; eggs 2-5, oftenest 2 or 3, averaging 1.95×1.55 , grayish or faintly greenish white, heavily marked with browns as a rule, sometimes obsoletely spotted with neutral tints, rarely almost immaculate. (*B. pennsylvanicus* of former eds. of the Key, as of most authors; but Wilson had given this specific name to *Accipiter fuscus* when he applied it also to this *Buteo*, and we therefore now take *latissimus*, given by his editor, Ord, in later copies of his work.)

(Subgenus BUTEOLA.)

B. brachyurus. (Gr. βραχὺς, *brachus*, short; οὐρά, *oura*, tail.) SHORT-TAILED BUZZARD, in melanistic plumage called the FULIGINOUS BUZZARD and LITTLE BLACK HAWK. Of small size, not over 16 00; wing under 13.50. Point of primaries extending beyond secondaries less than $\frac{1}{2}$ the length of wing; 3d, 4th, and 5th quills longest; 1st shorter than 8th; 1st, 2d, and 3d primaries emarginate on inner web; 4th with inner web sinuate. Tarsi bare in front for a less distance than length of middle toe without claw. Occurs in two phases, light and dark. *Light phase*: Ad. ♂ ♀: Above, blackish-brown; concealed bases of occipital feathers pure white; forehead and most of sides of head, white; below, entirely white, except some dark markings on each side of the breast, in the form of a rufous or grayish-brown patch, with or without dusky shaft-lines. Tail with black bands mostly broader than the grayish or brownish interspaces, which are 5 to 7 in number, and narrowly tipped with white. Bill black with bluish base; cere and feet yellow; iris brown ♂, wing 10.50-12.00; tail 6.00-7.00; bill 0.70; tarsus 2.25; middle toe without claw 1.35. ♀, wing 11.50-13.00; tail 7.00 or more. Young ♂ ♀: Above, grayish-brown, most of the feathers margined with tawny; sides of head and neck streaked with the same; whole of under parts tinged with tawny, immaculate, or streaked with brown, but no definite patches on sides of breast. Tail with bars more numerous and less firm than in the adult. *Dark phase*: Adult ♀: Resembling *abbreviatus* in being blackish or fuliginous all over, but entirely another bird, belonging to a different section of the genus. Color fuliginous, or dark umber-brown, nearly uniform, but barred on under wing- and tail-coverts with white; feathers of hind head and nape fleecy-white at base; the color blackening on exposed surfaces of primaries, inner webs of which are extensively whitened, with the usual dark bars; little white, however, on secondaries, excepting inner ones, most of them being simply spaced gray or light brown between their dark bars. Tail-pattern as usual in *young* Hawks of this genus, there being numerous (6 or 8 exposed) blackish and lighter grayish bars alternating, subterminal one of each broadest, whole tail tipped with grayish-white; inner webs of all the feathers excepting central pair whitening in the spaces between the dark bars. Length 16.00; wing 13.00; tail 7.00; tarsus 2.00. (Described from No. 12,117, Mus. Smiths. Inst., from Mazatlan, Mexico, agreeing with *B. fuliginosus* ScL. P. Z. S. 1858, p. 356; Tr. Z. S. 1858, p. 267, pl. lxii; a bird once supposed to be the *young* of the same is *B. acyrdus* Cass. Pr. Phila. Acad. 1855, p. 283; both are treated as one variety of *B. swainsoni* by Ridgw. Hist. N. A. B. iii, 1874, p. 266. See Ibis, Oct. 1876, p. 477; Bull. Nutt. Orn. Club, Oct. 1881, p. 207; Pr. U. S. Nat. Mus. viii, 1885, p. 75; Auk, Jan.

1890, p. 90. Mexican border, Florida, and southward through Central and most of South America; not known to occur in the West Indies. Breeds regularly in Florida, nesting in trees in March and April; eggs 1-3, 2.15×1.65 , greenish white, moderately spotted with rich brown.

ARCHIBUTEO. (Lat. *archi-*, from Gr. ἀρχός, *archos*, a leader, chief; *buteo*, a buzzard.) HARE-FOOTED BUZZARDS. Characters of *Buteo* proper, but tarsi feathered in front to toes, naked and reticulate along a strip behind. Wings very long; 3d and 4th quills longest; 1st shorter than 7th; 4 or 5 emarginate on inner webs. A small group, well marked by character of feet. The species are among the largest of the Buzzard-hawks, but are rather dull heavy birds, preying upon humble quarry, especially small quadrupeds, reptiles, and insects.

Analysis of Species.

Below, white, variously dark-marked, and often with a broad black abdominal zone, but generally no ferruginous; in melanotic state, whole plumage nearly uniform blackish. (ARCHIBUTEO proper.) . . . *lagopus sancti-johannis*
 Below, pure white, scarcely or not marked, excepting that the legs are rich rufous with black bars, in marked contrast; above, varied with dark brown, chestnut, and white; quills brown, with much white; tail silvery-ash and white, clouded with brown or rufous. (Subgenus BREWSTERIA.) *ferrugineus*

(Subgenus ARCHIBUTEO: *Rough-legs*.)

A. ligo'pus sancti-johan'nis. (Gr. λαγώπους, *lagopus*, hare-footed; Lat. *sancti-johannis*, of St. John, Newfoundland. Figs. 470, 471, 472.) AMERICAN ROUGH-LEGGED BUZZARD. "BLACK HAWK." Adult ♂ ♀: Too variable in plumage to be concisely described. In general, whole plumage with dark brown or blackish and light brown, gray, or whitish, the lighter colors edging or barring the individual feathers; tendency to excess of whitish on head, and to formation of a dark abdominal zone or area which may or may not include tibiae; usually a blackish anteorbital and maxillary area. Lining of wings extensively blackish. Tail usually white from base for some distance, then with dark and light barring. Inner webs of flight-feathers extensively white from base, usually with little if any of the dark barring so prevalent among buteonine Hawks. From such a light and variegated plumage as this, the bird varies to more or less nearly uniform blackish, in which case the tail is usually barred several times with white. Our lighter-colored birds are not fairly separable from normal European *lagopus*; but our birds average darker, and their frequent melanism does not appear to often befall the European stock. But in any plumage the Rough-leg is known at a glance from any *Buteo* by feathered shanks; while the peculiar coloration of *ferrugineus* is highly distinctive of the latter. Length of ♀, 22.00; extent 54.00; wing 17.50; tail 9.00; iris light brown; bill mostly blackish-blue; cere pale greenish-yellow; feet dull yellow; claws blue-black. ♂ averages smaller; length 20.00-22.00; wing 16.00-17.00. The name adopted, it must be observed, is not intended to discriminate the black from the ordinary plumage, but to separate the American bird subspecifically from the European. (The latter has been supposed to occur in its typical form in Alaska, and is carried in both editions of the A. O. U. List, 1886 and 1895, as No. [347.]; but I cannot admit it to the Key upon any such evidence as that which has been adduced.) N. Am., at large, common, especially in fertile, well-watered regions, as those of the Atlantic seaboard; a large, heavy, and somewhat sluggish Hawk, haunting meadows and marshes, to some ex-



FIG. 470. — American Rough-legged Buzzard. (L. A. Fuertes.)



FIG. 471. — Black Hawk. (From *The Osprey*.)

tent crepuscular in habits, of low, easy, and almost noiseless flight; preying upon insignificant quarry, particularly small rodent and insectivorous mammals, reptiles, batrachians, and insects. With us it is only a migrant in spring and fall, and a winter resident, breeding almost entirely north of the U. S. (excepting Alaska); but doubtless nests near our northern border as it does rarely on it, as in North Dakota. Nest usually in trees, but frequently on a ledge of



FIG. 472. — Rough-legged Buzzard, $\frac{1}{2}$ nat. size. (From Brehm.)

rocks or the edge of a cut-bank; a bulky mass of interlaced sticks, with softer matted material of miscellaneous kinds; eggs 2-5, ordinarily 3 or 4, laid late in May and in June, 2.05-2.45 \times 1.65-1.85, averaging 2.25 \times 1.80; varying in color from dingy whitish with scarcely any marking, or but faint clouding, to creamy-white boldly variegated with blotches and washes of dark brown on the surface, with neutral-tint markings in the substance of the shell.

(Subgenus BREWSTERIA.)

A. ferrugineus. (Lat. *ferrugo*, iron-rust.) FERRUGINOUS ROUGH-LEGGED BUZZARD. "CALIFORNIA SQUIRREL HAWK." "EAGLE HAWK." Adult ♂ ♀: Below, pure white from bill to end of tail; legs rich rufous or bright chestnut barred with black, in marked contrast; usually a few chestnut bars or arrow-heads on belly and flanks, and breast with sharp shaft lines of black. The older the bird the purer white below, with more perfect contrast of chest-

nut legs; ♀ retaining marks of immaturity longer than ♂; these consisting in extension of black-barred chestnut markings on to belly, flanks, and even more of the under parts, and spreading of fine shaft-lines on breast into ordinary streaks. Tail silvery-white below, above white at base and extreme tip, in most of its extent clouded with silvery-ash and more or less tinged with ferruginous. Back, rump, and wing-coverts mixed blackish and bright chestnut in varying but about equal amounts, the former color making central markings on the exposed portion of each feather, the chestnut yielding to white at bases of the feathers. Top, back, and sides of head streaked with blackish and white in about equal amounts, the feathers being cottony-white, with dark streaks or spaces on their exposed portions. Primaries blackish, with a glaucous bloom on outer webs, their shafts almost entirely white; several outer ones with extensive pure white areation on inner webs; inner primaries and secondaries continuing this pattern, but with more or less evident ashy spacing between blackish bars, as usual in buteonine Hawks. Length of ♂, 22.50; extent 54.50; wing 16.75; tail 9.25; tarsus 2.75; length of ♀, 23.50; extent 56.50; wing 17.25; tail 9.75. Iris pale brownish to light yellow; cere and feet bright yellow; bill dark bluish horn-color, very stout; mouth purplish flesh-color, and very capacious, measuring from corner to corner of the gape about 1.80; this is the chief character of the subgenus *Brewsteria* (in the common Rough-leg the same measurement is only about 1.40). Third and 4th quills subequal and longest; 2d between 5th and 6th; 1st about equal to 8th; 1st-4th abruptly emarginate on inner webs; 2d-5th sinuate on outer webs. The foregoing is from a fine pair I procured in Arizona in 1864. Young: less rufous above, and almost entirely white below, the flags scarcely variegated or contrasted; upper parts brownish-gray, with rusty or tawny edgings of the feathers; tail the same in ground color, but whitening toward the base and on the inner webs, and with several infirm dark bands. There is a melanistic or rather erythrismal phase, in which the bird becomes, except on the tail, chocolate-brown, more or less variegated with rusty-brown. In perfect plumage this is one of the largest, handsomest, and most distinctively marked Hawks of North America, somewhat recalling *Buteo albicaudatus*: common in the West, from the region of the Red River of the North and of the Saskatchewan to Texas and into Mexico, and from the Plains to the Pacific; sometimes even E. of the Mississippi, as in Illinois; resident as a species in most of its range, and breeding, but migratory to some extent. Nesting and habits nowise peculiar, as compared with those of other large Hawks; nest in trees, or on ledges and cut-banks, composed of sticks, with matted lining of various softer materials, and sometimes acquiring immense size, like those of the Osprey; eggs 2-5, oftener 3 or 4, averaging 2.55×1.95 , thus larger than those of the other species, but indistinguishable and equally variable in markings; they are mostly laid from the middle of April to that of May.

ASTURINA. (Modified from Lat. *astur*, a hawk.) **STAR BUZZARDS.** General characters of *Buteo*, in proportions, but system of coloration as in *Astur*: sexes alike; adults ashy, with black, white-barred tail: under parts closely barred crosswise with ashy and white; young different, under parts marked lengthwise with blackish on a whitish ground. Wings short for this subfamily; 3d, 4th, and 5th quills longest, 1st very short; outer 4 emarginate on inner webs; 2d-5th cut on outer webs. Tail even, long, about $\frac{3}{4}$ the wing. Legs longer than usual in *Buteoninae*, more nearly as in *Accipitrinae*; feet stout; tarsus scutellate before and half-way up behind, shortly feathered above in front, elsewhere strongly reticulate. A small group of handsome under-sized Hawks, peculiar to America.

A. plagiata. (Lat. *plagata*, striped.) **GRAY STAR BUZZARD.** **MEXICAN GOSHAWK.** Adult ♂ ♀: Upper parts nearly uniform emereous, or light plumbeous, the feathers dark-shafted, and with nearly obsolete undulations of lighter ash; upper tail-coverts in part white. Tail black, with several white zones, sometimes broken, and white or whitish tip. Under parts, including tibiae, white, beautifully and closely cross-barred with dark ash, except upon throat and crissum; some of the feathers also dark-shafted. Lining of wings white, less closely barred

with ashy. Primaries darkening from color of back, their inner webs spaced lighter and darker, and with extensive white areation, which characters increase on secondaries. Iris brown; cere and feet bright yellow; bill and claws blue-black. Wing of ♂ 10.00; tail 7.00; tarsus 2.75; middle toe without claw 1.50. Length, 16.00–18.00. Wing of ♀ 11.00; tail 8.00. Young: Blackish-brown above, much variegated with reddish-buff; white upper tail-coverts spotted with blackish; below, whitish, dashed with large blackish marks; flags barred; tail dark brown, with numerous narrow blackish bars. Central America and Mexico, regularly into southwestern U. S., said to straggle up the Mississippi Valley to Illinois, but only ascertained to breed over our border in Arizona and New Mexico, though it doubtless does so in some parts of Texas; it is only known as a summer visitor, arriving in March or April, breeding in May and June, leaving late in the fall. Nest usually in high trees, not peculiar; eggs 2–3, 2.00 × 1.60, colorless or with a few faint spots.

URUBITIN'GA. (South American *urubu*, a vulture; *tinga*, bright.) **ANTHRACITE BUZZARDS.** General characters of *Buteo*, but system of coloration peculiar, the adults being chiefly black and white, the tail typically broadly zoned. The limits of the genus vary with different writers; it contains several species, confined to America, one of them reaching our border. In this the tail is about $\frac{2}{3}$ as long as wing, emarginate or nearly even; wing with 3d–5th quills longest, 2d about equal to 6th, 1st very short; outer 4 sinuate on inner webs; point of folded wing reaching but little beyond the longest secondaries; bill lengthened and rather weak; tomia of upper mandible strongly festooned or almost lobated back of the hook; gonys convex; nostrils large, subcircular; lores extensively denuded; tarsus much longer than middle toe and claw, feathered but a little way down in front, lentellate before and behind, reticulated laterally like bases of toes, which in the rest of their length are broadly scutellate.

U. anthraci'na. (Lat. *anthracinus*, carbuncular; in this case coal-black.) **ANTHRACITE BUZZARD. MEXICAN BLACK HAWK.** Adult ♂ ♀: Coal-black; feathers of head and neck with concealed white bases; tail white at extreme base and tip, and crossed about the middle with a broad white zone; tips of its coverts white; quills of wing more or less mottled with rusty-brown; cere, rictus, base of bill, and feet, yellow; bill and claws blackish. Length 21.00–23.00; wing 13.00–15.00; tail 8.00–10.00; tarsus 3.25; ♀ larger than ♂; wing up to 16.00, etc. Young: Extensively varied with rusty or buff, which is gradually obliterated as the bird matures; tail numerously barred with black and white—6–9 such bars, mostly broken or otherwise irregular. Whole under parts white, more or less tinged with buff, pencilled on throat, heavily striped on breast and sides, closely barred across on tibiae and crissum, with blackish. Feathers of head, nape, and fore back largely white or whitish, appearing in streaks among the overlying blackish of the ends of the feathers. Exposed portions of primaries blackish, obsolete crossed with lighter; these feathers lightening basally and internally, where narrow blackish bars alternate with wider spaces of white tinged with brown and fulvous. Secondaries and larger coverts brown with narrow dark bars, their inner webs also indented with whitish and tawny. The younger the bird the more whitish or buff prevails over dark colors. The contrast between cross-barred tibiae and lengthwise-striped breast and sides is always notable. The tail varies from rounded through square to emarginate. A remarkable Hawk of Central America, West Indies, and Mexico, N. to Arizona, New Mexico, and the Lower Rio Grande valley of Texas, apparently not common over our border, and not resident; breeds; nest in trees; eggs 1–3, 2.30 × 1.85, greenish-white, moderately spotted with light and dark browns, laid April–June.

NOTE. — *Onychotes gruberi* RIDGW. Proc. Acad. Nat. Sci. Philada. Dec. 1870, p. 149; B. B. and R. Hist. N. A. Birds, iii, 1874, p. 254; RIDGW. Rod and Gun, May 1, 1875, p. 65; Bull. U. S. Geol. Surv. Terr. ii, Apr. 1876, p. 134; admitted in the Key, orig. ed. 1872, p. 219, and 2d ed. 1884, p. 553, is not North American: see Pr. U. S. Nat. Mus. Apr. 1885, p. 36, and Key, 3d ed. 1887, p. 883. It is a Sandwich Island Fish Hawk, originally described as *Buteo solitarius* by T. R. PEALE, U. S. Expl. Exped. 1848, p. 62, and figured as such by SLATER, Challenger Repts. Birds, 1881, p. 96, pl. 21; *Pandion solitarius* CASSIN, U. S. Expl. Exped. 1858, p. 97, pl. 4; *Polygonotus solitarius* SHARPE, Cat. B. Brit. Mus. i, 1874, p. 452. Its original ascription to "California" was simply a mistake.

THRASAË'TUS. (Gr. *θρασύς, thrasus*, bold; *ἀετός, aëtos*, an eagle.) **HARPY EAGLES.** A genus containing one species of enormous size, the most powerful raptorial bird of America, if not of the entire sub-order. Head with a broad flowing occipital crest. Bill of great length and depth, much compressed, so hooked that the curve of the culmen is about a quadrant of a circle; commissure about straight, tomia festooned but not toothed; cere extensive, with nearly vertical fore-edge, close to which are the narrowly oval nostrils, about midway between tomia and culmen; lores extensively naked and bristly; superciliary shield prominent; feet and talons of immense strength; tarsus feathered a little way down in front; feet reticulate, excepting a few scales on top of toes; lateral toes much shorter than middle; inner claw much larger than middle; hinder much the largest of all. Wings rather short, very ample; secondaries entirely covering primaries when folded; wing as a whole much vaulted, outer quills strongly bowed. Tail long, $\frac{3}{4}$ the wing, fan-shaped, vaulted.

T. harpyia. (Gr. *ἄρπυια, harpyia*, a harpy.) **HARPY EAGLE.** The largest and finest specimen before me I judge to have been nearly or about 4 feet long; wing about 2 feet; the tail 18 inches; chord of culmen, including cere, 2.75 inches; depth of bill 1.50; tarsus over 4.00; chord of hind claw nearly 3.00. Head and entire under parts dull white, more or less obscured with ashy or dusky, particularly on crest, across throat, and on tibiae, which latter are in some cases regularly barred with blackish. Upper parts at large ashy-gray, intimately but irregularly barred with glossy black, especially on wing-coverts. Flight-feathers mostly blackish, but with more or less ashy nebulation, to which whitish variegation is added on inner webs. Tail pretty regularly barred with black and ash, in other cases irregularly nebulated with light and dark ash. The bill appears to have been blackish, the feet of some yellowish color. Young birds are much darker. Central and South America and Mexico, a well-known and most formidable bird of prey, reaching the Texas border of the Lower Rio Grande; also, Louisiana?

A'QUILA. (Lat. *aquila*, an eagle.) **GOLDEN EAGLES.** Of great size, robust form, and powerful physique, but in technical characters near *Buteo* and especially *Archibuteo*. Tibia extensively flagged. Tarsus closely feathered all around to the toes; toes mostly reticulate on top, margined, outer and middle webbed at base. Bill large, long, very robust; tomia lobed; nostrils oval, oblique; superciliary shield prominent. Wings long, pointed by 3d-5th quills, 2d subequal to 6th, 1st very short, 5 or 6 emarginate on inner webs; 2d to 6th or 7th sinuate on outer webs. Tail moderate, rounded, or graduated. Feathers of occiput and nape lanceolate, acute, discrete, like a Raven's throat-plumes. Sexes alike; changes of plumage not great. This extensive genus includes Eagles properly so called, of which there are numerous Old World species, but only one American.

A. chrysaë'tus. (Gr. *χρυσάερος, chrusaëtos*, golden eagle. Fig. 473.) **GOLDEN EAGLE. RING-TAILED EAGLE. BLACK EAGLE. MOUNTAIN EAGLE.** Adult ♂ ♀: Dark brown, with purplish gloss, lighter on coverts of wings and tail and on flags or tarsi; the cowl of lanceolate feathers golden-brown. Quills and tail-feathers blackish, but basally more or less variegated or crested with light brown, gray, or whitish; at maturity these markings extensive and definite. Young birds blacker than adults, which "grow gray," with age, and are "ring-tailed," — that is, basal portion and finally most of tail white, offset by a broad black terminal zone. Length about 3 feet (or more); extent 6 or 7 feet; wing 2 feet (♂) or more (♀); tail 14.00-15.00 inches (♂) or more (♀); bill, without cere, 1.50-1.75; tarsus 3.50-4.00. This great bird inhabits North America at large, as well as Europe, Asia, etc.; in this country rather northerly, S. ordinarily to about 35°. The American is not fairly distinguished from the European, but on the whole is a larger and "better" bird, like several others of the present family, as well as of the goose and duck tribes. This I suppose to be owing to the fact that there is more room for them, more food, less persecution, and altogether less competition in the struggle for existence. It breeds chiefly in mountainous or boreal regions, the eyrie being usually upon a crag,

sometimes in a tree, the nest a platform of sticks, etc., sometimes acquiring enormous dimensions, by repair and addition year after year. The eggs are subspherical and equal-ended; five selected specimens measure: 2.65×2.15 , 2.90×2.40 , 3.00×2.35 , 3.10×2.25 , $3.25 \times$



FIG. 473.—The Eyrie of the Golden Eagle. (Designed by H. W. Elliott.)

2.55 ; average of many more, 3.00×2.30 ; in 12 cases, only one is white like a Bald Eagle's; the rest are whitish, wholly indeterminately spotted, splashed and smirched with rich sienna, umber, and bistre browns, with neutral-tint shell-markings; 2 or 3 are laid, at times varying with latitude from midwinter to June. The prowess of this Eagle is such that it can prey upon fawns and lambs; but its habitual quarry is much more humble.

HALIAËTUS. (Gr. *ἁλιᾶετος*, *haliaëtōs*, a sea-eagle; *i. e.*, the osprey.) SEA EAGLES. FISHING EAGLES. General characters of *Aquila*, but tarsi only feathered about $\frac{1}{2}$ down, and no webbing between outer and middle toes. This nakedness of shank is an infallible character: among the several different "kinds" of Eagles popularly attributed to North America, only *two* species have been found on this continent: the one with feathered shanks

is *Aquila chrysaëtus*; the one with scaly shanks is *Haliaëtus leucocephalus*, whatever its size or color. The reader of popular periodical literature about birds who comes across startling statements of Eagles six feet long and ten feet broad may safely set them down to the credit of journalistic enterprise, along with monkey-faced Owls, four-winged Quetzlis, flying wolves, two-headed snakes, and other fishy fairy tales. The scutellation of the tarsus varies in this species; there is normally a short row of scales in front, discontinued about the bases of the toes, where are granular reticulations, the scutellation being resumed farther on the toes. Wings pointed by 3d-5th quills; 2d nearly equal to 6th; 1st longer than 9th; 5 to 6 emarginate on inner webs. Tail rounded, of 12 rectrices. Feathers of neck all around lance-acute, discrete. About 8 species of this genus are recognized; one of them is appropriate to this continent; another occurs in Greenland.

Analysis of Species.

- Adult with head and tail white *leucocephalus*
- Adult with tail only white *albicilla*

H. albicilla. (Lat. *albicilla*, white-tailed.) WHITE-TAILED SEA EAGLE. ERNE. Adult ♂ ♀: Dark brown, blackening on primaries; head and neck gray; tail white. Bill and feet yellow. Young with tail not white, and otherwise different, the whole plumage much varied with light and dark browns. Length of ♂ nearly or about 3 feet; wing 2 feet; tail a foot; tarsus 3.50 inches; bill 2.00 or more; ♀ larger; length up to $3\frac{1}{2}$ feet; wing $2\frac{1}{4}$ feet, etc. Europe, etc., only North American as occurring in Greenland, where it breeds, making its eyrie on cliffs; eggs 1-3, usually 2, averaging about 3.10×2.25 , white.

H. leucocephalus. (Gr. *λευκός*, *leucos*, white; *κεφαλή*, *kephale*, head. Fig. 474.) WHITE-HEADED SEA EAGLE. "BALD EAGLE." "BIRD OF WASHINGTON" (the young). Adult ♂ ♀: Dark brown; quills black; head and tail white; bill, eyes, and feet yellow. Length

about 3 feet (or more); extent 6 or 7 feet; wing 2 feet (♀) or less (♂); tail a foot, more (♀) or less (♂). Three years are required to perfect the white head and tail of the "bald" Eagle.

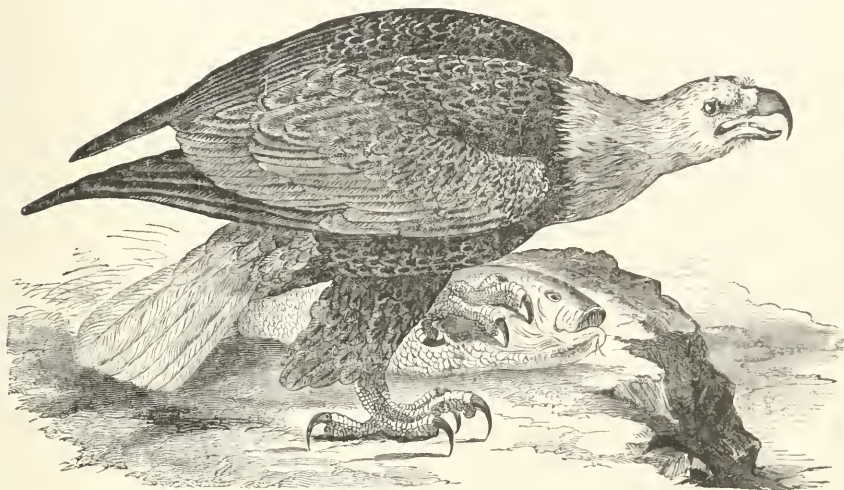


FIG. 474. — Bald Eagle. (From Tenney, after Wilson.)

The first year, the young are "black" Eagles: very dark colored, with fleecy white bases of the feathers showing here and there; bill black; iris brown; feet yellow. Next year, they are

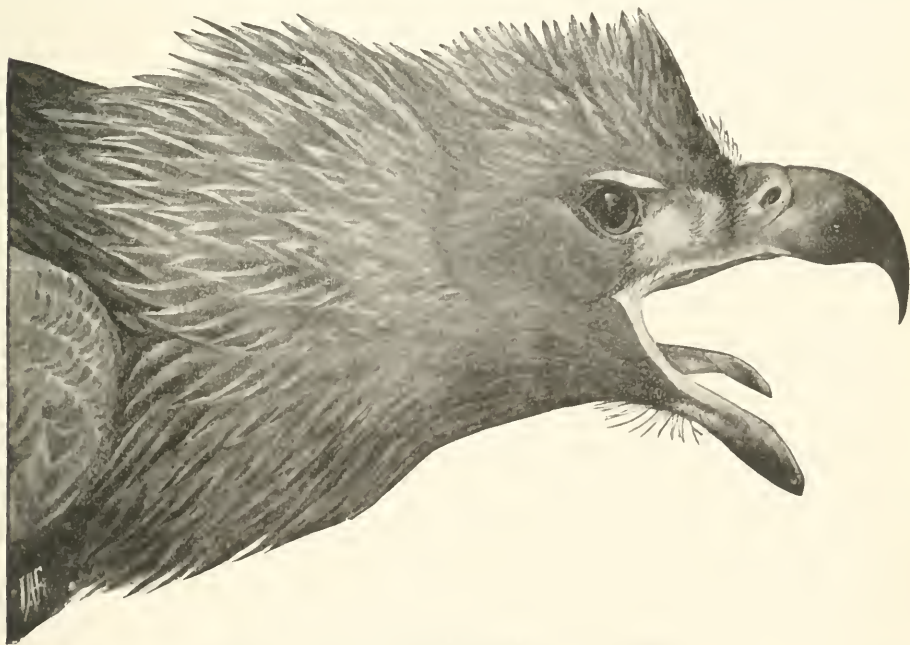


FIG. 475. — Alaskan White-headed Eagle. (L. A. Fuertes.)

"gray" Eagles, usually larger than old birds, the largest known specimens being of this age. Young in down are sooty-gray. North America anywhere, common — for an Eagle; pisciv-

orous; a piratical parasite of the Osprey: otherwise notorious as the emblem of the republic. There is a sort of jingoism about this bird which tickles the fancy of the average American patriot, who imagines that it can be heard around the world when it rumples up its feathers and screeches, making as much noise as a British lion with its tail twisted. It sometimes fishes for itself, at others stoops to carrion like a vulture, and also preys upon water fowl and mammals of considerable size. The nest is bulky, finally acquiring huge dimension by annual accretions, generally placed high in a tall tree, often also on a cliff, bluff, or cut-bank, rarely on level ground; eggs usually two, of which one is larger than the other, probably hatching opposite sexes, sometimes 3, or only one; average size 2.90×2.25 , with extremes of 3.05×2.35 and 2.45×2.00 ; color white, normally unmarked, rarely with a few spots. They are laid from November all through the winter on our southern border, all through the spring in most latitudes, or not till early summer in the far North.

H. 1. *alascanus*. (Lat. Alaskan. Fig. 475.) ALASKAN BALD EAGLE. Averaging somewhat larger. Wing 24.00–24.50; tail 11.50–12.00; tarsus 4.00; bill 2.50, its depth at base 1.50: thus at extremes of size for this species. Alaska; type from Unalaska Island. C. H. TOWNSEND, Pr. Biol. Soc. Wash. xi, June 9, 1897, p. 145; A. O. U. Suppl. List, Auk, Jan. 1899, p. 109, No. 352 a.

Obs. *Thalassæetus pelagicus*. (Gr. *θάλασσα*, *Thalassa*, the sea, ocean; Lat. *pelagicus*, pelagic, oceanic, marine.) WHITE-SHOULDERED SEA EAGLE. KAMTSCHATKAN SEA EAGLE. This most magnificent of the Eagles is found on the Commander Islands in Bering's Sea, as well as on the Asiatic mainland, and no doubt sometimes flies across to the neighboring Aleutian islands, as our Bald Eagle easily makes the same flight in the opposite direction, thus figuring as a bird of Asia. A fair exchange would be no robbery, but we have no authentic data for introducing the genus and species formally in the Key. Adult ♂ ♀: Dark brown; forehead, most of the wing-coverts, tail, rump, and thighs, pure white; bill and feet chrome-yellow; iris pale yellow. Length of ♂ over 3 feet; extent $7\frac{1}{4}$ feet; wing nearly 2 feet; tail 14 inches, cuneate, graduated 4.00, with 14 feathers; bill 2.50. ♀ larger: length nearly $4\frac{1}{2}$ feet; extent nearly 8 feet; wing 2 feet or more. The great white area on the wings, involving the lesser and middle coverts, is very conspicuous. Young birds are darker than the adults, have the white parts more or less mixed with dusky, according to age, and the bill is not bright yellow.

Family PANDIONIDÆ: Fish Hawks; Ospreys.

See page 619. Plumage peculiar, close and firm, imbricated, oily, lacking after-shafts; head densely feathered to eyes; occipital feathers lengthened; legs closely feathered, without any sign of a flag; quills of wings and tail acuminate, stiff and hard; primary coverts of similar character. Feet immensely large and strong, roughly granular-reticulate; tarsi little feathered above in front; toes all free to the base, the outer versatile. Claws very large, all of equal lengths, subcylindric or tapering terete, not scooped out underneath, but all compressed, and middle one sharply grooved on inner face. Bill toothless, contracted at cere, elsewhere inflated, with very large hook; gonys convex, ascending; nostrils oval, oblique, without tubercle, in edge of cere. The peculiarities of the plumage and of the feet are in evident adaptation to the semi-aquatic piscivorous habits of these "fishing hawks," which require a water-proof covering, and great talons to grasp their slippery quarry. The structural characters are rather those of buteonine than falconine birds of prey, in the coracoid arrangement, etc. The tarso-metatarsus has a bony equal for the passage of the common extensor of the toes, as in most Owls. The synpelmous condition of the flexor tendons occurs as in *Falconidae*, but with the modification that while the flexor perforans has 3 tendons for the 2d–4th toes the flexor hallucis splits into four, which thus also supply the same 2d–4th toes as well as the 1st.

The supraorbital shield is rudimentary, leaving eye flush with side of head. The family consists of a single genus, and probably but one cosmopolitan species, the well-known Osprey, *Pandion haliaëtus*. It is made type of a suborder *Pandionies* by SHARPE, and reduced to a subfamily of *Falconide* by the A. O. U.

PANDION. (Gr. *Πανδίων*, Lat. *Pandion*, nom. propr. Fig. 476.) OSPREYS. To the foregoing add: Wings very long, pointed; 2d and 3d primaries longest; 1st between 3d and 5th; 3 outer ones abruptly emarginate on inner webs, and 2d to 4th sinuate on outer webs. Tail short, scarcely or not half as long as wing. Sexes alike; ♀ larger. Young similar.

P. haliaëtus carolinensis. (See *Haliaëtus*.) AMERICAN OSPREY. FISH HAWK. Adult ♂ ♀: Above, dark vandyke-brown, blackening on quills; feathers of upper parts more or less completely edged with

paler color — the older the bird, the less conspicuous the white markings except on the head. Tail dark-brown with dusky bars, white tip and shafts, and inner webs of all but middle pair of feathers regularly barred with white and dark, but these markings tending to obscurity with increasing age. Head, neck, and under parts white; crown more or less extensively streaked with blackish, and a heavy blackish postocular stripe to nape; breast more (♀) or less (♂) spotted with dusky brown; the white more or less tinged with



FIG. 476. — The Fish Hawk, or Osprey. (After J. Wolf.)

tawny in some places, especially under the wings and on the head, except in old birds. Coloration very variable in relative amounts of dark and white colors, always irrespective of sex; general tendency with age to uniformity of dark tones on the back, wings, and tail, and purity of white on the head and under parts. Bill blackish, bluing at base and on cere; feet grayish-blue; claws black; iris yellow or red. Length 2 feet or rather less; extent about 5 feet; wing 17.50–21.50; tail 8.50–10.50; tarsus 2.25; middle toe without claw 1.75; chord of culmen without cere 1.30; chord of claws nearly the same. Young: darker above than the old birds, but the upper parts more mottled with white or buff edgings of the feathers, and the tail more regularly barred. Downy young much variegated with dusky, rusty, and whitish on a gray ground. Entire temperate North America, over inland waters and especially along sea-coasts, migratory, abundant. Few birds are better known than this industrious fisherman, so often purveyor perforce of the Bald Eagle. Breeds anywhere in its range; nest bulky, finally acquiring enormous dimensions by yearly repairs and additions, placed usually in a tree or stout bush, sometimes on rocks or the ground; sometimes hundreds together. Eggs laid

in May in most latitudes, through June in the North, and from February to April in the South, 2 or usually 3, seldom 4, in number, very variable in size, say 2.50×1.85 on an average, ranging from 2.75×2.00 to 2.25×1.65 , running through all the variations in color common to Hawks' eggs, from a white to creamy, tawny or reddish ground, from few brownish markings to heaviest blotching with sienna, umbre, bistre, and sepia; coloration usually richly reddish or mahogany. Some nests grow to be 6 or 8 feet in diameter, and as much in depth, and smaller birds, such as Grackles, frequently build theirs in the interstices of the mass without molestation from the bird of prey. This certainly proves the amiability of the Osprey; and the same association of birds raptorial and non-raptorial is witnessed in the West in the case of Swainson's Buzzard, in the same tree with the nest of which, even in the substance of the nest itself, have various small birds, such as the Arkansas Flycatcher, Hooded Oriole, and Burion, been observed domiciled.

SUBORDER CATHARTIDES: AMERICAN VULTURES.

(Or SARCORHAMPHI.)

As already stated (page 618), the characters of this group, for which I proposed the above name (New England Bird Life, vol. ii, p. 135), are of more than family value. The same subordinal rank is recognized by the name of SARCORHAMPHI in the A. O. U. List. In no event have these birds anything to do with Old World Vultures, which scarcely form a subfamily apart from other *Falconide*. In a certain sense they represent the galliaceous type of structure; our species of *Cathartes*, for instance, bears a curious superficial resemblance to a Turkey. They lack the strength and spirit of typical *Raptores*, and rarely attack animals capable of offering resistance; they are voracious and indiscriminate gormandizers of carrion and animal refuse of all sorts — efficient and almost indispensable scavengers in warm countries where they abound. They are uncleanly in their mode of feeding; the nature of their food renders them ill-scented, and when disturbed they eject the fœtid contents of the crop. Although not truly gregarious, they assemble in multitudes where food is plentiful, and some species breed in communities. When gorged, they appear heavy and indisposed to exertion, usually passing the period of digestion motionless, in a listless attitude, with wings half-spread. But they spend much time on wing, circling high in the air; their flight is easy and graceful in the extreme, capable of being indefinitely protracted. On the ground they habitually walk instead of progressing by leaps. Possessing no vocal apparatus, these Vultures are almost mute, emitting only a weak hissing sound.

Family CATHARTIDÆ: American Vultures.

(Or SARCORHAMPHIDÆ.)

See page 618. Head and part of neck more or less completely bare of feathers, sometimes caruncular; eyes flush with side of head, not overshadowed by a superciliary shield; ears small and simple. Bill lengthened, contracted toward base, moderately hooked and comparatively weak. Nostrils very large, completely perforated, through lack of bony septum. Wings very long, ample, and strong; tail moderate. Anterior toes long for this order, webbed at base; hind toe elevated, very short; claws comparatively lengthened, obtuse, little curved and weak. To these external characters, which distinguish our Vultures, I may add that there are numerous osteological peculiarities. No lower larynx is developed; the capacious gullet dilates into an immense crop; cœca wanting; carotids double. The feathers lack aftershafts; plumage sombre and unvaried, its changes slight; sexes alike in plumage; ♀ not larger than ♂. The famous Condor of the Andes, *Sarcorhamphus gryphus*; the King Vulture, *Gypagus* or

Gyparchus papa, which probably occurs in Arizona, and species of three North American genera, compose the family. It is divisible into two subfamilies, mainly according to the presence or absence of caruncular excreescences on the head.

Subfamily SARCORHAMPHINÆ: Condors and King Vultures.

A fleshy comb or crest surmounting the base of the beak, or also arising from the forehead, with or without an additional fleshy wattle or dewlap. Bill very stout, with short cere. In the ♂ Condor, the comb runs up on the head from the bill, and the throat is dewlapped, something like the domestic Turkey's; these appendages are wanting in the ♀. The size is great, though hardly surpassing that of *Pseudogryphus californianus*; the neck is collared with white cottony down where the feathers begin; and the point of the primaries overreaches the secondaries in the closed wing.

GYPAÛGUS. (Gr. γύψ, *gyps*, a vulture; and ἀγός, *agos*, a leader, ruler, chief. The word is well enough, and need not have been altered to *Gyparchus* by GLOGER in 1842.) KING VULTURES. Comb small, confined to the short cere of the stout bill; no wattle or dewlap. Wings short; secondaries reaching ends of primaries when closed. Size medium for the family; small for this subfamily; sexes alike. One species.

G. pa'pa. (Lat. *papa*, father, the pope.) KING VULTURE. COZCACOAHTL. Head and upper neck naked of true feathers, the skin much wrinkled, on the hind head pinched up into a sort of comb and extensively beset with black bristles; the fleshy excreescence on the bill tumid, erected from a contracted base, like a polypus; no cottony white collar on the neck, the plumage there beginning in a ruff of ordinary feathers, of a blackish color: a bare area on the chest, over the crop. General plumage cream-colored or pale buff above, below white, with a creamy or tawny tinge; rump and whole tail, with its coverts, and most of the wings, black. Bill and naked parts of head and neck curiously variegated with black, blue, red, orange and yellow; iris white. Young, simply sooty brown, lacking also the harlequin visage of the old birds. Length about 2½ feet; wing 19.50 inches; tail 10.00. Eggs white, about 3.70 × 2.65. Tropical continental America, N. probably over the border of Arizona. The supposed occurrence rests upon my own evidence, and is not conclusive; but I have never doubted that I saw a pair of these birds on the San Francisco (Verde) River, July 13, 1865: see COUES, Pr. Phila. Acad. 1866, p. 49, and Bull. Nutt. Club, Oct. 1881, p. 248; compare also the Sacred Vulture ascribed to Florida by BARTRAM, Trav. 1791, p. 150; ALLEN, Bull. Mus. Comp. Zool. ii, 1871, p. 313. I now first take the species into the Key, as it has been placed on the A. O. U. List, Hypothetical No. 12.

Subfamily CATHARTINÆ: Turkey Vultures.

No fleshy excreescences on the head in either sex. Bill lengthened and comparatively weak, with the cere longer than the rest of the upper mandible.

Analysis of Genera.

Head and neck entirely naked; tail square	<i>Pseudogryphus</i>
Head and upper part of neck naked; tail rounded	<i>Cathartes</i>
Head naked, but feathers running up to it behind; tail square	<i>Cathartida</i>

PSEUDOGRYPHUS. (Gr. ψεῦδος, *pseudos*, false; Lat. *gryphus*, a griffin.) CALIFORNIAN CONDOR. Size immense, about equalling that of the Andean Condor. Head and neck entirely bare, smooth, without caruncular appendages. No cervical ruff of snowy, downy feathers; plumage beginning over shoulders with loose lance-linear feathers, and that of under parts generally of similar character. Frontal region depressed below level of inflated cere, but general profile straightish from hook of bill to hind head. Bill wide and deep, comparatively little

hooked. Nasal passage much more contracted than nasal fossa. Wings of great amplitude, folding to or beyond end of square tail; ends of primaries uncovered by secondaries; 4th or 5th quills longest. Tarsus about as long as middle toe. One species.

P. californiā'nus. (Of California. Fig. 477.) CALIFORNIAN CONDOR. QUELELI. Adult ♂ ♀ : Blackish, the feathers with browner tips or edges, quite gray or even whitish on wing-coverts and inner quills; primaries and tail-feathers black; axillars and lining of wings white; bill yellowish, reddening on cere, and skin of head orange or reddish; iris said by some to be brown, by others carmine. Length 4-4½ feet; extent about 9½ feet; said to be sometimes "nearly 11 feet;" wing 2½-3 feet; tail 1¼-1½ feet; tarsus 4.50-5.00 inches; middle toe without claw 4.00-4.50; middle claw 1.90; hind claw 1.50; chord of culmen without cere about 1.50, but whole bill about 4.00, whole head about 7.00; cere on top nearly 3.00; weight 20-25 lbs. Young with bill and naked parts dusky, and more or less downy; plumage without white. Nestlings covered with whitish down. This great creature rivals the South American Condor in size, and like it is powerful enough to destroy young or otherwise helpless animals as large as itself, though its usual food is carrion. It formerly inhabited



FIG. 477. — Californian Condor. (From Tenney, after Audubon.)

the whole of the Pacific coast region from British Columbia to Lower California, E. to Arizona, where I saw it at Fort Yuma (mouth of the Gila) in 1865, and probably to some little portion of Utah; now much decreased in numbers, only locally distributed in Oregon and California, and restricted in the breeding season to California W. of the Sierras Nevadas S. of lat. 37°, including some parts of Lower California; known to have occurred in Arizona (Auk, July, 1899, p. 272). Casual in Alberta (Auk, Jan. 1897, p. 189). Early in this century it abounded on the Columbia river, as we learn from the accounts of Lewis and Clark, and others, who had difficulty in keeping large game they had killed from the attacks of these formidable birds of prey. They are still common in certain localities, and not likely to be soon exterminated, by poison or otherwise, as they are shy and sensible enough to betake themselves to the roughest country to breed in inaccessible places. The nidification is like that of the Turkey Buzzard; but eggs whitish, unmarked, narrowly elliptical, about 4.50 × 2.50. The general habits appear to be the same as those of the Turkey Buzzard; the flight is similar.

CATHARTES. (Gr. *καθαρίης*, *kathartes*, a purifier.) TURKEY BUZZARDS. Of medium size; body slender. Whole head and upper part of neck naked, the plumage beginning as a

circlet of ordinary feathers all around neck in *C. aura*, but mounting the neck behind in *C. burrovianus*; the naked skin corrugated and sparsely beset with bristles, especially a patch before eye, where it is also caruncular or papillose. Bill long, moderately stout and hooked; nostrils large, elliptical, with a raised rim completely pervious; cere contracted opposite them. Wings extremely long, not particularly broad, pointed, folding beyond tail, which is short and rounded. Point of wing formed by 3d or 4th quill; 2d and 5th nearly as long; 1st much shorter; outer 4 or 5 emarginate on inner webs. Tarsus about as long as middle toe without claw. Of *Cathartes* as restricted several species are described, but only one is established as North American. They are noted for their extraordinary powers of sailing flight.

Analysis of Species.

Plumage brownish, not peaked on the nape. Large: wing 20.00 or more. N. Am. *aura*
 Plumage black, peaked on the nape. Small: wing about 18.00. S. W. border? *burrovianus*

C. au'ra. (Vox barb., name of the bird. Figs. 478, 479.) COMMON TURKEY VULTURE.

TURKEY BUZZARD. Adult ♂ ♀: Blackish-brown, grayer on wing-coverts; quills black, ashy-gray on under surface; tail black, with pale brown shafts. Head red, from livid crimson to pale carmine, with whitish specks usually; bill dead white; feet flesh-colored; iris brown. Length $2\frac{1}{4}$ – $2\frac{1}{2}$ feet; extent about 6 feet; wing 2 feet or less; tail a foot or less; tarsus 2.25 inches; middle toe without claw rather more; outer toe 1.50; inner 1.25; hind 0.75; chord of culmen without cere 1.00. Weight 4–5 pounds. Young darker than adults; bill and skin of head dark, latter downy. Nestlings covered with whitish down, which extends upon



FIG. 478.—Turkey Buzzard, $\frac{1}{2}$ nat. size. (From Brehm.)

back of neck and head, but leaves the front and sides bare; skin black. U. S. and British provinces, S. through Central and S. Am.; N. in Saskatchewan to about 55°; resident N. to about 40° on the Atlantic side, and a few degrees farther on Pacific coast, beyond which migratory, being starved out in winter; casual in New England; breeds in most of range. Nests ordinarily on or near ground, in hollow stumps or logs, generally in communities; but sometimes in hollows of dead tree-tops at a great height, or again on rocky ledges; in some instances the old nest of another bird, as a Hawk or Heron, is used. Eggs commonly 2.

sometimes 1, rarely 3, from 2.75×1.85 to 3.15×1.95 , white or creamy, variously spotted and blotched with different browns, and with lavender or purplish-drab shell-markings, only



FIG. 479.—Turkey Vulture.

Catharista urubu. Adult ♂ ♀: Black, with white shafts of primaries; head blue and orange: bill flesh color; iris red. Length 24.00 or less; wing under 20.00, and other parts correspondingly less than those of *C. aura*, from which quite distinct. Tropical and subtropical America, attributed to California by Gambel (Journ. Acad. Phila. i, p. 26), and to Texas by Dresser (Ibis, 1865, p. 322). CASSIN, Pr. Phila. Acad. 1845, p. 212; Ill. 1853, p. 59; B. N. A. 1858, p. 6, originally described from Vera Cruz and Mazatlan; ELLIOT, B. N. A. 1866, pl. 26, type figured. Not taken up in former editions of the Key. A. O. U. Hypothetical List, No. 13.

CATHARISTA. (Gr. καθάρισμα, *katharizo*, I purify.) CARRION-CROWS. Of medium size; body stout. Head naked, and generally as in *Cathartes*, but feathers of neck running up behind to a point on occiput; outline of plumage thus very different from that of *C. aura*. Cere contracted; nostrils narrow, less openly pervious than in *Cathartes*. Wings shorter and relatively broader than in *Cathartes*, not folding to end of tail, which is short, only about $\frac{1}{2}$ the wing, even or emarginate; 4th and 5th quills longest. The difference in size and shape between *Cathartes* and *Catharista*

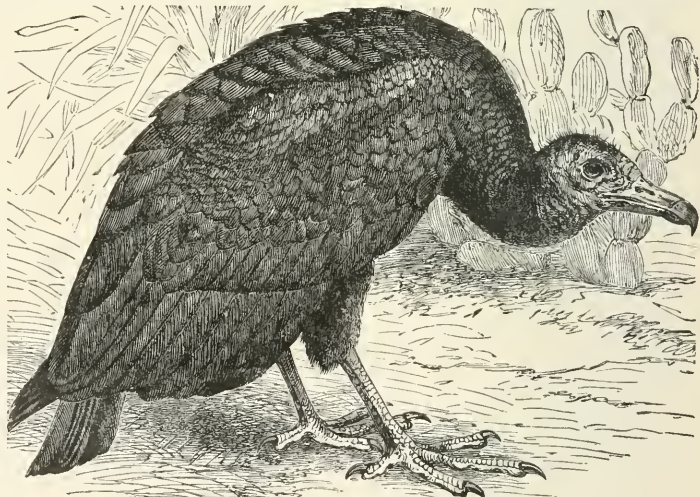


FIG. 480.—Black Vulture, $\frac{1}{4}$ nat. size. (From Brehm.)

is strikingly displayed when the birds are seen flying together; there is also a decided difference in mode of flight, as *Catharista* never sails for any distance without interrupting that easy motion by flapping the wings.

exceptionally immaculate; they are laid from the middle of February on our southern border, to June in the highest latitudes frequented by the bird. The young are fed with filth, by regurgitation, like squabs and various altricial water-birds. This Vulture has a curious habit of "playing possum," by simulating death when wounded and captured; the feint is admirably executed and often long protracted.

C. burrovianus. (To Dr. Burroughs.) BURROUGH'S TURKEY VULTURE. A small species, strictly of the form of *C. aura* in proportions of wings and tail, character of nostrils, etc., but with plumage peaked on nape to occiput, as in

C. urubu. (South American name of some bird of this family. Figs. 480, 481.) CARRION-CROW. BLACK VULTURE. Adult ♂ ♀: Entire plumage, including skin of head, and bill, blackish; shafts of primaries white, their bases paling to gray or whitish. Tip of bill and feet grayish-yellow; iris brown; claws black. Smaller than *C. aura*, in linear dimensions, but a heavier bird; length about 2 feet; extent only about $4\frac{1}{2}$ feet; wing 17.00 inches; tail 8.00; tarsus 3.00; middle toe rather less; chord of culmen without cere 1.00 or less. Nesting like that of *C. aura*; eggs similar, but averaging larger, or at any rate longer, being usually a little over 3.00×2.00 , though ranging from 3.35×2.20 down to 2.75×1.85 ; they are also tinged with pale greenish or bluish rather than creamy in the ground color, but in markings are indistinguishable from those of the other species; the number is 2 as a rule, rarely 1 or 3, and the period of deposition runs from March to May. Chiefly S. Atlantic and Gulf States, especially in maritime regions, there very numerous, outnumbering Turkey-Buzzards, and semi-domesticated in the towns, where their good offices are appreciated; N. regularly to North Carolina, thence straggling to Massachusetts and even Maine; and up the Mississippi Valley to Ohio, Indiana, Illinois, Iowa, and Kansas, and casually South Dakota; not authenticated as occurring on Pacific side, but of general distribution in Central and South America. *C. atrata* (BARTRAM, 1791) of all former eds. of the Key, and of A. O. U. Lists, 1886-95: *C. urubu* COUES, Auk, Jan. 1899, p. 84; A. O. U. Suppl. List, Auk, Jan. 1899, p. 108.



FIG. 481. — Black Vulture. (L. A. Fuertes.)

No one can fail to observe with interest the great difference in the form and general appearance of the Turkey-buzzard and Carrion-crow when he compares them sitting side by side sunning themselves upon chimney or house-top; and especially the discrepancy in their mode of flight as they wheel together overhead in endless insculating circles. The Turkey-buzzards look larger as they fly, though really they are lighter weights; they seem dingy-brown, with a gray space underneath the wing; the tail is long; the fore-border of the wing is bent at a salient angle, and there is a corresponding re-entrance in its hind outline; the tips of the longest quills spread apart and bend upward; and one may watch these splendid flyers for hours without perceiving a movement of the pinions. Comparing now the Carrion-crows, they are seen to be more thick-set, with less sweep of wing and shorter and more rounded tail, beyond which the feet may project; the front edge of the wing is almost straight, and the back border sweeps around in a regular curve to meet it at an obtuse point, where the ends of the quills are neither spread apart nor bent upward. The birds show almost black instead of brown; in place of a large gray area under the wing, there is a smaller paler gray spot at the point of the wing. And, finally, the Carrion-crows flap their wings five or six times in rapid succession, then sail a few moments; their flight appears heavy, and even laborious, beside the stately motion of their relatives.

Order COLUMBÆ: Columbine Birds.

An essential character of birds typical of this group is found in structure of bill, which is horny and convex at tip, somewhat contracted in continuity, furnished at base with a tumid membrane in which the nostrils open. Toes 4; 3 anterior, generally cleft to base, but occasionally with slight webbing; one behind, with few exceptions perfectly insistent or not obviously elevated. Feet desmopelmons in the ordinary way, never much lengthened; tarsus is commonly shorter than toes, either scutellate or extensively feathered, reticulate on sides and behind; envelop rather membranous than corneous. (One North American genus, *Sturnias*, has entirely reticulate tarsus and elevated hallux.) On the whole, the feet are insessorial, not rasorial; the habit is arboreal, not terrestrial; but there are many ground pigeons, some quite fowl-like; and progression is always gradient, never saltatory. The wings and tail do not

afford ordinal characters; but the rectrices are usually 12 or 14 instead of the higher numbers usual in gallinaceous birds, but run up to 16 in *Goura* and some species of *Phaps*, even to 20 in *Otidiphaps*; and the wings are usually long and flat, not short and vaulted. Plumage destitute of aftershafts (qu. *Didus*?). Syrinx with one pair of intrinsic muscles and asymmetrical extrinsic muscles. Oil-gland nude, when present (small in *Treron*, etc.; wanting in *Goura*, *Starnænas*); gall-bladder generally absent (present exceptionally in some true Pigeons); cœca absent, or present, but small; two carotids; gizzard muscular, sometimes in part horny or even osseous; a well-developed œsophageal crop; intestine varying from very short to extremely long (7 feet long in *Didunculus*!). There are many good osteological characters; palate schizognathous; nasal bones schizorhinal; basipterygoids present (except in *Didus*); sternum doubly notched, or notched and fenestrate, on each side; pectoral ridge of humerus salient and acute, and does not receive the insertion of the 2d pectoral muscle; ambiens normally present, the birds being unquestionably homalognathous, but sometimes lost; femoro-caudal, accessory femoro-caudal, semitendinosus, and accessory semitendinosus present; the fourth glutæal muscle, which in other schizorhinal birds covers the femur-head, is undeveloped (*Garrod*).

Some ornithologists, like Liljeborg, enlarge the Columbine order, under name of *Pullastræ*, to receive the American Curassows (*Cracidæ* — see beyond) and Old World Big-feet, or Mound-birds (*Megapodidæ*); mainly on account, it would appear, of the low position of the hallux in these families. But the balance of characters favors their reference to the gallinaceous series, where they are relegated by Huxley. While there is no question that Columbine birds are very closely related to Galline, in fact inosculating therewith, it seems best to draw the line, if one must be drawn, so as to leave the *Cracidæ* and *Megapodidæ* with *Gallinæ*.

The Sand-grouse (better Sand-pigeons), or *Pterocletes*, represent the inosculation of the two series. They are terrestrial Columbines, modified for a grouse-like life; the digestive system is fowl-like (cœca several inches long, etc.); but the pterylosis, the sternum and humerus, the cranial and many other characters, are pigeon-like. The skull is schizognathous and holorhinal, with basipterygoids; cervical vertebræ 15 or 16. The ambiens and other classificatory muscles of the legs (A B X Y) are present, together with the biceps slip and expansor of the secondaries. The intrinsic syringeal muscles are highly developed. There are two carotids, a nude oil-gland, and gall-bladder. The plumage is aftershafted, and covers the feet to the claws; the wings are aquitocubital. The young hatch downy. Of the two genera, *Pterocles* is 4-toed, *Syrnhaptes* 3-toed. The only alternative to reference of *Pterocletes* to the Columbine series is their elevation to independent ordinal rank, as proposed by Huxley, and as now generally agreed upon by ornithologists. I accordingly modify some expressions used in former editions of the Key, in order to characterize the *Columbæ* more strictly, by exclusion of *Pterocletes* therefrom.

The *Columbæ*, as above indicated, are exactly conformable to Huxley's *Peristeromorpha*. Assuming the imperfectly known extinct Dodo, *Didus ineptus*, and such of its kindred as the Solitaire, *Pezophaps solitarius*, to have been modified Columbines, the order may be separated into two suborders, DIDI and PERISTERÆ. The *Peristeræ* alone are American.

SUBORDER PERISTERÆ: TRUE COLUMBINE BIRDS.

(Equivalent to *Columbæ* proper of most authors, *Peristeromorpha* of Huxley; *Gemitores* of Macgillivray, or *Gyrantes* of Bonaparte plus *Didunculus*; *Columbæ* of Garrod minus *Pterocletes*; *Pullastræ* of Liljeborg minus *Cracidæ* and *Megapodidæ*.) Skull schizognathous, schizorhinal; basipterygoids prominent (they are absent from *Didi*); angle of mandible not produced but abruptly truncate; rostrum externally as abovesaid. Dorsal vertebræ heterocœlous. Sternum double-notched, or notched and fenestrate, on each side, rarely single-notched

(*Geophaps*). When there are a pair of notches on each side, the outer processes are short, as in *Gallinæ*. Furculum well developed and complete (it is reduced in the flightless *Didi*); pectoral crest of humerus, salient, acute. Carotids two. Syringeal muscles one pair. Cæca coli small, rudimentary, or wanting; gizzard muscular; crop developed; gall-bladder generally absent (present in *Carpophaga*, etc.). Fourth glutæal muscle undeveloped; second pectoral specially inserted; ambiens normally present, or wanting; deep plantar tendons desmopel-mous, that of the hallux alone supplying its own digit. Oil-gland nude, small, or wanting. Plumage without aftershfts, or with only very small ones; wings aquintocubital; spinal pteryla well defined, forked over the shoulders. Feet inessential; hallux normally insistent, in some terrestrial genera somewhat elevated and shortened; tarsus normally scutellate in front, reticulate on the sides and behind, rarely entirely reticulate (*Gourida*). Rectrices normally 12 or 14, exceptionally 16 or 20. Primaries 11. Altricial; psilopædic; monogamous; nidificant; eggs ordinarily one pair, white.

The *Peristeræ* will be immediately recognized by their likeness to the familiar inmates of the dove-cot. One seemingly trivial circumstance is so constant as to become a good clue to these birds: the frontal feathers do not form antæ by extension on either side of culmen, but sweep across base of bill with a strongly convex outline projected on culmen, thence rapidly retreating to the commissural point. The plumuleless plumage is generally compact, with thickened, spongy rachis, the insertion of which will seem loose to one who skins a bird of this suborder. The head is remarkably small; neck moderate; body full, especially in the pectoral region. The wings are strong, generally lengthened and pointed, conferring a rapid, powerful, whistling flight; the peculiar aerial evolutions that these birds are wont to perform have furnished the synonym *Gyrantes*. The tail varies in shape, from square to graduate, but is never forked; as a rule there are 12 rectrices, frequently increased to 14, as in nearly all the *Treronide*, rarely to 16 in the genera *Thoracotreron*, *Phaps*, and whole family *Gourida*, exceptionally to 20 in the genus *Otidiphaps*; all the North American genera have 12, excepting *Zenaidura*, with 14. The feet show considerable modification, when strictly arboricole are compared with more terrestrial species; their general character has been indicated above. The gizzard is large and muscular, particularly in species that feed on seeds and other hard fruits; the gullet dilates to form a capacious circumscribed crop, divided into lateral halves, or tending to that state. This organ at times secretes a peculiar milky fluid, which, mixed with macerated food, is poured by regurgitation directly into the mouth of the young; thus the fabled "pigeon's milk" has a strong spice of fact, and in this remarkable circumstance we see probably the nearest approach, among birds, to the characteristic function of mammals. "The voice of the turtle is heard in the land" as a plaintive cooing, so characteristic as to have afforded another name for the suborder, *Gemitores*. Pigeons are altricial, psilopædic, and monogamous — doubly monogamous, as is said when both sexes incubate and care for the young; this is a strong trait, compared with the precocial, ptilopædic, and often polygamous nature of rasorial birds. They are amorous birds, whose passion generally results in a tender and constant devotion, edifying to contemplate, but is often marked by high irascibility and pugnacity — traits at variance with the amiable meekness which Doves are supposed to symbolize. Their blandness is supposed to be due to absence of the gall-bladder. The nest, as a rule, is a rude, frail, flat structure of twigs; the eggs are usually 2 in number, sometimes 1, white; when 2, supposed to contain the germs of opposite sexes; the period of incubation is usually between 2 and 3 weeks.

"The entire number of Pigeons known to exist is about 300; of these the Malay Archipelago already counts 118, while only 28 are found in India, 23 in Australia, less than 40 in Africa, and not more than 80 in the whole of America." (The total number of species now known is about 475, but this increase over formerly known ones does not materially affect the relative proportions of the figures here said.) They focus in the small district of which New

Guinea is the centre, where more than a fourth of the species occur. Mr. Wallace accounts for this by the absence of fruit-eating forest mammals, such as monkeys and squirrels; and finds in the converse the reason why Pigeons are so scarce in the Amazon valley, and there chiefly represented by species feeding much on the ground and breeding in the bushes lower than monkeys habitually descend. "In the Malay countries, also, there are no great families of fruit-eating *Passeres*, and their place seems to be taken by the true Fruit-Pigeons, which, unchecked by rivals or enemies, often form with the *Psittaci* the prominent and characteristic features of the Avifauna." (*Newton*.)

There are several prominent groups of Pigeons; but authors are far from agreed upon subdivisions of the family. It is not probable that Garrod's three subfamilies, based upon characters of ambiens, cæca, gall-bladder, and oil-gland, will stand without great modification, and I cannot adopt his arrangement. Selater divided the suborder *Columbæ* as above defined into two families, *Columbidae* and *Carpophagidae*, to which he afterward added *Gouridae*, and probably *Didunculidae*. Bonaparte made five families, *Didunculidae*, *Treronidae*, *Columbidae*, *Calenadidae*, and *Gouridae* (three of them upon single genera), with 12 subfamilies. This is a pretty good scheme, the main features of which are reflected in the classification adopted by the latest monographer. Thus, Salvadori has also five families, as follows: 1. TRERONIDÆ, with subfamilies *Treronina*, *Ptilopodina*, and *Carpophagina*. 2. COLUMBIDÆ, with subfamilies *Columbina*, *Macropygiina*, and *Ectopistina*. 3. PERISTERIDÆ, with subfamilies *Zenaidina*, *Turturina*, *Geopeliina*, *Peristerina*, *Phabina*, *Geotrygonina*, and *Calenadina*. 4. GOURIDÆ, one genus. 5. DIDUNCULIDÆ, one genus. From this number of families I would not dissent, but propose to raise *Calenadina* to the rank of a family, and unite Salvadori's *Peristeridae* with his *Columbidae*, thus reverting to the Bonapartian evaluation of the five major groups, whose characters may be thus indicated:—

1. The extraordinary Tooth-billed Pigeon of the Samoan Islands, *Didunculus strigirostris*, alone represents a family, with its stout, compressed, hooked, and toothed beak, and many other peculiarities. The length of intestine is excessive, being 7 feet instead of about 2, as usual in *Columbidae*. Ambiens present; oil-gland and gall-bladder absent; 14 tail-feathers. (DIDUNCULIDÆ.)

2. The singular genus *Goura*, with six Papuan species like *G. coronata*, is outwardly distinguished by its immense umbrella-like crest of feathers whose webs are decomposed, and possesses anatomical peculiarities which entitle it to stand alone as type of another family. Tarsi entirely reticulate; 16 rectrices; cæca, gall-bladder, oil-gland,* and ambiens wanting; intestines 4-5 feet long; the pterylosis is galline rather than columbine, and the period of incubation is greatly protracted (4 weeks) (GOURIDÆ.)

3. The single Malaysian genus *Calenas*, with two species, *C. nicobarica* and *C. pelewensis*, has a very tumid bill, and acuminate, lengthened, pendulous feathers of neck like those of the domestic cock and hen; 12 rectrices, as in ordinary Pigeons, and the anatomy is conformable to a usual type, except that the lining of the gizzard is ossified. (CALENADIDÆ.)

4. The Old World genera *Treron*, *Ptilopus*, and *Carpophaga* are leading representatives of a large group of fruit-eating, arboricole species, with a short, stout beak, short, soft, broad-soled, and extensively feathered feet, normally 14 rectrices (very exceptionally 12 or 16), and soft, lustreless plumage, of which green is the characteristic color; "54 species are confined to the Austro-Malayan, while 28 inhabit the Indo-Malayan, subregion; in India 14, and in Africa a species are found; 30 inhabit the Pacific Islands, and 8 occur in Australia or New Zealand, while New Guinea has 14 species" (*Wallace*). (Family TRERONIDÆ, divided by Salvadori into: *Treronina*, 7 genera, 43 species; PTILOPODINÆ, 5 genera (one of them, *Ptilopus*, with 12 subgenera), 88 living species; and *Carpophagina*, 7 genera (one

* Beddard has, p. 314, "with" these organs, by evident slip for "without," as he marks them all absent in his table on p. 312.

of them, *Carpophaga*, with 6 subgenera), 59 living species. All are commonly called "Fruit Pigeons.")

5. All remaining members of the suborder *Peristeræ* may reasonably be held to constitute the single

Family COLUMBIDÆ: True Pigeons or Doves.

Readily recognized by exclusion of the characters of the four families above indicated. These birds are *Columbidæ* plus *Peristeridæ* and minus *Calœnadinæ*, of Salvadori. Broadly speaking they fall in two series, corresponding to these two Salvadorian families; but the nicer subdivisions are less easily determined, in view of their various interrelationships. (a) We may confidently begin by setting aside in a subfamily *Columbinæ* a certain group of arboreal Pigeons with short feet, at least partly feathered and scutellate tarsi, always 12-feathered tail, 2 cœca, an oil-gland, an ambiens, and no gall-bladder. The leading genera of this subfamily are the square-tailed *Columba*, of both Old and New Worlds, the wedge-tailed *Macropygia* of the Old World, and its representative in the New, the wedge-tailed *Ectopistes*. (b) All other *Columbidæ* are of more or less terrestrial habits, and have lengthened tarsi more or less completely bare of feathers. Most of them agree in possessing an ambiens and oil-gland, but no cœca and no gall-bladder. These Ground Doves are exemplified by such genera as *Peristera* and *Melopelia* with 12 rectrices, and *Zenaidura* with 14, of America; by *Lopholœmus* with 12, *Geopelia*, *Phlogœnas*, and *Ocyphaps* with 14, and *Phaps* with 16, of the Old World. They are the *Zenaidinæ* and *Phapinæ* of Bonaparte; the *Zenaidinæ*, *Turturina*, *Geopeliinæ*, *Peristerinæ*, *Phabinæ*, and *Geotrygoninæ* of Salvadori; and they correspond to the *Phapinæ* of Garrod. I doubt that so many as six subfamilies can be established upon any structural characters, and also believe that those just named should be reconstructed with more regard to geographical distribution. The Bonapartian *Zenaidinæ* would seem to cover all the American Ground Doves, with the probable exception of the genus *Starnœnus*, which differs from the rest more notably than authors, excepting Garrod, seem to have appreciated, though it is connected with the others by the genus *Geotrygon*; it is a pullet-like Ground Pigeon with long reticulate tarsus, short and somewhat elevated hind toe, two cœca, and no oil-gland nor ambiens — the reverse of the rule in *Zenaidinæ*. On these accounts I made it the type of a subfamily *Starnœnadinæ* in the second edition of the Key, 1884.

Of the several groups thus indicated, 3 are North American. They may readily be distinguished as follows:

Analysis of North American Subfamilies of Columbidae.

Tarsi scutellate, feathered	<i>Columbinæ</i>
Tarsi scutellate, naked	<i>Zenaidinæ</i>
Tarsi reticulate, naked	<i>Starnœnadinæ</i>

Subfamily COLUMBINÆ: Arboreal Pigeons.

Feet and bill small; tarsus short, not longer than lateral toes, scutellate in front, feathered above. Wing pointed. Tail variable in shape, of 12 rectrices.

Analysis of Genera.

Tail nearly even, much shorter than the wing, with broad obtuse feathers	<i>Columba</i>
Tail long, cuneate, equal to wings, with narrow tapering feathers	<i>Ectopistes</i>

COLUMBA. (Lat. *columba*, a pigeon.) Bill short and comparatively stout, about half as long as head. Wings pointed, 2d and 3d quills longest. No black spots on scapulars. Lateral toes of about equal lengths, with claws about as long as middle toe without; hind toe

and claw about as long as lateral without. Contains the domestic Pigeon, *C. livia*; Stock Dove, *C. anas*; Ring Dove, *C. palumbus*, and numerous other species of both hemispheres.

Analysis of Species.

A white band on nape; metallic scales of nape without borders. Tail with light terminal and dark subterminal bars; bill and feet yellow, former black-tipped	<i>fasciata</i>
No white on head; no metallic scales on nape; tail not banded; bill and feet not yellow	<i>flavirostris</i>
Top of head white; tail not banded; metallic feathers of nape black-bordered	<i>leucocephala</i>
See description, below, for	<i>squamosa</i>

C. fascia'ta. (Lat. *fasciata*, banded; alluding to the bars on the tail.) **BAND-TAILED PIGEON. WHITE-COLLARED PIGEON.** Adult ♂: Head, neck, and under parts purplish wine-red, fading to white on belly and crissum; nape with a distinct white half-collar; cervix with a patch of metallic, scaly, bronze-green feathers. Rump, upper tail-coverts, lining of wings, and sides of body, slaty-blue. Back and scapulars dark greenish-brown, with considerable lustre, changing on wing-coverts to slaty-blue, these feathers with light edging. Quills blackish-brown, with pale edging along sinuous portion of outer webs. Tail bluish-ash, paler beyond the middle on top and much paler below, crossed at the middle by a black bar. Bill yellow, tipped with black; feet yellow, claws black; a red ring round eye — these colors conspicuous in life. A large stout species: length 16.00; extent about 27.00; wing 8.00–8.50, pointed; tail 5.50–6.00, square; bill 0.75, stout for a Pigeon; tarsus 1.00, feathered half-way down in front; middle toe and claw 1.67. Adult ♀: Back, wings, and tail, as in ♂; metallic scales and white collar obscure or wanting. Head and under parts much less purplish, the rich hue replaced by a rusty-brown wash on an ashy ground; yellow of feet and bill obscured; smaller; wing 7.50; tail 4.75. Young ♂: Resembling ♀ in dullness of coloration, but the feathers of most parts with indistinct light edgings; no sign of a clean collar, under parts dull gray, browner on the breast. Rocky Mts. to the Pacific, U. S. and British Columbia, S. to Guatemala, common and of general but irregular distribution, chiefly in woodland, and especially where acorns, upon which it largely subsists, can be procured; sometimes in flocks of great extent. Nest very slight and frail, in trees and bushes, rarely on the ground; eggs 2, on our southern border only one as a rule, equal-ended, white, glistening, averaging 1.60×1.15 , ranging from 1.75×1.20 down to 1.45×1.10 , laid in almost every month of the year, and said to be sometimes carried about by the ♀.

C. f. vios'cæ. (To Mr. Viosca, U. S. Consul, La Paz, Lower California.) **VIOSCA'S PIGEON.** Similar to *C. fasciata*, but with the tail-band wanting or only faintly indicated, the general coloration lighter and more uniform, the vinaceous tints, especially, being more or less replaced by bluish-ash. Lower California. BREWST. Auk, Jan. 1888, p. 86; COUES, Key, 4th ed, 1890, p. 904; A. O. U. List, 2d ed. 1895, No. 312 a.

C. flaviros'tris. (Lat. *flavirostris*, yellow-billed; *flavus*, yellow; rostrum, beak.) **RED-BILLED PIGEON.** Adult ♂: Head, neck, and breast dark purplish wine-red, with a slight glaucous overcast, like the bloom on a grape; no metallic scales on neck. Middle wing-coverts like the head. Middle of back, and some inner wing-quills, dark olive-brown with a bronze-green gloss. Greater wing-coverts, lining of wings, sides of body, belly, crissum, and rump, slate-colored, sometimes quite sooty, sometimes more bluish; tail like rump, but more blackish, quite uniform, having no lighter or darker bands. Quills of wing dark slate with narrow pale edging. Bill pink for basal half, rest pale horn-color; feet purplish-red, with pale claws; eye-ring red; iris orange. Bill and feet drying an undefinable color. Bill remarkable for forward extension of feathers on culmen, to within 0.50 of tip, covering nasal scale. Length 13.50–14.50; extent 23.00–25.00; wing 7.50–8.00; tail 5.00–5.50; tarsus 0.87; middle toe and claw 1.50. ♀ and young similar, duller, and more dilute in color, the wine-red and slate-color more ashy. Central America, Mexico, Lower California, N. to Texas, New

Mexico, and Arizona; a dark, richly colored Pigeon, common in the valley of the Lower Rio Grande during most of the year. Nest in trees and bushes, of twigs, grasses, and roots, well-formed for a Pigeon's; egg single, in all instances observed in the U. S., equal-ended, glistening white; averaging 1.55×1.10 ; laid mostly in April, May, but also irregularly in other months. (*C. erythrina* of previous editions of the Key—a name I used to avoid saying "flavirostris" for a bird whose bill is not yellow, though the red may fade to a dingy yellowish in dried skins.)

C. leucocephala. (Gr. λευκός, *leucos*, white; κεφαλή, *kephalē*, head.) WHITE-CROWNED PIGEON. Adult ♂ ♀: Dark slaty, paler below, the quills and tail-feathers darkest. Whole top of head pure white; hind neck above rich maroon-brown, lower down and laterally metallic golden-green, each feather black-edged, giving the appearance of scales. Bill and feet dark carmine or lake red, tip of former bluish-white; bill drying dusky with yellowish tip, feet dingy yellowish. Iris yellow or white. Length 13.00–14.00; extent 23.00; wing 7.50; tail 5.75. ♀ only duller than ♂. West Indies and Florida Keys. Nest in trees and bushes, of twigs, roots, and grasses; eggs 2, white, 1.45×1.05 .

C. squamosa. (Lat. *squamosa*, scaly; *squama*, a scale.) SQUAMOUS PIGEON. Adult ♂: Head, neck, and breast rich vinous; no white on head; sides of neck metallic violet, each feather distinctly edged with velvety maroon; general plumage dark plumbeous, scarcely paler below; quills with narrow light edgings; tail dark slate; bill lake red, tipped with yellowish white; bare skin round eyes dull red with a yellowish bloom; iris with scarlet inner and golden outer ring; feet lake red; claws dark horn color. Length about 14.00; wing 8.50; tail 6.00; bill 0.62; tarsus 1.08. ♀ similar, rather smaller and duller. Young: brown, with rufus chestnut tips of the feathers. West Indies, except Jamaica and Bahamas; casual at Key West, Florida, one specimen, adult ♀, Oct. 24, 1898 (Auk, July, 1899, p. 272). *C. corensis*, TEMM. 1813, nec JACQ. 1784. *C. squamosa*, BONN. Tabl. Ency. Meth. i, 1790, p. 234.

ECTOPISTES. (Gr. ἐκτοπιστής, *ektopistes*, a wanderer; very appropriate.) PASSENGER PIGEONS. Tail long, equal to wings, emeate, of 12 tapering acuminate feathers, parti-colored.

Wing acutely pointed by first 3 primaries, with black spots on coverts. Bill small, with culmen less than half the head, short gonyes, feathered far forward between the rami. Tarsi short, feathered part way down in front, where scutellate, but not in one regular row of scales. Lateral toes unequal. Sexes unlike.

E. migratorius.

(Lat. *migratorius*, migratory. Fig. 482.) PASSENGER PIGEON. WILD PIGEON. Adult ♂: Upper parts, including head all around, slaty-blue, bright and pure on head and rump, shaded with olivaceous-gray on back and wings; back and sides of neck glittering with golden and violet iridescence; wing-coverts with velvety-black spots. Below, from throat, light purplish-chestnut, paler

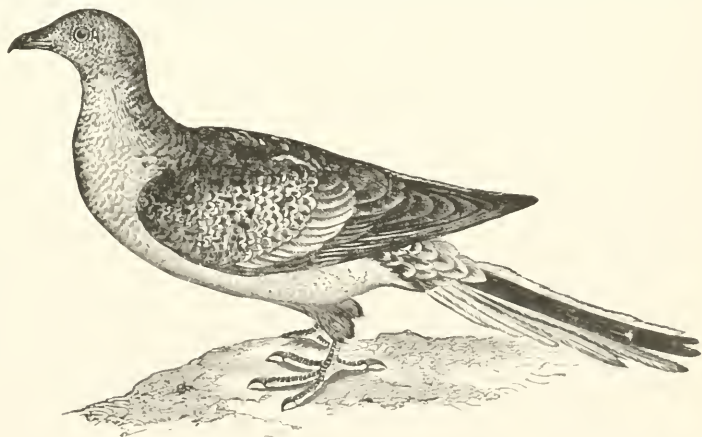


FIG. 482. — Passenger Pigeon. (From Tenney, after Wilson.)

behind and fading into white on lower belly and crissum. Tibiæ, sides of body, and lining of wings like upper parts. Quills blackish, with rufous-white edging. Two middle tail-feathers blackish; others fading from pearly-bluish into white, their extreme bases with black and chestnut spots. Bill black; feet lake red, drying an undefinable color; iris orange; skin about eye red. Length about 17.00, but very variable, according to development of tail; extent 23.00-25.00; wing 8.00-8.50; tail about the same, the lateral feathers graduated rather more than half its length; bill 0.75; tarsus 1.00; middle toe and claw, 1.25. Adult ♀: Upper parts, wings, and tail, as in ♂; below, brownish-gray, fading posteriorly. Young: Like ♀, but still duller; little or no clear slaty except on rump; plumage varied with white crescentic edges of the feathers, especially on back and wings; quills edged about with rufous; most of the lateral tail-feathers gray. "Wanders continually in search of food throughout all parts of North America; wonderfully abundant at times in particular districts;" chiefly, however, woodland of North America, E. of the Rocky Mountains, casually only W. of them. We do not now have the millions that the earlier writers speak of in the Eastern United States; and no contract for service has for many years included a clause that the hireling should not be fed too often on wild Pigeons or salmon; but I remember one great flight over Washington, D. C., when I was a boy, about 1858, and I witnessed in 1873 another, of countless thousands, on the Red River of the North; the greatest roosts and flights we now (1897) hear of are in the upper Mississippi Valley, though some of the birds may still breed in various wooded places all along our northern border and northward to Hudson's Bay. The Wild Pigeon seems now a passenger to happier hunting-grounds than it or the Indian has ever found in this country, in the wake of the bison and the fur seal; it has been often subjected to merciless and almost wanton destruction by hundreds of thousands at a single roost in a single season; and if it is not entirely exterminated soon, it will be only because there are too few left to pay for persecution. Nest in trees and bushes, usually a slight frail platform of twigs, so open as to leave the egg visible from below. Eggs 1 or 2, equal-ended, 1.45 × 1.05.

Subfamily ZENAININÆ: Ground Doves.

Feet larger than in *Columbinæ*. Tarsus lengthened to exceed lateral toes, entirely naked and scutellate in front (scarcely feathered in *Scardafella*). Tail-feathers normally 12, rarely 14 or more (*Zenaidura* the only North American Pigeon with more than 12). Seven North American genera, each (excepting *Geotrygon*) of a single species in this country. (The name of the subfamily may preferably be changed to *Peristerinæ*, for the reason that the generic name *Peristera* antedates *Zenaida*.)

Analysis of Genera.

Tail of 14 feathers, long and wedge-shaped	<i>Zenaidura</i>
Tail of 12 feathers.	
Outer primary attenuate, bistoury-like	<i>Egyptilia</i>
Outer primary normal.	
Tail longer than wing, double-rounded	<i>Scardafella</i>
Tail about equal to wing. Tarsus not shorter than middle toe and claw	<i>Geotrygon</i>
Tail shorter than wing Tarsus shorter than middle toe and claw.	
No blue-black spot nor metallic lustre on head or neck	<i>Columbigallina</i>
A blue-black spot and metallic lustre on head or neck.	
Black spots and no white patch on wing	<i>Zenaida</i>
White patch and no black spots on wing	<i>Melopelia</i>

ENGYPT'ILA. (Gr. ἔγγυς, *eggus*, narrow, straitened; πτελον, *ptilon*, feather; alluding to the outer primary.) **PIN-WING DOVES.** First primary abruptly emarginate, attenuate and linear near the end. Wings of moderate length; 3d and 4th primaries longest; 1st shorter than 7th. Tail much shorter than wings, rounded, of 12 broad feathers. Tarsus entirely naked, equalling

or rather exceeding middle toe and claw. Lateral toes nearly equal, ends of their claws reaching about opposite base of middle claw. Hind toe shortest of all, but perfectly incumbent. Bill small and slender, much shorter than head. A considerable naked space about eye, thence extending in a narrow line to bill. Size medium or rather small. Body full and stout. Coloration subdued, but hind-head and neck iridescent. No metallic spots on wing or head. Lining of wings chestnut. (Only North American genus with attenuate outer primary.) (*Leptotila*? Sw. 1837, correctly *Leptotila* G. R. GRAY, 1841, antedated by *Leptoptilos* LESS. 1831, a genus of Storks; the fact that Swainson misspelled it does not justify its use by the A. O. U. for this genus of Pigeons, for it is just as much preoccupied in its wrong form as it is in its right form, in either case being identically the same word as *Leptoptilos*. *Engyptila* SUNDB. Tent. 1873, p. 156, and of 2d-4th editions of the Key: I had overlooked this name when I proposed *Æchmoptila* in 1878. *Homoptila* SALVAD. 1871.)

***E. fulviventris brachyptera*.** (Lat. *fulvus*, fulvous; *reuter*, belly. Gr. *βραχύς*, *brachus*, short; *πτερόν*, *pteron*, wing. Fig. 483.) WHITE-FRONTED DOVE. Adult ♂: Upper parts

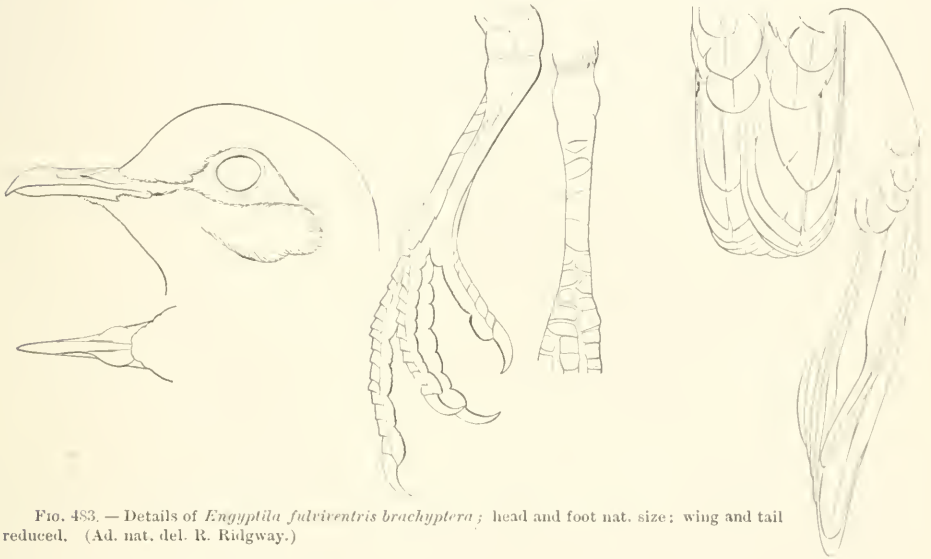


FIG. 483. — Details of *Engyptila fulviventris brachyptera*; head and foot nat. size; wing and tail reduced. (Ad. nat. del. R. Ridgway.)

brownish-olive, with silky lustre (much as in *Coccyzus americanus*, for example). Hind-head, nape, and back and sides of neck with coppery-purplish iridescence. Top of head of a bluish or glaucous "bloom," fading to creamy-white on forehead. Under parts dull white or whitish, more or less shaded with olive-brown on sides, deepening on fore-breast and jugulum to pale vinaceous; belly, crissum, and chin quite purely white. Wing-coverts and inner quills like back, and without metallic spots; other large remiges slaty-blackish, with very narrow pale edging toward the end. Under wing-coverts and axillaries bright chestnut. Two middle tail-feathers like back; others slaty-black, tipped with white in decreasing amount from the outer ones inward, the largest white tips about 0.50 in extent. Bill black. Feet carmine-red. Iris yellow. Bare skin around eye red and livid blue. Length 12.00-12.50; extent 19.00-19.50; wing 6.00-6.30; tail 4.25-4.50; bill 0.60-0.70; tarsus 1.25-1.35; middle toe and claw rather less. ♀ similar, duller everywhere, and especially less iridescent on the neck. Central America and Mexico to the Lower Rio Grande of Texas, where it is found during most of the year, and is known to breed. Nest in a bush, large for a Pigeon's, of sticks, twigs, and weed-strips; eggs 2, creamy or pale buffy white, 1.22 × 0.72. This bird was added to our fauna by

Sennett (COUES, Bull. Nutt. Club, July, 1877, p. 82). It has an extremely unfortunate synonymic record. Besides all the trouble with the generic name (see above), it bears the following: *Peristera brachyptera* G. R. GRAY, 1856, a bare name having no standing till used as *Leptoptila brachyptera* by SALVADORI, in 1893, for the stock species. *Leptoptila albifrons*, of authors, not of BP., whose bird turns out to be another species. *Æchmoptila albifrons* COUES, 1878. *Engyptila albifrons* COUES, Key, 2d-4th eds. 1884-90, p. 567; RIDGW. Man. 1887, p. 214; A. O. U. List, 1886, No. 318. *Leptoptila fulviventris* LAWR. 1882, and *Engyptila fulviventris* LAWR. 1885, being the earliest names given with a description to the stock form from Yucatan, and our bird being a subspecies of that, it becomes *fulviventris brachyptera*; and this phrase, coupled with the misspelled generic name that Swainson gave these birds in 1837, produces the strictly canonical miracle of *Leptotila fulviventris brachyptera* (SALVAD.), A. O. U. List, 2d ed. 1895, No. 318.

ZENAIDURA. (*Zenaida*, nom. propr., and οὐρά, *oura*, tail.) PIN-TAIL DOVES. Tail long, about equalling wings, cuneate, of 14 narrow, tapering, obtuse-ended feathers (unique among North American *Columbidae*). Wings pointed; 2d primary rather longest, 1st and 3d about equal and scarcely shorter. Tarsus naked, scutellate in front, in length intermediate between middle and lateral toes; latter of unequal lengths, outer shortest. Bill much shorter than head, slender and weak, the feathers running out far between the rami. A bare circumorbital space. Velvety black spots on head and wings. Lining of wings not rufous. Sexes unlike. There is a curious mimicry of *Ectopistes* in form and even in color; but the technical characters are widely different.

Z. macrura. (Gr. μακρός, *makros*, long, and οὐρά, *oura*, tail. Fig. 484.) CAROLINA DOVE. MOURNING DOVE. TURTLE DOVE. WILD DOVE. Adult ♂: Upper parts, including middle

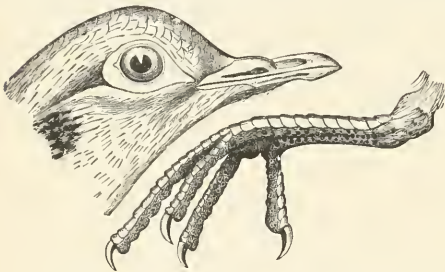


FIG. 484. — Carolina Dove, nat. size. (Ad. nat. del. E. C.)

tail-feathers, grayish-blue shaded with brownish-olive; head and neck ochrey-brown overlaid with glaucous blue; sides of neck glittering with golden and ruby iridescence; a violet-black spot under ear-coverts. Under parts glaucous-purple, changing gradually to ochraceous on belly and crissum, to bluish on sides and under wings, to whitish on chin; the purplish tint spreading up on sides and front of head to blend with the glaucous-blue. Black spots on some of the scapulars and wing-coverts, most of which are colored to correspond with back, the larger ones being rather bluish-plumbeous. Lateral tail-feathers plumbeous-bluish, crossed with a black bar, the outer 4 on each side broadly ended with white. Bill black; angle of mouth carmine; iris brown; bare skin around eye livid bluish; feet lake-red, drying dull yellowish. Length about 12.50; extent about 18.00; wing 5.75; tail the same, the feathers graduated for $\frac{1}{2}$ its length; culmen 0.60; tarsus 0.80; middle toe and claw 1.00. Adult ♀: A little smaller, not purplish below, the rich color replaced by grayish-brown, like back but paler; head and neck with little glaucous blue shade, and less iridescent. Young: Like ♀; but at an early age the velvety-black spots and iridescence are wanting, and the general tone is quite gray; many feathers with whitish edging, as in the Wild Pigeon, with which not only the colors but the sexual and juvenile differences are thus closely correspondent. Temperate N. Am., N. to southern British provinces, most widely diffused of its tribe, abundant in most localities, in some swarming — “millions” in Arizona, for example. S. to the West Indies and Panama. Irregularly migratory, imperfectly gregarious; great numbers may be together, but scarcely in compact flocks; breeds throughout its North American range. Terrestrial rather than arboreal, almost always feeding on the ground; where very numerous, they become familiar, like Blackbirds in the

West. Nest in trees (usually low down), cactus or bushes, or on the ground or a cliff. Eggs 2, or only 1, white, equal-ended, averaging 1.12×0.82 ; 2 or even 3 broods in the South. During the mating season, where these birds are numerous, their cooing resonands on every hand. (*Z. carolinensis* of former editions of the Key, as of most authors, after *Columba carolinensis* LINN. 1766, based on CATESBY, pl. 24, 1754; *C. marginata* LINN. 1766, based on EDWARDS, pl. 15, 1750; *C. macroura* LINN. 1758, in so far as based on EDWARDS.)

ZENAÏDA. (A proper name, that of Zénaïde, cousin and wife of Prince C. L. Bonaparte.) LOVE DOVES. Tail rounded, shorter than wings, of 12 feathers. Wings long, pointed by 2d and 3d quills; 1st little shorter. Bill short, slender, black. Feet as in other *Zenaidinæ*; tarsus intermediate in length between middle and lateral toes; those of unequal length, inner a little the longer. Circumorbital space little bare. Metallic iridescence on neck; blue-black ear-spot, and others on wings. Sexes similar. (West Indian and Tropical American.)

Z. zenai'da. ZENAIDA DOVE. Adult ♂ ♀: Olive-gray with a reddish tinge; crown and under parts vinaceous-red; sides and axillars bluish; a velvety-black subauricular spot, and others on wing-coverts and tertiaries; secondaries tipped with white; neck with purplish metallic lustre; middle tail-feathers like back, others bluish with whiter tips, a black band intervening; bill black with crimson corners of mouth; iris brown; feet red; claws black. Length 10.00–11.00; wing 6.00; tail 4.00. West Indies, Yucatan, and Florida Keys, the latter irregularly, and only as a rare summer visitor, but breeding. Nest usually on the ground; eggs 2, white, 1.25×0.95 . (*Z. anabilis* of former editions of the Key, as of most authors; *Columba zenaida* BP. 1825. According to SHARPE, II. L. 1898, p. 76, this is *C. meridionalis* LATH. 1801, wrongly ascribed to "New Holland." Cf. SALVAD. Br. Mus. Cat. xxi, 1893, p. 641; Forbes & Robins., Bull. Liverp. Mus. i, p. 36.)

MELOPÉLI'A. (Gr. μέλος, *melos*, melody; πτεία, *pteia*, a dove.) WHITE-WINGED DOVES. Tail rounded, shorter than wing, of 12 broad, rounded feathers. Wings pointed; 1st, 2d, and 3d primaries nearly equal and longest. Bill slender and lengthened, equalling tarsus, black. A large bare circumorbital space. A blue-black spot below auriculars, but none on wings; neck with metallic lustre. A great white space on wing. Feet as in other *Zenaidinæ*. Sexes similar.

M. leucop'tera. (Gr. λευκός, *leucos*, white; πτερόν, *pteron*, wing.) WHITE-WINGED DOVE. SINGING DOVE. Adult ♂: Wing with a broad white bar oblique from carpal joint to ends of longest coverts, continued by white edging at and near ends of outer webs of secondaries; very conspicuous, recognizable at gun-shot range. Lower back and rump, some of the middle coverts, lining of wings, and entire under parts from breast, fine light bluish-ash. Primaries blackish with narrow white edging. Tail, excepting two middle feathers, slaty-blue, becoming gradually slaty-black, then broadly and squarely tipped with ashy-white. General color of back, lesser wing-coverts, inner quills, and middle tail-feathers, olive-brown with some lustre; tail-feathers browner; top of head and back of neck purplish-vinous with a slight glaucous shade; sides of neck iridescent with golden-green; a violet or steel-blue spot below auriculars. Bill black, very slender. Length 11.25–12.25; extent 19.00–20.00; wing 6.00–6.50; tail 4.00–4.50; bill 0.87; tarsus 0.87; middle toe and claw 1.25. ♀ scarcely distinguishable, though duller. In the youngest, the white wing-bar appears, though there is little or no purplish, or iridescence, or blue-black below ears. Florida, Texas, New Mexico, Arizona, and Lower California, and southward to Central America, and the West Indies; sometimes N. to Colorado (COUES), breeding anywhere along our southern border, and abundant in suitable localities. In the breeding season, March–June, the sonorous cooing of this *Paloma cantador*, as the Mexicans call it, is incessant. Nest in bushes and low trees, slight and frail, of sticks and weeds; eggs 2, rarely 1, white or creamy, averaging 1.18×0.88 , or a trifle more.

COLUMBIGALLI'NA. (Lat. *columba*, a dove, pigeon, and *gallina*, a hen; *gallus*, a cock.) DWARF DOVES. Very small. Wings short and broad, with elongated inner secondaries,

nearly overreaching primaries in the folded wing. Tail still shorter than wing, nearly even, of 12 broad feathers. Bill slender, about half as long as head, mostly yellow. Feet largely zenaidine; tarsus as long as middle toe without claw. No iridescence nor blue-black spot on head; such spots on wings. Sexes unlike, but *Arcades ambo*. (*Chamæpelia* of most writers, and in all previous editions of the Key; but unfortunately the miserable word *Columbigallina* BOUÉ, Isis, 1826, p. 977, is forced upon us by the law of priority, in spite of the fact that the original "Columbigalline" of the mendacious Le Vaillant was a fictitious African bird, made up of a tame pigeon artificially fitted with caruncles, later type of the bogus genus *Verulia*: cf. SUND. Tent. 1873, p. 98, and COUES, Auk, 1897, p. 215.)

C. passerina terrestris. (Lat. *passerina*, sparrow-like; from the pygmy stature: Lat. *terrestris*, terrestrial, of the ground; *terra*, the earth, land. Fig. 485.) GROUND DOVE. Adult ♂: Grayish-olive, glossed with blue on hind head and neck, most feathers of fore-parts with darker edges, those of breast with dusky centres. Forehead, sides of head and neck, lesser wing-coverts and under parts purplish-red of variable intensity, paler or grayish on belly and crissum; under surface of wings orange-brown or chestnut, this color suffusing quills to a great extent; upper surface of wings sprinkled with lustrous steel-blue spots. Middle tail-feathers like back, others plumbeous, blackening toward ends, with paler tips. Feet yellow; bill yellow with dark tip. Diminutive: length 6.50-7.00; extent 10.00-11.00; wing 3.50, with inner secondaries nearly as long as primaries: tail 2.75, rounded; bill 0.45; tarsus 0.67; middle toe and claw 0.75. ♀ and young differ as those of the Wild Pigeon and Carolina Dove do, the purplish tints being replaced by gray or "ashes of roses," the very young bird having whitish skirting of the feathers. South Atlantic and Gulf States, breeding from S. Carolina to Louisiana, chiefly coastwise; N. accidentally to Washington, D. C., and New York; also West Indies and northern South America; common on its U. S. range. Nest on the ground or in bushes indifferently; eggs 2, white, 0.87 × 0.63, mostly laid March to June, in some cases through the summer and early autumn. (*Chamæpelia passerina* of all former eds. of the Key.)

C. p. pallescens. (Lat. *pallescens*, bleaching.) MEXICAN GROUND DOVE. Scarcely different; described as paler. Cape St. Lucas, BAIRD, 1859; range since extended to include the Mexican border of the U. S. from Lower California to Texas, and S. coastwise in Mexico to Central America. This form, which I have kept in all editions of the Key, 1872-95, was ignored by most writers for many years, but has lately been recognized as *Columbigallina passerina pallescens*: A. O. U. List, 2d ed. 1895, No. 320 a; see Key, 4th ed. 1890, p. 903.

SCARDAFELLA. (Italian, signaling the scaly appearance of the feathers, due to their color.) SHELL DOVES. Tail of peculiar shape, double-rounded, median and lateral feathers both shorter than intermediate ones; all narrow and tapering: 12 in number. Wings as in *Columbigallina*. Bill very slender, rather long, black. Feet not typically zenaidine; tarsus very short, slightly feathered above. No blue-black spots on head or wings; no iridescence on neck. Size very small. Sexes similar. Remarkable genus, of 2 tropical American species, one reaching our border.

S. inca. (*Inca* or *ymcas*, a Peruvian title.) INCA DOVE. SCALED DOVE. Adult ♂ ♀: Above, grayish-brown with the usual olive shade, anteriorly also with a slight "ashes of roses" hue; below, pale ashy-lilac, changing to ochraceous on belly and crissum — nearly all the plumage marked with black crescentic edges of the feathers, producing the shelly or scaly appearance, which becomes indistinct on the breast. Primaries and their coverts chestnut, with blackish ends; lining of wings black and chestnut; outer secondaries blackish with chestnut central areas, gradually diminishing till the inner secondaries assimilate with color of back. Middle tail-feathers like back; 3 lateral ones basally plumbeous, then black, then broadly tipped with white — the black running out into the white as a shaft-line. Iris reddish; feet pale pink. Young similar, but with little or no ashy-rosy, and sprinkled with white on upper parts. Length about 8.00; wing 3.75; tail more; bill 0.45; tarsus 0.50; middle toe and

claw 0.87. A very pretty little Dove, with mahogany wings upholstered in shell-figured ashen-of-roses velvet; a curious miniature of the Carolina Dove in form. Guatemala and Mexico to



Pls. 484. — Ground Dove.

Texas, New Mexico, Arizona, and Lower California, in the U. S. chiefly along the border, where common in some places, but irregularly distributed, breeding May-September. Nest in bushes, fairly well built; egg 2, white, 0.90×0.70 to 0.85×0.65 .

GEOTRYGON. (Gr. γέα, *gea*, the earth; τρυγών, *trugon*, a cooer.) LUSTRE DOVES. Tail about as long as wings, little rounded, of 12 broad rounded feathers, with curved shafts. Wings short, rounded; 3d and 4th quills longest, 2d and 4th little shorter, 1st much shorter. Feet strongly zenaidine; tarsus not shorter than middle toe and claw; still, scutellate in front, and hind toe more than half as long as the middle, perfectly insistent. Bill rather long and stout; frontal feathers obtuse on culmen. Head and wings without blue-black spots; whole upper parts highly lustrous. Medium size; form stocky, somewhat quail-like, but tail long. Sexes similar. Approaching *Starnæus*, but at a distance. West Indian and Tropical American.

G. chry'sia. (Gr. χρυσίον, *chrusion*, a piece of gold.) KEY WEST DOVE. BRIDLED DOVE. Adult ♂ ♀: Above, vinaceous-red with highly iridescent lustre of various tints, amethystine on the back, but greenish on the nape; below, pale purplish fading to creamy; wings and tail mostly cinnamon; a white infra-ocular stripe, and below this a dark malar stripe, bill red;

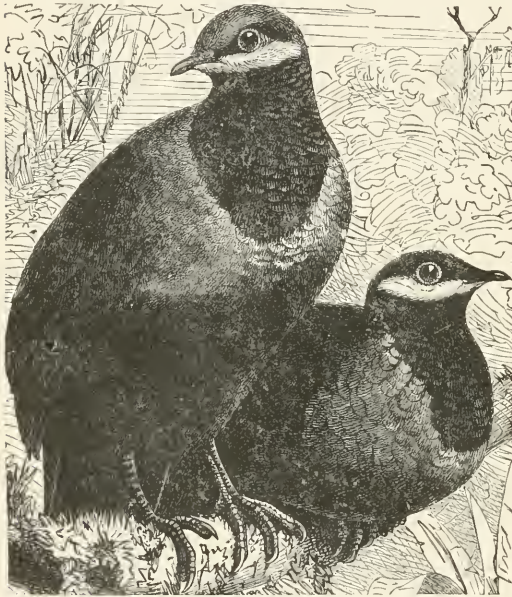


FIG. 486. — Blue-headed Quail Dove, $\frac{1}{2}$ nat. size. (From Erehm.)

feet pink; iris brown. Length 11.00; wing about 6.00; tail about 5.00. Cuba, Haiti, the Bahamas, and Key West, Florida, where only once observed of late (Sept. 15, 1889. See SCOTT, Auk, Jan. 1890, p. 90), though seeming to have been common in Audubon's time. Nesting as described, not peculiar; eggs 2, pale buff, 1.25×0.95 , laid Feb.-July (in Cuba). *G. martinica* of former editions of the Key, as of most authors; A. O. U. Check List, 1st ed. 1886, No. [322.]; but the bird which visits Cuba proves to be the somewhat different *G. chry'sia* Bp. Consp. ii, 1854, p. 72; SALVAD. Cat. B. Brit. Mus. xxi, 1893, p. 571; A. O. U. Suppl. List, Auk, Jan. 1897, p. 126, No. [322.].

G. monta'na. (Lat., inhabiting mountains.) RUDDY DOVE. MOUNTAIN DOVE. Adult ♂ ♀: Closely resembling *G. chry'sia* (and *G. martinica*); less brilliantly amethystine, and of nearly or

quite uniform tint over all the upper parts, which may be called purplish-rufous; under parts similar, not paling to creamy or white on the throat and vent, but to tawny buff; no white infra-ocular bar, but two poorly defined dark stripes on each side of the throat and head. Young dark brown with an olive cast above, and usually some rusty markings, more rufous and buffy on the lower parts; quills more extensively dusky than in the adults. Smaller than *chry'sia* and *martinica*: wing under 6.00; tail under 4.00. Eggs 1.10×0.85 , rounded oval, pale creamy or salmon buff. A long and well-known inhabitant of tropical and subtropical America, including the West Indies, N. to E. Mexico and Cuba, taken at Key West, Florida, Dec. 8, 1888: see SCOTT, Auk, April, 1889, p. 160, and July, 1889, p. 246. *Columba montana*, LINN. 1758; *Geotrygon Montana*, Bp. Consp. Av. II, 1854, p. 72; COUES. Key, 4th ed. 1890, p. 904; A. O. U. List, 2d ed. 1895, No. [322. 1.].

Subfamily STARNENADINÆ: Quail Doves.

See p. 709. Hallux not perfectly insistent; short, only about $\frac{1}{2}$ as long as middle toe and claw. Feet large and stout; tarsus longer than middle toe, entirely bare of feathers even on the joint, completely covered with small hexagonal scales. With cæca, but without oil-gland or ambiens muscle, the reverse of *Zenaidura*, of which it is a remarkable outlying form, grading toward gallinaceous birds in structure and habits; like some Partridges, even to the special head-markings. Including one isolated American genus and species, not referable to any established Old World group.

STARNENAS. (*Starna*, name of a genus of partridges; Gr. οὐνάς, *anas*, a dove.) **QUAIL DOVES.** In addition to the foregoing: Bill short, stout; frontal feathers projected in a point on culmen. Wings short, broad, vaulted and much rounded; 1st primary reduced. Tail short, broad, nearly even. Size medium; whole form and appearance quail-like. West Indian.

S. cyanocephala. (Gr. κυανός, *kyanos*, blue; κεφαλή, *kephale*, head. Fig. 486.) **BLUE-HEADED QUAIL DOVE.** Crown rich blue bounded by black; a white stripe under eye, meeting its fellow on chin; throat black, bordered with white. General color olivaceous-chocolate above, purplish-red below, lighter centrally. Length 11.00; wing 5.50; tail 4.50. Cuba; Florida Keys, rare or casual, and not observed there of late years; apparently also decreasing in Cuba. Nest in bushes, April and May; eggs 2, white or buffy, 1.40 × 1.05.

Order GALLINÆ: Gallinaceous Birds; Fowls.

Equivalent to the old order *Rasores*, exclusive of Pigeons — this name being derived from the characteristic habit of scratching the ground in search of food; connecting the lower terrestrial Pigeons with the higher members of the great Plover-Snipe group. On the one hand, it shades into the *Columbæ* so perfectly that Huxley has proposed to call the two together the "Gallo-columbine series;" on the other hand, some of its genera show a strong plover-ward tendency, and have even been placed in *Limicola*. I have already (p. 706) noted the insensation of *Gallinæ* with *Columbæ* by means of the grouse-like Pigeons, *Pterocletes*; it remains to indicate the limits of *Gallinæ* in other directions, by referring to two remarkable groups, one represented by *Opisthocomus* alone, the other consisting of Hemipods or *Turnices*. Both of these have usually been wrongly referred to *Gallinæ*.

1. The wonderful Hoatzin of Guiana, *Opisthocomus cristatus*, is one of the most isolated and puzzling forms in ornithology, sometimes placed near *Musophagida*, but assigned by maturer judgment to the neighborhood of the fowls, which it resembles in many respects, as an independent order **OPISTHOCOMI**, sole relict of an ancestral type. The sternum and shoulder-girdle are anomalous; the keel is cut away in front; the furcula ankylose with the coracoids (very rare) and with the manubrium of the sternum (unique); the digestive system is scarcely less singular; the clawed digits persist separate for some time; and other characters are remarkable. On the whole, this bird suggests the Jurassic *Archaeopteryx*, and some have hinted at a primary division of living *Aves* for its sole accommodation.

2. The Bush-quails or Button-quails of the Old World, *Turnicidæ*, differ widely from *Gallinæ*, resembling Grouse-pigeons and Tinamous in some respects, and related to Plovers in others. A singular character is a lack of the extensive vertebral ankyloses usual in birds, all the vertebrae remaining distinct. The palatal structure is curiously like that of *Passeres* (agithognathous). The crop is said to be wanting in some; as is also the hind toe (except in *Pediornis*), and one carotid. The nature is pitlopadic and precocial; eggs 3-5, spotted.

There are some 20 species of the wide-ranging principal genus, *Turnix*, and the single Australian *Pedionomus torquatus*. The singular *Ortyxelus meiffreni* is ranged here by some authors, by others referred to the *Limicola*. Late studies of the group have resulted in the view that it should represent a distinct order, HEMIPODII or TURNICES.

Elimination of these non-conformable elements renders the *Gallinæ* susceptible of much better definition, as follows :—

Bill generally short, stout, convex, with obtuse vaulted tip, not constricted in continuity, wholly hard and corneous except in the nasal fossa. Tomia of upper mandible overlapping lower; culmen high on forehead, the frontal feathers there forming a re-entrance, with more or less salience on both sides. Nostrils sealed or feathered, in a short abrupt fossa. Legs usually feathered to suffrago, often to toes, sometimes to claws. Hallux never absent, elevated (except in *Cracidae* and *Megapodidae*), normally shorter than anterior toes. Tarsus generally broadly scutellate, when not feathered. Front toes commonly webbed at base. Claws blunt, little curved. Wings short, strong, vaulted. Rectrices commonly more than 12 (not more in *Cracidae*). Head and brain small in proportion to body, as in Pigeons. Plumage with after-shafts. Wings quincuncubital. Oil-gland tufted, nude, or absent. Carotids two (except in *Megapodidae*). No intrinsic syringeal muscles as a rule. Sternum generally deeply doubly-notched, external xiphoid process flaring out over the ribs, its end expanded; furculum with a hypocleidium. Palate schizognathous. Nasal bones holorrhinal. True basipterygoid processes absent, but represented by sessile facets situated far forward on the basisphenoidal rostrum. Angle of mandible produced into a recurved process. Cervical vertebræ 16. Pectoral muscles 3; the 2d extensive: femoro-caudal variable; accessory femoro-caudal, semitendinosus, accessory semitendinosus, ambiens and expansor of the secondaries present. Feet desmopelmous in the usual way. Intestinal cæca extensive; gizzard muscular; crop large; gall bladder present. Nature præocial and ptilopædic, typically polygamous; eggs numerous. Chiefly terrestrial.

The order thus defined is equivalent to *Alectoromorphæ* of Huxley (1867), minus *Pterocletes* and *Hemipodii*. The birds composing it fall into two series or suborders, according to structure of feet and more essential characters.

SUBORDER PERISTEROPODES: PIGEON-TOED FOWLS.

(Suborder PENELOPES, A. O. U.)

Framed to accommodate Old World *Megapodidae*, or Mound-birds, and American *Cracidae*, or Curassows.

The Mound-birds, *Megapodidae*, as the name implies, have large feet, with little-curved claws, and lengthened insistent hallux. They share this last feature with *Cracidae* (beyond); and the osseous structure of these two families, except as regards pneumaticity, is strikingly similar. Both show a modification of the sternum, the inner one of the two notches being less instead of more than half as deep as the sternum is long, as in typical *Gallinæ*. The oil-gland is nude (tufted in *Cracidae*). The wing is quincuncubital (contrary to the rule in *Gallinæ*). Megapods do not incubate, but bury their eggs in the ground; the young pass through the downy stage in the egg, hatching with true feathers and able to fly almost immediately (p. 232). They are confined to Australia, Oceania, and the East Indies; *Megapodius* is the principal genus, of 12 or more species; others are *Leipoa ocellata* of Australia; *Talegallus euvieri* and other Papuan species; *Catheturus lathamii* of Australia; the Papuan *Æpypodius bruijnii* and *Æ. arfakianus*; with *Megacephalon malco*, the mallee-bird of Celebes.

Family CRACIDÆ: Curassows, Guans, etc.

This type is peculiar to America, where it may be considered to represent *Megapodidæ*, though differing so much in habit and general appearance. The affinities of the two have been indicated, and some essential characters noted; they are contrasted by Beddard in the characters of the shorter hind toe, tufted oil-gland, two carotids, generally coiled trachea, and absence of biceps slip, in *Cracidæ*. According to latest authorities on the family, it is divisible into three subfamilies: *Cracinae*, Curassows and Hoceos, with 4 genera, *Crax*, *Nothocrax*, *Mitua*, and *Pauxis*, whereof the first named has 10 species, the second one, the third three, and the fourth one, or 15 altogether; *Oreophasinae*, with a single genus and species, *Oreophasis derbianus*, and the

Subfamily PENELOPINÆ: Guans,

with 6 or 7 genera and many species, one of which reaches our border. None of the *Penelopinae* are helmeted, or have other hard outgrowths or curly feathers on the head, but they are mostly wattled, with more or less of the throat bare; in all, the inner web of the 1st primary is more or less emarginate. Extralimital genera are *Penelope*, *Penelopina*, *Pipile*, *Aburria*, and *Chamaepetes*.

ORTALIS. (Gr. *ὀρταλῖς*, *ortalis*, a pullet.) GUANS. Head crested; its sides, and strips on chin, naked, but no median wattle. Tarsi naked, scutellate before and behind, with small scales between the scutellar rows. Hind toe insistent, about $\frac{1}{3}$ the middle toe. Tail graduated, ample, fan-shaped, longer than the much rounded wings, of 12 broad, obtuse feathers. Wings short, concavo-convex, with abbreviated outer primaries; secondaries reaching about to ends of longest primaries when the wing is folded. Bill slender for a gallinaceous bird, without decided frontal antia. Coloration greenish. Sexes alike. In some points of size, shape, and general aspect, there is a curious superficial resemblance between this genus and *Geococcyx*, though the two genera belong to different orders of birds.

O. ve'tula maccalli. (Lat. *retula*, a little old woman. To Geo. A. McCall.) TEXAN GUAN. CHACHALACA. Dark glossy olivaceous, paler and tinged with brownish-yellow below, plumbeous on head; tail lustrous green, tipped with grayish-white except on middle pair of feathers; bill and feet plumbeous; iris brown. Length 22.00-24.00; extent 24.00-28.00; wing 7.50-9.00; tail 9.00-11.00; tarsus 2.00 or more; middle toe and claw about the same. ♀ similar. Downy young: Above, mixed brown, ashy and tawny, with a black central stripe from bill to tail; below white, ashy on jugulum. Mexico to Texas in the Lower Rio Grande Valley, abounding in some localities. A notable bird, unlike anything else in this country. Easily domesticated, said to be used as a game fowl. Very noisy in the breeding season, April-June, reiterating the syllables *chu-cha-luc* in a loud hoarse tone. Nest in bushes, a slight structure: eggs 3-4, rarely 5, with a thick, granular, and very hard shell, like a Guinea Fowl's, oblong-oval, buff-colored or creamy-white, large for the bird, averaging 2.35×1.65 .

SUBORDER ALECTOROPODES: TRUE FOWLS.

(Suborder PHASIANI, A. O. U.)

The birds of this suborder are more or less perfectly terrestrial: legs of mean length, and stout; toes 4, 3 in front, generally connected by basal webbing but sometimes free, and one behind, always short and elevated. Tibiæ rarely naked below; tarsi often feathered, as the toes also sometimes are; but ordinarily both these are naked, scutellate and reticulate, and often developing processes (*spurs*) of horny substance with a bony core, like horns of cattle. Bill as a rule short, stout, convex, obtuse; never cored, nor extensively membranous; the base of culmen parts prominent antia, which frequently fill the nasal fossæ: when naked the nostrils show a superincumbent scale. The head is frequently naked, wholly or partly, and often

develops remarkable fleshy processes. The quintoecubital wings are short, stout, and concavo-convex, conferring power of rapid, whirring, but unprotracted flight. The tail varies extremely; it is very small in some genera, enormously developed in others; the rectrices vary in number, but are commonly more than 12. The sternum shows a peculiar conformation; the posterior notches seen in most birds are inordinately enlarged, so that the bone, viewed vertically, seems in most of its extent to be simply a narrow central projection or keel, the lophosteon, with two long processes on each side, the inner one of which is simply directed backward, but the other is flaring and hammer-shaped. There are other distinctive osteological characters, as already noted. The digestive system presents an ample special crop, a highly muscular gizzard, and large cæca. The inferior larynx is always devoid of intrinsic muscles; the structure of the trachea varies with the genera, presenting some curious modifications. There are after-shafts, and a circle around the oil-gland. *Alectoropodes* are præcocial and pilopædic. A part of them are polygamous — a circumstance shown in its perfection by the sultan of the dung-hill with his disciplined harem; and in all such, the sexes are conspicuously dissimilar. The rest are monogamous, and the sexes of these are as a rule nearly or quite alike. The eggs are very numerous, usually laid on the ground, in a rude nest, or none. The suborder is cosmopolitan; but most of its groups have a special geographical distribution. Its great economic importance is perceived in all forms of domestic poultry, and principal game-birds of various countries; and it is unsurpassed in beauty — some of these birds offer the most gorgeous coloring of the class.

Genetically, Fowls are nearer than most birds to a generalized, old-fashioned type. They have relations in the curiously ostrich-like Tinamous of South America (*Tinamidae* or *Crypturi*), the Hoatzin (*Opisthocornis*), and other antique relicts. Notice a quarter-grown Turkey with this idea in mind, and you will hardly fail to see that it looks like an Ostrich in miniature.

Leading types of existing Alectoropod *Gallinæ* are: (1) the Quail or Partridge; (2) the Grouse; (3) the Domestic Coek; (4) the Turkey; (5) the Guinea Fowl; respectively the bases of the families (1) *Perdiciidæ*, (2) *Tetraonidæ*, (3) *Phasianidæ*, (4) *Melagruidæ*, (5) *Numididæ*. Quail or Partridges, and Grouse, are indigenous to both hemispheres; the Pheasant family is confined to the Old World, but some species have been introduced and naturalized in the United States; Turkeys are peculiar to America. Guinea Fowl or Pintados are an African and Madagascarian family, of which one species, *Numida meleagris*, is commonly seen in domestication. There are 6 species of this genus, in some of which the trachea is convoluted in an appendage of the fœculum; the frontal bone develops a process to support a fleshy process on the head, which is naked, wrinkled, and bristly; the very short tail has 16 feathers, and is carried downward; there are wattles, but no spurs. *Guttera* is the genus of crested Pintados, spurless, with 16 rectrices; there are 4 species, as *G. cristata*. *Phasidus niger* is the Black Guinea Fowl, with 14 rectrices, the ♂ with blunt spurs. *Agelastes meleagrides* has also spurs and 14 rectrices. In the remarkable *Acryllium vulturinus* the tarsi of the ♂ bear several knobs, the long emneate tail has 16 rectrices, and the feathers of the neck resemble the hackles of the Domestic Coek. The Pintado family is characterized by a peculiarity of the principal metacarpal bone, which has no backward process, and by the outward inclination of the costal processes; it is thought by some to furnish a link between *Peristeropodes* and *Alectoropodes*. The other four families are fully treated beyond.

Family PHASIANIDÆ: Pheasants, etc.

The most magnificent family of typical *Gallinæ*, of which the Domestic Coek is a characteristic example. The tarsi and toes, the nasal fossæ, and usually some of the head, if not the whole, are naked, and often furnished with fleshy outgrowths, as combs, wattles, horns, ear-

lappets, dewlaps, etc.; some of these caruncular formations are of fixed size and shape; others are of a soft erectile tissue, which varies in dimensions with sexual excitement; in some cases there is a special bony support of such protuberance. The head is often crested with feathers of ordinary character, or again of special shape or texture. The tarsi commonly develop spurs, especially in the ♂, sometimes also in the ♀; these spurs are as a rule one on each foot, but may be two, three, or more. The feet are never feathered below the suffrago, excepting in some artificial varieties of the Domestic Cock. The claws are always fairly developed (that of the hallux is sometimes rudimentary or defective in *Perdicida*), and the most characteristic habit of these birds, as of other *Gallinæ*, is to scratch the ground for food; they are thus *rasorial*. The general plumage, though so often extremely brilliant, is rather dry and hard: the birds do not wash in water, but take sand-baths; whence *Pulveratores* as a name of their order. The wings are of moderately variable shape, only presenting an extraordinary figure in the Argus Pheasants, which have the secondaries enormously elongated. Excepting in the genus *Phasianus* itself, the 1st primary is short—shorter than the 10th; and this seemingly trivial character is probably the most satisfactory one that can be found to separate the *Phasianidæ* as a family from the *Perdicidæ* (see beyond under head of the latter family). The most variable member in *Phasianidæ* is the tail, which, taken either with or without its coverts, has an extraordinary development in many of the genera. Thus, in the Peacock, *Pavo cristatus*, the tail-coverts form a superb train, capable of being erected and spread into a disc, the most gorgeous object in ornithology; in the Argus Pheasants the middle rectrices are extremely elongate; in the Reeves' Pheasant the length of the tail is very great. The compressed or folded tail of domestic poultry is familiar, yet it is a rare formation, except in the present family. The number of rectrices is more variable than in any other family of birds, and even differs in opposite sexes of some species. These feathers run from 12 to 20 in most genera, but there are only 10 in *Ophrysia* (if really belonging here), while in *Lobiophasis* there are 28 ♀—32 ♂. In general the *Phasianidæ* are polygamous; the outward marks of sex are strong, as a rule, the female lacking any extraordinary development of plumage, the spurs, etc.; but in some cases the sexes are quite similar.

Phasianidæ belong exclusively to the Old World, and are specially numerous and diversified in Asia; the number of species now known is nearly 100, usually referred to about 45 genera.

Subfamily PHASIANINÆ: Pheasants,

including the Pea-fowl, the Domestic Cock, and all the birds to which the name Pheasant is properly applicable. It is only of late years that the richness of this group has been developed by the discovery of strange types in the interior of Asia and elsewhere. The subfamily has not hitherto figured in the Key; but more than one species of *Phasianus* has of late been introduced and naturalized in the United States; and in giving this genus a place I may note some of the leading types of the subfamily. At the head of the series, at least in size and showiness, stands the Peacock, *Pavo cristatus*, native of India, now domesticated all over the world. The true rectrices are only 20, the coverts forming the voluminous train of the ♂. *P. muticus* is the only other well-established species of *Pavo*. *Argusianus* is the genus of Argus Pheasants of two or three species from the Malay countries, etc., with the inordinately long secondaries and middle tail-feathers of the ♂, and much of the plumage eyed. *Rhinhardtius ocellatus* of Tonkin shares the long tail of the last named, but not the exaggerated secondaries; in both, the rectrices are 12. The several species of *Polyplectron*, widely distributed in the Orient, have two or three spurs on each foot in the ♂, and ocellated tail feathers, 20–24 in number: *P. chinquis* and *P. bialecuratum* are examples. The genus *Chalcurus*, of one Sumatran species, is related to these, but lacks ocelli, and the tail is very long, as in ordinary Pheasants. The genus *Gallus* includes the Jungle-fowl, from which the familiar cock and

hen of the poultry yard have been developed in all their astonishing variation under artificial conditions. Were these normal, they would constitute several good genera. The technical generic characters are the peculiarly folded tail of 14–16 feathers, the hackles of the neck and rump, the spurs, wattles, and comb. The established wild species are 4: *G. gallus*, *bankiva*, or *ferrugineus*, *G. lafayettei*, *G. sonnerati*, and *G. varius*; they are wide ranging in Asia and many of its islands, and the first named is supposed to be the main origin of our poultry. The Macartneys are several species of the genus *Lophura*, with the 16-feathered tail compressed as in *Gallus*, a peculiar crest, and spurs; the plumage is extremely brilliant, as in the fire-backed Pheasant, *L. ignita*. This is the genus oftener called *Euplocomus*; one of its species, *L. diardi*, is the type of *Diardigallus*. The Painted or Golden and Amherstian Pheasants, *Chrysolophus pictus* and *C. amherstiae*, are singularly beautiful birds, even among their showy kind, having a long vaulted tail of 18 feathers, and in the ♂ a full crest, a peculiar erectile cape or frill on the neck, and a pair of spurs; they are often seen in confinement, far from their Tibetan and Chinese homes. The Pueras are six or more Asiatic species of the genus *Pucrasia*, as *P. macrolopha* with long eumate tail of 16 feathers, and in the ♂ a long crest, besides peculiar ear-tufts, and a pair of spurs. *Pucrasia nipalensis* is the type of a genus *Gallophasis*, and one of several species which share with some of the members of *Gennæus* the name of Kallege or Kalij Pheasant. The genus *Gennæus*, usually called *Nycthemerus*, includes the Silver Pheasant *G. nycthemerus*, mostly white above and black below, with a pair of spurs, a crest, and long compressed tail of 16 feathers; others are the white-crested *G. albocristatus*; the Nepal Pheasant, *G. leucomelanus*; Sylhet Pheasant, *G. horsfieldi*; Pheasant related to these, if not The Cheer or Wallich's Pheasant related to *Phasianus* proper. In is peculiarly long and loose, with and full rounded tail of 20–24 5, *C. tibetanum*, *C. leucurum*, *C.* habit high mountains, and are of all Pheasants is the lately discovered *Lobiophasis bulweri* of Borneo, the ♂ of which has three pairs of fleshy lappets on the head, a pair of spurs, and 32 rectrices — 28 in the ♀. In the three species of *Acomus*, the short compressed tail has 14 rectrices, and there are spurs in both sexes; *A. erythropthalmus* is Malayan, *A. pyronotus* inhabits Borneo, and *A. inornatus* is Sumatran. The refulgent Impeyans or Monauls constitute the genus *Lophophorus*, with a moderate rounded tail of 18 feathers, and a slender aigrette on the head, like a Peacock's; such are *L. impeyanus* of Cashmere, *L. refulgens* of the Himalayas from Bhotan to Afghanistan, *L. Phuyisi* of Szechuen and Kokonor, and finally *L. (Chalcophasis) sclateri* of Assam. In the curious Satyrs, constituting the



Fig. 487. — English Pheasant, *Phasianus colchicus*. (From Dixon.)

the Chittygong Pheasant, *G. muthura*; the the Lineated, *G. lineatus*, etc. A Formosan of the same genus, is *Hierophasis swinhoci*. is *Catreus wullichi*, of the Himalayas, closely the genus *Crossoptilon* of interior Asia the plumage curly feathers on the head, ear-tufts, a pair of spurs, feathers; of these Eared Pheasants the species are *mantchuricum*, *C. auritum*, and *C. harmani*; all in-called Snow Pheasants. One of the most remarkable discovered *Lobiophasis bulweri* of Borneo, the ♂ of which has three pairs of fleshy lappets on the head, a pair of spurs, and 32 rectrices — 28 in the ♀. In the three species of *Acomus*, the short compressed tail has 14 rectrices, and there are spurs in both sexes; *A. erythropthalmus* is Malayan, *A. pyronotus* inhabits Borneo, and *A. inornatus* is Sumatran. The refulgent Impeyans or Monauls constitute the genus *Lophophorus*, with a moderate rounded tail of 18 feathers, and a slender aigrette on the head, like a Peacock's; such are *L. impeyanus* of Cashmere, *L. refulgens* of the Himalayas from Bhotan to Afghanistan, *L. Phuyisi* of Szechuen and Kokonor, and finally *L. (Chalcophasis) sclateri* of Assam. In the curious Satyrs, constituting the

rump and upper tail coverts plain greenish slate-color; tail with broad black bars throughout. Length about $2\frac{1}{2}$ feet; tail $1\frac{1}{2}$; wing 9.50 inches. ♀ smaller; length 2 feet or less; tail

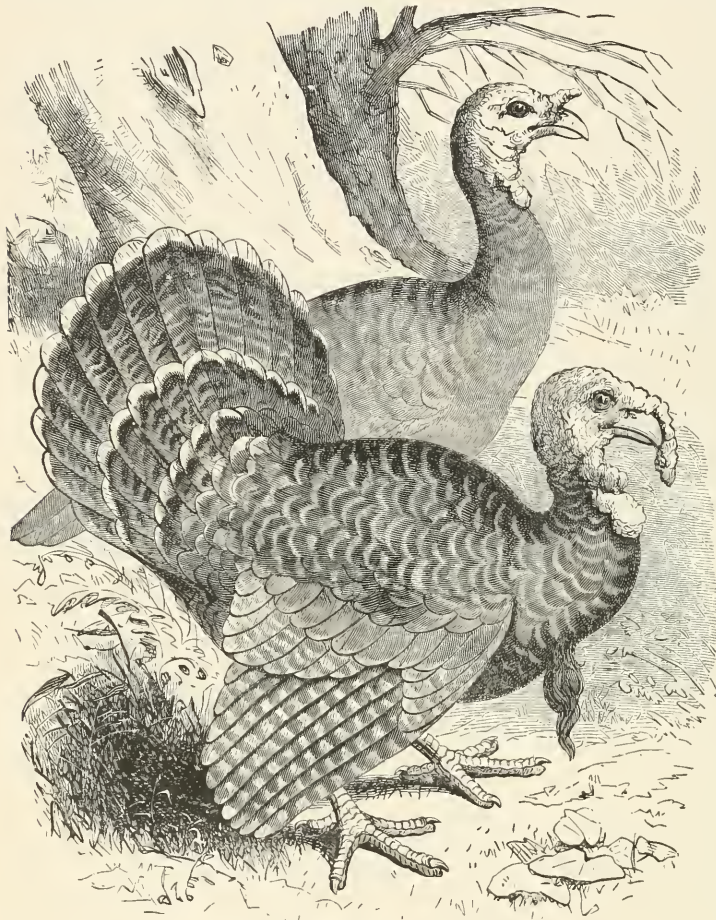


FIG. 488. — Turkey. (From Lewis.)

under 1 foot; wing 8.00 inches; feathers of back with black centres and usually buff shaft-stripes; those of under parts mostly black-barred. Japan; lately introduced and apparently naturalized in Oregon.

P. sømmer'ingi. (To the noted German anatomist and physiologist, Samuel Thomas von Sömmering, Jan. 18, 1755–March 2, 1830.)

COPPER PHEASANT. SÖMMERING PHEASANT. Adult ♂: Above, including head and neck, chestnut, shot with purple and gold; rump streaked with white; tail chestnut, tipped with black, the middle feathers barred throughout with darker chestnut, black, and light mottling, the three kinds of marking in regular series; the chestnut feathers of under parts with pale margins; primaries and secondaries blackish, mottled and margined irregularly with rufous. Length 3 or 4 feet; tail $2\frac{1}{2}$ –3 feet; wing 9.00 inches. Adult ♀: Much smaller; length about $1\frac{1}{2}$ feet; wing and tail about 8.50 inches; coloration lighter and more varied than in the ♂; most of the tail-feathers plain chestnut with subterminal black bar and white tip. A large handsome Pheasant, the ♂ very long-tailed and short-winged; native of some of the Japanese islands, lately introduced and apparently naturalized in Oregon.

Family MELEAGRIDIDÆ: Turkeys.

Head and upper neck naked, carunculate; in our species with a dewlap on the throat, and erectile process on the crown. Tarsi naked, scutellate before and behind, spurred in the ♂. Tail broad, rounded, of 14–18 feathers. Plumage compact, lustrous; in our species with a

tuft of hair-like feathers hanging on the breast; most of the feathers remarkably broad or even truncate. One genus, two species, peculiar to America. *M. ocellatus* is the very beautiful Turkey of Central America, especially Yucatan and Honduras, smaller than ours, but much more richly iridescent and eyed on some of the plumage like a Peacock; there is no bristly beard on the breast; the excrescences on the head are peculiar; the spurs of the ♂ are long and sharp, like gaffs. Its characters entitle it to recognition as a subgenus at least, if not a full genus, which may be named *Eumeleagris*.

MELEAGRIS. (Gr. *μελεαγρίς*, Lat. *meleagris*, a Guinea-fowl; transferred in ornithology to this genus.) **TURKEYS.** Characters of the family. Sexes similar in plumage, but ♀ less lustrous, smaller, and spurless. Nest on ground; eggs indefinitely numerous, colored.

M. gallopavo. (Lat. *gallus*, a cock, *pavo*, a pea-fowl. Figs. 488, 489.) **THE TURKEY. DOMESTIC TURKEY. MEXICAN TURKEY.** Upper tail-coverts chestnut, with very pale or

whitish tips; tail-feathers tipped with brownish-yellow or whitish; 3-4 feet long, etc. Weight of ♂ up to 30 lbs. or more, though averaging much less; ♀ about 12 lbs. Wild in western Texas, Colorado, New Mexico, Arizona, and southward; domesticated elsewhere. The Mexican bird is the original of the domestic race: it was upon this form, imported into Europe, that Linnæus imposed the name *gallopavo* (Fu. Succ. 1746, p. 198; Syst. Nat. i, 1758, p. 156; 1766, p. 268), which has generally been applied to the ordinary feral form. It is hard, therefore, to understand why ornithologists so long persisted in perpetuating the old error of calling



FIG. 489. — Mexican Turkey. (From "Game Birds of North America," by D. G. Elliot.)

this bird *M. gallopavo mexicana*. Granted that the Linnæan species was a composite, including all the kinds of Turkeys the Swede ever saw or heard of, the case was not altered thereby. For when the alleged composite came to be divided into its several forms, the common wild bird of eastern North America was the first to receive a distinctive name, thus restricting the Linnæan *gallopavo* to the Southwestern and Mexican form renamed *mexicana* by Gould, P. Z. S. 1856, p. 61. I repeatedly set forth the facts in this case, the two forms having stood correctly identified and named in the Key since 1872. *Mexicana* GOULD is a pure synonym of *gallopavo* LINN., as restricted by Bartram, Vieillot, and others,

and as such has no standing in ornithology. *Meleagris gallopavo mexicana* A. O. U. Lists, 1886-95, No. 310 *a*, has therefore been changed to *Meleagris gallopavo* A. O. U. Suppl. List, Jan. 1899, No. 310. See for example OGILVIE-GRANT, Cat. B. Brit. Mus. xxii, 1893, pp. 387-390, where the synonymy is given for all the forms of the genus; and especially COUES, The Turkey Question, Auk, July, 1897, pp. 272-275.

M. g. intermedia. (Lat. intermediate: *inter*, between, and *medius*, middle. Fig. 490.) TEXAN WILD TURKEY. RIO GRANDE TURKEY. Intermediate between the foregoing and



FIG. 490. — Elliot's Rio Grande Turkey. (From "Game Birds of North America," by D. G. Elliot.)

the following form; ends of the upper tail-coverts buff or somewhat rufous. Eastern Texas and southward. *M. gallopavo* and *M. mexicana* of authors referring to the Turkey of the Lower Rio Grande valley. *M. gallopavo* var. *intermedia* SENN. Bull. U. S. Geol. Surv. v, No. 3, 1879, p. 428; name later changed by Mr. Sennett to *M. g. ellioti*, Auk, April, 1892, p. 167, pl. 3; A. O. U. List, 2d ed. 1895, No. 310 *e*. Changed back to *intermedia*, Auk, Jan. 1899, p. 108, No. 310 *e*. **M. g. fe'ra.** (Lat. *fera*, wild. Fig. 491.) COMMON WILD TURKEY OF EASTERN NORTH AMERICA. Upper tail-coverts without light tips, and ends of the tail-feathers scarcely paler. This is the ordinary wild bird, having the ends of the feathers in mention rich

chestnut or maroon brown; furthermore, the fleshy frontal finger and the dewlap never show the enormous development they usually acquire in the domestic *gallopavo* proper. Eastern U. S. from some of the Middle States, and also from southern Ontario, S. to the Gulf coast, W. to the edge of the Great Plains, in the wooded extensions up streams, S. W. to some parts of Texas; formerly N. E. to Maine, but long since extirpated from all New England; formerly N. W. in the Missouri region to North Dakota; lately extirpated from that state, South Dakota and Nebraska, and become rare in Kansas and Missouri; still abundant in the Indian Territory and some parts of Texas, in different areas of which great State the present and both the preceding occur. The present northern limits of distribution include some portions of Pennsylvania, Ohio, Indiana, Illinois, probably southern Ontario, Michigan, Wisconsin, and Minnesota. This Turkey inhabits woodland, and is resident wherever found; breeds Feb.-June, mostly in April and May. Eggs 10-14 or more, ordinarily a

devil's or a baker's dozen (11-13), creamy or buff, pretty regularly and uniformly spotted or speckled in fine pattern with chocolate and reddish-brown, rarely neutral tints; size averaging 2.45×1.85 . *M. gallopuro*, wholly or in part, of authors: A. O. U. Lists, 1886-95, No. 310. *M. americana* BARTR. Trav. 1791, p. 290; *M. g. americana* COUES, Key, all editions. *M. g. occidentalis* ALLEN, Bull. Nutt. Orn. Club, i, 1876, p. 55. *M. palawa* BARTON, Med. and Phys. Journ. ii, 1805, p. 163. *M. fera* VIEILL. Nouv. Dict. ix, 1817, p. 447 and Gal. ii, 1825, p. 10; *Gallopuro sylvestris* LE CONTE, Pr. Phila. Acad. 1857, p. 179, thus reverting to BRISSON, Orn. i, 1760, p. 162, and CATESBY, 1730; *M. sylvestris* ELLIOT, Gall. Game Birds, 1897, p. 176. I make no point of insistence upon the availability of either of the Bartramian names, *americana* and *occidentalis*, though Allen has used the latter; but some

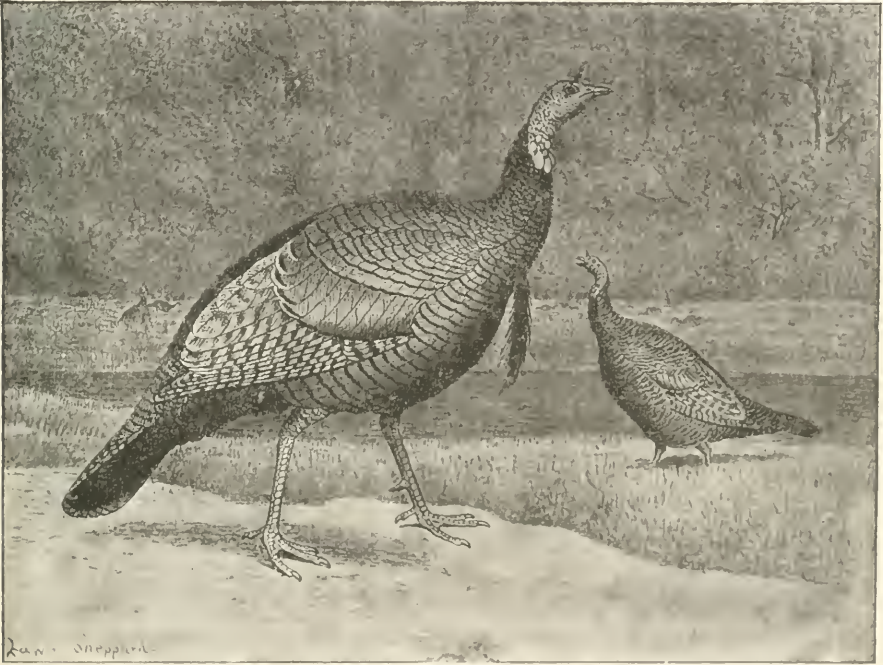


FIG. 491. — Wild Turkey. (From "Game Birds of North America," by D. G. Elliot)

name must be applied to this bird. Failing both the Bartramian ones for any reason, the next in order of date is *palawa* BARTON: failing which for any reason, the next is *fera* VIEILL. 1817, adopted by the A. O. U. at my instance, see Auk, Jan. 1899, p. 77 and p. 107; No. 310 a. of the Suppl. List, exchanging numbers with the stock form.

M. g. osceola. (Name of the famous Seminole Indian chief, b. in Georgia, 1801, d. prisoner at Fort Moultrie, S. C. Jan. 30, 1838. Fig. 492.) FLORIDA WILD TURKEY. Like the last: tips of upper tail-coverts somewhat paler, as in *intermedia*, but dark bars on the primaries in excess of width over the light ones. Southern Florida. *M. occidentalis* BARTR. Trav. 1791, p. 83 (Florida). *M. g. osceola* SCOTT, Auk, 1890, p. 376. A. O. U. No. 310 b.

ONS. — Before proceeding to the families *Tetraonidae* and *Perdidae*, it may be well to remark that the vernacular names "pheasant," "partridge," and "quail," as applied to our game birds in different sections of the country, are the cause of endless confusion and misunderstanding, which it seems hopeless to attempt to do away with in popular apprehension. (1) The

word "pheasant" (derived from the name of the river Phasis in Colchis) belongs to certain Old World *Phasianidæ* (see above; and fig. 487), having no indigenous representatives in



FIG. 492. — Florida Wild Turkey. (From "Game Birds of North America," by D. G. Elliot.)

called "partridge." (3) The term "quail" is specially applicable to the European Migratory or Messina Quail, *Coturnix dactylisonans* or *C. coturnix*. But this resembles our Bob-white not distantly, causing the latter to be called "quail" in the sections where the Ruffed and Spruce Grouse are called "partridge;" and in the Southwest, the species of *Callipepla*, *Lophortyx*, *Oreortyx*, and *Cyrtonyx* are universally called "quail."

America. But early settlers of this country applied it to the Ruffed Grouse, *Bonasa umbellus* — and "pheasant" is the Ruffed Grouse called to this day by the common people of the Middle and Southern States, after the bad example set by Edwards, who originally named it "Pheasant from Pennsylvania" in 1754. (2) "Partridge" is an old English word, specifically designating the English *Perdix cinerea*, then enlarged in meaning to cover all the family *Perdixidæ* (see beyond). In the Northern States, both the Spruce Grouse, *Canachites canadensis*, and the Ruffed Grouse, are commonly called "partridge." In the Middle and Southern States — wherever the Ruffed Grouse is called "pheasant" — the Bob-white, *Colinus virginianus*, is

Family TETRAONIDÆ : Grouse.

Head completely feathered, excepting, usually, a naked strip of skin over eye. Nasal fossæ densely feathered. Tarsi more or less perfectly feathered, the feathering sometimes extending on toes to claws; toes, when naked, with horny fringe-like processes, or pectinations. No spurs ever developed. Tail variable in shape, but never folded, nor very long, of 16-20, rarely 22, feathers. Sides of neck frequently with lengthened or otherwise modified feathers, or a bare distensible skin, or both. Plumage for the most part of subdued coloration, in which the browns and grays prevail; sometimes black or white, never brilliant, as in most *Phasianidæ*. Sexes similar or subsimilar; monogamy the rule. Nest slight or none, on the ground.

Eggs numerous, colored. The family thus characterized is the best defined division of the *Gallinæ*. It has been customary to include the Partridges and Quails in a family *Tetraonidæ*, then separated into *Tetraoninæ* for the Grouse, and one or more subfamilies for the Partridges, etc. Such was the arrangement in former editions of the Key, still kept up by the A. O. U. But the latest monographer of the *Gallinæ*, OGLIVIE-GRANT, has taught us better; and I alter my earlier scheme accordingly. There is no exception to the characters of *Tetraonidæ* as here drawn; and only two or three equivocal genera of *Perdicidæ* connect the two families. (See under *Perdicidæ*, beyond.)

The true Grouse are confined to the northern hemisphere, and reach their highest development, as a family, in North America, where singularly varied forms occur. All species of this family used to be referred to a single genus *Tetrao* — the only generic name familiar to sportsmen and others who make no technical study of birds. But such must not be surprised to find me discarding this well-known name, and adopting several different ones as generic designations of our Grouse, which differ much among themselves, in points of form and structure, and are all widely diverse from such as "*Tetrao*" *urogallus* or *Tetrao tetrrix*, both of Europe. The latter is now made type of the Linnæan genus *Tetrao*, upon the "principle of elimination" in restricting the old names of heterogeneous genera, adopted by the A. O. U. — a method of procedure in which I fully concur. *T. tetrrix* is the "black game" of Europe; the ♂ has curiously curled tail-feathers, 18 in number, producing a lyre-shaped tail, whence the synonym *Lyrurus* for this genus. There is a second species, *T. mlkosiewiczzi* — the bird's tail may resemble a lyre, but there is no music in its name! The genus *Urogallus* includes four species of Capercaillies, of Europe and Asia — *U. urogallus*, *U. uralensis*, *U. parvirostris*, and *U. kamtschaticus*. These are the largest Grouse, some two feet long, heavy-bodied, with 18-feathered tail. The sickle-winged species of *Falcipennis* represents our Canada Grouse in Siberia, and like it has 16 tail-feathers. Similarly our Ruffed Grouse is represented in Europe and Asia by three species of the genus *Tetrastes*, in which the ruffle is rudimentary, the tail has only 16 feathers, and the sexes differ more than they do in *Bonasa*; *T. bonasia*, *T. griseiventris*, and *T. severtsovi* compose this genus. The only one common to both hemispheres is *Lagopus*; the species of which, together with those of the other genera named in this paragraph, and those of North America now to be treated, compose the family *Tetraonidæ*.

Summary of North American TETRAONIDÆ — GROUSE, with feathers on the shank.

Sage Grouse: Sage Cock; Sage Hen; Cock-of-the-Plains. Western. One species: *Centrocercus urophasianus*.

Sharp-tailed Grouse: Pin-tail Grouse; Prairie Hen or Prairie Chicken of the Northwest. 1 species: *Pediocetes phasianellus*, with 2 subspecies.

Pinnated Grouse: common Prairie Hen or Prairie Chicken of the Mississippi, Ohio, and Lower Missouri valleys. 3 species: *T. cupido* (Martha's Vineyard); *T. americanus*, with a subspecies; *T. pallidicinctus*.

Tree Grouse: Spruce Grouse; Spotted Grouse; in the Northern States species improperly called "partridge." Two species: *C. canadensis*, Eastern: *C. franklini*, Western.

Dusky Tree Grouse: one species: *Dendragapus obscurus*, with 2 subspecies, all Western.

Ruffed Grouse: improperly called "partridge" in the Northern and "pheasant" in the Middle and Southern States. One species: *Bonasa umbellus*, of 2 or 3 subspecies.

Snow Grouse or *Ptarmigan*: boreal and alpine, turning white in winter. Several species or subspecies: as *Lagopus lagopus*, *L. rupestris*, *L. leucurus*, etc.

Analysis of N. Am. Genera of Tetraonidæ.

Tail stiff, pointed, wedge-shaped, equalling or exceeding wing, of 20 feathers; scaly and hair-like feathers on breast. Tarsi full-feathered. Very large. Western	<i>Centrocercus</i>
Tail stiff, pointed, wedge-shaped, much shorter than wing, of 18 feathers; no obviously peculiar feathers on neck. Tarsi full-feathered. Western and Northern	<i>Pediocetes</i>
Tail stiffish, rounded, much shorter than wing, of 18 feathers; wing-like tufts and great bare inflatable space on neck. Tarsi scant-feathered. Eastern and Western	<i>Tympanuchus</i>
Tail soft, rounded, about as long as wing, of 18 feathers; umbrella-like tufts on neck, but no obvious bare space. Tarsi bare below. Eastern and Western	<i>Bonasa</i>
Tail stiffish, flat, square, shorter than wing, of 16 feathers; no evidently peculiar feathers or obviously bare space on neck. Tarsi full-feathered. Eastern and Western	<i>Canachites</i>
Tail as in <i>Canachites</i> , but of 20 feathers; no evidently peculiar feathers on neck, but a bare inflatable space. Tarsi full-feathered. Western	<i>Dendragapus</i>
Tail, etc. as in <i>Canachites</i> . Tarsi and toes fully feathered. Boreal and alpine. White in winter	<i>Lagopus</i>

CANACHITES. (With formative suffix *-ites*, denoting agent or doer, from Gr. *καναχέω* or *καναχίζω*, *kanacheo* or *kanachizo*, I make a noise; *καναχός*, *kanachos*, or *καναχή*, *kanache*, a noise. Hence *Κανάκη*, *Kanake*, Lat. *Canace*, a proper name of the daughter of Æolus, formerly used for this genus.) **TREE GROUSE.** **SPOTTED GROUSE.** No obviously lengthened or otherwise peculiar feathers on neck or head. No obviously naked space on neck; but there is a piece of skin capable of some distension. A strip of bare colored skin over eye. No crest. Tarsi feathered to toes. Tail little shorter than wing, stiffish, nearly square, of broad, obtuse feathers, normally 16 in number (exceptionally 14 or 18, as an individual peculiarity). Of medium size, and dark blended colors, inhabiting woodland, like species of *Bonasa*, and quite arboreal; northerly and alpine, eastern and western. Sexes distinguishable. Eggs heavily colored. Meat of breast dark. (*Canace* of former eds. of the Key, preoccupied in entomology. *Canachites* STEJ. Pr. U. S. Nat. Mus. viii, Sept. 1885, p. 410, as a subgenus of *Dendragapus*, and so rated by the A. O. U. 1886-95; but given proper rank in A. O. U. Suppl. List, Auk, Jan. 1899, p. 107, after Ogilvie-Grant, Cat. B. Brit. Mus. xxii, 1893, p. 69, and ELLIOT, Gall. Game Bds. 1897, p. 202. The characters, especially the number of tail-feathers and the undeveloped neck-drums, are of the kind usually held to mark genera in this family.)

Analysis of Species.

Tail with broad orange-brown end, its upper coverts without white spots. Eastern	<i>canadensis</i>
Tail without orange-brown end, its upper coverts with white spots. Western	<i>franklini</i>

C. canadensis. (Of Canada. Fig. 493.) **CANADA GROUSE.** **BLACK GROUSE.** **SPOTTED GROUSE.** **SPRUCE GROUSE.** **WOOD GROUSE.** **SPRUCE "PARTRIDGE."** **CEDAR "PARTRIDGE."** **SWAMP "PARTRIDGE."** Adult ♂: Head smooth, but feathers susceptible of erection into a slight crest. A colored comb of naked skin over eye, bright yellow or reddish when fully injected. Tail slightly rounded, of 16 feathers, a scant inch broad to their very ends. Tarsi full-feathered to toes, which are naked, scaly, and fringed with deciduous pectinations which grow and are moulted periodically. Tail black, broadly tipped with orange-brown; its upper coverts without decidedly white tips, though they may be edged and tipped with gray. Under parts glossy black, extensively varied with white; under tail-coverts tipped with white; sides and breast with white bars or semicircles; white spots bounding throat; white spots on lore. Upper parts wavy-barred with black and gray, usually also with some tawny markings on back and wings, and white markings on scapulars and wing-coverts. In full feather, the appearance is of a black bird, grayer above, spotty with white below, and orange-brown tail-end. Length 15.00-17.00; wing 7.00; tail 5.50. Hen rather smaller than the cock. No continuous black below, where white and tawny, latter particularly on breast, nearly everywhere pretty regularly wavy-barred with blackish, and usually streaked with white on the flanks. Above, more like ♂, but browner. End of

tail more narrowly orange-brown, and most of the tail irregularly barred or mottled with buff, these markings tending to disappear with age. Pullets resemble the hen. Chicks in the down are buff, more brownish above and yellowish below, variegated with black spots and stripes on the head and rump; they resemble young Ptarmigan, but the toes are bare. N. Am., E. of the Rocky Mountains, northerly, in woodland; N. nearly or quite to limit of trees; N. W. to the Pacific in Alaska; S. into the northern tier of States, especially Maine, Michigan, Wisconsin, and Minnesota; casually to Massachusetts, more commonly to northern New York. It is a very hardy bird, enduring the rigors of sub-arctic winters, not properly migratory, and breeds throughout its regular range. It is especially a bird of coniferous woods, as spruce groves and tamarack swamps; its food is mainly buds, leaves, and berries of many different kinds. The cocks begin to strut and drum early in the spring, and the hens lay in May and June. Eggs numerous, 9-16, usually about a dozen, averaging 1.68×1.25 , though some run up to 1.90 in length; they are rather pointed, buff-colored, dotted, spotted, and boldly splashed with rich chestnut, and darker brown; the markings rarely obsolete. Shape and pattern of eggs more like those of Ptarmigan than of the prairie Grouse. *Canace canadensis* of former editions of the Key. *Dendragapus (canachites) canadensis*, A. O. U. 1886-95. *Canachites canadensis*, A. O. U. Suppl. List, Auk, Jan. 1899, p. 107, No. 298.



FIG. 493. — Canada Grouse, nat. size. (Ad. nat. del. E. C.)



FIG. 494. — Franklin's Grouse. (From "Game Birds of North America," by D. G. Elliot.)

markings on upper parts; ♀ in summer much more purely black, gray, and white, with little buff or ochraceous. Hamilton Inlet, northern Labrador. BANGS, Pr. N. Engl. Zool. Club, i, June 5, 1899, p. 47; Auk, Oct. 1899, p. 340.

EGGS numerous, 9-16, usually about a dozen, averaging 1.68×1.25 , though some run up to 1.90 in length; they are rather pointed, buff-colored, dotted, spotted, and boldly splashed with rich chestnut, and darker brown; the markings rarely obsolete. Shape and pattern of eggs more like those of Ptarmigan than of the prairie Grouse. *Canace canadensis* of former editions of the Key. *Dendragapus (canachites) canadensis*, A. O. U. 1886-95. *Canachites canadensis*, A. O. U. Suppl. List, Auk, Jan. 1899, p. 107, No. 298. **C. c. labradorius.** (Lat. of Labrador.) **LABRADOR SPRUCE GROUSE.** Like true *canadensis*; ♂ in summer with heavier white markings on under parts, and purer gray

C. franklini. (To Sir John Franklin, of Arctic fame and sorrow. Fig. 494.) FRANKLIN'S SPRUCE GROUSE. Size, shape, and whole appearance of the foregoing. Tail rather longer, more nearly even, with broader feathers; lacking terminal orange-brown bar; tipped narrowly with white, and its upper coverts broadly tipped with pure white, making upper side of tail conspicuously spotty. Rocky and other mountains of western U. S., northerly, in Montana, Idaho, Oregon, and Washington; N. to the sources of the Saskatchewan, Athabasca, and McKenzie Rivers in British America, and N. W. in the Pacific coast region through British Columbia to southern Alaska, about lat. 60°. It abounds in the huge nest of mountains which occupy most of Idaho, where it was discovered by LEWIS and CLARK in 1805, as described but not technically named by them in 1814; see COUES, History of the Expedition, ed. of 1893, p. 870. It was rediscovered in Oregon and Washington by David Douglas, who named it *Tetrao franklini* in Trans. Linn. Soc. xvi, 1829, p. 139; figured by Bonaparte, Am. Orn. iii, 1830, pl. 30; best figured by Swainson, F. B. A. 1831, pl. 61 ♂, 62 ♀. The difference from *C. canadensis* is parallel with that of *Dendragapus richardsoni* as compared with *D. obscurus*, but seem to be pushed to specific characters, as intergrades are unknown. In habits the counterpart of *C. canadensis*: eggs undistinguishable. This bird shares with some others the name "fool hen," given in consequence of their innocence, and the insouciance with which they permit approach so nearly that they may often be killed with a stick. (*Canace canadensis franklini* of previous eds. of the Key. *Dendragapus (canachites) franklinii*, A. O. U. Lists, 1886-95. *Canachites franklinii*, A. O. U. Suppl. List, Auk, Jan. 1899, p. 107, No. 299.

DENDRA'GAPUS. (Gr. δένδρον, *dendron*, a tree; ἀγαπᾶω, *agapao*, I love.) DUSKY GROUSE. Characters of *Canachites*, for the most part, but tail normally of 18-20 feathers, rarely 16 or 22, and a well-developed naked space on each side of the neck, ordinarily covered by a bunch of special feathers, but capable of inflation into a hollow drum or tympanum. Size large; wing over 8.00. Meat of breast dark. Eggs fewer than in *Canachites*, and less heavily colored. One Western species, with two subspecies.

Analysis of Subspecies.

Tail black, with distinct slate-colored end.

Under parts clear bluish-slate color. Rocky Mts., etc., southerly *obscurus*

Under parts sooty plumbeous. Alaska *fuliginosus*

Tail black, with indistinct or no slate-colored end. Rocky Mts., etc., northerly *richardsoni*

D. obscurus. (Lat. *obscurus*, dark.) DUSKY GROUSE. BLUE GROUSE. GRAY GROUSE. PINE GROUSE. PINE HEN. Old cock: Back and wings blackish-brown, finely waved and vermiculated in zigzag with slate-gray, mixed with more or less ochrey-brown and some white on scapulars. Long feathers of sides with white ends and shaft-stripes; other under parts fine bluish-gray or light slate color, varied with white, especially on lower belly, flanks, and vent-feathers. Cheeks black; chin and throat finely speckled with black and white. Though the lateral feathers of the neck are smooth and simple, forming no decided tufts as in *Tympanuchus* or *Bonasa*, they are somewhat enlarged, covering a naked tympanum: these feathers with snowy white bases and black tips. Tail brownish-black, veined and marbled with gray, and with a broad slate-gray terminal bar, 1.00-1.50 wide; normally of 20 feathers, broad to their very ends; tail as a whole slightly rounded. Bill black; iris brown-orange; comb over eye, and neck-drum yellow. Size very variable; well-grown cocks usually 20 or 22 inches, sometimes up to 2 feet long; extent of wings about 30 inches; wing 9 or 10; tail 7 or 8; weight up to 3½ lbs. Hen smaller; length 17 to 19 inches; wing 9 or less; tail 6 or less; coloration lighter, more extensively varied with white and tawny; but showing distinctive slate-gray of under parts, and slate bar at end of tail. Pullets like hen, but upper parts with hammer-headed white shaft-lines. Tail with white shaft-lines enlarged at end, also marked on some of the feathers with wavy blackish crossbars. Chicks in the down whitish below, above mixed

whitish and brownish, numerous spotted and streaked on the head and rump with blackish. A species of general dispersion in elevated and wooded, especially coniferous, regions of the West; S. to New Mexico and Arizona; in the Rocky Mts. northerly shading into *richardsoni* in Montana and Idaho, westerly into *fuliginosus*. A large cumbersome bird, usually displaying stolidity or indifference to the presence of man, taking to trees when disturbed, and very easily slaughtered; hence it is a "fool hen" in the idiom of the "wild and woolly West." Besides buds, leaves, and various berries, this Grouse feeds much on insects. Resident wherever found, breeding up to the timber-line; the rumbling mating process with much noise and fuss in spring: eggs laid in May and June. These are fewer in number than those of *Cana-chites*, generally 8 or 9, but from 7 to 10, or perhaps a dozen; larger, more elongated, and less heavily colored than those of Spruce Grouse and Ptarmigan; creamy-buff, finely freckled all over with chocolate-brown, seldom with any large spots: 2.00×1.40 . (*Canace* (*Dendragapus*) *obscura* of previous eds. of the Key. *D. obscurus* A. O. U.)

D. o. rich'ardsoni. (To Sir John Richardson.) RICHARDSON'S DUSKY GROUSE. Size, shape, and whole appearance of the foregoing. Tail rather longer, more nearly even, with broader feathers, having the terminal slate bar reduced or wanting; general color more uniformly darker; black of throat more extensive. Rocky Mts., northerly, U. S. and northward. It shades into *obscurus* proper in Idaho and Wyoming, into *fuliginosus* westward from this region, but keeps its own characters N. to the limit of its range in the interior of British America to about lat. 62° . (*Canace obscura richardsoni* of previous eds. of the Key. *D. obscurus richardsoni* A. O. U.)

D. o. fuligin'osus. (Lat. *fuliginosus*, sooty.) SOOTY GROUSE. With less broad slate tail-bar than *obscurus* proper, but colors darker than in *richardsoni* even. ♂ above, blackish, minutely freckled with gray and rusty-brown; below, dark plumbeous; usually no distinct white markings on scapulars or flanks. The hen is more different, with prevailing rich rusty and chestnut-brown markings. Northwest Coast mountains, California and Oregon to Sitka, Alaska, E. in the interior till it shades into *obscurus* in Nevada and Idaho, and into *richardsoni* in Idaho and British Columbia. Eggs indistinguishable from those of the foregoing, usually 8-10 in number, sometimes more, averaging 1.95×1.35 . (*Canace obscura fuliginosa* of previous eds. of the Key. *D. obscurus fuliginosus* A. O. U.)

CENTROCER'CUS. (Gr. *κέντρον*, *keutron*, a spine, prickle: *κέρκος*, *kerkos*, tail.) SAGE GROUSE. SPINE-TAIL GROUSE. Of great size. Tail very long, equalling or exceeding the wings, of 16-20 stiffened, narrow, acuminate feathers, much graduated in length. Neck susceptible of enormous distention by means of air-sacs covered with naked livid skin — not regularly hemispherical and lateral like those of *Dendragapus* and *Tympanuchus*, but forming a great protuberance in front, of irregular contour; surmounted by a fringe of hair-like filaments, several inches long, springing from a mass of erect white feathers; covered below with a solid set of sharp white horny feathers, like fish-seales. (The affair is not easy to describe in few words, especially as it is constantly changing with wear of the feathers, and is only fully exhibited by the cock during the amours. The anatomical arrangement for inflation is only a special exhibition of the air-sacs of other genera, as *Dendragapus*, *Tympanuchus*, and *Pediocetes*; the peculiarities of the feathers are the inherited results of habitual attrition, the birds rubbing the breast against the ground in their love-spasms; and, as said, the state of the parts is always changing with wear of the feathers. This accounts for the vague or conflicting statements of authors.) Tarsus feathered to toes. Digestive system remarkable for slight muscularity of the gizzard, which is rather a membranous paunch than a grist-mill; the bird browses rather than scratches for a living, feeding on wormwood and also extensively on insects. The food is by no means so exclusive as some have supposed, including many kinds of berries and seeds, and sometimes consisting mainly of grasshoppers. Sexes similar in color, unlike in size and to some extent in form. Meat of breast dark. Eggs dark in ground color, uniformly spotted. One prairie species, perfectly terrestrial.

C. urophasia'uus. (Gr. οὐρά, *oura*, tail; φασιανός, *phasianos*, a pheasant.) SAGE COCK. SAGE HEN. COCK OF THE PLAINS. Largest of American Grouse. Full-grown cock 2-2½ feet long; extent of wings 3 feet or more; wing and tail about a foot; weight upward of 4 pounds — up to 8 pounds. Hen a third smaller, weighing 3-5 pounds. Above, varied with black, gray, brown, and buff; below, chiefly white, with a large squarish black area on belly. To describe the peculiar neck-feathering of the old cock more particularly: On each side is a patch of feathers, meeting in front, with extremely stiff bases, prolonged into hair-like filaments about 3.00 in length; with the wearing away of these feathers in the peculiar actions of the bird in pairing-time, their hard horny bases are left, forming the "fish-scales" above said. In front of these peculiar feathers is the naked tympanum, capable of enormous inflation under amatory excitement. Above them is a tuft of down-feathers, covered with a set of long soft filamentous plumes corresponding to the ruff of *Bonasa*. Many breast-feathers resemble the scaly ones of the neck, and are commonly found worn to a bristly "thread-bare" state. Scaly bases of these feathers soiled white; thready ends blackish; fluffy feathers snowy-white, like wool, the longer overlying filamentous plumes glossy black. Chin and throat blackish, speckled with white ends of the feathers, usually presenting a definite white half-collar. Lining of wings white. Hen: Length about 21.00; wing 10.50; tail 7.00-8.50, of the same general character as the cock's, but softer, shorter, less cuneate, with more rapidly tapering feathers. A small tympanum, but no obviously peculiar feathers on neck. Coloration quite like that of the cock, excepting that the throat is not black. Pullet: No peculiar neck-feathers; tail beginning to show its special form; general coloration of the hen. Before the September moult, all feathers of upper parts with sharp white hammer-headed shaft-lines, and circular spotting of feathers of breast. Sooty belly-patch showing with first feathering. Chick in down altogether different from the dingy yellow chick of *Pediocetes*; below grayish-white, above grayish-brown mottled with black; bill black. This remarkable bird, quite a Roland for the Capercaille's Oliver, inhabits the sterile sage-bush plains of the West; an abundant and characteristic species of these forbidding regions, beginning with the eastern foot-hills of the Rocky Mts., S. into New Mexico and Arizona, sparingly N. to 49° or farther, in British Columbia and the Milk River region of southern Assiniboia and Alberta, in both of which provinces I have observed it. Not in Dakota east of the Coteau, or in the Missouri Basin much below the Yellowstone country. Its centre of abundance is the artemisia tracts of Colorado, Wyoming, Utah, Nevada, Idaho, eastern California, and Oregon. It straggles through the sage-bush, but I have seen packs of hundreds in the fall. In the breeding season its sonorous hullabaloo resounds on every hand where the birds are numerous; the trouble begins in some regions in February, and is kept up for a month or so; the laying season is protracted from the latter part of March through May. The flesh is edible or not, "as you like it." The behavior toward man varies with circumstances; sometimes the birds may almost be knocked over with a stick, at others it is difficult to get a shot. In walking, the tail is somewhat elevated, and swings sideways with each step. The flight is extremely vigorous, and at times greatly protracted, with wings so widely expanded that the tips of the primaries stand apart; the course rapid and steady when the bird is once fairly on wing, accomplished with a succession of quick energetic wing-beats, alternating with sailing with stiffly motionless wings until the impulse is spent. From the nature of its resorts the bird is exclusively terrestrial. The egg is narrower and more pointed than that of any other Grouse of our country, measuring from 2.05-2.35 × 1.50-1.60; average length 2.20; grayish or greenish-drab color, thickly speckled with chocolate-brown, mostly in minute dots evenly distributed, occasionally with well-defined spots up to size of a split pea, tending to circular shape. The number to a clutch is indefinite, but does not average over 9, though 12, 15, even 17 have been found in one nest.

PEDIE'CETES. (Gr. πεδίον, *pedion*, a plain; οἰκέτης, *oiketēs*, an inhabitant.) PIN-TAIL GROUSE. Neck without obviously peculiar feathers, like those either of the Pinnated or

Ruffed Grouse or Sage Cock, but with a hidden, definitely circumscribed space of reddish, vascular, and distensible skin on each side, constituting an undeveloped tympanum, over which lies a lateral series of slightly enlarged feathers. Head lightly crested; longest feathers of crown falling on occiput; a crescentic naked patch over each eye of numerous orange or chrome-yellow fringe-like processes, in several parallel curved rows. Feet full-feathered to between bases of toes, with long, hair-like plumage reaching to or beyond end of hind claw; toes above with one row of broad, transverse scutella, a row of smaller rounded scales on each side, and a conspicuous fringe of horny processes; below, bossed and scabrous. Tail much shorter than wings, normally of 18 true rectrices, of which the central pair are soft, parallel-edged and squar-tipped, projecting 1.00-2.00 beyond next pair; the rest rapidly graduated, stiffish, and crisp (making a creaking sound when rubbed together); at first about straight-edged, soon becoming club-shaped (with a constriction near apex) by mutual attrition. Sexes similar, but cock rather larger and darker than hen, with more prominent supra-ciliary papillæ. One species, of two or three subspecies, of prairie, perfectly terrestrial. (A. O. U. Lists, 1886-95 had *Pediocetes*, after a misspelling of BAIRD, 1858, corrected to *Pediocetes* BAIRD, 1858, and COUES, 1872; see COUES, Auk, Jan. 1884, p. 54; GILL, Auk, Jan. 1890, pp. 20-23; A. O. U. Suppl. List, Jan. 1899, p. 107.

Analysis of Subspecies

Northern Sharp-tailed Grouse. The markings black, white, and dark brown, with little or no tawny; spots on the under parts numerous, blackish, V-shaped; throat white, speckled. (Arctic America) *phasianellus*
Common Sharp-tailed Grouse. The markings black, white, and especially tawny; below, spots fewer, brown, U-shaped; throat buff. (U. S. and British Provinces) *columbianus* (and *campestris*)

P. phasianellus. (Diminutive of Lat. *phasianus*, a pheasant.) **NORTHERN SHARP-TAILED GROUSE.** As above, in comparison with the ordinary bird next described. Very dark-colored, in blackish and white variegation, with little buff, even in fall. Markings below heavier, in sharper, more arrow-headed shape, quite blackish. Feet very heavily feathered, almost like a Ptarmigan's. Interior of British America, E. to Hudson's Bay, N. and W. to the Yukon, southward shading directly into the U. S. bird before reaching 49°. This is the true *Tetrao phasianellus* — a name which was commonly applied to the following:

P. p. columbianus. (Of the Columbia River. Fig. 495.) **COMMON SHARP-TAILED GROUSE. PRAIRIE CHICKEN OF THE NORTHWEST. PIN-TAILED GROUSE OR PIN-TAIL. SPRIG-TAILED GROUSE OR SPRIG-TAIL. SPIKE-TAILED GROUSE OR SPIKE-TAIL. WHITE-GROUSE OR WHITE-BELLY.** Adult ♂ ♀: Upper parts closely and pretty evenly variegated with blackish-brown, reddish-brown, and grayish-brown, the pattern smallest on rump and lower back, where the blackish is mostly in sharp-angled stars; the reddish most conspicuous on upper back, and both the lighter colors everywhere finely sprinkled with blackish. Wing-coverts like upper back, but with numerous conspicuous rounded white spots, one on end of each feather. Crown and back of neck nearly like back, but in smaller pattern, and the markings mostly transverse. An illly-defined white area on each side of neck, over tympanum, and slight whitish stripe behind eye. Throat fine light buff, usually immaculate, but sometimes finely speckled quite across. Under parts white, more or less tinted with buff toward throat: breast with numerous regular dark brown U-shaped spots, one on each feather; similar but smaller, sharper, and fewer such spots thence scattered over most of the under parts, only middle of belly being left unmarked. Long feathers of sides under wings matching upper wing-coverts nearly; under wing-coverts and axillaries pure white, not marked; flanks with bars or U-spots of dark brown. Legs grayish-white, unmarked. Quills of wings fuscous; outer webs of secondaries with equidistant, squarish, white or tawny spots, secondaries tipped and imperfectly twice or thrice barred with white, and gradually becoming sprinkled with the varied colors of back, so that the innermost of them are almost precisely like greater coverts. Four middle tail-feathers variegated, much like back; others white, or grayish-white on inner webs, the outer webs being mottled;

a few under tail-coverts spotted, the rest white; upper tail-coverts nearly like rump. Iris light brown; bill dark horn-color; part of under mandible flesh-colored; claws like bill; toes on top light horn-color, soles darker. Length 18.00–20.00; extent 24.00–30.00; wing 8.00–9.00; middle tail-feathers 4.00–6.00; shortest tail-feathers (outermost) about 1.50; tarsi 2.00; middle toe and claw about the same; culmen of bill about 0.67; gape of bill 1.00–1.25; depth of bill at base 0.50 or rather less. Pullets, before first moult: Crown bright brown, varied with black. Sharp white shaft-lines above, which, with a black area on each feather, contrast with fine gray and brown mottling of upper parts. Wing-coverts and inner quills with whitish spots.



FIG. 495. — Head of Sharp-tailed Grouse, nat. size. (Ad. nat. del. E. C.)

Several inner tail-feathers with whitish shaft-lines, and mottled with blackish and brown. Lower throat and breast with numerous dark brown spots; sides similar, the markings lengthening into streaks. Bill brown above, pale below. This lasts till the September moult is completed. Chicks hatch dingy yellow, mottled on crown, back, and wings with brown and black. The Pin-tail Chicken inhabits the western portions of Minnesota, southern Wisconsin, a small part of Iowa and of Illinois, all of both Dakotas, thence diagonally across Nebraska and Kansas to Colorado in the Laramie and upper Platte regions; thence westward in suitable country to the Sierras Nevadas and Cascade Ranges of California, Oregon, and Washington; northern limit may be conventionally taken along the N. border of the U. S., beyond which it shades into the true *phasianellus*; but birds rather referable to this form than to the Arctic stock reach N. through British Columbia to some portions of Alaska. In fine, this is the "prairie chicken" of the whole Northwest; usually occurring where *Tympanuchus americanus* does not, though the two overlap to some extent. Formerly ranged in all the prairie of Minnesota, Michigan, and Iowa, but is pushed westward by the grain-fields—the same carrying *Tympanuchus* along, so that the one recedes as the other proceeds westward. It is a fine game and table bird, like its near relative, much hunted and easily killed; its numbers have been materially reduced of late years, and its range eastward has contracted. The packs in which it goes in winter, sometimes by hundreds, break up in early spring into the smaller "dancing-parties" which indulge in amorous revelry until such ribaldry results in matrimony, April–June; chicks are mostly able to fly by midsummer. Eggs 5–10–12–14–16, grayish-olive or drab-colored, uniformly dotted with brown points, rarely larger than a pin-head; always quite different from those of *Tympanuchus*; 1.60 to 1.80 long by 1.20 to 1.30 broad; average 1.70×1.25 . This bird was originally discovered and described accurately by LEWIS and CLARK, who note that the scales fall off the toes in summer. They found it abundant on the plains of the Columbia, 1805–6, whence it was named *Phasianus columbianus* by ORD in 1815; whence *Pediæctes phasianellus columbianus* COUES, 1872, and all later editions of the Key.

P. p. campes'tris. (Lat. relating to a *campus* or plain.) PRAIRIE SHARP-TAILED GROUSE. Birds of those portions of the Sharp-tail's range E. of the Rocky Mts., as above given, have

been so called, and are said to be "above more rusty or ochraceous." I record the name without further remark: *Pediocates phasianellus campestris* RIDGW. Pr. Biol. Soc. Wash., April, 1884, p. 93; A. O. U. No. 308 b.

TYMPANUCHUS. (Gr. *τύμπανον*, *tympanon*, Lat. *tympanum*, a sort of kettledrum or tambourine, such as was used by Corybantes in the orgies of Cybelé and Bacchus, also an eardrum, tympanum, etc.; and *ἔχω*, *echo*, I have or hold.) PIN-NECK GROUSE. PRAIRIE HENS proper. CUPIDONIAS. Neck with a peculiar tuft of loose, lengthened feathers on each side, like little wings, fancied to resemble those worn by Cupid instead of clothes, beneath which is a circular tympanum of bare, yellow skin, capable of great distension, like half of a small orange. Head with a slight soft crest. Tarsi scant-feathered to toes in front and on sides, bare on a strip behind; toes extensively webbed at base. Tail short, rounded, of 18 broad stiffish feathers, with obtusely rounded ends. Sexes nearly alike in size, form, and color; plumage below barred transversely. Meat of breast dark. Eggs plain or scarcely marked, very numerous. Three species, one of them with a slight variety, of prairie, perfectly terrestrial. (*Cupidonia* REICH., 1852, of most authors, as of all previous editions of the Key; antedated by *Tympanuchus* GLOGER. 1842.)

Analysis of Species.

- MARTHA'S VINEYARD BIRD. Feathers of neck-wings few, lance-acute *cupido*
 Feathers of neck-wings many, lance-obtuse.
- THE COMMON BIRD. Tarsal feathers hiding the bare strip. Dark bars above black and broad; top of head mostly blackish *americanus*
- TEXAS BIRD. Tarsi very scant-feathered, the bare strip exposed. Dark bars above brown and narrow; top of head little blackish *pallidicinctus*

T. cupido. (The tufts on the neck likened to conventional "Cupid's wings.") PINNATED GROUSE OF MARTHA'S VINEYARD. HEATH HEN OF MASSACHUSETTS. BREWSTER'S CUPIDO. Resembling closely the common bird next to be described, but apparently distinct, and now isolated geographically. Adult ♂: Ground color above light reddish-brown or rusty; scapulars spotted with whitish tips of the feathers; below, rusty white with dark reddish-brown bars in excess; feet cinnamon-brown mottled with white. "Neck-tufts composed of from 3 to 5 narrow, acutely lance-pointed, stiffened feathers, with about the same number of overlapping coverts." Smaller than the common bird; weight considerably less; wing 8.35. ♀ still smaller; wing hardly 8.00; darker and rustier, the bars on the under parts dull black; tail dark clove-brown with many fine irregular rusty bars. A woodland bird, inhabiting scrub oak and pine tracts, now entirely confined to Martha's Vineyard, formerly ranging over much of the U. S., E. of the Alleghanies, from Massachusetts to "Virginia." Eggs in June and July, drab, unmarked, 1.70 × 1.30. *Tetrao cupido* LINN. in part (in so far as based on Catesby and supposed to be Virginian and as now restricted). *Cupidonia cupido* BREWST. Auk, Jan. 1885, p. 82. *Cupidonia cupido brewsteri* COLES, Key, 1887, 3d ed. p. 884. *Tympanuchus cupido* RIDGW. Pr. U. S. Nat. Mus. 1885, p. 355. A. O. U. Check List, 1886-95, No. 306.

T. america'nus. (Lat. American. Figs. 496, 497.) COMMON PINNATED GROUSE. PRAIRIE HEN OR CHICKEN. Adult ♂ ♀: Above, variegated with black, brown, tawny, or ochrey, and white, the latter especially on wings; below, pretty regularly barred with dark brown, white, and tawny, in about equal amounts; throat tawny, a little speckled, or not; vent and crissum mostly white; quills fuscous, with white spots on outer webs; tail fuscous, with narrow or imperfect white or tawny bars and tips; feet plain. Sexes alike in color, but ♀ smaller, with shorter neck-tufts. Length 16.00-18.00; extent about 28.00; wing 8.00-9.00; tail about 4.50; tarsus rather over, middle toe and claw rather under, 2.00; neck-tufts 2.00-3.50 inches long, little lanceolate or almost parallel-edged to their obtuse or broad rounded ends; the longer stiff ones 7-10 in number, with as many more short ones. This well-known bird formerly ranged across much of the U. S., in open country, to the Atlantic coast in some latitudes. It is

now and long has been a bird of the Mississippi Valley at large, S. to some portions of Texas and Louisiana, and in the other direction extending in the Great Lake region into Ontario. Its usual range includes, wholly or in part, Kentucky, Ohio, Indiana, Illinois, Michigan, Wisconsin, Minnesota, N. and S. Dakota, Iowa, Kansas, Nebraska, Missouri, Arkansas, and the Indian Territory. It is creeping westward with the grain fields, especially along lines of railroad. About 1874 it began to mix with the Sharp-tails in the vicinity of St. Paul, Minn., and pushed up the Missouri beyond Sioux City, Iowa; and this was about the time it reached

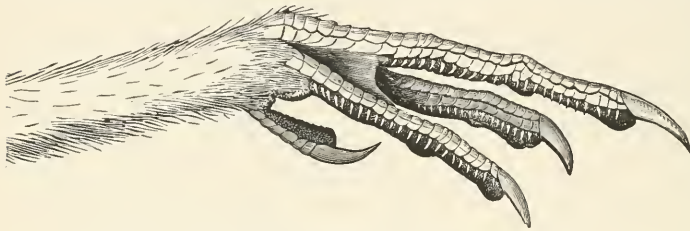


FIG. 496. — Foot of Prairie Hen, nat. size. (Ad. nat. del. E. C.)

over into the valley of the Red River of the North, both in Minnesota and North Dakota, and so on into Manitoba. Its general recession from easterly localities corresponds to its westward advance; the area of

greatest abundance has altered decidedly since I penned it for the 1884 edition of the Key, and will doubtless continue to shift. It is a resident bird for the most part, wherever found, but some N. and S. migration with season has been locally observed, in Minnesota, Iowa, and Missouri, thus mostly west of the Mississippi. Its abundance, and the excellence of its flesh, render it an object of commercial importance. Though there may be little probability of its extinction, legislation against its wanton or ill-timed destruction is a measure of obvious propriety. The food of this bird consists largely of cultivated grain, as well as of a great variety of seeds and berries, and also insects. The wintering packs break up usually in March; there is then a period of courtship with strange antics and much booming noise before the birds quietly pair off; the eggs may be found from the latter part of that month through the summer, but mostly April-June. They are in-

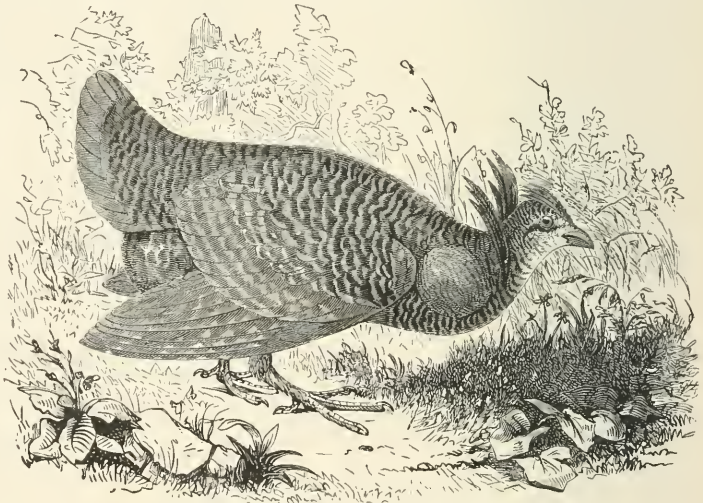


FIG. 497. — Prairie Hen. (From Lewis.)

definitely numerous, averaging over a dozen, and more than 20 have been found in one nest; they average 1.75×1.30 , with extremes in length of 1.60 to 1.85, thus averaging shorter, rounder, and smaller than those of the Sharp-tail; pale greenish-gray, with sometimes a glaucous bloom, usually unmarked, sometimes very minutely dotted with brown. (*Cupidonia cupido* of former editions of the Key, as of most authors since BAIRD, 1858, nec *Tetrao cupido* LINN. as above restricted; *C. pinnata* BREWST. Auk, Jan. 1885, p. 82; *Tympanuchus pinnatus* RIDGW. 1885; *Cupidonia americana* REICH. Syst. 1852, p. xxix, "based

on Völlst. Naturg. Hühnen, pl. 217, figs. 1896-8;" *Tympanuchus americanus*, A. O. U. No. 305.)

T. a. attwateri. (To H. P. Attwater.) ATTWATER'S PRAIRIE HEN. A form described from the coast region of Louisiana and Texas. *T. attwateri* BENDIRE, Forest and Stream, May 18, 1893, p. 425. *T. a. attwateri* A. O. U. Suppl. List, Auk, Apr. 1894, p. 130; Check List, 2d ed. 1895, No. 305 a.

T. pallidicinctus. (Lat. *pallidus*, pale; *cinctus*, begirt.) PALE PINNATED GROUSE. LESSER PRAIRIE HEN. Above, dark markings not in excess of lighter markings, and rather brown than black, each bar being brown between a pair of narrow borders; below, dark bars narrow, with the same tendency to enclose a broad brown one between any two dusky ones. Tarsi scant-feathered, exposing the bare strip behind. Size smaller than that of average *americanus*; ♂ wing under 8.50, ♀ wing about 8.00. Southwestern prairies, from some portions of Kansas and the Indian Territory into Texas. *C. cupido pallidicincta* RIDGW. Bull. Essex Inst. Dec. 1873, p. 199; COUES, Key, 2d ed. 1884, p. 584, and of later editions. *T. pallidicinctus* RIDGW. 1885; A. O. U. Check List, 2d ed. No. 307.

BOXA'SA. (Gr. βόνασος, Lat. *bonasus*, a bison: the "drumming" of the bird being likened to the bellowing of a bull.) RUFFED GROUSE. SHOULDER-KNOT GROUSE. Head with a full soft crest. Neck on each side with a tuft or umbel of numerous (15-30) broad soft glossy-black feathers, covering the rudimentary tympanum. Tail about as long as wings, amply rounded or fan-shaped, normally of 18 soft broad feathers, with truncate ends. Tarsi scant-feathered, naked below, with 2-3 rows of scutella in front. Plumage of blended and varied colors; sexes alike. Meat of breast white, unlike that of any of the foregoing Grouse. Eggs numerous, normally unmarked or with little spotting. Woodland species, more or less arboreal, of common occurrence in suitable places, representing in America the closely allied European genus *Tetrastes*, in which the tail has only 16 feathers, the epaulettes are undeveloped and the sexes unlike.

Analysis of Varieties.

Brown, of mixed and varied shades of reddish and gray. Eastern and Northern	<i>umbellus</i>
Pale; slaty-gray the prevailing shade. Rocky Mountain region	<i>umbelloides</i>
Dark; chestnut-brown the prevailing shade. Pacific Coast region	<i>sabinei</i>

B. umbellus. (Lat. *umbellus*, an umbel, umbrella; *umbra*, shade, shadow; alluding to the neck-tufts. There is no such Latin word as "*umbellus*;" and the form of the feminine noun *umbella* happens to suit *Bonasa*. Linnaeus had *Tetrao umbellus*, as if the specific name were an adjective in the masculine gender, but the only proper form of the adjective from *umbella* would be *umbellatus*, a, um. Figs. 498, 499.) RUFFED GROUSE. RUFFED HEATH-CKOCK. SHOULDER-KNOT GROUSE. TIPPET GROUSE. DRUMMING GROUSE. "PARTRIDGE," New England. DRUMMING PARTRIDGE. BIRCH PARTRIDGE. "PHEASANT," Middle and Southern States. DRUMMING PHEASANT. MOUNTAIN PHEASANT. WHITEFLESHER. Adult ♂ ♀: Above, variegated reddish- or grayish-brown; back with numerous, oblong, pale, black-edged spots. Below, whitish, barred with brown. Tail brown or gray, numerous and narrowly black-banded, with a broad subterminal black zone, and tipped with gray. Neck-ruffle of ♂ mostly glossy black, and very full; of ♀ smaller and more brown. Colors endlessly varied as well as blended, and the prevailing tone of the brown birds of the East shades insensibly into that of the Western subspecies. Length 16.00-18.00; extent 23.00; wing 7.00-8.00; tail about the same. Young of both sexes sufficiently resemble the adults to be unmistakable, and detailed description of every feather would be tedious and profitless. Chicks in down are very pretty, being of various buff shades deepening on some parts into chestnut, with a black stripe on each side of the head. There is a sort of dichromatism in this species, somewhat like that of the red and gray *Megascops* Owls, some individuals being browner, others grayer, than

the average; but this is irrespective of age, sex, season, or locality, does not in the least correspond with the pretended geographical distribution of the subspecies *togata* which some late Grouse-fanciers have sought to establish, and I cannot imagine myself humoring such a whim in the "Key." We have quite enough to do in making out *umbelloides* to be subspecifically different. A woodland bird, like the species of *Canachites*, abundantly distributed over

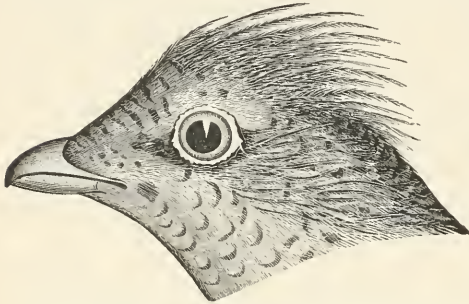


FIG. 498. — Head of Ruffed Grouse, nat. size. (Ad. nat. del. E. C.)

eastern North America; W. in the U. S. to the central plains; in British America from Hudson's Bay to Alaska; S. in the U. S. to Georgia, Mississippi, and Arkansas, but less common, except in the southern Appalachian regions. This fine game bird is well known under the above names in different sections; but it is neither a "partridge" nor a "pheasant," being, in fine, a Ruffed Grouse. The "drumming" sound for which this bird is noted is not vocal, as some suppose, but is produced by rapidly whirring the wings in the air, without beating them against each

other, against the body of the bird, nor yet against the log or other hard object upon which the cock stands to perform this peculiar love-act; the hen does not drum. The sound may be heard at any season, but chiefly in spring, from February to the end of the breeding season, which is at its height in May. This grouse is not migratory, and its breeding range is coincident with its general distribution; its favorite haunts are groves, coppices, and under woods rather than deep forests; the nest is of a few leaves, etc., on the ground, rarely on a log or stump or in a brush heap, but often under or amidst such things. Eggs 8-14, exceptionally more, averaging a devil's dozen in number, in color very characteristic; from creamy white to creamy buff, usually immaculate, sometimes minutely dotted or even speckled with brown; they resemble Partridge eggs somewhat in shape, which approaches the



FIG. 499. — Ruffed Grouse. (From Lewis.)

pyriform, broad and blunt at one end, pointed at the other; size about 1.60 X 1.20, moderately variable either way. *B. umbellus* and *B. u. togata*, A. O. U. Nos. 300 and 300 a.

B. u. umbelloi'des. (Lat. *umbella*, as above defined, and Gr. *εἶδος*, *eidos*, resemblance.) **GRAY RUFFED GROUSE.** A subspecies of the last, of very different tone of color in its extreme development, but shading into the common Ruffed Grouse by insensible degrees in British America. When fully manifested, as follows: ♂ Lower back, rump, upper tail-coverts and tail slate-gray, with little if any brown tinge; the feathers of the back and rump with

light gray cordate or arrow-headed spots narrowly bordered with black; tail-feathers finely vermiculated with black, and with a broad subterminal black zone. Ruffe glossy greenish-black. Under parts whitish, more or less tinged with tawny-brown, with several broad brown cross-bars on each feather, largest and most distinct on long feathers of sides, some of which have also white shaft-lines; heavy feathers of flanks and vent mostly whitish, unmarked. Feathers of fore-neck and scapulars blended with gray, rich reddish-brown, ochrey-brown, and white, in indescribable confusion. Most of the wing-coverts with white shaft-lines. Hen with ruffe less developed, varied with brown and white. General tone more rufous than in the cock. Rocky Mountain region, U. S. and British America, running into both the other varieties.

B. u. sabinei. (To J. Sabine.) RED-RUFFED GROUSE. OREGON RUFFED GROUSE. More nearly resembling the common Ruffed Grouse, but coloration more heavily brown, — darker and richer. More blackish to the brown, and latter almost chestnut in well-marked cases. Pacific coast region, northern California to British Columbia. This bird was discovered by LEWIS and CLARK in 1805-6, and first named *Tetrao fusca* by ORD, Guthrie's Geogr. 2d Am. ed. ii, 1815, p. 317. But owing to the badly edited text of the History of the Expedition published in 1814, what Lewis and Clark meant by their "small brown" was unintelligible till I found out by examination of their original manuscripts: see the 1893 edition of the History, p. 872. In strictness, therefore, this bird should be called *B. umbella fusca* COUES; but I waive the point in favor of *B. u. sabinei* COUES, Key, 1872, p. 235, as this is the established name, adopted by the A. O. U. No. 300 c, after *Tetrao sabinei* of DOUGLAS, who rediscovered the bird and described it in Trans. Linn. Soc. xvi, 1829, p. 137.

LAGO'PUS. (Gr. *λαγώπους*, *lagopous*, Lat. *lagopus*, hare-foot: the densely feathered feet resemble those of rabbits.) PTARMIGAN. SNOW GROUSE. No peculiar feathers on head or neck. Tarsi and toes densely feathered. Tail short, little rounded, normally of 14 broad feathers, with long upper coverts, some of which resemble rectrices, the central pair of these usually reckoned as rectrices, making 16. A naked red comb over eye. Eggs most heavily colored (except in *L. leucurus*). Boreal and alpine Grouse, shaped nearly as in *Canachites*, remarkable for their changes of plumage, becoming in winter snow-white (excepting the British insular race), with or without black tail and loreal stripe. The plumage is subject to frequent and rapid change, either by loss and gain of feathers, or by their wear and tear: there are ordinarily three different plumages a year, not the same in summer in opposite sexes of some species; the shedding extends even to the claws, which are dropped periodically when they have overgrown, like some portions of the claws of some lemmings. Pullets when half grown drop their first flight-feathers, which are brown, and the new set comes out white in all the species but one. Hence, specific characters founded upon color alone are peculiarly fallacious in this genus. We have three well-known good species, one of them with several alleged subspecies; I record all these, also the three other North American forms, without vouching for any excepting *L. lagopus*, *L. rupestris*, and *L. leucurus*. The extralimital species are: (1) *L. scoticus*, the Red Grouse, Red Game, or Moor-fowl of Britain. (2) *L. mtius* or *alpinus*, the Ptarmigan most properly so-called, of Continental Europe from the Pyrenees and Alps northward, also in Scotland. (3) *L. hyperboreus* or *hemileucurus*, of Spitzbergen, with the tail partly white in winter. The word *ptarmigan*, with an unexplained initial *p*, dating back over 200 years, is from the Gaelic *tarmachan*, supposed to mean mountaineer, and was earlier spelled *termigant*, *termagant*, etc.

Analysis of Species, alleged Species, and A. O. U. Subspecies.

Tail black at all seasons.

In winter, no black stripe on head. Bill stout.

Secondaries white-shafted.	Northern N. Am. and Europe, etc.	<i>L. lagopus</i>
Secondaries black-shafted.	Newfoundland only	<i>L. alpinus</i>

In winter a black stripe on head. Bill slender.

Northern N. Am. at large, Europe, etc.	<i>r. rupestris</i>
Greenland and N. E. Arctic Am.	<i>r. reinhardti</i>
Newfoundland only	<i>welchi</i>
Unalashka and adjacent Aleutian Islands	<i>r. nelsoni</i>
Atka, one of the Aleutians	<i>r. athensis</i>
Kyska and Adak, two of the Aleutians, June and July	<i>r. townsendi</i>
Attu, one of the Aleutians, May and June	<i>evermanni</i>
Tail white at all seasons	<i>leucurus</i>

L. lagopus. (Figs. 500, 501.) WILLOW GROUSE. WHITE GROUSE. WILLOW PTARMIGAN. WILLOW PARTRIDGE. REHUSAK. Bill very stout and convex, its depth at base 0.40 or more, as much as distance from nasal fossa to tip; whole culmen 0.75; bill black at



FIG. 500. — Willow Ptarmigan, summer plumage, 1/2 nat. size. (From Brehm.)

all seasons. ♂ ♀, in winter: Snow white; 14 tail-feathers black, white-tipped; middle pair (which most resemble and perhaps are true retrices, having no after-shafts) together with all the coverts, one pair of which reach to end of tail, white; shafts of several outer wing-quills black; those of the secondaries white; no black stripe on head. ♂, in summer: Head and fore parts rich chestnut or orange-brown, more tawny-brown on back and rump; the richer brown parts sparsely, the tawny-brown more closely, barred with black; most of the wings and other under parts remaining white. ♀ similar, wholly colored excepting wings, the color more tawny

than in ♂, and more heavily, closely, and uniformly barred with black. Length 15.00–17.00; wing 7.50–8.00; tail 5.50. No concise description will fit all the plumages of age and sex, when the bird is not white; but the species is unmistakable in all its mutability. Chicks in down are extremely pretty, of a drab color above and sulphury below, the upper parts mottled with black, the head and rump striped with the same, the crown chestnut. A circumboreal species of Europe, Asia, and North America, in the latter S. barely to the U. S. border, as accidentally in winter to Maine and Massachusetts: in Alaska S. to Sitka; breeding range confined to the Fur Countries from lat. 55° northward to the limit of trees, but in the Barren Grounds mainly replaced by the Rock Ptarmigan; migratory to some extent. Packing

from end of September through winter and most of spring. Pairing in April, laying from late in May through June. Nest on the ground, of a few leaves, etc.; eggs 6-12, measuring

about 1.75×1.25 , ranging from 1.85×1.35 down to 1.60×1.15 ; they are very heavily colored, ordinarily, with bold confluent blotches or snears of intense burnt sienna color, almost black in effect, upon a more or less reddish-tinted buff ground, seldom evenly marked with small discrete spots. All the eggs of birds of this family are colorless when the shell first forms high in the oviduct, acquiring pigment as they pass down; in Ptarmigan, where the coloring is so heavy, an egg cut from the pigment-secreting part of the passage is as if covered with fresh paint, soft and sticky, which may be rubbed off before it "sets" on the shell. *L. albus* of most authors, as of former editions of the Key, after *Tetrao albus* GM.; but as this species is the prior *Tetrao lagopus* LINN., our rules now require



FIG. 501. — Willow Ptarmigan, winter plumage, $\frac{1}{2}$ nat. size. (From Brehm.)

the tautonym *L. lagopus*. It is also *T.* or *L. lapponicus*, *rehusak*, *eachinnans*, *subalpinus*, *saliceti*, and *brachydaetylus* of various writers.

L. l. al'leni. (To Dr. J. A. Allen, first president of the A. O. U.) ALLEN'S WILLOW PTARMIGAN. NEWFOUNDLAND WILLOW PTARMIGAN. Like the last; said to be distinguished by having both secondaries and primaries black-shafted, and these and some of the coverts marked on their webs with blackish. Newfoundland only. *L. alba alleni* STEJ. Auk, Oct. 1884, p. 369. *L. lagopus alleni* RIDGW. Man. 1887, p. 113; A. O. U. No. 301 a.

L. rupest'ris. (Lat. *rupestris*, relating to *rupis*, a rock; *rupestrine*.) ROCK PTARMIGAN. Bill slenderer for its length than that of *lagopus*, its depth at base under 0.40, and less than distance from nasal fossa to tip; whole enlmen 0.67; bill always black. ♂ ♀, in winter: As in *L. lagopus*, but a black transocular or loreal stripe. ♂ ♀, in summer: Plumage, excepting much of wings, and tail, barred with blackish-brown and brownish-yellow, mostly in rather coarse zigzags, but also blotched on the back. Lower parts except breast and sides white in ♂. Rather smaller than *lagopus*. Length 13.00-14.75; wing 7.00-7.50; tail 4.50. The black stripe on the head is usually evident at all seasons, but may be lacking in the ♀. Arctic America, including some parts of Greenland; not S. to the U. S.; supposed not to occur from N. Labrador northward, that region being prudently reserved for *L. r. reinhardtii*; allowed on those Aleutian islands which are not reserved by the classifiers for some other Rock Ptarmigan; N. Asia; Iceland. The bird has never been found S. of the Gulf of St. Lawrence, or anywhere in the U. S. except Alaska. It is a near relative of the European *L. mutus* or *alpinus*, indistinguishable in winter plumage, separable in summer. In North America its breeding range is practically coincident with its general distribution. In the Barren Grounds, of which the Rocker is so characteristic, the eggs are laid in June and July; they resemble those of *lagopus*, but average fewer, usually 6-10, rarely more; they are also darker and rather smaller; size about 1.70×1.18 . "The summer plumage is assumed at variable periods of

the months of April, May, and even in early June, according to the locality. The moult for the summer is usually shown first on the head and neck, followed by the lower back, sides, breast, middle back, flanks, and abdomen, in the order named. The abdomen and chin are the last areas to show the complete moult. The parts named also assume, in the order given, the white winter plumage. During the time of the summer plumage scarcely a single day passes that the general color of the feathers is not modified by the appearance or loss of some feather." (*Turner.*) Hence the difficulty if not impossibility of establishing races of this species upon color, as the amount of barring, vermiculation, or nebulation with dusky, tawny,



FIG. 502. — Evermann's Ptarmigan.

and gray is so rapidly changing in the same individuals; and birds taken at different dates in summer, in the same locality, may differ from one another more than specimens from different regions, representing several alleged varieties, are always found to do. Rock Grouse, of Penant and Lathan; *Tetrao rupestris* Gm. 1788; AUD. Orn. Biog. iv, 1838, p. 483, pl. 368. *T. (L.) rupestris* Sw. and RICH. F. B. A. ii, 1831, p. 354, pl. 64. *L. rupestris* LEACH, 1817; AUD. B. Am. v, 1842, p. 122, pl. 301; ELLIOT, Mon. Tet. 1865, pl. 23; and of authors generally, as of all editions of the Key; A. O. U. No. 302. But *L. mutus* var. *rupestris* RIDGW. in Bd. BREW. and RIDGW. N. A. B. iii, 1874, p. 462.

L. r. reinhardtii. (To J. Reinhardt, the well-known naturalist.) REINHARDT'S ROCK PTARMIGAN. GREENLAND PTARMIGAN. As before; ♂ in summer less regularly and more finely barred above on a grayish-brown ground. Greenland and opposite shores of N. Am., S. to Ungava in Labrador. *Tetrao reinhardi* BREHM, Lehrb. 1823, p. 440. *T. reinhardtii* BREHM, Isis, 1826, p. 930. *Lagopus reinhardtii* BREHM, Naum. 1855, p. 287. *L. rupestris reinhardtii* BLAS. B. Eur. 1862, p. 16. *L. rupestris reinhardtii* A. O. U. Check-List, 1886, No. 302 a; RIDGW. Man. 1887, p. 200. *L. rupestris reinhardtii* A. O. U. Check-List, 2d ed. 1895, No. 302 a, reverting to Brehm's original misspelling, which had been set right in the former ed. of the List, as in the Key, 2d ed. 1884, p. 588. *T. (L.) mutus* SW. Fn. Bor. Am. ii, 1831, p. 450. *L. mutus reinhardtii* DUBUS, Consp. 1871, p. 21. *Tetrao mutus* AUD. Orn. Biog. v, 1839, p. 196, pl. 318. *Lagopus americanus* AUD. B. Am. v, 1842, p. 119, pl. 300; BAIRD, B. N. A. 1858, p. 637. *L. groenlandicus* BREHM, Naum. 1855, p. 287. *L. rupestris* var. *occidentalis* SUND. Svensk. Vet.-Ak. Förh. 1874, p. 20. (Obs. Connected with this geographically is *L. velchi* of Newfoundland, given below as a full species.)

L. r. nelsoni. (To E. W. Nelson.) NELSON'S ROCK PTARMIGAN. UNALASHKA PTARMIGAN. As before: ♂ in summer very finely vermiculated above with black on a deep amber-brown ground, below the same on a bright tawny ground, and with some blackish feathers intermixed: ♀ indistinguishable from that of *rupestris* proper. Unalashka and some of the neighboring Aleutian Islands. *L. albus* DALL, 1873, nec anct. *L. rupestris bis* NELSON, Cruise Corwin, 1883, p. 81, No. 79 (not No. 78). *L. rupestris* TURNER, Cont. Nat. Hist. Alaska, 1886, p. 155, in part. *L. rupestris nelsoni* STEJ. Auk, July, 1884, p. 226, type No. 93,448 U. S. N. M. May 18, 1877; NELSON, Rep. Alaska, 1887, p. 138, pl. 10; RIDGW. Man. 1887, p. 204; A. O. U. Check-Lists, 1886-95, No. 302 b; see COLES, Auk, Jan. 1884, p. 79.

L. r. atkhen'sis. (Lat. of Athha, Athka, or Atka, one of the intermediate islands of the Aleutian chain.) TURNER'S ROCK PTARMIGAN. ATKHAN PTARMIGAN. As before: ♂ in summer very finely and densely vermiculated above with black on a pale raw-umber ground,



FIG. 503. — White-tailed Ptarmigan. (From "Game Birds of North America," by D. G. Elliot.)

below the same on a pale brownish-ochre ground. ♀ in summer similarly marked on a pale grayish-buff ground. Atkha Island; type specimens Nos. 85,597–85,600, U. S. N. M. May 29 and June 7, 1879. *L. mutus atkensis* TURNER, Pr. U. S. Nat. Mus. v, July, 1882, p. 227 and p. 230; COUES, Key, 2d ed. 1884, p. 588. *L. rupestris atkensis* NELSON, Cruise Corwin, 1883, p. 56 *e* (an erratum leaf cancelling *L. rupestris occidentalis* of p. 82); TURNER, Cont. Nat. Hist. Alaska, 1886, p. 155, pl. 3 ♂, 4 ♀; RIDGW. Man. 1887, p. 201; A. O. U. No. 302 *c*.

L. r. town'sendi. (To Chas. H. Townsend.) TOWNSEND'S ROCK PTARMIGAN. KYSKA and ADAK PTARMIGAN. Based on specimens taken on Kyska Island, June 8, 1894, Nos.



FIG. 504. — White-tailed Ptarmigan in Winter. (From "Game Birds of North America," by D. G. Elliot.)

135,634 ♂, 135,636 ♀, U. S. Nat. Mus.; and others on Adak Island, July 4th. ELLIOT, Auk, Jan. 1896, p. 26; A. O. U. Suppl. List, Auk, Jan. 1897, p. 119, No. 302 *d*. As Mr. Elliot says: "Comparisons of Ptarmigans should be made between individuals not only from the same locality, but also taken in the same month, if possible the same day, for these perplexing birds being in a constant state of moult, a few days' difference in their time of capture exhibits much change in their appearance, and one who has not studied them carefully with sufficient material, could easily be led to form an erroneous opinion regarding the status of a subspecific or

even a specific form." I have little faith in the expediency, even in the possibility, of distinguishing this from the three foregoing subspecies, all of which are lumped by the latest monographer, OGILVIE-GRANT, Cat. B. Brit. Mus. xxii, 1893, p. 48. The two following appear to be better marked.

L. welch'i. (To Geo. O. Welch, of Lynn, Mass.) WELCH'S PTARMIGAN. NEWFOUNDLAND PTARMIGAN. Similar to *L. rupestris*. ♂ in summer less regularly or very confusedly vermiculated and dotted with black on a gray ground with little if any tinge of tawny, and shafts of primaries brown. ♀ lacking the black transocular bar. "The general effect is that of a dark grayish-plumbeous bird, plentifully besprinkled with fine dots of 'pepper-and-salt' color." Newfoundland; believed to be peculiar to that island, where true *rupestris* does not occur, and therefore not to intergrade. BREWST. Auk, Apr. 1885, p. 194; RIDGW. Man. 1887, p. 201; A. O. U. No. 303.

L. ev'ermanni. (To Prof. W. B. Evermann. Fig. 502.) EVERMANN'S ROCK PTARMIGAN. ATTU ROCK PTARMIGAN. Different from any of the foregoing, and bearing upon the Eurasiatic *L. mutus* rather than upon any of the American forms of *L. rupestris*. ♂ in June blackish, little varied with any russet markings, and these chiefly on the head and neck and rump, leaving the rest uniform except for some lingering white feathers of the winter dress. Forehead, throat, lower breast and belly, crissum, feet, and the whole wings, except some of the coverts, white; shafts of primaries pale brown. Bill and claws black; comb scarlet. Length 14.00; wing 7.50; tail 5.30. ♀ in May differs as usual in this section of the genus, and is smaller; length 13.00; wing 6.60; tail 5.00. Attu Island, about 1,400 miles W. of Unalashka. ELLIOT, Auk, Jan. 1896, p. 25, pl. 3, pub. in July. A. O. U. Suppl. Check-List, Auk, Jan. 1897, p. 119, No. 302. 1. (Compare *L. ridgwayi*, probably to be known as *L. mutus ridgwayi*, from the Commander Islands, 300 miles W. of Attu.)

L. leucurus. (Gr. λευκός, *leucos*, white; οὐρά, *oura*, tail. Figs. 503, 504.) WHITE-TAILED PTARMIGAN. ROCKY MOUNTAIN SNOW GROUSE. MOUNTAIN QUAIL. ♂ ♀, in winter: Entirely snow-white; bill black, rather slender, and general proportions nearly as in *rupestris*, but rather smaller; length 12.00-13.00; wing under 7.00. ♂ ♀, in summer: Tail, most of the wing, and lower parts from breast, remaining white; rest of the plumage minutely marked with black, white, and tawny or grayish-brown, varying in precise character almost with every specimen. But there is no difficulty in recognizing this white-tailed species, of alpine distribution in western North America extending from Alaska to New Mexico (lat. 37°), N. to Liard River, W. in British Columbia, Washington, and Oregon. In its southerly latitudes, in summer, it inhabits the mountain ranges from timber-line to the highest peaks, in winter ranging lower down, as it does also in summer in the higher latitudes. Eggs very different from the heavily painted ones of *lagopus* and *rupestris*, and resembling those of the Grouse of the genera *Canaachites* and *Dendragapus*, being of dull creamy complexion, minutely dotted over the whole surface with burnt-sienna, and not thickly enough to obscure the ground-color, few of the markings exceeding a pin's head in size; shape purely ovoidal, greatest diameter near the middle; size 1.70 × 1.14 to 1.85 × 1.20; number variable, usually less than a dozen. In the Rocky Mts. of the U. S. they are laid in June and July.

Family PERDICIDÆ: Partridges and Quails.

Well distinguished from *Tetraonidæ* by the nakedness of the feet and nasal fossæ; less easily separated from *Phasianidæ*, which also have these parts unfeathered. Viewing only the central or typical members of the *Percidæ*, or ordinary Partridges and Quails, their difference from such birds as Pheasants is obvious; but they are so closely connected by a number of outlying genera that their separation, either as families or as subfamilies, becomes a matter of convention, there being actually no line of demarcation. Thus, in the Indian and Ceylonese genus *Galloperdix* the characters are equivocal; both sexes are usually spurred, have the orbits bare, differ in plumage, and are technically phasianine; yet they are only 12-14 inches long, with short 14-feathered tail, and have a perdicine aspect. Another equivocal genus is *Bambusicola*, with 3 species of India, China, and Formosa, in which the sexes are alike in plumage, the ♂ and sometimes the ♀ is spurred, the orbits are feathered, the 14-feathered tail is rather long, and the total length is only 10-12 inches; thus they stand directly on the line between phasianine and perdicine forms. Again, the African *Ptilopachys fuscus* is not spurred in either sex; the sexes are alike; there is a post-orbital bare space; the moderate tail is 11-feathered; the length is a foot or less, and the whole aspect perdicine. One, the Indian *Ophrysia*, is thoroughly quail-like in aspect, only 8 or 9 inches long, wing 3.50, tail 10-feathered, and sexes dissimilar; thus no doubt belonging on the perdicine side of the line. The genera here

named are the links between *Phasianinæ* and *Perdicinæ*; for *Galloperdix* and *Bambusicola* lean toward the former, while *Ptilopachus* and especially *Ophrysia* connect them directly with such undoubted quail-forms as *Excalfactoria*, *Synæcus*, and *Coturnix*. Ogilvie-Grant has pointed out a character which almost unexceptionally separates *Perdicidæ* from *Phasianidæ*. This is, that in the former the 1st primary is longer than, or at least equal to, the 10th, while in the latter it is much shorter — or if longer (as it is in *Phasianus*) the tail is much longer than the wing in phasianine birds, it being always shorter than the wing in perdicine birds. Waiving the four exceptional genera named, the following characters apply to the *Perdicidæ*:

Tarsi, toes, and nasal fossæ bare of feathers, at least in part, as a rule entirely. Sides of head usually feathered. Tail short, always shorter than the wings, usually much shorter; first primary longer than, or at least equal to, the 10th (or if decidedly shorter, then the tail much shorter than the wing). Spurs, combs, and wattles as a rule wanting (the reverse of the rule in *Phasianidæ*). Sexes in general similar, and sexual habit monogamous.

These expressions will almost infallibly separate any perdicine bird from the *Phasianidæ*, in which the rule is: Large size, long many-feathered tail, spurs on the tarsi, head in part naked and carunculate, sexual diversity, and polygamous habit. On the side of the *Tetraonidæ* the line is much better drawn. The most ambiguous form is *Lerwa nivicola* of the Himalayas, with half-feathered yet spurred tarsi, 14-feathered tail, and sexes similar. Another grouse-like perdicine genus is *Tetraogallus*, with spurred tarsi, 20-22-feathered tail, a length of 20 inches or more, and the sexes subsimilar; it includes several species, as *T. tibetanus*, *T. himalayensis*, *T. caspius*, and *T. caucasicus*, the latter known as the Chourtka. A remarkable bird related to these is *Tetraophasis obscurus* of Tibet, about 18 inches long, with spurred tarsi and 18-feathered tail. But the three genera here noted are no doubt to be brought within the perdicine line, being in fact not far removed from the genus *Perdix* itself.

The *Perdicidæ* are divisible into two subfamilies mainly or solely upon geographical grounds, though the American forms have a facies peculiar to themselves. The introduction of the common Quail of Europe into this country brings both within our limits.

Analysis of Subfamilies of Perdicidæ.

Old World forms, with no peculiarity of the under mandible	<i>Perdicinæ</i>
New World forms, sometimes with dentate under mandible	<i>Odonthorhinæ</i>

Subfamily PERDICINÆ: Old World Partridges and Quails.

Character as just said. Before describing our single introduced representative of this subfamily, some idea of its composition may be given. The genera above named lead directly to *Perdix*, type and name-giving genus of this group, in which the tail has 16 or 18 feathers and the tarsi are not spurred. It includes the common gray Partridge of Europe, etc., *P. perdix* or *P. cinerea*, and a few others, a glance at any of which would suffice to show how very different they are from any of the birds called "partridges" in America. Then comes a series of genera in which the tail is 14-feathered, the tarsi being spurred in some of them and not in others. Such is *Caccabis*, with several species, including *C. rufa*, the Red-legged or Guernsey Partridge, *C. petrosa*, the Barbary Partridge, *C. saxatilis*, the Greek Partridge. *Francolinus* is the largest genus, of some 40 species, chiefly African and Asiatic, some of which are spurless, while others have a pair or two pairs of spurs; the common Francolin is *F. francolinus* or *F. vulgaris*, once common in southern Europe. The African genus *Pternistes* includes several francolin-like species, but with bare throats, as *P. nudicollis*. A large Asiatic genus is *Arboricola*, of 17 species, as *A. torqueola*, the Olive Partridge. Nearly related to these is *Caloperdix*, like all the foregoing with a 14-feathered tail, but the claw of the hind toe rudimentary; there are three

species, with one or more spurs, as *C. ocella*, the Eyed Partridge of the Malay Peninsula. Several other genera have 12 tail-feathers, as follows: The Roulroul of the Malay countries, etc., *Rollulus roulroul*, is a curiously crested bird, with a rudimentary hallucal claw. *Melanoperdix nigra* of the same countries is in like state, but uncrested. *Hæmatortyx sanguiniceps* of Borneo has 3 pairs of spurs in the ♂. *Rhizothera longirostris* is the oriental Long-billed Partridge, with spurs in both sexes. The Indian genus *Pedicula* includes two species of very small Partridges or Quails, *P. asiatica* and *P. argooides*, with 12 rectrices as in the foregoing, and blunt spurs in the ♂. *Ammoperdix* is a genus related to *Caccabis*, but with only 12 rectrices, and includes two species of desert Quails, *A. bonhami* and *A. heyi*; the latter inhabits the region of the Red Sea, the Dead Sea, etc., and might be the one which furnished what basis could be found for the myth of the miraculous feeding of the Israelites. *Margaroperdix madagascariensis* is similarly related to *Perdix* proper, but with only 12 tail-feathers. In *Microperdix* the tail is 10-feathered; there are 3 Indian species, *M. erythrorhyncha*, *M. blewitti*, and *M. manipurensis*, in which spurs are represented by blunt tubercles in the ♂; they are very small Quails, only 6 or 7 inches long. In *Coturnix* itself there are indifferently 10 or 12 feathers, and no spurs; and this is represented in Australia and Papua by a few closely related species in which 10 rectrices are the rule, though 12 sometimes occur. Finally, in the curious little Quail of the genus *Excalfactoria*, there are only 8 very short soft feathers, hidden by their coverts; such are the Chinese Quail, *E. chinensis*, and the African *E. adansoni*, only about 5 inches long. Such forms as these bring us around again to the genus *Ophrysia*, mentioned above under the head of the family *Perdicidæ*.

COTURNIX. (Lat. *coturnix*, a quail; from its note.) Bill smaller and much slenderer than that of any American genera of *Odontophorinæ*; nasal fossæ feathered, except on the tumid nasal scale. Wings of moderate length, little vaulted and not rounded, pointed by the 1st-3d quills, the 1st scarcely or not shorter than the next. First primary emarginate on inner web; 2d and 3d sinuate on outer web. Tail of 10-12 feathers extremely short and slight, not half as long as wing, pointed, its feathers very soft, the central pair lanceolate. Feet small; tarsus shorter than middle toe and claw, slightly feathered above in front, with two rows of alternating large scutella in front, two rows of smaller rounded scales meeting in a ridge behind, the sides filled in with small plates. Size smaller than that of any of our native species; pattern of coloration somewhat as in *Colinus*; sexes nearly alike. There are several species, besides the one given below, as *C. japonica*, wide ranging in Asia; *C. capensis* of South Africa; *C. coromandelica* of India, etc.; *C. delegorguei* of Africa; *C. pectoralis* of Australia; and *C. novæ-Zelandiæ*.

C. coturnix. (Fig. 505.) MESSINA QUAIL. MIGRATORY QUAIL. COMMON QUAIL of Europe. Adult ♂ ♀: Upper parts variegated with buff or whitish and black upon a mixed reddish-brown and gray ground, the most conspicuous markings being sharp lance-linear lengthwise stripes of buff or whitish over most of the upper parts, these dashes mostly edged with black; other less prominent buff or whitish cross-bars, several to a feather, likewise framed

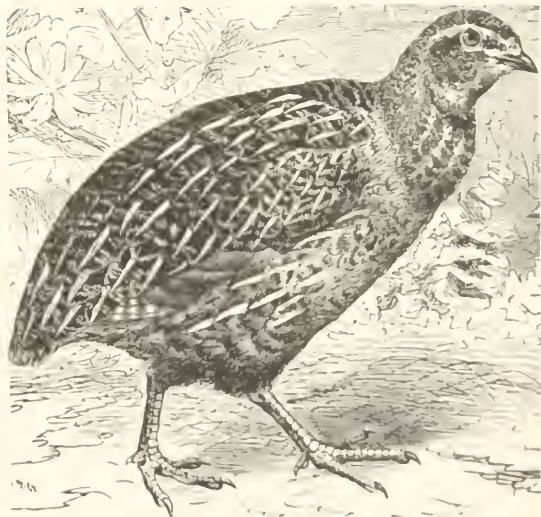


FIG. 505. — Common Quail of Europe, nat. size. — From Rehm.

in black. Crown mixed brown and black, with sharp median and lateral buff stripes. Throat white, bounded before by a dark bar curving down behind auriculars; behind, by a necklace of ruddy-brown, blackish, or whitish spots; chin varied with dark marks in advance of the auricular bar. Under parts fading to whitish from the buff or pale yellowish-brown breast, without any dark crossbars, but long feathers of sides and flanks with large and conspicuous white shaft-stripes and otherwise variegated with black, brown, and buff. Primaries fuscous, spotted with light brown on outer webs; secondaries similar, but the markings becoming bars on both webs. Tail-feathers brownish-black, much varied with shaft-lines, crossbars, and edgings of buff; crissum immaculate, like abdomen. Bill dark; feet pale; iris dark brown. Length about 7.00; wing 3.75; tail 1.75; tarsus 1.00; middle toe and claw rather more. Europe, Asia, Africa; recently imported and turned loose in considerable numbers in the U. S., as in New England; but its permanent naturalization is open to question. If one will compare this bird with Bob White he will see how very different is the Old World Quail from our Colins, or any other birds of this country called "quail;" but that it resembles these more nearly than the European Partridge, *Perdix cinerea*, does; so that, if we must borrow a name from any Old World birds for our species of *Colinus*, *Lophortyx*, *Callipepla*, etc., the term "quail" is rather more appropriate than "partridge."

Subfamily ODONTOPHORINÆ: American Partridges and Quails.

Head completely feathered, and usually crested, the crest frequently assuming a remarkable shape. Nasal fossæ not filled with feathers; nostrils covered with a naked scale. Tarsi and toes naked, latter scarcely or not fringed, former scutellate. Usually a small claw on the thumb. Tail typically of 12 feathers, rarely 14. Size smaller than in *Tetraonide*.

Our Partridges may be distinguished, among American *Gallinæ*, by the foregoing characters, but not from those of the Old World; and it is highly improbable that, as a group, they are separable from all the forms of the latter by any decided peculiarities. The principal supposed character, namely, toothing of under mandible, is very faintly indicated in some forms, and entirely wanting in others. Pending final issue, however, it is expedient to recognize the group, so strictly limited geographically, if not otherwise. Several beautiful and important genera occur within our limits, but these Partridges are most numerous in species in Central and South America. *Odontophorus* is the leading genus, with perhaps 15 species, in which the head is crested, and the sexes are similar. *Dactylortyx thoracicus* is a single species lately separated from *Odontophorus* on account of the difference in the sexes and some other characters, including the length of the claws. In *Eupsychortyx* the head is also crested, but the sexes are unlike; there are at least 5 species of this genus. In the three species of *Dendrortyx*, all Central American, the sexes are alike, there is a short occipital crest, and the rounded tail is nearly as long as the wing; the size is also large, from 12 to 15 inches in length. *Philortyx fasciatus* of Mexico, the only species of its genus, is very small, only about $7\frac{1}{2}$ inches long. *Philortyx fasciatus* is a peculiarly crested species. The genus *Rhynchortyx* has been established for two small species usually included in *Odontophorus*, but having only 10 rectrices; *R. spodrosethrus* and *R. cinctus* both inhabit Central America. This case of 10 rectrices in *Rhynchortyx*, and that of our *Callipepla* (see beyond) with 14, are the only exceptions to the rule in *Odontophorinæ* that the tail is 12-feathered. No members of the family are spurred, combed, or wattled, and all have the head fully feathered, as well as more or less crested, sometimes in very elegant fashion; there is also little range of variability in size, and for the most part a general similarity to one another in pattern of coloration, among the about 45 species of which the subfamily is known to be composed. They are thus a compact group, in comparison at least, with the widely diversified *Perdiciinæ* of the Old World; and this fact may have its weight in deciding us to recognize them as a subfamily, even if they do not very well ex-

hibit the character to which the name *Odontophorina* is due. In habits, they agree more or less completely with the well-known Bob White. Our species are apparently monogamous, and go in small flocks, called "coveys," usually consisting of the members of one family: some species "pack" in large flocks; they are terrestrial, but take to trees on occasion; nest on the ground, laying numerous white or speckled eggs; are chiefly granivorous, but also feed on buds, soft fruits, and insects; and are non-migratory.

Analysis of Genera.

- An inconspicuous crest, scarcely visible except in life. Tail about $\frac{3}{4}$ as long as wing, 12-feathered. Coloration everywhere variegated. Sexes distinguishable. (Two species.) *Colinus*
- A short, soft, full crest. Tail $\frac{3}{4}$ the wing, 14-feathered. Coloration much the same all over, showing curious semi-circular markings. Sexes similar. (One species.) *Callipepla*
- A long, slender, arrowy crest, two or three inches long, of two narrowly linear feathers. Tail $\frac{3}{4}$ as long as wing, 12-feathered. Parti-colored, but the coloration chiefly in masses. Sexes similar. (One species.) . . . *Oreortyx*
- A long, recurved, helmet-like crest, of several imbricated plumes, enlarged at extremity. Tail $\frac{3}{4}$ as long as wing, 12-feathered. Coloration chiefly in masses. Sexes unlike. (Two species.) *Lophortyx*
- A short, soft, full crest. Tail scarcely $\frac{1}{2}$ as long as wing, 12-feathered. Coloration peculiar, in round, white spots on under parts of the ♂. Sexes very unlike. (One species.) *Cyrtonyx*

COLINUS. (Latinized from the French *colin* of Buffon and others; probably derived from some Mexican word.) **COLINS.** **BOB WHITES.** Feathers of crown lengthened and erectile, but hardly forming a true crest. Tail about $\frac{3}{4}$ as long as wing, 12-feathered. Outstretched feet reaching beyond end of tail. Coloration much variegated; reddish-brown varied with black and white the leading color. Meat of breast white. Eggs white, pyriform, numerous. Besides the species treated beyond there are several others, as *CC. graysoni*, *pectoralis*, and *coyolcos* of Mexico, and *C. nigrigularis* of Yucatan.

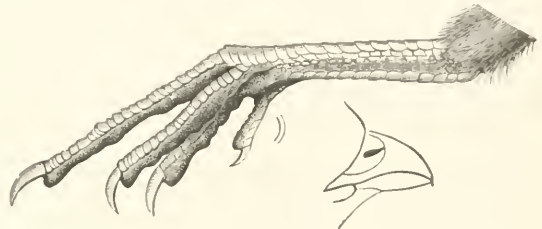


FIG. 506. — Bill and foot of *Colinus*, nat. size. (Ad nat. del. E. C.)

(*Ortyx* of all former eds. of the Key, as of most writers, after STEPH. Gen. Zool. xi, 1819, p. 376; but this is untenable because antedated by *Ortyx* OKEN, Lehrbuch Naturg. vi, 1816, p. 611 (which is a synonym of *Ortygis* ILLIGER, 1811 — an Old World genus of a different family). The next name in order of dates is *Ortygia* BOIE, Isis, 1826, p. 977; but this is the same word as *Ortygis*, and so cannot be used. The next name, and the first one which is tenable by our rules, is *Colinus* LESSON, Man. ii, 1828, p. 190, also used, in the form *Colinia*, by NUTTALL, Man. i, 1832, p. 646; see Ank, Jan. 1855, p. 45.)

Analysis of Species and Subspecies.

- Under parts varied with black and rusty on a white or whitish ground.
 - Length of ♂ 10.00 or rather more; extent 15.00 or more; wing 4.50 or more. Bill blackish-brown. Ground color dull pinkish-red with narrow black bars below *virginianus*
 - Length of ♂ scarcely 10.00; extent under 15.00; wing scarcely or not 4.50. Bill jet black. Ground color dark reddish, with much broader black bars below *v. floridanus*
 - Length, etc., as in *floridanus*. Ground color paler than in *virginianus*, with numerous black bars, and increase of ashy and tawny *v. texanus*
- Under parts mostly uniform cinnamon brown *redgum*

C. virginianus. (Of Virginia. Figs. 506, 507, 508.) **COMMON COLIN, PARTRIDGE, or QUAIL. BOB WHITE.** "QUAIL:" New England, wherever the Ruffed Grouse is called "partridge." "PARTRIDGE:" Southern and Middle States, wherever the Ruffed Grouse is called "pheasant." Also specified as the **AMERICAN, VIRGINIAN, and MARYLAND COLIN, PARTRIDGE, or QUAIL.** Adult ♂: Forehead, superciliary line, and throat white, bordered with black; crown, neck all round, and upper part of breast brownish-red; other under parts

tawny-whitish, all with more or fewer doubly crescentic black bars; crissum rufous; sides broadly striped with brownish-red; upper parts variegated with chestnut, black, gray, and tawny, the latter edging inner quills, forming a continuous line when the wing is closed. ♀: Known by having throat buff instead of white, less black about fore-parts, and general coloration subdued. The reddish of this bird is of a peculiar dull pinkish shade; black crescents of under parts scarcely or not half the width of intervening white spaces; bill not jet black. Length of ♂ 10.00–10.50; extent 15.00–15.50; wing 4.50 to nearly 5.00; tail 2.75–3.00. ♀ 9.50–10.00; extent 14.50–15.00; wing 4.25–4.50; tail 2.50–2.75. Chicks in down buff below, browner on sides and paler on throat, the back chestnut, a patch of same on top of head, and black marks on its sides. Among thousands of Bob Whites yearly destroyed, albinotic or melanotic, and other abnormally colored specimens, are frequently found; but the percentage of these cases is nothing unusual, and the sportsman must be cautioned against supposing that such birds have any status, in a scientific point of view, beyond their illustration of certain perfectly well-known variations. Such specimens, however, are interesting and valuable, and should always be preserved. Eastern U. S. N. to Maine, Ontario, and Minnesota. West

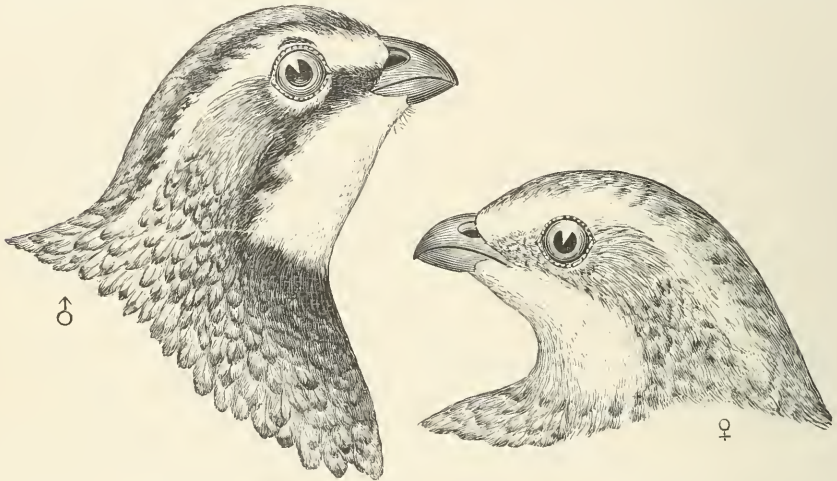


FIG. 507. — Mr. and Mrs. Bob White, nat. size. (Ad. nat. del. E. C.)

to high central plains, in South Dakota, Kansas, Nebraska, Indian Territory, Oklahoma, and eastern Texas, and all the while steadily extending in that direction with the settlements and railroads; it has already got beyond the limits assigned in the Key in 1884, and has been introduced and become acclimated in various parts of Colorado, New Mexico, Utah, Idaho, California, Oregon, and Washington. I shot it at Fort Randall, S. D., in 1872–73. It breeds indifferently throughout its range, and is usually resident wherever found. The characteristic game bird of this country, whose mellow and melodious pipe proclaims its name, so dear to the heart of the sportsman. It is translated in our language in many ways besides “bob-white,” and may be heard throughout the breeding season, which commonly extends through most of the spring and summer, though eggs have occasionally been found in nearly all months of the year. Eggs indefinitely numerous, averaging over a dozen, usually 12–18, sometimes up to 3 dozen, pure white, pointed at one end and very blunt at the other, from 1.30×1.00 to 1.05×0.90 , averaging 1.20×0.95 .

C. v. florida'nus. (Of Florida.) FLORIDA QUAIL. Rather smaller, ♂ about size of ♀ *virginianus*, but bill relatively larger, jet-black; colors darker, all black markings heavier, those of under parts nearly as broad as intervening white spaces. Florida, and similar specimens in

the lower Mississippi Valley; an approach to the Cuban form (*C. cubanensis*). Habits, nest, and eggs indistinguishable from those of the common Bob White; but this southern form breeds earlier, from February onward. As stated in the Key, 4th ed. 1890, p. 904, the Cuban bird was for a time supposed to occur in Florida, being so given in RIDGW. MAN. 1887, p. 188, figuring in the A. O. U. Abridged Check-List, 1889, as No. 289 c, and separately treated as such by BENDIRE, i, 1892, p. 9. All the Bob Whites of Florida belong to the single sub-species established in the original edition of the Key, 1872, p. 237.

C. v. texanus. (Of Texas.) TEXAS QUAIL. Size of *floridanus*; colors paler, prevailing shade rather gray than brown; upper parts much variegated with tawny. Texas, N. to Kansas,

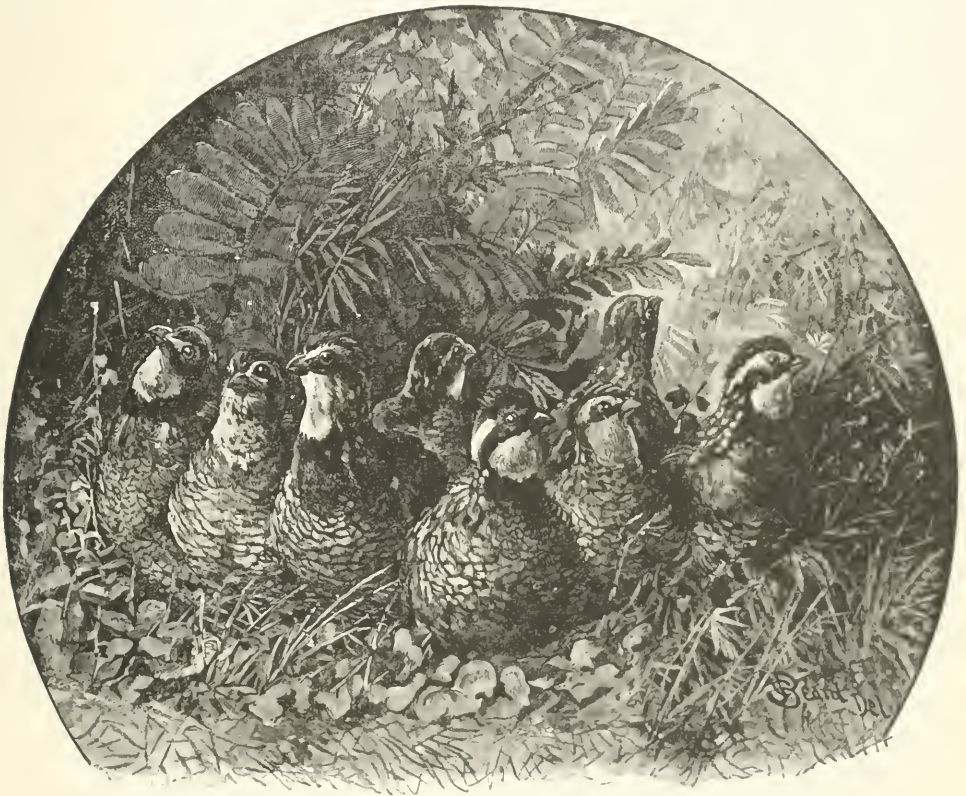


FIG. 508. — The Bob White Family. (From "Sport with Gun and Rod;" The Century Co., N. Y.)

S. into Mexico. No difference from *virginianus* proper in habits, nest, or eggs, the latter average 1.20×0.90 , as before. This bird shades directly into the stock form on the one hand, and on the other approaches *C. graysoni*.

C. ridgwayi. (To R. Ridgway. Fig. 509.) RIDGWAY'S COLIN. ARIZONA BOB WHITE. MASKED BOB WHITE. HOODED QUAIL. Adult ♂: Front, and sides of head and neck, black, with or without a narrow white frontal line and superciliary stripe. Under parts chestnut or cinnamon (about the color of breast of Robin), varying much in shade, generally unspotted, except on flanks, where the feathers are usually tipped with an oval white spot, preceded by a subterminal black bar; lower tail-coverts with a V-shaped black spot bordered with whitish; occasionally small touches of black and white along sides. Crown, hind head, and nape mixed black, white, and pale brown, or yellowish-white; hind neck and interseapu-

lars reddish-brown, usually with a grayish cast; back, rump, and upper tail-coverts minutely variegated with blackish, pale brown, and grayish-white, the black usually prevailing, but variable in amount. Wing-coverts rufous, each feather barred with blackish and edged and tipped with whitish; primaries dusky, edged and scalloped internally with whitish; secondaries



FIG. 509.—Masked Bob White. (From "Game Birds of North America," by D. G. Elliot.)

externally dusky, barred and freckled with pale brown and yellowish-white; inner secondaries and scapulars edged with yellowish-white (very broadly so on inner edges), and otherwise variegated. Tail above bluish-gray, minutely freckled and waved with whitish; tail below gray, faintly and irregularly barred and waved with grayish-white. Bill black; feet horn-color; iris brown. Length 9.75; extent 14.25; wing 4.50; tail 2.75; tarsus 1.20. The female resembles that sex of *C. v. texensis* so closely as not to be readily distinguished. The species is closely related to *C. graysoni* of Mexico, and may yet be found to intergrade therewith.

Southern Arizona and Sonora, where it has

long been known as a game bird, though long unrecognized as a species by ornithologists; I heard of it there in 1864-65, though I never had a specimen. It calls "Bob-white," like the rest of its kind, has the same habits, and its eggs are indistinguishable. On its first introduction to our Fauna it was mistaken for *C. graysoni* of LAWRENCE, Ann. Lye. N. Y. viii, May, 1867, p. 476, and thus appeared as *Colinus graysoni* in the A. O. U. List, 1886, p. 168, No. 290. It was first described as *C. ridgwayi* by BREWSTER, Auk, Apr. 1885, p. 199, and figured as such by ALLEN, Bull. Amer. Mus. Nat. Hist. July, 1886, pl. 23. *Ortyx ridgwayi* COUES, Key, 3d ed. 1887, p. 884. *Colinus ridgwayi* A. O. U. Lists, 1st and 2d eds. No. 291.

OREORTYX. (Gr. *ōpos*, *oros*, a mountain; *ōprvξ*, *ortux*, Lat. *ortyx*, a quail. The grammatical gender is in question; the Greek word is masculine, the Lat. feminine. In ornithology, good usage is about equally divided.) **PLUMED QUAIL.** Head adorned with an arrowy crest of 2 slender keeled plumes, 3-4 inches long in ♂ when full-developed; present in ♀, shorter. Bill and feet stout; tarsus equal to middle toe and claw. Tail about $\frac{3}{4}$ the wing, broad, rounded, with long coverts and 12 rectrices. Size large; colors massed in large areas; sexes alike. Eggs buff-colored. One large handsome species.

Analysis of Subspecies.

Above extensively glossed over with olive-brown; inner edges of secondaries buff; forehead ashy. Coast region northerly	<i>pictus</i>
Above restrictedly glossed over with olive-brown; inner edges of secondaries pale buff; forehead whitish. Interior region, and coastwise southerly	<i>p. plumiferus</i>
Like the last; grayer; bill thicker. Lower California	<i>p. confinis</i>

O. pic'tus. (Lat. *picta*, pictured, painted. Fig. 511.) PLUMED PARTRIDGE. MOUNTAIN QUAIL of the Californians. Adult ♂ ♀: Back, wings, and tail olive-brown; inner secondaries



FIG. 510. — Helmet Quail (*L. gambeli*), nat. size. (Ad. nat. del. E. C.)

and tertiaries bordered with buff or tawny, forming a lengthwise border in single line when wings are folded; primaries fuscous; tail-feathers fuscous, minutely marbled with color of back. Fore-parts, above and below, slaty-gray (above more or less glossed with the olive-brown shade of back, below minutely marbled with black); throat chestnut, immediately bordered laterally with black, then framed in a firm white line, broken through eye, reappearing around base of under mandible. Extreme forehead ashy. Arrow-plumes black.



FIG. 511. — Plumed Quail. (From Tenney, after Audubon.)

Belly chestnut; sides banded with broad bars of black and white, or rufous-white; middle of lower belly, tibia, and flanks, whitish or rufous; crissum velvety-black, streaked with chestnut. Bill dusky, paler below; feet brown. Length 11.00–12.00; extent 16.00–17.00; wing 5.00–5.50; tail 3.00–3.50; tarsus 1.60; middle toe and claw about the same. Chicks in down very curiously striped and spotted with black, brown, and chestnut on the head, back, and flanks, dull whitish on the breast and belly. An elegant species, much larger and more beautiful than Bob White, inhabiting the mountainous parts of the Pacific coast region from California to Washington; extension in the latter State recent, partly natural, but artificially assisted: lately introduced also on Vancouver Island. The relative extent of the olive and slaty parts is very variable (see following subspecies). There is something of a Grouse in the composition of this Partridge. Egg a miniature of the Ruffed Grouse's, only distinguished by smaller size — 1.40 × 1.10 to 1.30 × 1.00; the clutch is 6–16, averaging about a dozen, mostly laid in May and June.

O. p. plumif'erus. (Lat. *plumiferus*, plume-bearing; *pluma*, a plume; *fero*, to bear, carry.) PLUMED PARTRIDGE or MOUNTAIN QUAIL of the interior. Like the last, with which included in former editions of the Key. Differing in greater extent of the slaty-gray, and corresponding restriction of the olive-brown overtone, the whitish forehead, and the pale buff or whitish border line along the inner edge of the wing. In the best marked cases, the back of the neck is quite like the breast, instead of being olive-brown like the back. This is the prevailing form on both sides of the Cascade range in Oregon, the Sierras Nevadas in California, and even the

coast range in the latter State from about lat. 34° to Lower California; in fine, it is the ordinary Mountain Quail of most parts of California, aside from the restricted Coast Range of the preceding, and also the one which extends E. into Nevada. The distinction is a subtle one, but I am willing to let the subspecies pass muster with a hundred others of which I have no favorable private opinion. *O. picta*, in part, of most authors. *Ortyx plumifera* GOULD, 1857. *Oreortyx pictus* var. *plumiferus* RIDGW. in BD. BREW. and RIDGW. Hist. N. A. B. iii, 1874, p. 476; A. O. U. No. 292 a.

O. p. confinis. (Lat. next to, adjoining, being on the border of.) SAN PEDRO MOUNTAIN QUAIL or PLUMED PARTRIDGE. "Differing from *O. p. plumiferu* in grayer upper parts and thicker bill." San Pedro Mts. of Lower California. ANTHONY, Proc. Cal. Acad. Sci. 2d ser. ii, Oct. 1889, p. 74; COUES, Key, 4th ed. 1890, p. 904; A. O. U. List, 2d ed. 1895, No. 292 b. **LOPHORTYX.** (Gr. λόφος, *lophos*, a crest; ὄρυξ, *ortux*, a quail.) HELMET QUAIL. With an elegant crest, recurved helmet-wise, of several (6-10, usually 6 or 7) keeled, clubbed, glossy-black, imbricated feathers, more than 1.00 long when fully developed; in ♀, smaller, of fewer feathers. Tarsus slightly shorter than middle toe and claw. Tail normally of 12 feathers, exceptionally 10 or 14, about $\frac{4}{5}$ as long as wing; outstretched feet not reaching to its end. A small claw on the pollex. Bulk of Bob White, but longer; 10.00-11.00; wing 4.00 or more; tail 3.00 or more. Coloration chiefly in masses; sexes unlike. ♂ with chin and throat jet-black, sharply bordered with white; a white line across vertex and along sides of crown, bordered behind by black; ♀ without these head-markings. Eggs heavily colored. Two elegant species in the U. S., and another in Mexico, *C. elegans*. This genus is closely related to the Mexican genus *Philortyx* (*P. fasciatus* and *P. personatus*). It was reduced to a subgenus of *Callipepla*, by the A. O. U. in 1886-95. See COUES, Auk, 1897, p. 214, whence A. O. U. restored to full genus, Suppl. List, Auk, Jan. 1899, p. 106, as it has always stood in the Key. See also ELLIOT, Gall. Game Birds, 1897, pp. 195, 196.

Analysis of Species and Subspecies.

- ♂ middle of belly orange-chestnut; sides like back, with white stripes; hind-head smoky-brown; forehead chiefly whitish, with white loreal line.
- Back and flanks dark brown; edges of inner secondaries deep buff *californica*
- Back and flanks light brown; edges of inner secondaries pale buff *c. vulticola*
- ♂ middle of belly jet-black; sides chestnut, with white stripes; hind-head chestnut; forehead chiefly black; no white loreal line *gambeli*

L. califor'nica. (Lat. Californian. Fig. 512.) CALIFORNIAN PARTRIDGE. VALLEY QUAIL or TOP-KNOT QUAIL of the Californians. Adult ♂: With a small white line from bill to eye; forehead whitish with black lines; occiput smoky-brown; nuchal and cervical feathers with very dark edging and shaft-lines, and fine whitish speckling. General color of upper parts ashy, with strong olive-brown gloss, the edging of the inner quills brownish-orange. Fore breast slaty-blue; other under parts tawny, deepening into rich golden-brown or orange-chestnut on the belly, where all the feathers are sharply edged with jet-black; sides olive-brown like back, with sharp white stripes; vent and crissum tawny, with dark stripes. Length 10.00-11.00; wing 4.25; tail 3.75; tarsus 1.25; middle toe and claw rather more. Besides lacking definite head-markings, ♀ wants rich sienna color of under parts, which are whitish or tawny with black semicircles as in ♂; breast olive-gray. Young in first plumage marked with white, black-bordered shaft-lines on the upper parts, breast with angular white spots, and belly with obscure gray bars. Chicks in down dingy white, more rusty above, varied with lengthwise brown markings, especially one on the nape, and dusky on side of head. The changes of plumage are parallel with those of *gambeli*. Lower portions of California, Oregon, Washington, and British Columbia; S. to Monterey, N., in part at least, due to introduction; characteristic of the Pacific coast region, where abundant. A fine species, entirely distinct from

gambeli, but habits and manners in all respects the same; replaces *gambeli* westward. Nest normally on the ground, as usual in this order of birds, exceptionally in a bush or even a tree; eggs 10–20, creamy or buff, well marked all over with small rounded spots and larger blotches of rich golden brown, chestnut, and drab, about 1.25×1.00 , ranging in length from 1.20 to 1.40 with less relative variation in breadth, shaped like those of *Colinus*. (*Callipepla* (*Lophortyx*) *californica* A. O. U. No. 294. *L. californicus* A. O. U. Suppl. List, Auk, Jan. 1899, p. 106. *L. c. vallicola*. (Lat. *vallis*, a valley, and *colere*, to cultivate; *incola*, an inhabitant.) CALIFORNIA VALLEY QUAIL of the interior. Like the last; lighter colored, the back and flanks grayish-brown rather than olive-brown, the line along inner edge of the wing pale buff. Interior of California and Oregon, S. to Cape St. Lucas, E. to Nevada but not quite to Arizona. This is the common bird away from the coast region, in the valleys and foothills; the difference is slight, and exactly parallel with that of *Oreortyx plumifera* as compared with *O. picta*. This is of course the subspecies which meets *L. gambeli* in southeastern California, about the sink of the Mojave River, a little W.

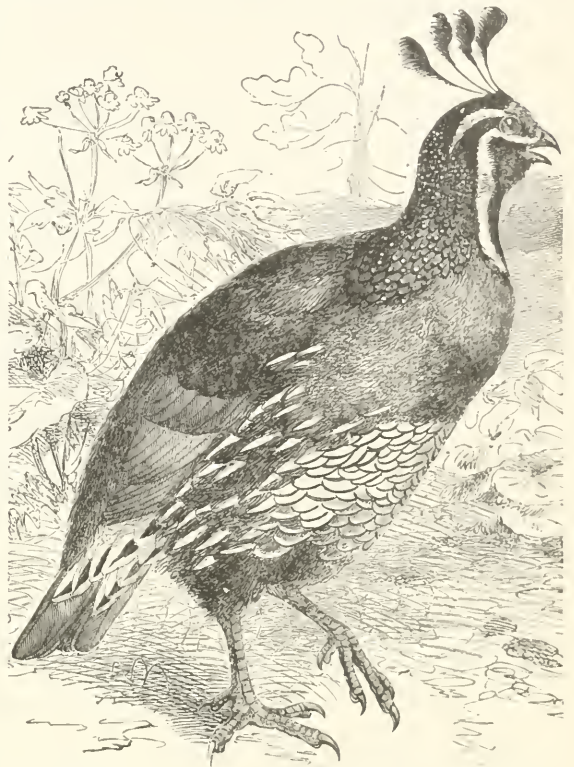


FIG. 512.—California Helmet Quail, $\frac{1}{2}$ nat. size. (From Brehm. But in life the feathers of the crest are always bunched in a bunch, not standing apart, as in this figure.)

of Arizona: see my Birds N. W. 1874, p. 440; but there is not the slightest intergradation between the two perfectly distinct species. *L. californica*, in part, of previous editions of the Key, and of nearly all authors; *Callipepla californica vallicola* RIDGW. Pr. U. S. Nat. Mus. viii, 1885, p. 355; Man. 1887, p. 192; A. O. U. No. 294 a, 1886–95.

L. gambeli. (To Wm. Gambel. Figs. 510, 513.) GAMBEL'S PARTRIDGE. ARIZONA QUAIL. ♂: Without white loreal line: forehead black with whitish lines; occiput chestnut; nuchal and cervical feathers with dark shaft-lines, but few dark edgings or none, and no white speckling. General color of upper parts clear ash; edging of inner quills white. Fore-breast like back; other under parts buffy whitish, middle of belly with a large jet-black patch; sides rich purplish-chestnut, with sharp white stripes; vent, flanks, and crissum white with dusky streaks. Bill black; iris brown. Besides lacking definite head-markings, ♀ wants black abdominal area, where the feathers are whitish with dark lengthwise touches; crest dark brown, not recurved, and fewer-feathered than that of the cock. Top of head grayish-brown, nearly uniform from bill to nape; throat grayish-white with slight dark pencilling. Chicks, in down: Bill above reddish, nearly white below; feet dull flesh-color. Head dingy yellowish, with a large brown spot on occiput, a few black, white-streaked feathers on crown, and crest sprouting in a week or two. Upper parts grayish-brown mottled with black spots, and conspicuously striped with

white lines. Outer webs of sprouting quills marked with blackish and whitish. Throat white; other under parts narrowly barred with black and tawny-white, striped lengthwise with pure white. Sprouting tail-feathers like primaries. Pullets, quarter-grown, 6.00–7.00 long: Leaden-gray, becoming tawny on wings, which are still a little mottled as above described; below, light gray, nearly white on throat and belly. Breast waved with light and dark gray, with traces of white stripes. Sides under wings slightly fulvous or rufescent, but without definite stripes. Quills plain dusky; tail-feathers more plumbeous, marked with blackish and whitish. A broad white superciliary line. With progress of the fall moult this dress changes for one like that of the adults, and sexes are soon distinguishable. Eggs indefinitely numerous, 8–12–20, averaging 1.25×1.00 , pyramidal, narrow and pointed at one end, very obtuse the other; color buff or rich creamy, dotted and spotted all over with bright brown, splashed here



FIG. 513. — Gambel's Quail. (From *The Osprey*.)

and there with large blotches of same or a darker brown; the tone varies much, but in general is heavier than in *L. californica*, and under some circumstances there is a peculiar bloom on the brown markings obscuring their richness; they are laid all through spring and summer. Nest on the ground like that of any other Partridge, occasionally in a bush, or a nest of some other bird appropriated. New Mexico and Arizona, both in mountains and valleys, very abundant; N. to Nevada and Utah; S. into Mexico; E. to Pecos and San Elizario, Texas, beyond which replaced by the Massena Partridge; W. beyond the Colorado River, in southeastern California to San Bernardino Co., the range thus overlapping that of *L. californica*; and hybrids occur where the two species meet, as noted in Auk, July, 1885, pp. 247–249. The characteristic game bird of Arizona, and much of the “Great American Desert.” The subspecies described as *Callipepla gambeli deserticola* STEPHENS, Auk, Oct. 1895, p. 371, is not admitted by the A. O. U.

CALLIPEP'LA. (Gr. *καλλιπέπλος*, *callipeplos*, beautifully arrayed.) SHELL QUAIL. General character of *Lophortyx*, but head with a short, full, soft crest as in *Cyrtonyx* (fig. 514), nothing like the elegant helmet-plumes or pompons of the preceding genus. Tail long, about $\frac{2}{3}$ the length of wing, unique in *Odontophorine* in having 14 rectrices. Coloration of under

parts producing a shelly or scaly appearance. Sexes nearly alike. Eggs not heavily colored. One U. S. and Mexican species.

C. squama'ta. (Lat. *squamata*, squamous, scale-like.) SCALED PARTRIDGE. BLUE QUAIL. Adult ♂: General color bluish-plumbeous, shading into olive-brown on back and wings and to rufous on under parts behind wings, with a large abdominal area of pale buff, with little or no orange-brown; feathers of neck all around, and most of those of under parts, sharply edged with black, producing a peculiar shell-like appearance; on breast the feathers also with concealed reddish shaft-lines. Long feathers of sides like back in color, with white brown-edged stripes or long oval spots. On flanks and crissum the feathers lose the scaly appearance, becoming blended rusty-brown, with linear, sagittate, or cordate dark spots. Inner secondaries edged with buff or whitish, affording to folded wing the lengthwise stripe so characteristic of North American Partridges. Quills plain fuscous; tail-feathers plumbeous. No definite stripes about head; crest of soft blended feathers brown, ending in pure white. Length 10.00–11.00; extent 14.50–15.50; wing 4.50; tail 3.50–4.00; tarsus 1.25; middle toe and claw 1.04. ♀ little different; head-markings the same; size rather less. Western Texas, New Mexico, Arizona and southward; generally dispersed, but far less numerous than the top-knot Quails, and more southern. It is mainly a bird of the desert, found in the most arid, cactus-ridden regions, often far from water, sometimes in company with Gambel's Quail. The breeding season extends from March to September; the nest is placed on the ground, and the eggs, 8–10–12–16 in number, averaging 1.30 × 1.00, are rather elliptical than conical, creamy white or pale buff, minutely freckled with buff of a darker shade, or with various pale brownish spots, usually small, rounded, and uniformly distributed; the general effect being thus quite unlike that of the eggs of *Lophortyx*.

C. s. castanogas'tris. (Gr. *κάστανος*, *castanos*, Lat. *castanea*, the chestnut, and hence the peculiar reddish color of the nut; and *γάστρις*, *gastris*, pot-bellied, from *γαστήρ*, the belly. The preferable form of the name would be *Castaneiventris*, as given in the Key, 3d ed. 1887, p. 885, or *castaneiventer*, as in the British Museum Catalogue, 1893, p. 396.) CHESTNUT-BELLIED SCALED PARTRIDGE. BREWSTER'S QUAIL. Like the last; general coloration deeper and richer; crown concolorous with back, and cheeks with breast, both darker than throat; belly of ♂ with a conspicuous central patch of uniform chestnut, wanting or scarcely indicated in ♀. Lower Rio Grande Valley of Texas and southward in the lowlands of north-eastern Mexico to San Luis Potosí. BREWST. Bull. Orn. Club, Jan. 1883, p. 34; A. O. U. Lists, 1886 and 1895, No. 293 a.

CYRTO'NYX. (Gr. *κυρτός*, *kurtos*, bent, crooked; *ὄνυξ*, *onux*, nail, claw.) HARLEQUIN QUAIL. Bill very stout. Head with a full, soft, depressed occipital crest. Tail very short, of 12 soft feathers, almost hidden by coverts, scarcely or not $\frac{1}{2}$ as long as wings. Wing-coverts and inner quills highly developed, folding entirely over primaries. Feet small; tarsus rather shorter than middle toe and claw; toes short, but with remarkably developed claws. A very distinct genus. Plumage of head of ♂ curiously striped; of under parts ocellated. Sexes very unlike. Eggs white, unmarked.

C. montezu'mæ. (To Montezuma or Motecuzuma II., also called Xocoyotzín, an Aztec war-chief, Emperor of Mexico at the time of the Spanish Conquest, b. 1479, d. at Tenochtitlan (City of Mexico), June 30, 1529. The name is a Nahuatl word, meaning "angry chief." Fig. 514.) MONTEZUMA QUAIL. BLACK QUAIL. FOOL QUAIL. MASSENA PARTRIDGE. Adult ♂: Upper parts intimately waved with black and reddish-brown and tawny-brown, and marked with sharp buff or whitish shaft-lines; on wings the irregular black variegation changing to black bars and round spots, in regular paired series on each feather. Outer quills fuscous, their outer webs spotted with white or buff. Under parts crowded with innumerable round white spots on a dark ground, several pairs on each feather; middle line of breast and belly mahogany-colored, flanks, vent, and crissum velvety-black. Top of head black in front, with

slight white touches, changing on crest to brown. Sides of head and throat fantastically striped with black and white; a broad black throat-patch; another on cheeks, across lores and along-side of crown; a third on ear-coverts; a fourth bordering the white all around behind. Length about 9.00; extent 17.00; wing 4.75; tail 2.00; tarsus 1.20; middle toe and claw 1.60; its claw alone 0.50. Adult ♀: Upper parts as in ♂, but markings of wings less regular, more



FIG. 514. — Massena Quail, ♂, nat. size.

assimilated with the general variegation, and tone more fulvous. No peculiar marks on head, throat whitish or buff; general tone of under parts pale purplish-cinnamon, with fine mottling of black and white on each feather. Young ♂: Resembling the hen, but under parts ochrey or whitish with black variegation. Chicks, scarcely fledged, 3-4 inches long: Bill reddish above, whitish below; feet dull brownish. Above, light warm brown, varied with black, boldly striped with white—each feather having a hammer-headed white shaft-line. Some inner wing-quills like back; others dusky with whitish shafts, broken-barred with buff, chiefly on outer webs. Below, buffy-white, with numberless spots of blackish paired on each feather, sharp and circular on breast, further back widening to bars. Chicks in down: Rusty-brown above, whitish below, back obscurely spotted with dusk, a pair of whitish streaks on rump, a dusky streak behind each eye, and a chestnut spot on hind head. A singular species, ♂ very showy in full plumage, inhabiting western Texas, New Mexico, and Arizona; in the latter, W. to Fort Whipple at least, where I found it in 1864, S. far into Mexico. It differs much in its habits from the other Quail of that Territory, lies very hard, and is so easily killed that the people recognize its innocence in an uncomplimentary name. It is a bird of woodland, or at least of scrub and brush, not of the open, ranges up mountains to 9,000 feet, feeds much on a certain bulbous root, and does not pack in large coveys; nest on the ground, rather well made of grasses; eggs not known to be more than a dozen, pure white, unmarked, about 1.25×0.95 , not very pointed. *C. massena* of all former editions of the Key; but *Ortyx montezumæ* VIGORS, Zool. Journ. v, 1830, p. 275, is safely presumed to have priority over *O. massena* LESSON, Cent. Zool. 1830-32, p. 189, and the latter was not properly described by the proposer of the name: see Auk, Jan. 1885, p. 46.

Order LIMICOLÆ: Shore Birds; Waders.

Commonly known as the great "Plover-Snipe group," from the fact that the pluvialine and scolopaciine birds form the bulk of the order, which is practically equivalent to *Charadriomorpha* of Huxley. The name *Limicolæ* was bestowed by Illiger in 1811 upon certain genera of the modern family *Scolopacidae*, but is now used in a more comprehensive sense for all the Shore Birds, as distinguished from the Marsh Birds which form the order *Paludicolæ* (see beyond). The total number of species is not large, probably under 300, but the genera are disproportionately numerous. They average of small size, with rounded or depressed (never extremely compressed) body, and live in open places on the ground, usually by the water's edge. With rare exceptions, the head is completely feathered; the general pterylosis is of a nearly uniform pattern; the plumage is aftershafted; the spinal pteryla is well-defined, usually forked over the shoulders, with lateral apteria; the crural pteryla does not reach the suffrago; there are 10 functionally developed primaries, and a rudimentary 11th one; the secondaries are *aquintocubital* (lacking the 5th); the oil-gland is tufted.

The osteological characters are shared to some extent by certain swimming birds, as Gulls and Auks — in fact, the affinity between a Plover and a Gull is real, and so close that a group called *Laro-Limicolæ* has been named to include both, though it is not reasonably possible to bring them together in linear sequence in a book, without disarranging some other sequences which must be preserved. Cervical vertebrae are 15 as a rule, with 2 cervico-dorsals, and 5 or 6 dorsals (exceptions in *Oediemidæ* and *Jacanidæ*). Palate typically schizognathous; nasal bones normally schizorhinal (but holorhinal in *Pluvianus* and *Oedieminae*); angle of mandible produced into a slender hooked process; maxillo-palatines thin and scroll-like; prominent basipterygoids (wanting in *Oedieminae*, *Cursoriinae*, *Chionididæ*, etc.); rostral bones slender, often much elongated; sternum usually doubly, sometimes singly, notched behind or notched and fenestrated; and this difference may be only a generic character, as it is presented by certain true Snipes of very close relations to one another in all other respects; the furculum develops a hypocleidium; carotids double; syringeal muscles not more than one pair. The physiological nature is precocial and ptilopædic (or dasypædic, as it is also called), for the young hatch clothed and able to run about almost immediately, being quite as nidifugous as chicks of gallinaceous birds; and in this respect the *Limicolæ* differ from all those Waders which compose the order *Herodiones*. The eggs are laid as a rule in a rude nest or bare depression, and are from 2 to 4 in number, mostly 4, well marked all over on a non-committal ground-color (white only in *Dromas ardeola*). The food is insects, worms, and other small or soft animals, either picked up from the surface, or probed for in soft sand or mud, or forced to rise by stamping with the feet on the ground; from this latter circumstance, the birds have been named *Calcatores* (Stampers). With a few exceptions, the wing is long, thin, flat, and pointed, with narrow stiff primaries, rapidly graduated from 1st to 10th; secondaries in turn rapidly lengthening from without inward, the posterior border of the wing thus showing two salient points separated by a deep emargination. The tail, never long, is commonly quite short, and has from 12 (the usual number) up to 20 or even 26 feathers (in one remarkable group of Snipe). The legs are commonly lengthened, sometimes extremely so, as in the Stilts (*Himantopus*); rarely quite short, and are usually slender; they are indifferently scutellate or reticulate, or partly both. The toes are generally short (as compared with the case of Herons and Rails), the anterior usually semipalmate, frequently cleft to the base, only much lengthened in *Jacanidæ*, only palmate in *Recurvirostra*, and only lobate in *Phalaropodidæ*. The hinder is always short and elevated, or absent; when present, the hallux is supplied by its proper flexor longus hallucis, the flexor digitorum perforans going by 3 slips to the front toes; but their tendons are connected by a vinculum, and the arrangement is thus desmopelmous, as usual in non-passerine birds with 4 toes. The length of phalanges of anterior toes decreases from basal to penultimate. The lower part of tarsus never has feathers inserted upon it, though the leg may appear feathered to suffrage, owing to length of superincumbent feathers. The bill varies much in length and contour, but is almost always slender, abruptly contracted from frontal region of skull, and usually as long as, if not much longer than, the head, representing the "pressirostral" (pluvialine) and "longirostral" (scelopacine) types. In the former of these types, represented by any Plover, the base of the bill is small and soft, with short nasal grooves, beyond which it is enlarged into a well-marked dertrum or hard, horny part; in the latter type, as represented by any Snipe or Sandpiper, it is soft and sensitive to the very tip, with long nasal grooves. Aside from these predominant cases of the *Charadriidæ* and *Scelopacidæ* — those two large families which make up most of the order, the bill assumes special shapes in each of the small families *Dromulidæ*, *Glaucidæ*, *Himantopodidæ*, *Recurvirostridæ*, *Chionididæ*, *Thinocorythidæ*. The nostril is generally a slit in the membranous part, and probably never feathered.

The *Limicolæ* are among the most cosmopolitan orders of birds, being represented wherever in the world any birds can live; some of its members, like the Turnstone and Black-

bellied Plover, have a range almost conterminous with that of the order to which they belong, and many others perform annual migrations of extraordinary extent.

No division of the order into suborders has been established. We pass at once to its families, most of which are well represented in North America, and will be found fully characterized beyond. Before taking these up, it will assist the student to note briefly certain outlying or inosculated groups of limicoline affinities, as well as the exotic families which certainly belong to *Limicola*.

1. Of prime importance in this connection is the Bustard family, OTIDIDÆ, which connects the Limicoline and Paludicoline orders so perfectly that its position in the system has long wavered between the two, and been compromised by the erection of these birds into a separate order *Otides*. Their affinity with the former, through the family *Ædicnemidæ*, is so close that the Stone Curlew, *Ædicnemus crepitans*, has been called Thick-Kneed Bustard; but the balance of evidence favors their reference to the *Paludicolæ* (which see, beyond).

2. In speaking of some inosculated groups between *Gallinæ* and *Limicolæ* (p. 719), I had occasion to remark upon the TURNICIDÆ, or family of the Bustard-Quails or "Button-Quails" as they are indifferently called, as forming a separate order *Hemipodii*, *Turnices* or *Turnicomorphæ*. This group consists of the 4-toed *Pedionomus* of Australia, and the 3-toed species of *Turnix* or *Hemipodius*; the latter is quintocubital, the former aquincubital. Both have 12 rectrices, aftershafted plumage, tufted oil-gland, long cœca, and a gall-bladder; sternum single-notched; cervical vertebræ 15; palate incompletely aegithognathous: nasal bones schizorhinal, basipterygoids present. The single anomalous genus and species, *Ortyxelus meiffreni*, is brought under *Limicolæ*, as a member of the family *Cursoriidæ*, by late authority (Cat. B. Brit. Mus. xxiv, 1896, p. 26 and p. 30); but this case is still unsettled.

Regarding the following exotic families, there seems to be no longer any doubt that they are true components of the *Limicolæ* as above defined:—

3. THINOCORYTHIDÆ. The curious little birds of this family, confined to South America and represented by the two genera *Thinocorys* and *Attagis*, resemble Quails or Partridges in superficial appearance, but have the flight and general habits of Shore birds. The bill is as in gallinaceous birds, and there is a globular crop like that of ordinary poultry. There are four toes, with rudimentary and interdigital web, and the tarsus is reticulate; the short tail is held downward, as usual with Quails—not straight out behind, as usual with limicoline birds. Among anatomical characters may be noted the shizognathous (aegithognathous) palate, with a vomer broadly rounded in front; pseudo-holorhinal nasals; absence of basipterygoid processes and occipital foramina; superorbital fossæ; presence of ambiens, femoro-caudal, semitendinosus, and the accessories of both these last muscles; and two carotids. I suspect a closer relationship than is generally conceded of these "Lark-partridges," as they are generally called, with the Hemipodes. The species are very few—*Attagis gayi*, *A. chinborazensis*, *A. malouinus*, *Thinocorys ramicivorus*, and *T. orbignyana*.

4. CHIONIDIDÆ. The remarkable Sheath-Bills are snow-white birds, of about the size and somewhat resembling Pigeons, or Ptarmigan in winter. The base of the bill is covered with a separate horny case, unlike anything seen in other limicoline birds. In one of the genera, *Chionis*, the sheath is flat, something like the "cere" of a Skua; in the other, *Chionarchus*, the sheath rides up in front, like the pommel of a saddle, with a round hole for the nostrils; it thus resembles the nasal tube of a Petrel. The face is carunculate. The wing has a carpal spur. The feet are 4-toed, with reticulate tarsi, and basal webbing between the outer and middle toes. The nasals are pseudo-holorhinal; the palate is schizognathous; there are superorbital fossæ, but no basipterygoids nor occipital foramina. These birds form the superfamily *Chionomorpha* of Kidder and Coues. The relationships are close with the *Thinocorythidæ*, probably still closer with the *Hematopodidæ*. These birds live on the seashore, feed on seaweed, molluscs, crustaceans, and birds' eggs, and lay two or three colored eggs among rocks. The common Kelp-pigeon, or Sore-eyed Pigeon of the sailors, is *Chionis alba* of the Falklands and adjacent mainland; the smaller Saddle-bill, *Chionarchus minor*, inhabits Kerguelen and some other islands, while *C. crozetensis* is found on those whence it takes name.

5. DROMADIDÆ. This isolated family consists of *Dromas ardeola*, the so-called Crab-plover of wide distribution in Asia and Africa, whose place in the system has been disputed with needless vehemence. Though it has been placed now with the Terns, now with Herons, now in some other association, it is a limicoline bird belonging in the vicinity of the Thick-Knees and Coursers (to be presently noted). It is not exactly pluvialine; but "the possibility of its being with *Chionis*, a surviving link between the *Charadriidæ* and *Laridæ* is very great" (NEWTON, Dict., p. 100). The feet are 4-toed, and the anterior digits are extensively palmate—about as in the Tern genus *Hydrochelidon*, or nearly as in an Avoset; the tarsi are scutellate; the middle claw is pectinate, or rather jagged, on the inner edge, strikingly like that of the Coursers. The long, straight, hard, trenchant bill with its long gonyes and correspondingly short mandibular rami, recalls that of an Oystercatcher; the nostrils also open directly in the hard sheath of the bill, having no nasal scale. The wings are long, and the tail is short. The coloration is chiefly black and white, and there are long plumes on the back as in Herons. The bird is remarkable, among all its relatives, in breeding in burrows and laying white eggs.

6. GLAREOLIDÆ. The Glareoles or Pratincoles are a remarkable Old-world family, thoroughly limicoline and in fact closely related to the Coursers, yet of strange superficial appearance, like long-legged Swallows, with the bill of a Cuckoo; the tail is long and deeply forked, even to be called forficata, like a Barn Swallow's, in *Glareola* proper, though shorter and simply emarginate in the genus *Galachrysis*; the wings are long, or extremely long, and sharp pointed; the tarsus is scutellate before and behind, short (for a wader) in *Glareola*, very long in *Sillia*; the hind toe is present; the middle claw is denticulate or jagged. The bill is short, compressed, and somewhat decurved at the tip, with a wide deep cleft in fissional style. Such a combination of external characters could not fail to set some omni-

thologists' wits wool-gathering. Linnæus referred the common Glareole to the genus *Hirundo*, and Sundevall put these birds with the *Caprimulgide*. But in all their organization they agree with the Coursers, and might even go into the family *Cursoriide*. They are handsome birds, swift of foot and dashing on the wing, taking part of their prey in flight, like Swallows or Night-hawks. The best known species is *Glareola pratincola* of Europe, etc., with which *G. melanoptera* and *G. orientalis* agree closely. Five or six others, with less forked tails, form the genus *Galachrysis*; one, *Stiltia isabella*, is the long-legged Glareole of Australia, etc.

The Coursers and the Thick-Knees have each been set apart as a type of a family. The *Cursoriide* of Sharpe, however, as composed of the genera *Dromas*, *Ortyzelus*, *Pluvianus*, *Cursorius*, and *Rhinoptilus*, with *Glareola*, *Galachrysis*, and *Stiltia*, appears to me to be an indefensible combination of at least five families of two different orders of birds, and should be broken up. But when we have referred *Ortyzelus* to another order, eliminated *Dromas* as type of *Dromadide*, and *Glareola* with its associate genera as forming the *Glareolide*, there is nothing left of the group but three genera which may readily be referred to the *Charadriide*. There is probably more to be said in favor of making *Edicnemus* type of a separate family; yet it may perhaps be best treated as the Plover which it seems to be. Though it has some undeniable relationships with the Bustards, I think that these have been overestimated as to their taxonomic significance.

All the families of *Limicolæ* not noted above occur in North America, and most of the North American *Limicolæ* belong to one or the other of the two largest families — *Charadriidæ* and *Scolopacidæ*.

Family JACANIDÆ (PARRIDÆ): Jaçanás.

A small family of mostly small wading-birds, of 6 or 7 genera and fewer than 12 species, combining characters of Plovers and Rails, outwardly distinguished from either by excessive development of toes and especially of claws. These are slender, compressed, acute, nearly or quite straight; that of hind toe much exceeding its digit in length. The spread of feet thus acquired enables the birds to run with ease over floating vegetation of the marshes they inhabit, and on which the nest is placed, after the fashion of Rails. The eggs are heavily colored (except in two genera, in which they are glossy olive, unmarked). The systematic position of the family has been much questioned. On nearly all counts, it would appear to be *Limicoline*, not *Paludicoline*, and should be placed next to *Charadriide*. The bill of *Jacana* is quite plover-like; the spur on the wing and skin-flaps about the bill are like those of *Hoplopterus* and *Lobivanellus* (Plovers). With this understanding, I left the family where I found it, among the *Ralliformes*, in earlier editions of the Key; but now make the required transposition to *Limicolæ*, upon the following anatomical characters: Skull schizorbinal and schizognathous, with basipterygoid processes and no lateral occipital fontanelles: dorsal vertebrae opisthocælonous; spinal pterygia bifid; phalangeal bones of the feet enormously lengthened. The family has usually been called *Parridæ*, but it should be *Jacaniidæ*: for *Parra* was not used till 1766, (after *Jacana* BRISS. 1760), and the process of elimination to which its Linnæan species have been subjected makes it only tenable as the name of that genus of Plovers which Strickland named *Lobivanellus* in 1841 (see Auk, Oct. 1885, p. 337). The *Jacaniidæ* inhabit the warmer parts of both hemispheres. The most remarkable genus is the Asiatic *Hydrophasianus*, with very long tail-feathers, like a Pheasant's, and no frontal lappets. The Indian *Metopidius* has a singularity of the bones of the wing. The Australian *Hydractector* is another notable form. The African genera are *Phyllopezus* and *Microparra* (or *Aphalus* ELLIOT, Auk, 1888, p. 301). For the American genus, see next article; for the views of the most recent monographers of the family, see ELLIOT, Auk, July, 1888, pp. 288-305, and SHARPE, Cat. B. Brit. Mus. xxiv, 1896, pp. 68-89.

JACANA. (Brazilian *jaçaná*, name of a bird of this genus.) **JAÇANÁS.** Bill plover-like, contracted in continuity, enlarged terminally; with culmen depressed to end of nasal groove, then convex and decurved; outline of mandibular rami about straight to gonys, which is ascending; commissure about straight to decurved end. Nasal grooves along contracted portion of bill; nostrils small, elliptical, situate in advance of base of bill. Angle of mouth with a leaf-like lobe of skin (rudimentary in our species). Forehead with a large leaf-like lobe of skin, with free lateral and posterior edges, adherent centrally and anteriorly where reaching

base of upper mandible. A sharp horny spur on bend of wing. Primaries 10, not peculiar; outer 3 about equal and longest, overlaid by inner quills in closed wing. Tail very short, with soft rectrices concealed by coverts. Tibiæ bare below, and with the tarsus scutellate before and behind, the scutella tending to become confluent in a continuous sheath. All the toes, claws included, longer than tarsus; middle toe alone nearly as long as tarsus; outer toe alone about as long as middle, its claw shorter than that of middle toe; inner toe a little shorter than outer, its claw longer; hind toe only about as long as basal joint of middle toe, but its claw much longer than itself; all the claws slender, about straight, very acute. The



FIG. 515. — *Jacana jacana*, $\frac{1}{2}$ nat. size. (From Brehm.)

type of the genus is *Parra jacana* LINN. of South America, with bifid frontal flap and well developed wattles as shown in fig. 515. Our species is type of the genus *Asarcia* SHARPE, 1896, with undeveloped wattles and the frontal flap trifid like a fleur-de-lis, accepted as sub-genus by the A. O. U. Auk, Jan. 1897, p. 119.

J. spinosa. (Lat. spinous, referring to the spur on the wing. Fig. 53 *ter.*) MEXICAN JAÇANÁ. Adult: General plumage rich purplish-chestnut, brightest on wings and tail, darkest on head, neck, back, breast, and sides, fading on lower belly. Quills pale yellowish-green, with dusky edging in increasing extent from secondaries to outermost primary; alula and primary coverts blackish. Bill and wing-spur yellow; frontal leaf orange; base of upper mandible whitish, and space between it and frontal leaf carmine; feet greenish; iris brown. Young: Grayish-brown above, marked with brownish-yellow; below, buffy-whitish, darker across breast, sides and lining of wings dusky; a light superciliary and dusky postocular stripe; wing-quills greenish-

yellow as in adult; wattle rudimentary. Eggs 1.20×0.95 , drab, profusely scrawled and blotted with black. Length 8.50; wing 5.00; bill 1.25; tarsus and middle toe, 2.00. West Indies, Central America, and Mexico, to S. Florida and Texas on the Lower Rio Grande. *Fulica spinosa* LINN. 1758, and *Parra variabilis* LINN. 1766, both based on EDW. Nat. Hist. i. 1743, p. and pl. 48. *Parra gymnostoma* WAGL. 1831, and of most authors, as of 2d and 3d eds. of the Key. *Jacana gymnostoma*, A. O. U. List. 1st ed. 1886, No. [288]. *Jacana spinosa* ELLIOT, l. c. p. 297; COUES, Key, 4th ed. 1890, p. 905; A. O. U. List, 2d ed. 1895, No. [288]. *Asarcia variabilis* SHARPE, l. c., p. 86, fig. 10. The species should properly stand as *ASARCIA SPINOSA* COUES, Auk, Jan. 1897, p. 88.

Family CHARADRIIDÆ: Plovers, etc.

A large, important family of more than 100 species of all parts of the world. Its limits are not quite settled, there being a few forms sometimes referred here, sometimes made types of distinct families, as noted above: but about 40 genera are now generally recognized as composing the *Charadriidæ*, divisible into at least 3 subfamilies. Coursers (*Cursoriinæ*) are an Old World type of 3 genera and not less than 12 species. In these the nasal fossa is shorter and the gape of the mouth is longer than in the true Plovers, somewhat as in the *Glareoles*, with which *Cursorius* also agrees in the curvature of both mandibles, though the gonys is not concave in the associate genus *Rhinoptilus*; in both, the feet are 3-toed, as usual in this family, but the tarsi are scutellate, the middle claw denticulate, and there are no basipterygoids, contrary to the rule in *Charadriidæ*: the sternum has a deep outer and a shallow inner emargination. The Cream Courser, *C. gallicus*, and the Bronze-winged *R. chalconotus*, are examples of the *Cursoriinæ*. The notable genus and species *Pluvialis aegyptius* has been referred to the *Cursoriinæ* by those who take it out of *Charadriinæ*. This is the Black-backed Courser or Black-headed Plover, believed to have been the celebrated trochilus of the ancients, who describe it as playing the part of a friendly tooth-picker to the crocodile. This bird has the short nasal fossæ, 3 toes, scutellate tarsi, and most other characters of the *Cursoriinæ*, including lack of basipterygoids; but the nasals are holorbital as in the Thick-knees. These remarkable birds, constituting the subfamily *Edicnemidæ*, if not a separate family *Edicnemidæ*, are related in some respects to the Bustards, and thus furnish a link between the Limicoline and Paludicoline orders. The bill is thoroughly pluvialine, as are the feet, with their long reticulate tarsi and 3 short toes; but the nasal bones are holorbital, there are no basipterygoids, and the spinal pteryla is not forked. The species are of great size for this family, some 15-20 inches long, with broad flat-topped heads, long wings, and graduated tails; most of them live on dry ground, and all lay 2 eggs. The original Thick-knee, or Thick-kneed "Bustard," *Edicnemus crepitans*, also known as the stone-"curlew" or stone-plover, or Norfolk plover, inhabits Europe, Asia, and Africa; there are six or seven other species of the genus, among which *E. bistriatus*, *E. dominicensis*, and *E. superciliaris*, are American. The other members of this group are the Australian *Burhinus grullarius*, the Indian *Esacus recurvirostris*, and the Austro-malayan *Orthorhamphus magirostris*. All other pluvialine birds appear to fall in the

Subfamily CHARADRIINÆ: True Plovers.

Toes generally 3, the hallux being absent (excepting, among our forms, *Squatarola* and *Vauellus*, and with other exceptions among exotic genera); tarsus normally reticulate, frequently scutellate in part, longer than middle toe; toes always with basal webbing between the outer and middle at least, often with two basal webs; tibiae naked below. Bill of moderate length, much shorter or not longer than head, shaped somewhat like that of a Pigeon,

with a convex horny terminal portion, or dertrum, contracted behind this; nasal fossæ rather short and wide, filled with soft skin in which the nostrils open as a slit, not basal, and perforate. Gape very short, reaching little beyond base of culmen. Wings long and pointed, reaching, when folded, to or beyond end of tail, and sometimes spurred; crissal feathers long and full; tail short, generally nearly even and of 12 feathers. Body plump (neither depressed as in Avocets and Phalaropes, nor compressed as in Rails); neck short and thick; head large, globose, sloping rapidly to the small base of bill, usually fully feathered, sometimes carunculate or wattled. Size moderate or small. The foot rule for Plovers is, reticulate tarsi and 3 toes, as against the rule of scutellate tarsi and 4 toes in Scolopacine birds; but there are many exceptions to this, especially among the Plovers, which have the head crested or wattled and the wings spurred; in which all these variable features are variously combined, affording good generic characters, but not to be overestimated as affording any basis for their separation from other *Charadriinæ*.

Our species are very closely related, and will be readily recognized by the foregoing characters. There are about 75 species of all countries. The most singular of them all is the Wrybill or Crook-billed Plover of New Zealand, *Anarhynchus frontalis*, in which the bill is bent sideways. Though thus anomalous in the whole class *Aves*, this bird is in other respects a plain Plover, with a little suspicion of a Turnstone. (The rare *Pluvianellus sociabilis* of Patagonia is more decidedly like a Turnstone, with its very short tarsi, and peculiar bill; this should be removed from the present subfamily to the *Arenarinæ*.) The Chilian *Oreophilus ruficollis* (or *Totamrostris*) has scutellate tarsi and a very slender, long-grooved bill, like a Tattler's; but it is otherwise an ordinary 3-toed Plover, coming near the Dotterel. *Thinornis novæ-zealandiæ* is likewise a slender-billed true Plover. *Peltolyas australis* of Australia has been needlessly made type of a different subfamily on account of its scutellate tarsi in connection with 3 toes. *Erythrogonys cinctus* of the same country and the two African species of *Defilippia* are 4-toed. They introduce us to the interesting group of genera (sometimes associated as a subfamily *Lobivanellinæ*) which have 3 or 4 toes, with or without wattles and wing-spurs, and only agree in the scutellation instead of reticulation of the tarsi. Thus, *Sarciophorus tectus* of Africa is 3-toed, crested, wattled, and spurless; *Lobipluria malabarica* is 3-toed, wattled, crestless, and spurless; *Microsarcoptes cinereus* of Asia is 4-toed, wattled, crestless, and spurless; *Hoploxypterus cayanus* and *Ptiloscelis resplendens*, both of South America, are 3-toed, spurred, and crestless; while the species of the genus commonly called *Lobivanellus*, of wide distribution in the Old World, are 4-toed, spurred, and wattled, such being *L. lobatus*, *L. miles*, *L. senegalus*, and *L. lateralis*. In this last genus the spurs and wattles are highly developed, the spurs being as large and sharp as in Jacanas; but in the whole series of genera the condition of these appendages varies much, the spur being reduced in some to a mere knot, and the wattles being also in some cases rudimentary. Passing from these, which agree in scutellation of the tarsi, we come to other genera in which the tarsi are reticulate, according to the foot-rule for Plovers, yet in which we find the same curious changes rung upon the hind toe, wattles, and spurs. Thus, *Xiphidiopterus albiceps* is 3-toed, with large spurs and wattles; *Sarcogrammus indicus* and *Tylibyx melanocephalus* are 4-toed, wattled, and spurless; *Zonifer tricolor* of Australia, and *Anomalophrys superciliosus* of Africa are 3-toed, wattled, and spurless; the three species of *Hoplopterus*, *H. spinosus*, *H. ventralis*, and *H. speciosus* are 3-toed, crested, and sharply spurred, but not wattled; the two American species of *Belonopterus*, *B. cayennensis* and *B. chilensis*, are 4-toed, crested, bluntly spurred, and without wattles. Thus the development of spurs and wattles is by no means concomitant, nor is either correlated with a hind toe or a crest. None of the following have either spurs or wattles: *Vanellus* is 4-toed and crested; *Eurypterus*, *Chatusia*, *Zonibyx*, and *Squatarola* are 4-toed and crestless. All other *Charadriinæ* conform to the norm for this subfamily, which is, to have 3 toes, reticulate tarsi, no crest, and no spurs. Our species are found along the sea-

shore, by the water's edge in other open places, and in dry plains and fields. All perform extensive migrations, appearing with great regularity in spring and fall; most of them breed far northward; all are more or less gregarious, except when breeding. They run and fly with great rapidity; the voice is a mellow whistle; the food is chiefly of an animal nature. The eggs are commonly 4 in number, speckled, very large at one end and pointed at the other, placed with the small ends together in a slight nest or mere depression in the ground. The sexes are generally similar, but changes with age and season are great.

Analysis of Genera.

Toes 4.	Head with a long flowing crest. Wing over 8.00. Iridescent	<i>Vanellus</i>
	Head not crested. Wing under 8.00. Speckled	<i>Squatarola</i>
Toes 3	Plumage of upper parts speckled; no rings or bands of color about head or neck	<i>Charadrius</i>
	Plumage of upper parts not speckled; rings or bands of color about head or neck.	
	Tarsus not nearly twice as long as middle toe without claw	<i>Ægialitis</i>
	Tarsus about twice as long as middle toe without claw	<i>Podasocys</i>

VANEL/LUS. (Lat. *vanellus* or *ramellus*, diminutive of *ramus*, a fau; so named from the way the wings winnow the air.) LAPWINGS. Bill slender, shorter than head, perfectly pluvialine. Legs long; tibia much denuded below; tarsus greatly longer than middle toe and claw. A web between bases of middle and outer toes; inner toe cleft to base. A small hind toe. Wings very long, folding to end of the long square tail, but rounded; 2d-5th primaries subequal and longest, 1st about equal to 7th; primaries very broad, 3 or 4 outer ones much narrowed toward end; secondaries long and ample. A long thin recurved occipital crest of filamentous feathers. No spurs nor wattles. Plumage of upper parts highly lustrous with metallic iridescence.

V. vanellus. (Figs. 516, 517.) CRESTED GREEN PLOVER. LAPWING. PEWIT. KIEBITZ. KIEWIET. VIPA. PAVONCELLA. PEASWEEP. HORN-PIE. TEUCHIT. DIXHUT. VANNEAU. Adult ♂: Top and front of head, including the 2-3 inch long crest, throat-line, and large pectoral area, glossy black. Sides of head mostly, and sides of neck, white, on hind neck mixed with gray. Upper and under tail-coverts chestnut or orange-brown. Under parts, except as said, snowy-white. Tail white, with broad black bar at ends of feathers excepting outermost, tips of all narrowly white. Upper parts iridescent green, passing on wings to violet-purple and steel-blue. Quills glossy blue-black, several outer primaries fading to grayish-white on the narrow terminal portion, secondaries white at base. Bill black; feet red. ♀ similar; crest shorter. Length 13.00; wing 8.50-9.00; tail 4.00; bill 1.00; tarsus 2.00. This splendid wanton of the crest inhabits Europe, etc.: has occurred in Greenland, Alaska, and Long Island (Auk, 1886, p. 438). Few birds are better known than the Lapwing in Europe, where it has many names in different languages, a few of which are given above. It is *V. cristatus* or *vulgaris* of most authors, as of former

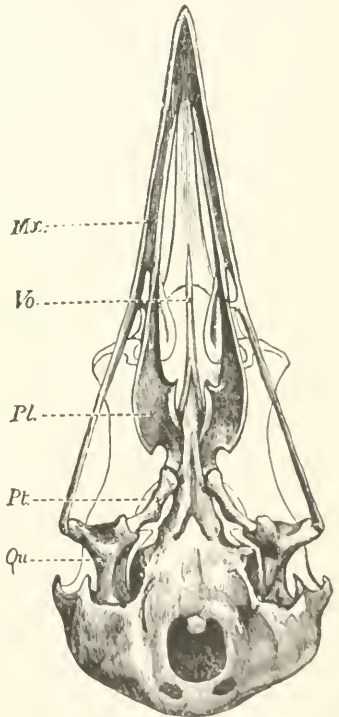


FIG. 516. — Under view Skull of Lapwing. *Mx.*, The Maxilla. *Vo.*, The Vomer. *Pl.*, The Palatine Bone. *Pt.*, The Pterygoid Bone. *Qu.*, The Quadrate Bone. (From Seebohm's Charadriidæ.)

editions of the Key; *V. vanellus*, A. O. U. No. [269]. This bird furnishes a large part of the Plover's eggs of commerce, so prized by epicures. Professor Newton estimates that 800,000

a year have been sent from Holland into England; and that many eggs of the Black-headed Gull, various Terns, Redshawks, and Golden Plover are also sold and eaten under the same name (Dict. p. 504).

SQUATAROLA. (Ital. *squatarola*, name of the species. Fig. 519.) **FOUR-TOED PLOVER.** A small but distinct hind toe, contrary to the rule in this family. Tail less than $\frac{1}{2}$ as long as wing. Tarsus much longer than middle toe and claw. Tibia bare below, reticulate like the tarsus. Basal web between outer and middle toes. Legs dark-colored. Upper plumage speckled, lower black or white; no rings or bars of color about head or neck. Tail fully

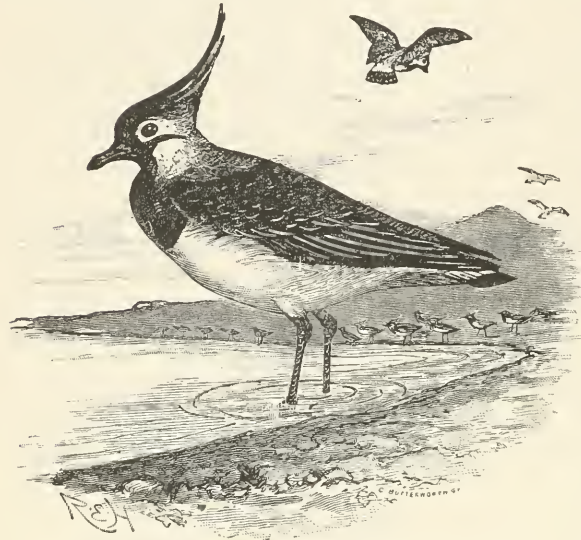


FIG. 517. — Crested Lapwing. (From Seebohm's Charadriidæ.)

barred. Axillaries black. No crest. Seasonal changes of plumage very great; sexes alike. Excepting the hallux, this genus is identical with *Charadrius* proper. (*Charadrius* by error, A. O. U. Lists, 1886-95, corrected 1897.)

S. squatar'ola. (Figs. 518, 519, 520.)

GRAY PLOVER. SWISS PLOVER.

BLACK-BELLIED PLOVER. BLACK-

BREAST. BULL-HEAD PLOVER.

BETTLE-HEAD. CHUCKLE-HEAD.

HOLLOW-HEAD. OWL-HEAD. WHIST-

LING PLOVER. OX-EYE. MAY-CK.

PILOT. ♂ ♀, in summer: Upper parts

fretted with blackish and ashy-white,

the feathers being white basally, then

black, tipped and usually scalloped

with white. Upper tail-coverts mostly

white, with few dark touches. Fore-

head, line over eye and thence more

broadly over side of neck, lining of

wings, tibiæ, vent, and under tail-

coverts, white. Sides of head to an ex-

tent embracing eyes, *avillary plumes*,

and entire under parts (except as said),

black. Tail closely barred with black

and white. Primaries dark brown,

blackening at tips, with large basal

areas and a portion of their shafts, white.

Bill and feet black. Length 11.00-12.00;

wing 7.00-7.50; tail 3.00; bill 1.00-1.25;

tarsus 2.00; middle toe and claw 1.33;

tibiæ bare



FIG. 518 — Gray Plover. (From Seebohm's Charadriidæ.)

tibiæ bare

1.00. But such a perfect bird as this rarely seen in the U. S. ♂ ♀, old, in fall and winter, as usually seen in U. S.: Upper parts speckled with grayish. Under parts white or whitish, anteriorly speckled or mottled with grayish-brown; axillary plumes, however, black (or blackish), as before, and this is a good color-mark of the species in any plumage, in comparison with the Golden Plover. Birds changing show every mixture of black and white below. ♂ ♀, young: Similar to winter adults, but upper parts speckled with yellowish, as in *C. dominicus*, most of the feathers having edgings of this color; less white also on forehead. Feet grayish-blue. Downy young yellowish-drab above, mottled with black, hind neck and under parts white, and 2 or 3 black streaks on each side of the head. A large stout Plover, with big head and a little hind toe, commonly diffused over most parts of the world: in America, breeding in Arctic regions, flocking S. and N. in fall and spring, preferably coastwise; common, but less so than *C. dominicus*. Eggs 4, pyriform, 1.90-2.10 long × 1.40-1.45 broad; drab or dark brownish clay-color, very heavily marked, especially on the larger half of the shell, with irregular blotches of brownish-black, smaller spots being more thinly distributed over the rest of the surface; markings about great end usually confluent and wreathy; a few pale markings in the shell. (*S. helvetica* of most authors, as of all former editions of the Key. *Charadrius squatarola* A. O. U. Lists, 1st and 2d eds. 1886-95, No. 270. *Squatarola squatarola* A. O. U. Suppl. List. Auk, Jan. 1897, p. 126.)

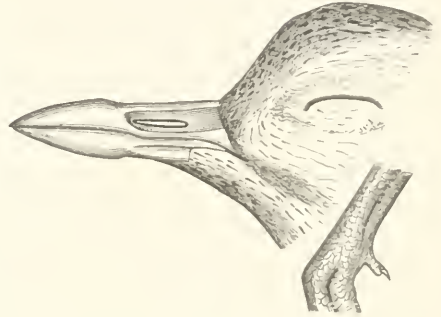


FIG. 519.—Bill and hind toe of *Squatarola*, nat. size. (Ad. nat. del. E. C.)

CHARADRIUS. (Gr. χαράδριος, *charadrios*, Lat. *charadrius*, a plover.) GOLDEN PLOVERS. Characters as in *Squatarola*, but no hind toe. (This is the type-genus of the whole family. The several species are closely related: to our long-known Golden Plover have been added as birds of North America both the Asiatic subspecies *fulvus* and the European species *C. apricarius* (or *pluvialis*); the latter from its occurrence in Greenland, the former in Alaska. U. S. birds are all *C. dominicus* — *C. virginicus* of most authors.)

Analysis of Species and Subspecies.

Lining of wings ashy.

Length 10.00-11.00; wing 7.00; tail 3.00; tarsus 1.75 *dominicus*

Length 9.00-10.00; wing 6.50; tail 2.60; tarsus 1.65 *d. fulvus*

Lining of wings white *apricarius*

C. dominicus. (Lat. *dominicus*, of St. Domingo. Figs. 521, 522.) AMERICAN GOLDEN PLOVER. COMMON PLOVER. THREE-TOED PLOVER. WHISTLING PLOVER. ALWAGRIM PLOVER. SPOTTED PLOVER. FIELD PLOVER. GREEN PLOVER. GREEN-BACK. BRASS-BACK. GREEN-HEAD. BLACK-BREAST. PALE-BREAST. MUDDY-BELLY. BULL-HEAD. TOAD-HEAD. HAWK'S-EYE. SQUEALER. PASTURE-BIRD. FIELD-BIRD. FROST-BIRD. TROUT-BIRD. PRAIRIE PIGEON. ♂ ♀, in summer: Upper parts blackish, everywhere spangled with golden-yellow, and mostly also with white, the brighter color in excess, the markings of individual feathers a tipping and one or several paired scallops. Hind neck less strongly marked than crown or back. Forehead, and long stripe over eye, snowy-white. Region immediately around bill, sides of head to include eyes, and entire under parts, glossy brownish-black. Lining of wings, and axillars, sooty-gray or ashy (neither black nor white). Tail dusky grayish-brown, with numerous irregular pale gray bars, and reddish-brown shafts; upper tail-coverts and rump like back. Primaries fuscous, blacken-

ing at tips and whitening at bases of inner webs, though without definite white spaces; shafts white for a space. Secondaries and many coverts, like primaries, plain fuscous, without the golden and white fretwork of back. Bill and feet black. Length 10.00–11.00; extent 22.50; wing 7.00; tail 3.00; bill 0.90; tibiæ bare 1.00; tarsus 1.75; middle toe and claw 1.20. ♂ ♀, in winter, and young, much alike, very different from breeding dress: Upper parts much as before, but colors not so pure and intense; the spangling mostly golden or somewhat greenish-yellow, with little white if any. Front and line over eye

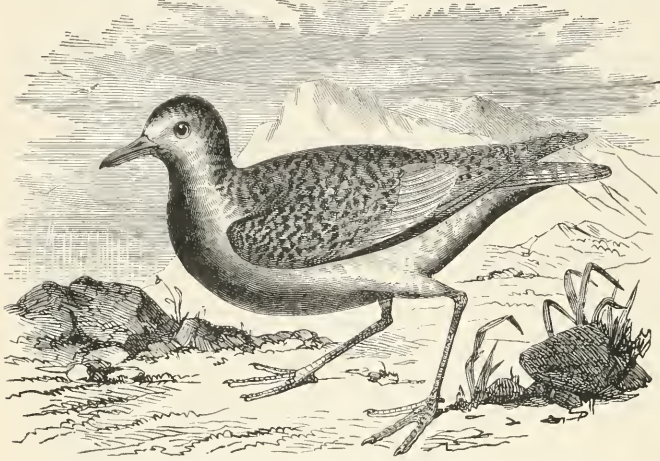


FIG. 520. — Black-bellied Plover, in summer, reduced. (From Lewis.)

not purely white, but tawny, with dusky streaks. Tail lacking transverse bars, the feathers being dark grayish-brown with white or yellow edging and notching. Axillars and lining of wings ashy-gray as in summer; but, as in *Squatarola*, the chief difference is in the under parts, which have no black, being grayish-white, clearest on chin, belly, and crissum, throat and sides of head streaked, breast and sides of neck and body mottled, with dark grayish-brown. Legs not perfectly black. This is the muddy-bellied state in which the Golden Plover is generally seen in the U. S., though beautiful black-bellied birds with pure silver and gold spangles may be found late in the vernal migration. Young of the first autumn, which make the best eating, are not certainly distinguishable from old birds of the same season and of winter; but they are "greener," *i. e.*, the freckles are more colored in proportion to the amount of white, and have a tarnished tint, like "old gold;" this color is also washed over the breast. Downy young are yellow above, varied with black, an eye spot and the under parts white. North America at large — in fact, most of Western Hemisphere; breeds in Arctic regions; passes N. and S. in spring and fall, formerly in great waves and affording fine sport at the latter season. Eggs 4, similar to those of *Squatarola*, smaller, usually paler clay-color, sometimes whitish; markings of same tone and pattern; size 1.80–2.00 × 1.30–1.35. This is the usual "field-plover" of sportsmen; a well-known and highly esteemed game-bird, with a profusion of vernacular names, some of them very pat, and some shared with *Squatarola*; "prairie-pigeon" is only heard in the West, and even there is oftener applied to Bartram's Sandpiper.

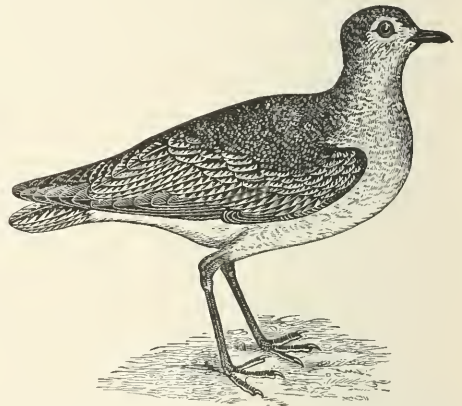


FIG. 521. — Golden Plover, in fall or winter, reduced. (From Nuttall, after — ?)

C. d. fulvus. (Lat. *fulvus*, yellowish. Fig. 525.) ASIATIC GOLDEN PLOVER. Similar; more suffused with yellow on head, especially along superciliary stripe; smaller; length

about 9.50; wing 6.50; tail 2.60; tarsus 1.65; middle toe and claw 1.10; bill 0.90. Alaska, from Asia.

C. aprica'rius. (Lat. *apricari*, to bask in the sun, take a sun-bath, *apricate*; *apricus*, sunny. Linnæus had two names for this bird, *apricarius* and *pluvialis*, the latter word meaning pluvial, being etymologically the same as *plover*. *C. pluvialis* of 1766 is used by most authors, as in former editions of the Key; but *C. apricarius* of 1758 now takes precedence by our rules. It makes no difference about the bird, which is always the same, "rain or shine.") EUROPEAN GOLDEN PLOVER. Like *C. dominicus*, and of same size; feet stouter, with shorter tarsi, averaging under 1.60, thus both relatively and absolutely shorter than in *dominicus*, and relatively shorter than in *fulvus*, which is a smaller bird; but best distinguished from both by always having the lining of the wings *white*. Greenland, from Europe. (Auk, 1889, p. 217.)

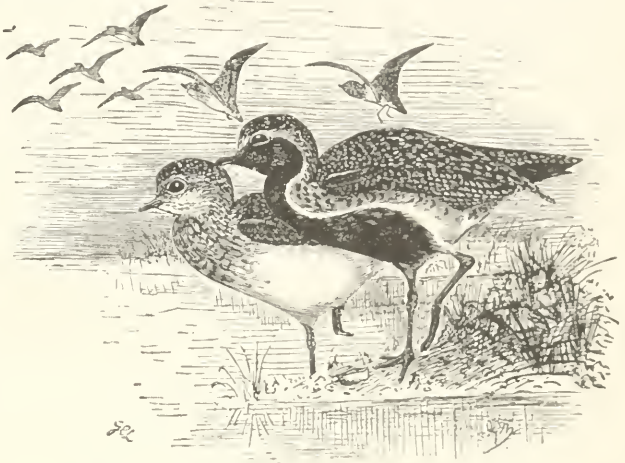


FIG 522. — Golden Plover. (From Seebohm's Charadriidæ.)

ÆGIALITIS. (Gr. *αἰγιαλίτης*, *aigialites*, masc., a doer by the sea, as we should say a "long-shoreman," or *αἰγιαλίτις*, *aigialitis*, fem. form of the same, from *αἰγιαλός*, *aigialos*, the seashore, beach, with the suffix denoting agency. Both forms, *Ægialitis* and *Ægialites*, are in common use, without much regard to gender. I confess my own fault in this particular, and now revert to the feminine form *Ægialitis* of the original edition of the Key, as that originally given by BOIE, Isis, 1822, p. 558, and correctly in the A. O. U. List. The accent is on the penult — not on the antepenult, as commonly spoken by us.) BEACH PLOVERS. SAND PLOVERS. SHORE PLOVERS. RING PLOVERS. A genus not easy to define with precision, owing to differences in details of form which the numerous species present, but readily distinguished from *Charadrius* by color: Upper parts not speckled; lower never extensively black, but white, with bars or rings of color about head and neck. Tarsus not twice as long as middle toe without claw (compare *Podasocys*). No trace of a hind toe (compare *Squatarola*); front toes with one basal web, or two. Bill thoroughly pluvialine, but of variable size. Sexes and ages usually distinguishable. Plates of front of tarsus tending to enlarge in two or three special rows, instead of uniform reticulation. There are many species of several subgenera of these "Ploverlets," found in nearly all parts of the world. We have six perfectly good North American species, a subspecies of one of these, and two stragglers from Asia: they represent the subgenera *Oxyechus*, *Ochthodromus*, *Ægialeus*, and *Ægialitis* proper.

Analysis of Subgenera, Species, and Subspecies (adult males).

Tail half as long as wing or more, extending far beyond tip of wings when they are folded, and graduated an inch or more. Bill slender. (Subgenus OXYECHUS.)

Bill black; rump bright chestnut; two black bands on throat and chest. N. Am. *macrurus*

Tail not half as long as wing, extending little if any beyond tips of wing when they are folded

Feet semipalmate, with 2 evident basal webs, that between outer and middle toe reaching to end of 2d joint of the latter. Bill short, but stout and stubby. (Subgenus ÆGIALEUS.)

Bill black and orange. Back hair-brown. One heavy black ring on fore-neck, a white one on hind-neck, and black bar on head. N. Am. *semipalmata*
 Feet less semipalmate; no evident web between inner and middle toe, that between outer and middle reaching only to end of 1st joint of the latter.

Bill variable. (*Subgenus* ÆGIALITIS proper.)

Bill moderate, black and orange. Back hair-brown; broad black ring on neck and bar on head; lores black. Wing 5.00. Europe, etc.; Greenland *hiaticula*

Bill slenderer, black. Colors as before. Wing 4.50. Asia, etc.; Pacific coast, straggler . . . *aubia*

Bill very slender, black. Back pale gray, a black bar on head and patch on side of breast, never completed as a ring; lores white. Western N. Am. *nivosa*

Bill very short and stubby, orange and black. Back pale gray; black bar on head; white collar on hind neck; lores white.

Black collar on neck incomplete in front. Chiefly Eastern N. Am. *meloda*

Black collar completed on neck in front. Chiefly Interior N. Am. *m. circumcincta*

Bill large and stout, black. (*Subgenus* OCHTHODROMUS.)

Bill extremely large, as long as middle toe and claw. Black ring across fore-neck and bar on head. S. Atlantic Coast *Wilsonia*

Bill moderately large, shorter than middle toe alone. Rufous brown ring around neck, and sides of head mostly black, with a white line over lores. Asia, etc., Alaska, straggler *mongola*

Subgenus (OXYECHUS: Killdeers.)

Æ. vociferæ. (Lat. *vociferus*, voice-bearing, noisy; *vox*, voice; *ferre*, to fetch or carry. Figs. 523, 524, 526.) CHATTERING PLOVER. NOISY PLOVER. KILLDEER PLOVER. KIL-DEE. Adult ♂ ♀: Above, grayish-brown, with an olive shade, and in high plumage a slight

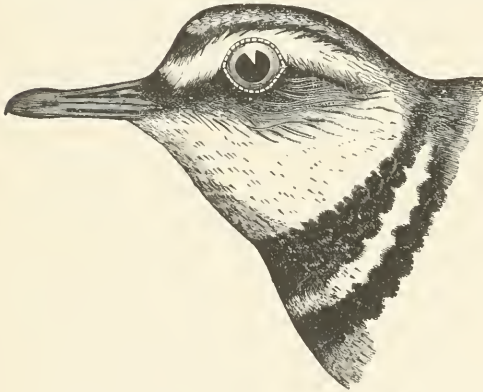


FIG. 523. — Killdeer Plover, nat. size. (Ad. nat. del. E. C.)

brunzy lustre. Rump and upper tail-coverts bright-colored, very variable in tint, from tawny or orange-brown to cinnamon-brown or chestnut. Forehead with a white band from eye to eye, more or less prolonged as a superciliary stripe, and a black band above this white one. A white collar around hind neck, continuous with white of throat. A black collar around back of neck, continuous with a black breast band. Behind the latter another black breast belt. Thus the fore parts are encircled with one complete black ring, behind which is a black half-ring on breast, before which latter is a complete white ring. A white stripe over and behind eye; a dusky stripe

below eye. Under parts entirely pure white, except the two pectoral belts. Primary quills blackish; a white space on outer webs of most of them, forming an oblique series, and a longer white space on their inner webs. Secondaries mostly white, but with black areas in increasing extent from within outward. Long inner secondaries like back. Tail-feathers singularly variegated; several inner pairs like back, insensibly blackening toward their ends, then lightening again, and usually with rusty tips; lateral ones gaining more and more of the bright color of rump, with more definite black subterminal bars, and pure white tips; outermost pair mostly white, with the rufous shade and several broken black bars. The effect of all this variegation is very striking when the parts are displayed in flight. Bill black; eye black, with a bright orange or red ring around it on the edges of the eyelids; feet of a variable pale flesh color. Length 9.00–10.00 or more, very variable; extent 20.00 or more; wing 6.00–6.50; tail 3.50–4.00, proportionally longer and more rounded than usual in the genus, and the principal character of this subgenus; bill 0.80; tibiae bare 0.80; tarsus 1.40–1.50; middle toe and claw 1.12. ♂ ♀, young: The black bands replaced by gray; upper parts

duller and more grayish; and when quite young the feathers of upper parts margined with rusty brown, giving a spotty appearance: rump pale; markings of tail incomplete; but the birds speedily acquire a plumage like that of adults. Downy young: Above, gray with a ruddy tinge; ring round top of head, ring round neck, a loreal stripe, stripe down back, and another on each side of the colored area, black; collar round back of neck, forehead, and ends of wing-tufts, white; tail-tuft and bill black—queer little creatures, readily recognized. Temperate North America at large, very abundant, breeding anywhere; not gregarious nor maritime; extensively but somewhat irregularly migratory, reaching the West Indies and South America in winter. A very noisy bird—the curious name is derived from its shrill two-syllabled whistle, like *kil-deer! kil-deer!* and may be spelled in four ways

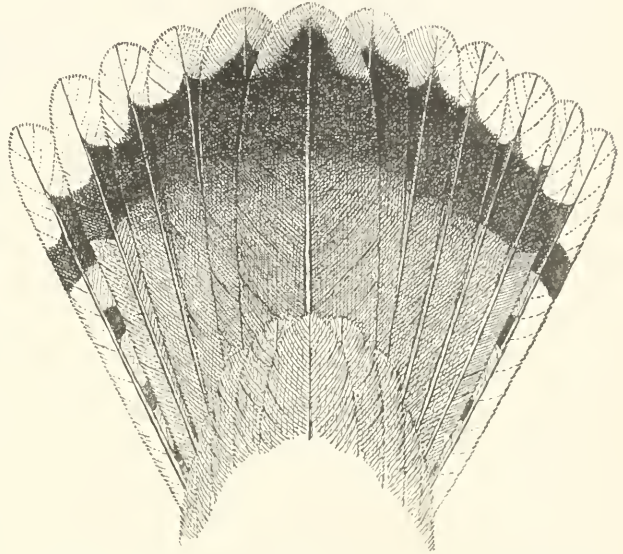


FIG. 524.—Tail of the Killdeer Plover. (From "North American Shore Birds," by D. G. Elliot.)

on good authority—*killdeer*, *kildeer*, *kildur*, *kildee*. Nest anywhere in grass or shingle usually near water. Eggs 4, about 1.50×1.10 , of the pyriform shape usual among limicoline birds; ground varying from drab through clay-color to creamy, marked in endless variation with blackish-brown. Killdeers' eggs and those of the Spotted Sandpiper do excellent duty in boys' and amateurs' cabinets for those of most small waders.

(Subgenus *ÆGIALEUS*.)

Æ. semipalmata. (Lat. *semi*, half; *palmata*, palmated: the species is remarkably distinguished by the extent of the half-webbing between the toes. This is the character of the subgenus, given full generic rank by Dr. Sharpe, but ignored by the A. O. U. Figs. 527, 528.) SEMIPALMATED PLOVER. RING PLOVER. RING-NECK. Adult ♂ ♀, in summer: Upper parts uniform dark ashy-gray or light hair-brown (wet-sand color); under parts pure white. A broad black ring encircling fore-neck. In advance of this a white half-collar around back of neck, spreading into white of throat. A white frontal bar, entirely surrounded by black: *i. e.* a black coronal bar and black stripe along lore and side of head, meeting its fellow over base of upper mandible. Primaries blackish, with narrow white spaces reduced to a portion of the shaft alone on outer primary; secondaries largely white; greater coverts white-tipped; long inner secondaries like the back. Tail like back, the feathers insensibly blackening toward their ends, most of them white-tipped, outermost nearly all white. An orange ring round eye, very bright; iris hazel brown. Bill black, with orange basal half; feet pale flesh-color, drying dingy yellowish; claws black. Web between outer and middle toe reaching to end of second joint of the latter. Length about 7.00; extent 15.00–15.50; wing 4.75–5.00; tail 2.25, rounded; bill 0.50; tarsus 0.90; middle toe and claw the same. Adults in winter: The black on head and fore-neck replaced by a color like that of the back. The

sexes hardly differ at any season, though the ♀ in breeding dress may have the black parts less pure or less complete. Young: No black coronal bar, the white of forehead



FIG. 525. — Asiatic Golden Plover. (L. A. Fuertes.)

reaching bill and eyes, and prolonged over the latter; neck-ring and loreal stripe gray, not black; bill mostly black. Upper parts with slight whitish or rusty edging of the feathers.

Excepting in the latter respect, they are hardly distinguishable from the winter adults.

Chick: Upper parts mottled with gray, black, and brown, in no special pattern. Collar round hind-neck, forehead, and under parts, white. North America at large, in migration the most abundant and generally diffused of the Ring-necks, especially plentiful in unsuspecting flocks on beaches, marshes, and flats in late summer and early autumn, passing south to winter from Florida, Gulf States, West Indies, and L. Cala. to much of S. Am. Breeds from N. Manitoba, Ontario, and Gulf of St. Lawrence to high latitudes; eggs 4, closely like those of Killdeer, but much smaller, averaging about 1.25×0.95 . This bird represents in America the common European Ring-neck, and is very similar in coloration; but a glance at the toes suffices to distinguish it from the following:



FIG. 526. — Killdeer Plover. (From "North American Shore Birds," by D. G. Elliot.)

(Subgenus *ÆGIALITIS* proper.)

Æ. hiati'cula. (Dimin. of Lat. *hiatus*, a gape; *hiaticula* being a mistaken translation of *χαράδριος*, *charadrios*, because the bird is

found about the mouths (*hiatus*) of rivers. The proper form of the word, according to the intent and meaning, would be *hiaticola*, from *hiatus* and *colere*, to inhabit, or *in-colu*, an inhabitant. Figs. 529, 530.) EUROPEAN RING PLOVER. Adult ♂ ♀: Size of the last, or rather larger, and general aspect the same; but no evident web between inner and middle toe, and that between outer and middle only reaching to end of first

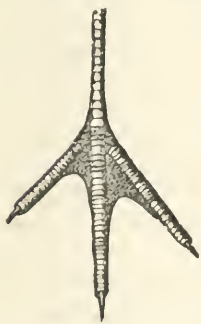


FIG. 527. — Semipalmated Plover.



FIG. 528. — Semipalmated Plover.

between inner and middle toe, and that between outer and middle only reaching to end of first

joint of the latter; no colored ring round eye? One description would answer for the black markings of both, but in this species these are very heavy; there are white touches on the lower eyelids, and the white patch behind the eye is well marked. Upper parts hair-brown, as before, and tail also as in *Æ. semipalmata*. Primaries blackish-brown, the outer 4 or 5



FIG. 529. — European Ring Plover. (From Seebohm's Charadriidæ.)

with white only on the shafts for a space near their ends, the white beginning to invade the webs on the 4th or 5th, and enlarging in width with diminishing length on the rest. Secondaries white with dark ends diminishing in length inward till one or two of the short inner ones are almost entirely white; long flowing innermost ones, however, like black. Length about 7.50; wing 5.00; tail 2.45; bill 0.60, orange, with black tip; tarsus 0.95; middle toe and claw 0.85; feet orange; claws black; iris brown. Young: Like that of *semipalmata*; no black on vertex; that of side of head and around neck dusky-gray; whitish front, line over eye, and under eyelid; primaries quite dark, with white spaces on shafts and webs well marked; feathers of upper parts with pale beady tips; ends of even middle tail-feathers white. Widely distributed in the Old World; Greenland and Cumberland Sound, N. Am. (Auk, 1889, p. 217), where it is known to breed. Thus it is not a mere straggler in this country, and I am able to describe it from an American specimen. Eggs not certainly distinguishable from those of our Ring-neck; coloration the same; size averaging a trifle more, about 1.40×1.00 .

Æ. dubia. (Lat. *dubia*, dubious, doubtful; but there is nothing in question about the bird, except its name. Fig. 531.) EUROPEAN LESSER RING PLOVER. Adult ♂ ♀: Closely resembling the last, but smaller, and otherwise distinct. Black of vertex and auriculars sharply bordered behind with white; no white on lower eyelid; white frontlet small, not reaching to the bill. Shaft of 1st primary alone white; bill slender, black, or yellow only at base of lower mandible; legs flesh-color; a bright yellow ring around eye; iris dark brown. Length about 6.00; bill 0.60; wing 4.50; tail 2.30, almost square; tarsus 0.90. Young: Differs much as young *hiaticula* does. Ring around neck dusky-gray; that on side of head chiefly reduced to a loreal stripe. No black across vertex; white of forehead soiled. Upper parts darker than in adult,

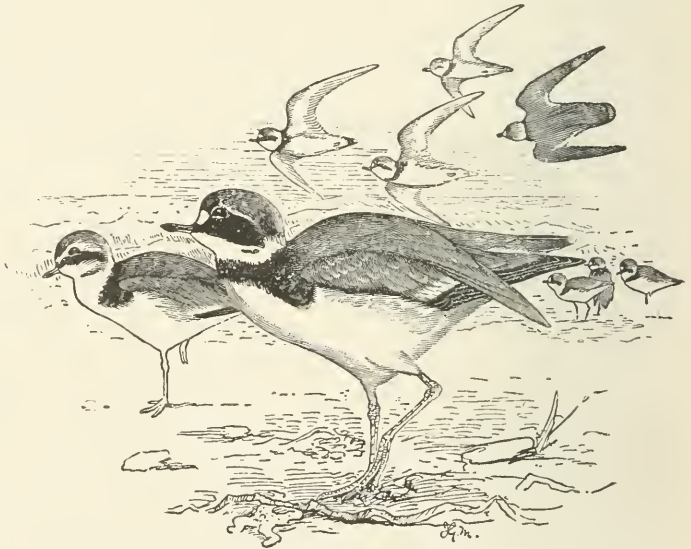


FIG. 530. — European Ring Plover. (From Seebohm's Charadriidæ.)

in an early stage with pale or fulvous edgings of the feathers. This species ranges very widely in Europe, Asia, Africa, etc., and has occurred casually on our Pacific coast, in Alaska and California. It has a profusion of names, the earliest Latin one of which appears to be *Charadrius dubius* Scop. 1786. *C. curonicus* Gm. 1788, of 2d-4th editions of the Key, as of

authors. *C. erythropus* GM. 1788. *C. philippinus* LATH. 1790. *C. minor* WOLF and MEYER, 1805. *C. fluviatilis* BECHST. 1809. *C. minutus* PALL. 1811. *C. pusillus* HORSF. 1821. *C. hiaticuloides* FRANKL. 1831. *C. intermedius* MÉNÉTRIER, 1832. *C. zonatus* SW. 1837. *C. gracilis* and *C. pygmaeus* BREHM. 1855. *Hiaticula simplex* LICHT. 1854. *Ægialitis microrhynchus* RIDGW. Am. Nat. viii, 1874, p. 109, San Francisco, Cal. *Æ. dubia* A. O. U. No. [276].

Æ. melo'da. (Lat. *meloda*, melodious. Fig. 532.) PIPING PLOVER. PALE RING-NECK. Adult ♂, in summer: Above, very pale ash, lighter than any other North American species. A white half-collar round back of neck. A black ring behind this, tending to encircle neck; but I have seldom seen it complete on cervix, and as a matter of fact it is seldom complete on fore-neck either; there is ordinarily a link only on each side of neck. A black coronal bar from one eye to the other. Fore-head, sides of head, and entire under parts snowy-white, excepting black on sides of neck, there being no dark bars on lores or sides of head. Primaries dusky, with large white spaces, their shafts white for a corresponding extent. Secondaries and greater coverts mostly white; long inner secondaries like back. Upper tail-coverts and bases of tail-feathers white; the latter blackening toward their ends, the outer pair or two entirely white. A colored ring round eye. Bill orange or yellow,



FIG. 531.—Lesser Ring Plover. (From Seebohm's Charadriidæ.)

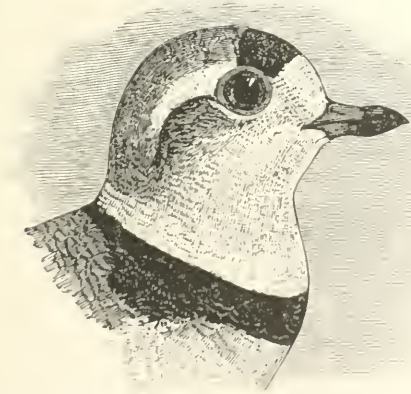


FIG. 532.—Piping Plover. (From Seebohm's Charadriidæ.)

the end beyond nasal fossæ black. Feet like base of bill. Web between outer and middle toe not reaching to end of basal joint of the latter. Rather smaller than *semi-palmata*; length 6.50-7.00; wing 4.50-4.75; tail 2.00-2.25; bill under 0.50, very obtuse, and stout for its length; tarsus 0.87; middle toe and claw 0.75. Adult ♀: Coronal bar reduced to a dark brown trace; ring of neck reduced to a dusky-gray spot on each side. Young: Resembling ♀ as just said, but no trace of dark color on head and little if any on sides of neck; feathers of upper parts with pale or rusty edgings; bill mostly black. The sexes are indistinguishable in winter, then resembling the adult ♀ in summer; the assumption of the black markings of the ♂ is gradual, and probably perfected by such individuals as have been called *circumcincta*. A very pretty little species, with its pale dry-sand colored upper parts and stumpy bill; perfectly distinct from the common Ring-neck, with which it is often found associated. U. S. and British Provinces, east of the Rocky Mts. (beyond which apparently replaced by *Æ. nirosa*); abundant along the Atlantic coast of the U. S., breeding north to the St. Lawrence and some parts of Labrador, wintering from the

Carolinas southward and in the West Indies. Eggs of this "Beach-bird" laid preferably on shingle of the beach, while the Semipalmated Plover usually goes to some grassy or mossy spot back of the sand. They are pretty certainly distinguishable from those of the other Ring-neck by their lighter coloring — there is much the same difference in tone that there is between the birds themselves — clay-color or palest creamy-brown, sparsely and almost uniformly marked with blackish-brown specks, without spots of any size or scratchy lines; the markings are sometimes mere points, and usually include neutral tint shell-spots. The eggs are of about same capacity as the common Ring-neck's, but rather less elongate and pointed; $1.20-1.30 \times 0.95-1.00$. Musical notes more varied than the Ring-neck's.

Æ. m. circumcineta. (Lat. *circumcineta*, bound about; *circum*, around, and *cingere*, to bind, girdle, cinch.) BELTED PIPING PLOVER. A black ring completed around the neck in front, by connection of the black patches of the sides of the neck; otherwise exactly like *meloda*, of which it is perhaps only the highest breeding dress, or a variation in some individuals of the species. Originally described from the Platte River, Neb., in July, probably breeding; since ascertained to breed from Illinois to Lake Winnipeg, and believed to be usually developed in the interior, though also known to occur on the Atlantic; not recognized in winter, or in immature plumage. (Dr. Sharpe declines to recognize the alleged subspecies in Cat. B. Brit. Mus. xxiv, 1896, p. 294.)

Æ. nivo'sa. (Lat. *nivosa*, snowy (white). Fig. 533.) SNOWY RING PLOVER. Adult ♂, in full breeding dress: Above, pale ashy-gray, little darker than in *Æ. meloda*. Top of head with a fulvous tinge. A broad black coronal bar from eye to eye. A narrower black post-ocular stripe, tending to meet its fellow on nape, and thus encircle the fulvous area. A broad black patch on each side of breast; no sign of its completion in a ring above or below; no complete

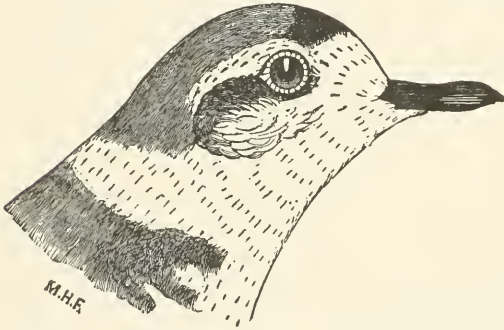


FIG. 533. — Snowy Ring Plover. (From Seebohm's Charadriidæ.)

black loreal stripe, but indication of such in a small dark patch on either side of base of upper mandible. Forehead continuous with line over eye, sides of head excepting the black post-ocular stripe, and whole under parts excepting the black lateral breast-patches, snowy-white. No white ring complete around back of neck. Primaries blackish, especially at bases and ends, the intermediate extent fuscous; shaft of 1st white, of others white for a space; nearly all primaries bleaching toward bases of inner webs, but only some inner ones with a white area on

outer webs. Primary coverts like primaries, but white-tipped. Greater coverts like back, but white-tipped. Secondaries dark brown, bleaching internally and basally in increasing extent from without inward, their shafts white along their respective white portions; long inner secondaries like back. Several intermediate tail-feathers like back, darkening toward ends; two or three lateral pairs entirely white; all the feathers more pointed than usual. Bill very slender and acute, black. Feet black. Length 6.50-7.00; extent 13.50-14.00; wing 4.00-4.25; tail 2.00 or less; bill 0.60; tarsus 1.00; middle toe and claw 0.75. The adult ♀ in summer closely resembles the ♂, but the black parts are less pure — rather dusky gray. Both sexes in winter are similar, but with the black parts replaced by grayish-brown. Young: Upper plumage rather darker than as above said, and less uniform, the individual feathers with pale or whitish edges. Whole crown like back; no black or fulvous on head; forehead white; lores slightly dusky; black of sides of breast replaced by a patch of color of back. Bill black; tarsi pale livid bluish; toes blackish (see COUES, Ibis, 1866, p. 275). Downy young: Above

grayish-buff, mottled with black, and with a black eye-stripe, white collar, and white ends of wing-tufts; below, white. U. S., chiefly west of the Rocky Mts.; Utah; Kansas; California coast, breeding and wintering, yet found S. to Chili in winter; also, coast of Texas, and Cuba; Florida, breeding, March–April. Toronto, Ontario, casual. A specimen (♂, Corpus Christi, Texas, June 24, Sennett), though in midsummer plumage, has no fulvous on head; no trace of loreal mark; coronal bar, post-ocular stripe, and lateral pectoral blotch dark brown, not black. Eggs 3; tone and style of coloration about as in *Æ. wilsonia*; size 1.20 × 0.90, thus about as in *Æ. meloda*, but markings more numerous and serate. This is the American representative of the common Kentish Plover, *Æ. cantiana* (or *alexandrina*) of authors; but it is perfectly distinct, and should never have been united therewith, or even reduced to a subspecies. In combining the two, in the original edition of the Key, 1872, I said that I had then had “no opportunity of a direct comparison;” and in making it a subspecies of *cantiana* in the 2d edition, 1884, I added the saving clause, “probably specifically distinct,” which should have prevented further misunderstanding. The species has acquired the following synonymy since its original description as *Æ. nivosus* CASS. in *Bd. B. N. A.* 1858, p. 696: *Charadrius cantianus* HEERM. *P. R. R. Rep.* x, pt. vi, 1859, p. 64. *Æ. cantiana* COUES, *Key*, 1872, p. 245. *Æ. cantiana* var. *nivosus* COUES, *B. N. W.* 1874, p. 456. *Ægialites cantianus nivosus* COUES, *Key*, 1884, p. 603. *Charadrius cantianus nivosus* SEEBOLD, *Charad.* 1887, p. 171. *Æ. alexandrina nivosus* STEJ. 1884; *Bd. Brew. and Ridgw. Water B. N. A.* i, 1884, p. 164. *Æ. tenuirostris* LAWR. 1862 (Cuba). (A. O. U. No. 278.)

(Subgenus OCHTHODROMUS.)

Æ. wilsonia. (To Alexander Wilson.) WILSON'S PLOVER. Adult ♂, in summer: Above, pale ashy-gray (dry-sand color), the feathers with still paler edges, the shade tending to fulvous on nape and hind neck. A narrow black band across vertex, not reaching eyes, being cut off by white of forehead which extends backward over each eye to nape. A blackish loreal stripe, not prolonged behind eye, *not* meeting its fellow over base of bill, where the white forehead comes down to bill. A black half-ring on fore-neck, *not* completed around back of neck. White of throat passing around hind-neck as a slight collar. Under parts, excepting the black bar, entirely white. Primaries blackish, bleaching toward their bases on inner webs, the short inner ones also with white on outer webs. Shaft of 1st primary almost entirely white; of others brown, then a long white space, then blackening at end. Secondaries, excepting long inner ones, mostly white on inner webs, dark on outer. Middle and intermediate tail-feathers like back, growing dusky toward their ends, nearly all with white tips, and outer one or two white. No colored ring round eye; iris dark brown. Bill entirely black. Legs flesh-colored; outer toe semipalmate, inner cleft. Length 7.00–8.00; wing 4.50–5.00; tail 2.00, nearly square; tarsus about 1.10; middle toe and claw 0.90; bill 0.90, extremely large and stout, not much shorter than head, quite as long as middle toe and claw. Adult ♀, in summer: Like the ♂; but the black coronal, loreal, and pectoral bands replaced by dark gray, often with a fulvous tinge; still, the tendency of the bars is to blacken, especially on the vertex; in many specimens the sexes are not readily discriminated, even in the breeding season, and they are quite alike in winter. The appearance of a fulvous or rufous tinge, best marked before and after the breeding season, indicates the relationships of this species to the Mongolian Plover, and thus the combination of the two in the same subgenus *Ochthodromus*, as is done by British authorities, not by the A. O. U. Young: Similar to the adult ♀; no black on vertex or lore; a broad band of the color of the back across the neck in front. Downy young are buff above; mottled and clouded with black; a black stripe behind eye; collar around hind-neck, front-sides of head, end of wing-tufts, and under parts, white. Seacoast of S. Atlantic and Gulf States, common; N. regularly to the Middle States, rarely to New England and even

Nova Scotia; on Pacific side to Lower California. Winters to West Indies and S. Am. from Louisiana and Texas. Breeds throughout its regular North American range; I have found it doing so in abundance on the North Carolina coast, in June, as others have N. to New Jersey. Eggs usually 3, laid on bare shingle or in sparse beach grass, 1.22–1.45 long \times 1.00–1.05 broad, pale olive-drab, more greenish in some cases, more clay-colored in others, thickly marked all over with blackish-brown in irregular sharply defined spots, splashes, and fine dots, among which are some neutral tint shell-markings; the blotches seldom if ever numerous or confluent enough to obscure the ground color. Note low, piping, and rather plaintive; disposition gentle and confiding.

Æ. mon'gola. (Lat. *Mongola*, a Mongol, inhabitant of Mongolia; Arabic, Persian, and Hindu *Mughal*, a Mongol or Mogul. Fig. 534.) MONGOLIAN PLOVER. Adult ♂ ♀, in summer: Above, brownish-gray; below, white, with a broad cinnamon or chestnut pectoral bar,

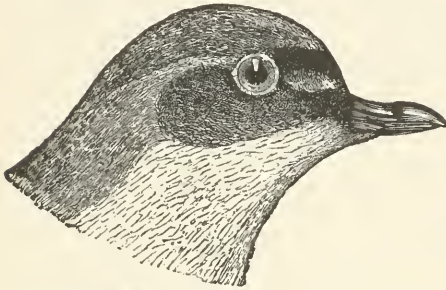


FIG. 534. — Mongolian Plover. (From Seebohm's Charadriide.)

extending more or less along sides, encircling neck behind, and somewhat tingeing pileum; this band tending to be narrowly edged with black anteriorly, in high plumage. A long black subocular stripe, involving lores and auriculars, reaching to bill, continuous in front of eye with a black frontlet, in which is a white area of variable size, sometimes divided by a narrow median line of black which connects the black frontlet with base of culmen. Wing-feathers dusky; shaft of first primary white; several inner primaries with white area along their outer webs; secondaries and greater coverts tipped with white. Tail-feathers like back, tipped with white, and successively paler laterally, till the outermost are nearly white; upper tail-coverts also tipped with whitish. Bill black; feet blackish; iris dark brown. The adults in winter, and young, lack distinctive chestnut and black markings, though the breast may be somewhat suffused with pale cinnamon; at an early age all the feathers of upper parts have pale sandy edgings, and the feet are yellowish gray. Length 7.00–7.50; wing 5.25; tail 2.25; bill 0.70; tarsus 1.15; middle toe 0.75. Eggs 1.45 \times 1.05, pale brownish-olive, sparingly speckled with blackish-brown. A well-known species of wide distribution in the Old World, recorded from Choris Peninsula, Alaska (Ibis, 1870, p. 384; P. Z. S. 1871, pp. 111, 114). It is entirely different from any other Plover described in this work, being closely related to *Æ. geoffroyi*, and thus a member of the subgenus *Ochthodromus*, though not so put by the A. O. U. (see SHARPE, Cat. B. Brit. Mus. xxiv, 1896, p. 223). *Charadrius mongolus* PALLAS, Reise, iii, 1776, p. 700. *C. mongolicus* PALLAS, Zoög. R.–A. ii, 1811, or 1826, p. 136. *Pluriarhynchus mongolus* BONAP. Comptes Rendus, xliii, 1856, p. 417. *Ægialites mongolus* SWINHOE, P. Z. S. 1870, p. 140. *Ægialitis mongolicus* SWINHOE, Ibis, 1870, p. 360. *Eudromias mongolicus* SEVERTZOW, Ibis, 1876, p. 327. *Ægialitis mongola* SWINH. Ibis, 1873, p. 275; Bd. BREW. and RIDGW. Water B. N. A. i, 1884, p. 167; STEJ. Bull. U. S. N. M. No. 29, 1885, p. 105, and Pr. U. S. N. M. x, 1887, p. 126 (Commander Islands, breeding); NELSON, Rep. Alaska, 1887, p. 127; RIDGW. Man. 1887, p. 179, A. O. U. Lists, No. [279]. *Ægialites mongolicus* COUES, Key, 3d ed. 1887, p. 886. *Charadrius cirrhepidesmus* and *C. gularis* WAGLER, 1827. *C. sanguineus* LESS. 1828. *Hiaticula inornata* GOULD, 1846. *Ægialitis mastersi* RAMSAY, 1877.

PODASO'CYs. (The Homeric epithet of Achilles, *πόδας ὠκός*, *podas okus*, swift as to his feet.) MOUNTAIN PLOVER. In general, characters of *Ægialitis*; but no black belt or patches on neck or breast; a coronal and loreal black bar. Size large. Tail short, half the wing, square. Legs very long; tibiae nude over $\frac{1}{3}$ the length of tarsus; which is more than half as long again

as middle toe and claw. Toes very short, the lateral of unequal lengths. Tarsus and tibia entirely reticulate. Sexes alike. One species. This is a good genus, so recognized by most authors since I founded it in 1866; wrongly reduced to a subgenus of *Ægialitis* by the A. O. U. Committee in 1886: observe the excellent characters it presents, and see SHARPE, Cat. B. Brit. Mus. xxiv. 1896, p. 146 and p. 240.

P. montanus. (Lat. *montanus*, of mountains. Badly named: it is a prairie bird.) PRAIRIE PLOVER. "MOUNTAIN" PLOVER. ♂ ♀, in summer: Upper parts uniform grayish-brown; in most breeding individuals the shade is pure, but in many cases the feathers are skirted with tawny or ochrey. Under parts entirely white (*no* black belt or patches): but breast often shaded across with diffuse fulvous or gray. A sharp black loreal line from bill to eye, cutting off white forehead and superciliary line from white of other parts. A coronal black bar across sinciput, varying in width from a mere line to a band nearly half the length of crown in width. Quills blackish, shaft of 1st white, of the others white for a space; some of the inner primaries with white spaces toward bases of outer webs, and secondaries a little pale on inner webs. Tertials and greater coverts like back, the latter white-tipped. Tail-feathers like back, blackening toward ends, outermost pale throughout; all tipped with whitish. Bill black, slender; legs pale plumbeous; the toes darker. Length 9.00; extent 18.00; wing 5.50-6.00; tail 2.50-3.00; bill 0.90; tibiae bare over 0.50; tarsus 1.60; middle toe and claw 0.90. ♂ ♀, in winter: No black coronal or loreal stripe; otherwise, generally as in summer; but general plumage more rusty, with more decided wash of color on breast. Young: As last said; whole upper parts rusty from extensive edgings of all the feathers; sides of head and neck similarly suffused with tawny; ground color of upper parts also darker than that of adults. Chick in down: Forehead, sides of head and under parts white, with sulphury-yellow tinge. Crown, back, and tibiae sulphury or tawny-yellow, closely and evenly mottled with black. Unmarked line over eye; black ear-spot. Bill light at extreme base below, and at point. Livid patch of naked skin on neck. An interesting, isolated species, plentifully and generally distributed in western U. S., Plains to the Pacific: N. to lat. 49° at least. I have shot it in Kansas, Colorado, Wyoming, New Mexico (June), Arizona, Montana (lat. 49°, June), and on the California coast (November). Breeds mainly in northern portions of this range, including some adjoining portions of the British Provinces, and extends in winter from middle California and W. Texas into L. California and Mexico; casual in Florida. It inhabits the most sterile prairie as well as better watered regions, quite independently of water, and is not in the least aquatic; even on the California coast it haunts the plain, not the marsh, mud-flat, or beach. Feeds chiefly upon insects, especially grasshoppers, and is generally seen in loose straggling companies of small extent. Nest anywhere on the bare prairie; eggs 3-4, 1.40-1.50 × 1.10, less pointed than Plovers' eggs usually are, olive-drab with a brown shade, profusely dotted all over, but especially at the larger end, with blackish, dark brown and neutral tint; markings mere dots and points, the largest scarcely exceeding a pin's head. They are laid June and July. (*Æ. montana*, A. O. U. Lists.)

Family APHRIZIDÆ: Surf-birds and Turnstones.

A small family which I named as above in the Key, 2d ed. 1884, p. 605, to be constituted by the genera *Aphriza* and *Arenaria*, and placed next to, but apart from, *Hamatopodidae*; though at that time I left *Aphriza* as a queried genus of *Charadriidae*, and did not remove *Arenaria* from its customary association with the Oyster-catchers. The proposition has found favor and the name has been adopted by the A. O. U. There is probably no better way of arranging these two unconformable genera, which certainly have much in common, and serve as connecting links between the two great groups of limicoline birds — the phalarine and the

scelopacine; for *Aphriza* may be characterized as a Plover in the guise of a Sandpiper, while *Arenaria* is a Sandpiper of Oyster-catcher affinities. The name of the present family might preferably have been *Arenariidæ*, derived from the older and better known one of its two component genera; but *Aphrizidæ* has the sanction of the A. O. U. The two genera agree in structure of feet, which are 4-toed, with anterior toes cleft to base and tarsi scutellate in front, and differ from each other in form of bill, as in the following

Analysis of Subfamilies.

Bill like a Plover's, with evident dertrum, but both mandibles long-grooved.	Tarsus longer than bill.	Tail square.
		<i>Aphrizinæ</i>
Bill like an Oyster-catcher's, but short and sharp.	Bill and tarsus nearly equal.	Tail rounded . . .
		<i>Arenariinæ</i>

Subfamily APHRIZINÆ: Surf-birds.

APHRIZÆ. (Gr. ἀφρός, *aphros*, sea-foam; ζῶω, *zao*, I live: badly formed, but euphonious.)
SURF-BIRDS. PLOVER-BILLED TURNSTONES. Bill pluvialine, shorter than head, stout at base, contracted in continuity, with enlarged horny termination; both mandibles deeply grooved to their horny ends; nostrils subbasal, close to commissure, linear, perforate; feathers reaching equally far forward on side of each mandible, much farther in interramal space. Wings very long and acute, folding to or beyond end of tail; 1st primary longest, all rapidly graduated; flowing inner quills not nearly reaching point of wing. Tail very short, square (emarginate), less than $\frac{1}{2}$ as long as wing, 12-feathered. Feet scolopacine, with well-developed hind toe; short and stout, much as in *Arenaria*; tibiæ naked below, but feathers falling to suffrago; tarsus little longer than middle toe and claw, reticulate, scutellate in front; toes cleft to base, lateral of equal lengths, reaching base of middle claw; inner edge of middle claw dilated and jagged. General character of plumage, in its pattern of coloration and seasonal changes, as in Sandpipers. One species; a remarkable isolated form, much like a Plover, and connecting *Charadriidæ* with the next family by close relationships with *Arenaria*, but with hind toe well developed, as usual in Sandpipers, and general appearance rather sandpiper-like than plover-like.

A. virgata. (Lat. *virgata*, striped. Fig. 537.) **SURF-BIRD.** In summer: Dark ashy-brown, streaked with whitish on head and neck, varied with rufous and black on back and wings. Upper tail-coverts and basal half or more of tail pure white; rest of tail black, white-tipped. Under parts white or ashy-white, variously marked with brownish-black; throat and fore breast narrowly streaked, the streaks changing on breast to curved bars, and there very profuse, on other under parts sparse and spotty. Bases and shafts of primaries, tips of most of them, greater part of secondaries, and tips of greater coverts white; exposed portions of primaries blackish. Bill black, flesh-colored at base below; legs greenish-yellow. In winter: Plumage of head, neck, breast, and upper parts nearly uniform dusky brown, unvaried with white or reddish, but with obsoletely darker shaft-lines; white under parts slightly spotty; wings and tail as in summer, showing the same conspicuous white areas. Length 9.00–10.00; extent 17.00 or more; wing 6.50–7.00; tail 2.75; bill 1.00; tarsus 1.25; middle toe and claw 1.10. Varies greatly in plunage with age and season, but unmistakable in any guise; quite young birds are white below, only streaked on the breast, and the dark gray feathers of the upper parts are more or less edged with white. Extensively dispersed over coasts and islands of the Pacific; along whole western coast of America, N. to Bering's Strait, S. to Chili. Breeding unknown.

Subfamily ARENARIINÆ: Turnstones.

The character of the subfamily is constructed to exclude *Aphriza*. (See p. 783, under *Aphrizidæ*.) Probably *Pluvianellus sociabilis* belongs here (see p. 768).

ARENARIA. (Lat. *arenaria*, adj. fem., relating to sand, sandy; *arenaria*, noun, a sand-pit; *arena*, sand, a sandy place, sea-beach, arena. This is the genus commonly called *Strep-*

silas (Gr. στρέψις, *strepsis*, a turning over. λᾶς, *las*, a stone), as in all former editions of the Key; but *Arenaria* BRISS. 1760, antedates *Strepsilas* ILLIGER. 1811, and must be adopted. Fig. 535.) TURNSTONES. Bill shorter than head, not longer than tarsus, constricted at base, then tapering to acute tip, almost a little recurved. Culmen straight or a little concave, especially over nostrils; commissure straight or slightly recurved; under outline curving up from base, or straight to angle, then gonys ascending. Nasal fossæ short and broad, about half length of bill; grooving of under mandible short and shallow. Gonys longer than mandibular rami. Wings long and pointed. Tail short, a little rounded, scarcely or not half as long as wing. Legs short and stout; tibiæ little denuded; tarsus scutellate in front, reticulate on sides and behind, about as long as middle toe and claw. Toes 4; hinder short, but as well developed as in Sandpipers generally; front toes cleft to base. Claws curved, compressed, acute. There is one cosmopolitan species, the scientific (*strepsilas*) and vernacular (*turnstone*) names of which are both derived from its habit of turning over pebbles along the shore in search of food; shared by the other species of the genus, *A. melanocephala*.

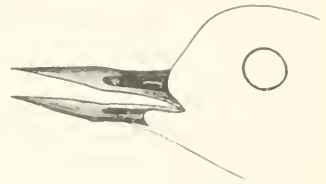


FIG. 535. — Bill of Turnstone, nat. size. (Ad. nat. del. E. C.)

Analysis of Species.

- Pied with black, white, and chestnut *interpres*
- Blackish and white *melanocephala*

A. inter'pres. (Lat. *interpres*, a factor, agent, go-between, interpreter. Prof. Newton tells us (Dict. 1896, p. 997), that the name originated with Linnaeus on the island of Gottland, July 1,

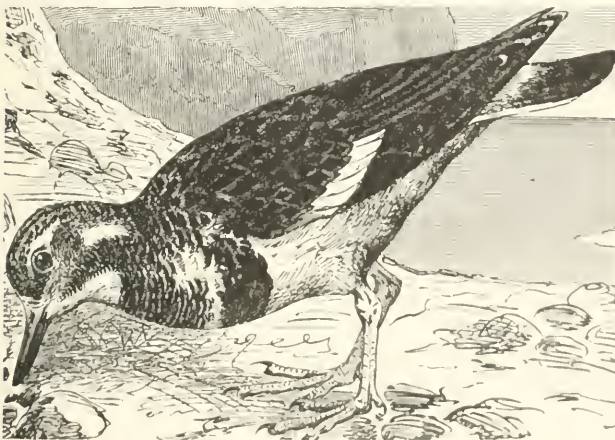


FIG. 536. — Turnstone, 1/2 nat. size. (From Brehm.)

1741, under the mistaken belief that this was the bird there called *Tolk*, a name properly belonging to the Redshank, and equivalent to Tattler or Tell-tale as used by us for various Totinæ birds. Fig. 536.) TURNSTONE. TOURNE-PIERRE. COULON-CHAUD. SEA DOTTEREL. SEA LARK. SEA QUAL. SKIRE CRAKE. SAND-RUNNER. STONE-PECKER. TANGLE-PICKER. MAGGOT SNIPE. HORSE-FOOT SNIPE (from its eating the spawn of the horseshoe

crab). CHECKERED SNIPE. BRANT SNIPE. BRANT BIRD. RED-LEGGED PLOVER. RED-LEGS. BISHOP PLOVER. SPARKED-BACK PLOVER. CHICKEN PLOVER. CHICKEN-BIRD. CHUCKLING. CALICO-BIRD. CALICO-BACK. CALICO-JACKET. CHECKRATUCK. CREDOCK. JINNY. Adult ♂, in breeding dress: Pied above with black, white, brown, and chestnut-red; below, snowy, with jet breast. Top of head streaked with black and white. Forehead, cheeks, sides of head and back of neck white, with a bar of black coming up from side of neck to below eye, then coming forward and meeting or touching to meet its fellow over base of bill, enclosing or nearly enclosing a white loreal space, and another

black prolongation on side of neck; lower eyelid white or not. Lower hind-neck, interseapulars, and scapulars pied with black and chestnut; lower back, rump, and upper tail-coverts snowy-white, with a large central blackish field on the latter. Tail white, with broad subterminal blackish field, narrowing on outer feathers and incomplete, widening usually to cut off white tips of central feathers. Wing-coverts and long inner secondaries pied like scapulars with black and chestnut; greater coverts broadly white-tipped or mostly white, short inner secondaries entirely white, the rest acquiring dusky on their ends to increasing extent, with result of a broad oblique white wing-bar. Primaries blackish, the longer ones with large white fields on inner webs, the shorter ones also definitely white on outer webs for a space, shafts white unless at end; primary coverts white-tipped. Under parts, including under wing-coverts, snowy-white; breast and jugulum jet-black, enclosing a white throat-patch, and sending limbs on sides



FIG. 537. — Plover-billed Turnstone. (From "North American Shore Birds," by D. G. Elliot.)

of head and neck as above said. Bill black; iris black; feet orange-red. ♀ similar, lacking much of the chestnut, replaced by plain brown, especially on wing-coverts; dark parts in same pattern, but restricted somewhat, the black not jet and glossy. Adults in winter, and young, lacking chestnut, and with the black mostly replaced by browns and grays, that of breast especially restricted or very imperfect; at an early age the feathers of the upper parts skirted with buff or tawny. Downy young are dark gray with a yellowish tinge, varied with black points, and with black stripes on the head; the belly white. Length 8.00–9.00; extent 16.00–19.00; wing 5.50–6.00; tail 2.50; bill 0.80–0.90; tarsus, or middle toe and claw, about 1.00. Nearly cosmopolitan; in North America, both coasts abundantly, and less

frequently on large inland waters; migrating through the U. S., and some wintering in the Gulf States, breeding in high latitudes. Eggs usually 4, 1.60 × 1.12, olive-drab, thickly marked with dark brown. Beautiful and conspicuous among beach birds.

A. melanocephala. (Gr. μέλας, *melas*, black; κεφαλή, *kephale*, head.) **BLACK-HEADED TURNSTONE.** Without any of the chestnut coloration of the last, parts that are pied in *interpres* being blackish; white parts, however, and distribution of colored areas, nearly the same. Crown and upper parts with a greenish gloss. Head, neck, throat, and breast brownish-black, the color extending farther along breast than the jet plastron of *interpres*, and not uniform, but the dark brown nebulated with sooty centres of the feathers, and shaded by mixture of white-

tipped feathers into white of under parts. White lower back, rump, and upper tail-coverts, with black central field of the latter, as in *interpres*; black and white of wings substantially the same. A white loreal spot, and indication of the white of head and neck of *interpres* in white speckling. Head, neck, and chest of winter plumage uniform sooty. Young like winter adults, but head grayer and feathers of back with buff edgings. Size about as in *interpres*. Eggs similar. Pacific and Arctic coast of N. Am., from Lower California to Point Barrow, breeding S. to British Columbia; common.

Family HÆMATOPODIDÆ: Oyster-catchers; Sea Pies.

A small but remarkable family, of one genus and about 12 species, whose structure and affinities have been much discussed. Elimination of the unconformable genus *Arenaria*, which has usually been placed under *Hæmatopodidæ*, as type of a special subfamily, leaves the family susceptible of much better definition; and this becomes the same as that of the genus *Hæmatopus* (see below). The Oyster-catchers are large birds for their order, of very striking appearance in life, with their sharply contrasted masses of color, or wholly sombre plumage, set off by usually bright-colored feet, and particularly by the richly painted and strangely shaped bill, — whose singularity of form almost equals that of the Scissor-bill or Skimmer. It looks like a clumsy instrument, but is efficient in prying open the shells of bivalve mollusks, as well as in cutting off the attachment of limpets and barnacles to rocks.

HÆMATOPUS. (Gr. *αἷματόπους*, *haimatopous*, red-footed; *αἷμα*, *haima*, blood, *πούς*, *pous*, foot.) OYSTER-CATCHERS. No hind toe. Front toes with basal webbing, conspicuous between middle and outer, broadly fringed with membrane continuous with webs to claws, reticulate on top, with a few scutellæ near their ends. Tarsus shorter than bill, longer than middle toe and claw, entirely reticulate, the plates in front enlarged and quite regularly hexagonal. Tibiæ briefly bare below. Legs as a whole very stout, coarse and rough, and light-colored. Wings long, pointed; 1st and 2d quills subequal and longest. Tail short, square, scarcely or not half as long as wing. Bill peculiar — hard, straight, or deflected sideways, longer than tarsus, twice as long as head, constricted near base, much compressed, almost like a knife-blade toward end, and truncate like a Woodpecker's (Fig. 538). Nasal groove very short, broad, and shallow; grooving of lower mandible slight; interramal space very short, scarcely $\frac{1}{4}$ the length of long ascending gonys. Nostrils remote from feathers, linear, close to commissural edge of bill. Size large. Sexes similar. Eggs 2-3, buff, drab, or olivaceous, fully marked with spots of different dark tints. The species inhabit the sea-coasts of most countries. Our four species illustrate the two groups, in one of which the colors are pied in large contrasted areas, in the other uniformly fuliginous. Among exotic species of the former may be named *H. osculans* of Asia, *H. longirostris* of Australia, *H. leucopus*, and *H. galapagensis* of South America; while the dark-bodied birds are *H. unicolor* of Australia and New Zealand, *H. capensis* (or *moquini*) of Africa, and *H. ater* of South America, in which the bill reaches a climax in singularity.



FIG. 538. — Bill of Oyster-catcher, nat. size. (Ad. nat. del. E. C.)

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Analysis of Species.

- Head, neck, and back glossy-black; rump and belly white *leucopus*
- Head and neck glossy-black; back and rump smoky brown, belly white *pullarius and frater*
- Head and neck glossy-black; back and belly smoky-brown *unicolor*

H. ostrilegus. (Gr. ὄστρεον, *ostreon*, Lat. *ostræa*, an oyster; λέγειν, *legein*, Lat. *legere*, to gather, pick out. Fig. 539.) EUROPEAN OYSTER-CATCHER (oyster-opener would be a better name, as oysters do not run fast. The word has not been traced back of Catesby, 1731, but has equivalents in several other languages, as French *huîtreur*, Brisson, 1760, literally

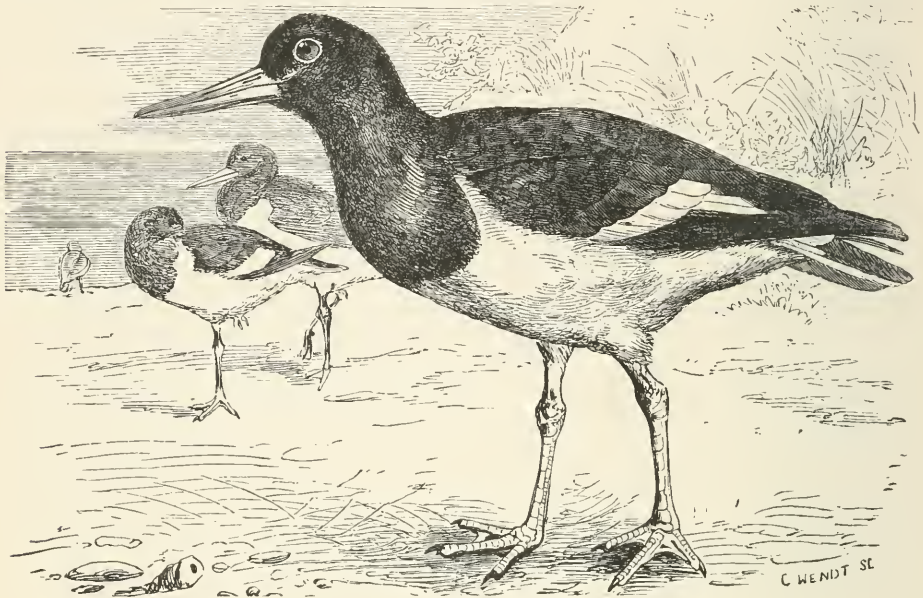


FIG. 539. — European Oyster-catcher, $\frac{1}{2}$ nat. size. (From Brehm.)

“oysterer,” German *austermann* or *austernfischer*, Frisian *oesterrischer*, etc. The Linnæan form of the specific name *ostralegus* is used by most authors, including so scholarly a writer as Professor Newton; but *ostrilegus* is classic). SEA PIE. OLIVE (for Olave). Similar to the next to be described. Upper parts glossy-black, like head and neck. Quills black, broadly margined with white on inner webs excepting toward end, also with isolated white shafts and spaces near end. Back below interscapulars, rump, greater wing-coverts, and upper tail-coverts entirely white, as well as bases of tail-feathers. Length about 16.00; bill about 3.00; wing 9.50–10.00; tail 4.50; tarsus 2.00. Europe, Asia, Africa; N. Am. as occurring in Greenland.

H. palliatus. (Lat. *palliatus*, wearing the *pallium*, a cloak.) AMERICAN OYSTER-CATCHER. MANTLED OYSTER-CATCHER. BROWN-BACKED OYSTER-CATCHER. Adult ♂ ♀: Bill vermilion or coral-red, changing to yellow at end. Feet pale purplish flesh-color, drying dingy yellowish. Eyes and ring around them red or orange. Whole head and neck all around glossy-black, frequently overcast with an ashy or glaucous shade. Back and wing-coverts smoky-brown — the contrast with head and neck decided. Rump and central field of upper tail-coverts like back (not white); lateral and longest central coverts white. Tail-feathers white at base for nearly the space covered by coverts, on lateral feathers rather farther: then like back, blackening at ends. Long inner secondaries like back; next few secondaries pure white; rest gaining dark color in increasing amount; white of secondaries forming with the long white tips of greater coverts a conspicuous broad oblique white bar. Primaries dusky, blackening toward end, touched with white at bases of inner webs of longer ones, with white on outer webs of short inner ones, but no isolated white subterminal spaces. (Thus much less white on back, rump, wings, and tail than in *ostrilegus*, besides the difference in color of mantle from that of head and

neck; though some allowance in either case must be made for normal variation from the minuteness of my description.) Entire under parts from the breast pure white, including lining of wings — where, however, a few dusky feathers commonly show along the edge. Length 17.00–21.00; extent 30.00–36.00; wing 10.00 or more; tail 4.00 or more; tarsus 2.00 or more; middle toe and claw under 2.00. Bill 3 or 4 inches long, varying in shape with almost every specimen, with wear and tear under the rough usage to which it is subjected; ordinarily both mandibles trineated: often the lower, sometimes both, acute. Bills worn thinnest and most like a knife-blade toward the end are often bent sideways, as if from habitual use of them in a particular direction. Young: Head and neck not black, but rather brown, or black mixed with brown; feathers of mantle with buff edges; bill dull colored. Downy young: tawny gray above, with dark mottling; postocular and lateral dorsal stripes of black; under parts white. Eggs 2 or 3, not known to be ever 4, buff of varying shade, spotted irregularly with blackish, dark brown, and neutral tints; size about 2.20×1.55 . North, Central, and South America, almost entirely coastwise, and chiefly along Atlantic side but also on Pacific to Mexico. Migratory all along, wintering southerly, N. regularly only to the Middle States, casually to Mass. and Maine, breeding in abundance but irregularly at different points. There are well-known breeding resorts along the S. Atlantic coast.

H. frazari. (To M. Abbot Frazar, of Boston.) FRAZAR'S OYSTER-CATCHER. Resembling *H. palliatus* and *H. galapagensis*: differs from both in the broad zone of mottled black and white feathers across breast: from *H. palliatus* in stouter and more depressed bill, little or no white on eyelids, darker back and wings, more or less varied upper tail-coverts, and some other respects; from *H. galapagensis* in rather shorter bill, brown instead of black mantle, dark markings on under tail-coverts, and greater amount of white on under primary coverts.

Lower California, on both coasts; southern California. BREWSTER, Auk, Jan. 1888, p. 84; COUES, Key, 4th ed. 1890, p. 904; A. O. U. List, 2d ed. 1895, No. 286.1.

H. bachmani. (To Rev. John Bachman, Fig. 540.) BLACK OYSTER-CATCHER. BACHMAN'S OYSTER-CATCHER. Size and shape of *H. palliatus*. Head and neck the same, but no white on eyelids, and no white anywhere; rest of plumage dark smoky-brown, blackening on wing-quills and tail-feathers. Edges of eyelids and most of



FIG. 540. — Black Oyster-catcher. (L. A. Fuertes.)

bill vermilion, feet pale flesh-color; iris yellow. Young browner. Eggs 2–3, 2.20×1.50 , buff or drab, finely speckled, or sparsely spotted with blackish and purplish-gray. Pacific coast of the U. S. and British Columbia, from the Aleutian Islands to Lower California. *H. niger* PALL. of most authors, and all earlier editions of the Key: *H. bachmani* AUD. Orn. Biogr. v, 1839, p. 245, pl. 427; A. O. U. Lists, 1st and 2d eds. 1886 and 1895, No. 257.

Family RECURVIROSTRIDÆ: Avocets. Stilts.

Another small family, characterized by extreme length of slender legs, and extreme slenderness of long acute bill, which is either straight or curved upward. *Recurvirostra* is 4-toed and full-webbed; bill decidedly recurved, flattened, and tapers to a needle-like point; body

depressed; plumage underneath thickened as in water-birds. The species swim well. *Cladornychus leucocephalus* (or *pectoralis*) of Australia is 3-toed, web-footed, with tarsus more than twice as long as middle toe and claw, and scarcely recurved bill. *Himantopus* is 3-toed,



FIG. 541. — European Avocet, *Recurvirostra avocetta*, $\frac{1}{2}$ nat. size. (From Brehm.)

semipalmate, the bill nearly straight, and not flattened; in relative length of leg it is probably not surpassed by any bird whatsoever. These three genera compose the family.

RECURVIROSTRÆ. (Lat. *recurvus*, bent upward; *rostrum*, bill. Figs. 541, 542.)

AVOCETS. Bill excessively slender, more or less recurved, upper mandible hooked at extreme tip; much longer than head, more or less nearly equalling tail and tarsus; flattened on top, without culminal ridge. Wings short (for a wader). Tail very short, square, less than half the wing. Legs exceedingly long and slender: tibiæ long-denuded; tarsus not more than twice as long as middle toe and claw; covering of legs skinny. Feet 4-toed; front toes full-webbed, hind toe short, free. Body remarkably depressed and feathered underneath with thick duck-like plumage; altogether, as in swimming rather than as in wading birds. It is a modification like that seen in the lobe-footed Phalaropes. Sexes and young alike; winter and summer plumage different (in the North American species at any rate). The extralimital species are the European *R. avocetta*; the Australian and New Zealand *R. nova-hollandia*, and the more different *R. andinus*, which has a white head and under parts and a black mantle, thus resembling a Stilt. (The English word *avocet*, better spelled *avocet*, is from Italian (Ferrarese) *avocetta*, whence New Lat. *avocetta*; all these being considered as diminutive forms of Lat. *avis*, a bird.)

R. americana. (Lat. *americana*, American. Figs. 543, 544.) **AMERICAN AVOCET.** "IRISH SNIPE." **BLUE-STOCKING.** Adult ♂ ♀, in summer: White, changing gradually to cinnamon or chestnut-brown on neck and head, excepting, usually, the parts about base of bill. Interseapulars and part of scapulars black; wings black, with lining, and part of secondaries and coverts, white. Tail pearl-gray. Iris red (sometimes brown). Legs dull blue (drying blackish), much of the webs flesh-color; bill black, often pale at base below. Size extremely variable: length 16.00–20.00; extent 28.00–38.00! wing 7.00–9.50; tail 3.00–4.00; tibiæ bare 2.50; tarsus 3.50 or more; middle toe and claw 2.00 or less; bill 3.50, more or less, varying in shape from nearly straight to strongly recurved and hooked. The bill resembles whalebone, and

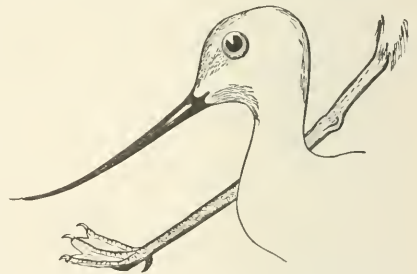


FIG. 542. — Head and foot of Avocet, about $\frac{1}{2}$ nat. size.

is as flexible as the bones of a woman's corsets; it acquires its full curvature only in old birds, who have poked in the mud with it for years. Adult ♂ ♀, in winter: Head and neck ashy or pearl-gray, like tail; this has been called *R. occidentalis*; afterward considered the young. Young: Head and neck strongly washed with cinnamon-brown; rusty or tawny edgings of black feathers: bill straight or nearly so. I have shot scarcely fledged birds in this state, in which the shank is also peculiarly swollen about the suffrago, suggesting the so-called Thick-knee (*Edicnemus*). U. S. and British Provinces; N. in the interior to the Saskatchewan and Mackenzie River regions; S. in winter from Louisiana, Texas, and southern California to Cuba, Jamaica, and Guatemala; rare now in eastern U. S. and only casual in New England. Abounding in the West, especially in alkaline regions, as those of the Yellowstone and Milk River, Utah, etc. Its appearance is striking, as might be supposed; its clamor is incessant when breeding-places are invaded. It is not a wary bird, and may easily be approached when wading about in small flocks in the shallow alkaline pools it loves so well. Feeds by immersing the head and neck for some moments whilst probing about with the curious bill in soft slimy ooze. On getting beyond its depth, it swims with perfect ease, and often alights from on wing in deep water. The bird is migratory, but breeds throughout its regular N. Am.

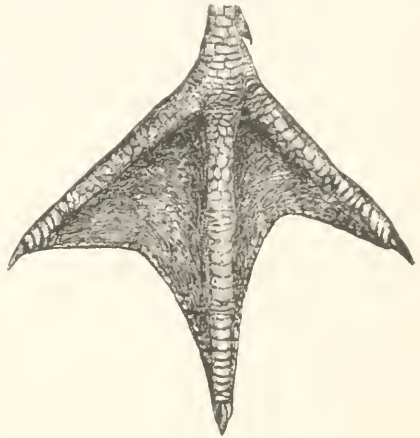


FIG. 543. — Avocet.

range. Eggs 3-4, as variable in size, shape, and markings as the parents; 1.80-2.10 × 1.25-1.45; ground color from dark olive to brownish-drab, thence to creamy-brown or buff, like those of Shanghai fowls; pretty uniformly and profusely marked with small sharp spots of different shades of chocolate-brown, with neutral-tint shell-markings; on buff eggs usually smallest and most numerous, bolder on olive ones.

HIMANTOPUS. (Gr. *ἡμάντιπος*, *himantopous*, strap-leg. Figs. 547, 548.) **STILTS.** Bill extremely slender, but not flattened, nor turned up, nor hooked; longer than head, rather shorter than tarsus. Wing long and pointed, folding



FIG. 544. — American Avocet (From Seebohm's Charadriidae.)

beyond the short and square tail, which is less than half the wing. Legs of unique length and slenderness, the bare part about as long as wing; tibiae denuded for a great distance; tarsus more than twice as long as middle toe. Feet 3-toed, semipalmate; but the species scarcely swim. Sexes similar; young different. Species few; the extralimital ones are *H. himantopus* of Europe, Asia, and Africa; *H. leucocephalus* of Australia; *H. pacificus* of New Zealand and the

black *H. melas* of that region; *H. knudseni* of the Sandwich Islands; and *H. melanurus* of South America.

H. mexicanus. (Lat. *mexicanus*, Mexican. Figs. 545, 546.) BLACK-NECKED STILT. LONG-SHANKS. LAWYER. Adult ♂ ♀: Mantle, constituted by interseparulars, scapulars, and wings (above and below)

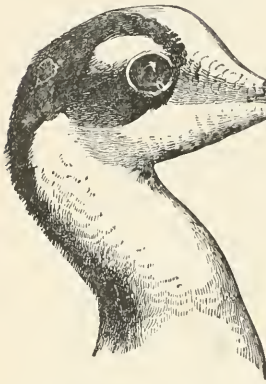


FIG. 545. — Black-necked Stilt, ♂ nat. size. (From Sclater.)

glossy black, prolonged up back of neck and on top and sides of head, embracing eyes. A spot over and behind eye, one on under eyelid, forehead to opposite eyes, sides of head below eyes, sides of neck and entire under parts, together with lower back, rump, and upper tail-coverts, white; tail pearl-gray. In life the long black wings fold entirely over the white upper parts and tail, so that the bird looks entirely black above. Bill black; eyes and legs carmine, latter drying yellowish. Length about 15.00; extent about 30.00; wing 8.50–9.50; tail 2.75–3.25; bill 2.50–2.75; tibiæ bare 3.00–3.50; tarsus 4.00–4.50; middle toe and claw 1.75–2.00. Adults, not in perfect dress: Some of the dark parts brown, not glossy-black; feather edged with whitish or pale buff; head also with buffy; wings black or blackish-brown, but some of the quills white-tipped, edge of wing white, coverts edged with pale ochre. Tail not so pearly-gray as in the adults, with some irregular dusky markings. Legs probably different (skins afford no criterion). Chick, in down: Bill apparently blackish; legs pale. Under parts white; above prettily mottled with black, brown, and tawny or orange. U. S. generally, like the Avocet, now rare eastward, though still rather common in Florida; abundant in the West, rather more southerly than the Avocet; in winter S. from Texas and Louisiana to West Indies and S. Am.; breeds indifferently in its regular U. S. range. Nest a mere depression at the water's-edge or on heaped vegetation just above the surface in shallow water; eggs 3–4, pyriform, 1.60–1.85 × 1.15–

1.15–

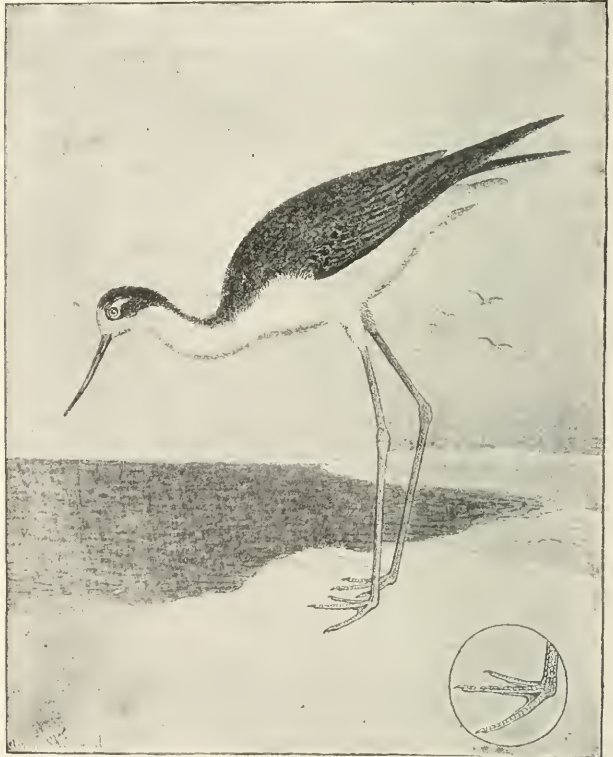


FIG. 546. — Black-necked Stilt. (From "North American Shore Birds," by D. G. Elliot.)

1.25; greenish-drab or pale brownish-olive to dark ochraceous, boldly marked all over with spots and splashes of blackish-brown; they resemble those of the Avocet, but average decidedly smaller.

Family PHALAROPODIDÆ: Phalaropes.

This is likewise a small family; the three species composing it resemble Sandpipers, but are immediately distinguished by lobate feet; toes furnished with plain or scalloped membranes, like those of Coots and Grebes, but not so broad. Body depressed, and under plumage thick and duck-like to resist water, on which the birds swim with perfect



Fig. 547. — Stilt. (From Tenney, after Wilson.)



Fig. 548. — Stilt. (From Seeborn's Charadriidæ.)

ease and grace. Wings and tail like those of ordinary Sandpipers; tarsi much compressed, with serrulate hinder edge, like a Grebe's; there is basal webbing of the toes besides the marginal membranes; the bill, and some other details of form, differ in each of the three genera (Fig. 549). These birds inhabit the northern portions of both hemispheres, two of them at least breeding only in boreal regions, but they all wander far southward in winter. There are but three species, one peculiar to America, the others of general distribution. The duties of incubation are undertaken largely by the male Phalarope.

Analysis of Genera.

- Membranes plain; bill very slender, subulate *Steganopus*
- Membranes scalloped; bill very slender, subulate *Limopus*
- Membranes scalloped; bill stouter, flattened, with lance-shaped tip *Phalaropus*

STEGANOPUS. (Gr. στεγανόπους, *steganopous*, web-foot.) FRINGE-FOOT PHALAROPE. Bill long, equalling tarsus, exceeding head, extremely slender, terete and acute. Culmen and gonys broad and depressed. Lateral grooves long and narrow, reaching nearly to tip of bill. Interramal space narrow and very short, extending only half-way to end of bill. Nostrils at extreme base of bill. Wings of moderate length. Tail short, deeply doubly-emarginate; legs greatly elongated; tibiae bare for a considerable distance; tarsus exceeding middle toe. Toes long and slender, broadly margined with an even, unscalloped membrane, united but for a brief space basally. Claws moderately long, arched, and acute. This is an excellent genus, founded by Vieillot in 1819, which the A. O. U. made only a subgenus of *Phalaropus* during

1886-1895; but finally raised to a full genus: see A. O. U. Suppl. List, Auk, Jan. 1897, p. 126. *Amblyrhynchus* NUTTALL, 1834. *Holopodius* BONAPARTE, 1828.

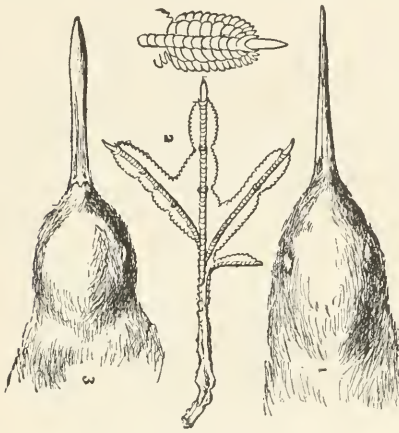


FIG. 549. — Details of Phalaropes. (From The Osprey, by R. C. McGregor.)

a weak solution of the rich color on the neck, and a faint tinge of the same along sides of body to flanks. Bill and feet black. Iris brown. Length 8.50-9.50 or more; extent 15.50-16.00; wing 5.00-5.30; tail 2.25; bill 1.33; tarsus 1.33; middle toe and claw 1.12. Adult ♂: Less richly colored, and smaller; length 8.25-8.75; extent 15.00; wing 4.75-5.00. Adult ♀, in winter: No rusty red or pure black. Above, pure ashy gray, each feather usually skirted with whitish; frequently some blackish, pale-edged feathers. Wing-quills fuscous, usually with light edgings; tail as in summer; upper tail-coverts, line over eye, parts about bill, and whole under parts, white; jugulum and sides usually shaded with ashy. Young, before first moult: Bill blackish, about 1.10 long; legs dull yellow (tarsus 1.20; middle toe and claw 1.05). Upper parts, including crown and upper surface of wings, brownish-black, each feather edged with rusty-brown, very conspicuous on long inner secondaries, giving a general aspect like that of a Sandpiper of the genus *Actodromas*. Upper tail-coverts pure white. Tail clear ash, edged and much marbled with white, the ash darker at its line of demarcation from the white. Line over eye, and whole under parts white, breast with a faint rusty tinge, sides slightly marbled with gray.

Quills dusky, secondaries white-edged, and shafts of primaries whitish. This stage is of extremely brief duration, beginning to give way, almost as soon as the bird is full grown, to the clear uniform ashy of upper parts of the fall and winter condition. The change, in some specimens shot early in August, is already very evident, clear ashy feathers being mixed, on crown and all upper parts, with such as just described. Size of the smallest specimen only 8.25 in length by 14.50 in extent; wing 4.60. A plumage like this answers to the long-lost Plain Phalarope of Pennant and Latham (*glacialis* G.M.). Chicks are covered with buff-colored down, paler or whitish on the belly, striped on the hind head and rump with black; a black spot on the flanks. In full plumage this is the handsomest and largest of the Phalaropes, and one of the most elegant of waders. U. S. and British Provinces, N. to the Saskatchewan and

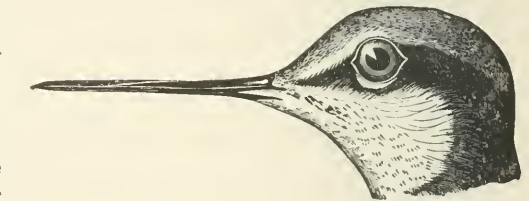


FIG. 550. — Head of Wilson's Phalarope, nat. size. (Ad. nat. del. E. C.)

S. wilsoni. (To A. Wilson. Figs. 550, 551.) AMERICAN PHALAROPE. WILSON'S PHALAROPE. TRICOLOR PHALAROPE (adult). PLAIN PHALAROPE (young). Adult ♀, breeding dress: Bill and feet black. Crown of head pale ash, passing into white along a narrow stripe on nape. A narrow, distinct, pure white line over eye. Sides of neck intense purplish-chestnut, or dark wine-red; anteriorly deepening upon auriculars into velvety-black; posteriorly continued, somewhat duller in tint, as a stripe along each side of back to tips of scapulars. Other upper parts pearly-ash, blanching on rump and upper tail-coverts. Wings pale grayish-brown; coverts slightly white-tipped; primaries dusky-brown, their shafts brownish-white, except at tip. Tail marbled with pearly-gray and white. All under parts pure white, but fore part and sides of breast washed with pale chestnut-brown, as if with

Hudson's Bay, casually within the Arctic Circle (lat. 69° 30'); rare in U. S. E. of Illinois and Lake Michigan; abundant in the Mississippi Valley at large and westward, but not on the Pacific coast.

Migratory; S. in winter, even to Patagonia; breeds in suitable places in much of its N. Am. range. Nest in low grassy meadows and marshes. Eggs 3-4, 1.20-1.35 × 0.90 broad, thus elongate pyriform, clay-color to brownish-drab, heavily marked with large splashes and sizable spots, with

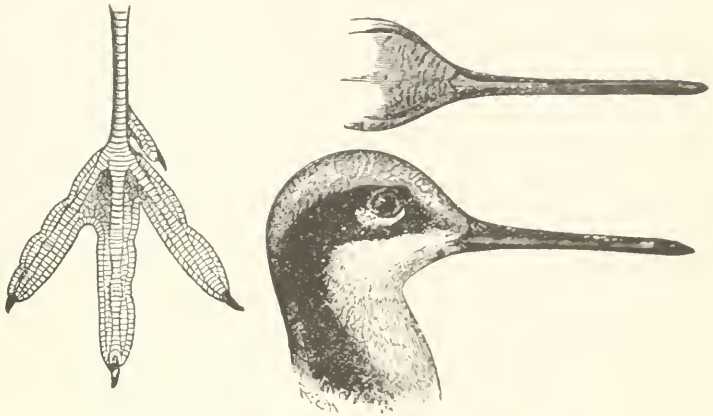


FIG. 551. — Wilson's Phalarope. (From Seebohm's Charadriidæ.)

numberless specks and scratches, of dark bistre or chocolate-brown: some eggs much less painted than others, in finer pattern; incubated by the ♂. This is the Plain Phalarope of Pennant and Latham, described as having the "toes bordered with a plain or unscalloped membrane" — an expression inapplicable to either of the other species: see my Birds N. W. 1874, p. 467. The Plain Phalarope is the basis of *Tringa glacialis* GM. 1788, the earliest technical name, and therefore the one we should adopt, as Nuttall did in 1831, when he called the bird *Amblyrhynchus glacialis*, in his Man. ii, p. 247. *Steganopus tricolor* VIEILL. 1819; A. O. U. Suppl. List, Auk, Jan. 1897, p. 126, No. 224. *Ph. tricolor* STELL. Auk, 1885, p. 183; RIDGW. Man. 1887, p. 145; A. O. U. Lists, 1886-95, No. 221. *Ph. wilsoni* SABL. 1823. *Lobipes wilsoni* STREPT. 1824. *Holopodius wilsoni* BP. 1828-35. *Steganopus wilsoni* COUES, Ibis, 1865, p. 158; Key, 1872-90, and of most authors. *Ph. fimbriatus* TEMM. 1825. *Ph. frenatus* VIEILL. 1826. *Ph. stenodactylus* WAGL. 1831. *Lobipes incanus* JARD. and SELBY.

LOBIPES. (Lat. *lobus*, a flap, *pes*, foot.) LOBE-FOOT PHALAROPES. Bill generally as in *Steganopus*, but shorter, basally stouter, and tapering to very acute, compressed tip; ridge of culmen and gonys less depressed; interramal space longer and broader. Wings long. Tail short, greatly rounded. Legs and feet short: tibiæ denuded but a brief space; tarsus not longer than middle toe. Toes very broadly margined with a membrane which is scalloped or indented at each joint, and united basally to second joint between outer and middle toe, to first joint between inner and middle toe; feet thus semipalmate. Claws small and short. A perfectly good genus, duly founded by Cuvier in 1817, but which the A. O. U. have nevertheless made a subgenus of, under the wrong name *Phalaropus*. I am no stickler for needless generic divisions, and would put all our Phalaropes under one genus with three subgenera. But there cannot be two genera, with two subgenera of one of them, for the differences in form of each of the three species are on a par. See my Birds N. W. 1874, p. 466, and article in Auk, Jan. 1896, p. 65; see also under *Phalaropus*, beyond.

L. lobatus. (Lat. *lobatus*, lobed, as the toes are. Figs. 552, 553.) NORTHERN PHALAROPE. HYPERBOREAN PHALAROPE. RED-NECKED PHALAROPE. COOT-FOOTED TRINGA. Adult ♀, in summer: Above, plumbeous, with lateral stripes of ochraceous or tawny; neck rich rust-red, nearly or quite all around; under parts otherwise white, sides marked with color of back. Upper tail-coverts like back, some lateral ones white. Wings blackish; ends of greater coverts broadly white, forming a conspicuous cross-bar, continued on some of the inner

secondaries. ♂ duller and smaller. Bill and feet black. Length 7.00-7.50; extent 13.50; wing 4.25-4.50; tail 2.00; bill, tarsus, middle toe and claw, each, under 1.00. Adult ♂ ♀, in



FIG. 552. — Foot of Red-necked Phalarope, nat. size. (Ad. nat. del. E. C.)

winter: Above plain pearly gray or light ash, varied with white edgings of the feathers, especially marked on the scapulars and long inner secondaries, and also with some dusky shaft-lines; most of the head and all the under parts white; a dusky patch on the side of the head, involving eyes and ears; bill blackish; feet pale bluish; iris blackish-brown. Young: Above blackish, with distinct buff borders of the dorsal and scapular feathers; wing-coverts similarly dusky, with buff or whitish edges, the greater coverts more distinctly tipped with white; middle tail-feathers edged with buff, others with white; top of head and hind-neck dark slaty; a dark patch about eyes and on auriculars; forehead, line over eye, and whole under parts white, more or less overcast with light brownish on the sides of the neck and breast; bill blackish; feet pale, obscured on the joints and outside of tarsus; iris light brown. It thus varies much in plumage with age and season, but is easily recognized by the small size and generic characters. Chicks in down rich buff above, silvery-gray below; crown mixed blackish and yellow; a long black stripe down back, another over each hip, one across rump, and a shoulder-spot. Northern Hemisphere at large, breeding in Arctic and some subarctic regions, migrating into the Tropics sometimes; generally distributed, but especially coastwise, maritime; large flocks at sea. Eggs 3-4, June, July, average 1.20×0.80 (from 1.30×0.75 to 1.10×0.82), very variable in size, shape, and color; greenish-olive or brownish-olive to various drab and buffy shades of ground color, usually very boldly spotted and splashed, sometimes in finer pattern, with bistrous, chocolate, and lighter brown. This species is the type of the genus *Lobipes* CUV. 1817, but not of *Phalaropus* BRISS. 1760. It is the Coot-footed *Tringa* of EDW. Nat. Hist. pl. 46 and pl. 143. *Tringa lobata* LINN. 1758; *T. lobata* and *T. hyperborea* LINN. 1766, by his descriptions, but with some wrong references under the former name; *Phalaropus hyperboreus* LATH. 1790, ♂, his supposed ♀ being the next species, and of many authors; *Lobipes hyperboreus* of most authors, as of all former eds. of the Key. *Ph. fuscus* LATH. 1790. *Ph. vulgaris* BECHST. 1803. *Ph. williamsii* SIMMONDS, 1807. *Ph. cinereus* MEYER, 1810. *Ph. ruficollis* and *Ph. cinerascens* PALL. 1811; *Ph. angustirostris* NAUM. 1836. *Ph. lobipes* KEYS. and BLAS. 1840. *Ph. australis* and *moluccensis* "TEMME." *Ph. asiaticus* and *Lobipes tropicus* HUME, 1873. *Lobipes lobatus* BD. BREW. and RIDGW. 1884. *Phalaropus* (*Phalaropus*!) *lobatus* A. O. U. Lists, 1886-95, No. 223.

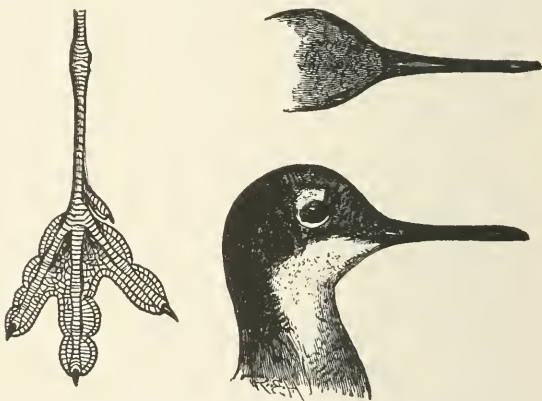


FIG. 553. — Red-necked Phalarope. (From Seebohm's Charadriidae.)

Ph. fuscus LATH. 1790. *Ph. vulgaris* BECHST. 1803. *Ph. williamsii* SIMMONDS, 1807. *Ph. cinereus* MEYER, 1810. *Ph. ruficollis* and *Ph. cinerascens* PALL. 1811; *Ph. angustirostris* NAUM. 1836. *Ph. lobipes* KEYS. and BLAS. 1840. *Ph. australis* and *moluccensis* "TEMME." *Ph. asiaticus* and *Lobipes tropicus* HUME, 1873. *Lobipes lobatus* BD. BREW. and RIDGW. 1884. *Phalaropus* (*Phalaropus*!) *lobatus* A. O. U. Lists, 1886-95, No. 223.

PHALAROPUS. (Coined by Brisson in 1760 from Gr. *φαλαρίς*, *phalaris*, the coot, and *πούς*, *pous*, foot, to express what Edwards meant in saying "Coot-footed.") **COOT-FOOT PHALAROPES.** Bill scarcely longer than head or tarsus; very stout for this family; much depressed, so broad as to be almost spatulate, tip only moderately acute, lancet-shaped. Upper mandible with ridge broad and flattened, apex arched and decurved, lateral grooves wide and shallow. Interramal space broad and very long, extending nearly to end of bill. Nostrils

subbasal, at some distance from base of bill. Wings long and pointed. Tail long, rounded, central rectrices projecting, rather acuminate. Legs and feet much as in *Lobipes*, but the semipalmation of less extent. *Phalaropus* BRISS. 1760, type *Phalaropus phalaropus* BRISS. Orn. 1760, vi, p. 12, as fixed by Brisson himself; and by no process of "elimination" can the type be made another species of a different genus, *Crymophilus*, as was done by the A. O. U. in 1885. *Crymophilus* VIEILL. 1816, type *Phalaropus phalaropus* BRISS., and thus a strict synonym of Brisson's genus *Phalaropus*. Vieillot's citations of authors are not to the point; but his diagnosis is strictly and exclusively pertinent to the present genus.

P. fulcivarius. (Lat. *fulcivarius*, coot-like; *fulica*, a coot; *fuligo*, soot. Fig. 554.) RED COOT-FOOTED TRINGA. GRAY COOT-FOOTED TRINGA. RED PHALAROPE. GRAY PHALAROPE. FLAT-BILLED PHALAROPE. WHALE BIRD. Adult ♀, in summer: Under parts, with sides of neck, dark purplish, or wine-red, with a glaucous bloom. Top of head, all parts and around bill, sooty.

Sides of head white, this color meeting on nape. Back black, all the feathers edged with tawny or rusty-brown, the light sandy color conspicuous on the larger feathers, where the black is reduced to a central stripe on each: rump and upper tail-coverts mixed sooty, black, and chestnut. Quills brownish-black, with white shafts and much white at bases of webs; wing-coverts dark ash, ends and inner webs of greater row white; some of the secondaries almost entirely white; axillaries and under coverts white. Middle tail-feathers blackish with buff margins: the lateral ones gray with white edging. Bill yellowish, with dusky tip; feet yellowish.

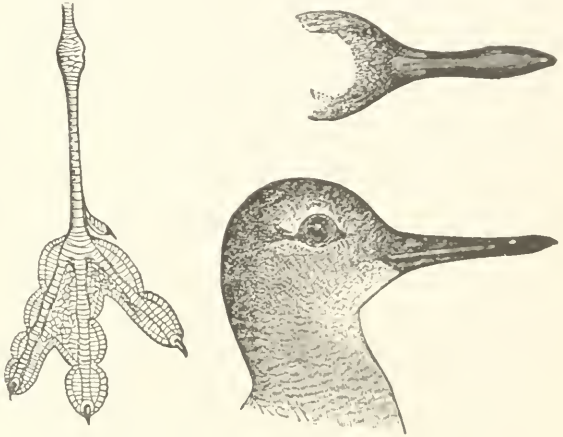


FIG. 554. — Gray Phalarope. (From Seeböhm's Charadriidæ.)

Length 7.50–8.00; extent 14.50 or more; wing 5.00–5.50; tail 2.50; bill 0.90; tarsus 0.75–0.80; middle toe and claw rather more. The adult ♂ in summer is smaller and not so richly colored, especially on the under parts: top of head streaky, like the back, less white on sides of head. Adult ♂ ♀, in winter: Head all around, and entire under parts, white; a dusky circumocular area and nuchal crescent, and a wash of ashy along sides of body. Above, nearly uniform pearly ash. Wings ashy-blackish, the white cross-bar very conspicuous; bill mostly dark; feet obscured. Young birds resemble the winter adults in being white below, but there not pure, with a buff tinge on the neck and breast; they resemble the summer adults above, but have the dusky nuchal crescent. Young in the down are bright buff above, with black streaks; top of head brown bordered with black; lower parts whitish, more or less tinged with buff on the throat and breast. A species of circumpolar distribution in summer, wandering south in winter, chiefly maritime, but liable to appear casually anywhere in the U. S. Nesting and eggs not distinguishable from those of the last; eggs averaging larger, — 1.15–1.30 × 0.85–0.90. This is the Red Coot-footed Tringa of Edwards, Nat. Hist. 1743, pl. 142, in summer plumage, and the Gray Coot-footed Tringa of the same, Gleanings, 1750, pl. 308: the latter became *Phalaropus phalaropus* of Brisson, Orn. 1760, vi, p. 12, and the former became *Ph. rufescens* of Brisson, *ibid.* p. 20. The red bird of these two authors is the sole basis of *Tringa fulcivaria* LINN., but Linnaeus mixed the gray bird up with his *Tringa lobata*, which is described for *Lobipes hyperboreus*, but whose synonymy includes these references to the present species. The gray bird is also the one figured in Philus Trans.

vol. 50, pl. 6, p. 255. The Red Phalarope ♀ and the Gray Phalarope of Latham are both this species; the Red one is *Phalaropus hyperboreus* ♀ LATH. 1790; WILS. Am. Orn. ix, 1814, p. 75, pl. 73, fig. 4; and the Gray one became *Ph. lobatus* LATH. 1790. The present species is the *Phalaropus fulicarius* of authors, as in all editions of the Key. *P. rufus* BECHST. 1809. *P. platyrhynchus* TEMM. 1815. *P. griseus* LEACH, 1816. *P. rufescens* KEYS. and BLAS. 1840. *P. platystris* NORDM. 1840. *P. cinereus* FRITSCH, 1871. *Crymophilus fulicarius*, A. O. U. Lists.

Family SCOLOPACIDÆ: Snipe, Sandpipers, etc.

Snipe and their allies form a well-defined and perfectly natural assemblage, one of the two largest limicoline families, agreeing with Plover in most essential respects, yet well distinguished from pluvialine birds. In general, the bill is much elongated, frequently several times longer than head, and in those cases in which it is as short as in Plover, it does not show the particular, somewhat pigeon-like, shape described under *Charadriinæ*, being slender and soft-skinned throughout. It is generally straight, but frequently curved up or down, and in one genus spoon-shaped at the end (*Eurymorhynchus*). The nasal grooves, always long and narrow, range from $\frac{1}{2}$ to almost the whole length of bill; similar grooves usually occupy sides of under mandible; interramal space correspondingly long and narrow, nearly naked. This length, slenderness, grooving, and peculiar *sensitiveness*, are prime characteristics of the scolopacine bill. The gape, never ample, is generally very short and narrow, reaching little, if

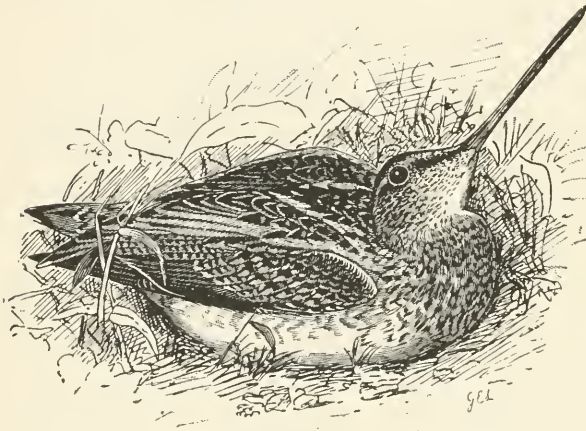


FIG. 555. — Common Snipe. (From Seebohm's Charadriidæ.)

any, beyond base of bill. The nostrils are short narrow slits, exposed. The head is completely feathered to bill (except in one species), at base of which ptilosis stops abruptly without forming projecting antiae. The wings commonly show the thin pointed contour described under *Limicola*, but they are occasionally short and rounded. The tail, always short and soft, has as a rule 12 rectrices; in one genus, however, there are from 12 to 26. The crura are rarely feathered to suffrago. The tarsi are scutellate before and behind, and reticulate on sides, except in the Curlews (*Numenius*), where they are scutellate only in front (yet with the exception to this exception, thus proving the rule, of *Numenius minutus*, a small Curlew which has the tarsi scutellate behind as before, and on this account has been made type of another genus, *Mesoscolopax*); and in *Heteractitis*, where the tarsal envelope is variable. They are entirely reticulate (the normal state in Plover) only in the remarkable *Ibidorhyncha struthersi*, now made type of a special subfamily. The hallux is absent in only 3 genera — *Ibidorhyncha*, *Phegornis*, and *Calidris*; anterior toes commonly show one basal web, and often two, but in many genera they are entirely cleft. The presence or absence of basal webbing has been made the sole basis of *Totuinæ* and *Scolopacinae* as two subfamilies of *Scolopacidae*; but this is a generic character only, and cannot be used to mark off subfamilies, because to do so would throw

such a thoroughly snipe-like genus as *Macrorhamphus*, and such a thorough sandpiper as *Ereunetes*, into the Totanine group, instead of leaving them in *Scolopacine* where they belong.

Scolopacine birds are of medium and small size, ranking with Plover in this respect: none attain the average stature of *Herodiones*. The general economy of these birds is similar to that of Plover; a chief peculiarity being probably their mode of procuring food, by feeding for it, in the majority of cases, in sand or mud with their delicately sensitive, probe-like bill. The eggs are commonly 4, parti-colored, pointed at one end and broad at the other, placed with the small ends together in a slight nest or mere depression on the ground; the young run about at birth. The sexes, with very rare exceptions (as in the genus *Rostratula*), are alike in color or nearly so; ♀ usually a little larger than ♂, but external sexual distinctions are rarely strong (remarkable exception in *Pavonella*). Color distinctions with age, likewise, are rarely marked; but, on the contrary, seasonal plumages are in many cases, as among Sandpipers, very strongly indicated, the nuptial dress being entirely different from that worn the rest of the year. Excepting a few species that frequent dry open places like Plover, these birds are found by the water's edge where the ground is soft and oozy — in moist thickets, low rank meadows, bogs and marshes, by the riverside, and on the seashore. Some are solitary, but the majority are gregarious when not breeding, and many gather in immense flocks, especially during the extensive migrations that nearly all perform. The voice is a mellow pipe, a sharp bleat, or a harsh scream, according to the species. Few birds surpass Snipe in rapid quality of flesh, and many kinds rank high in the estimation of sportsman and epicure. The family is cosmopolitan, but the majority inhabit the northern hemisphere, breeding in boreal regions. There are about 90 well-determined species of *Scolopacida*, referable perhaps to 25 tenable genera, although many more than this are often employed. Various attempts to divide the group into subfamilies have met with little success, owing to close interrelation of several types. The most exceptional of these are *Ibidorhyncha*, *Rostratula* (or *Rhynchœa*) and *Phlogornis* — if the latter be not pluvialine rather than scolopacine; aside from which, all the leading forms of the family, with most of the lesser genera, are represented in this country, and are indicated by the detailed descriptions given beyond; while its entire composition may be pointed out and rendered perfectly intelligible by a brief summary:

a. The remarkable genus *Rostratula* (usually called *Rhynchœa*) contains the Painted or Golden Snipes, whereof there are three species — *R. capensis* of the Ethiopian and Oriental regions, *R. australis* of Australia, and *R. semicollaris* of South America. They have the toes cleft to the base; the bill, tarsus, and middle toe with its claw of about equal lengths: the wings short and rounded. There is something suggestive of Rails in the general aspect of these birds. The plumage is peculiar, and the sexual characters are extraordinary: for the females are larger and handsomer than the males, do their own courting, make their mates incubate, and are further peculiar in the anatomical arrangement of the windpipe, which is tortuous and folded, making one or more loops under the skin before passing into the thoracic cavity. These birds form the subfamily *Rostratuline* (Cuv. & G., 1888: see Cent. Dict. s. v.).

b. In *Woodcock* (*Scolopax*, *Neoscolopax*, and *Philohela*) and *true Snipe* (*Gallinago*) the ear appears below and not behind the eye, which is placed far back and high up; and if the brain be examined, it will be found curiously tilted over so that its anatomical base looks forward. The bill is perfectly straight and much longer than head, deep-grooved to the very end, which is either knobbed, or widened just behind tip, where there is a furrow in the flattened enlucen. The membranous covering is abundantly supplied with nerves: this organ constitutes a probe of delicate sensibility, an efficient instrument of touch, used to feel for food below the surface of the ground. In the dried state, the soft skin shrinks tight like parchment to the bone, and becomes studded with small pits. The gape of the mouth is extremely short and narrow: the toes are cleft to the very base: the legs, neck, and wings are comparatively short, and the body is rather full. There are no obvious seasonal or sexual differences in plumage.

Not completely gregarious; no such flights of Woodcock and true Snipe occur as are usually witnessed among Sandpipers and Bay-snipe; they inhabit bog and brake rather than open waterside; they cannot be treacherously massacred by scores, like some of their relatives; they are knowing birds, if their brains are upset, and their successful pursuit calls into action all the better qualities of the true sportsman. There is but one species of *Philohela*, our own Woodcock, *P. minor*; one Moleucan Woodcock, *Neoscolopax rochusseni*; two Woodcock of the restricted genus *Scolopax*, *S. rusticula* and *S. saturata*; and about 20 true Snipe of the genus *Gallinago*. Among the latter the tail-feathers range from 12 to 26 in different species, though 14 or 16 is the usual number. In those with 20 or 26 several outer pairs (6 or 8) are narrow, linear, and stiffish; these birds are the Wire-tailed or Pin-tail Snipes, as *G. stenura* and *G. megalala*, both of Asia, the former with 26 rectrices, the latter with 20; they form the subgenus *Telmatias*, according to some authors, the subgenus *Spilura* according to others. *G. australis*,

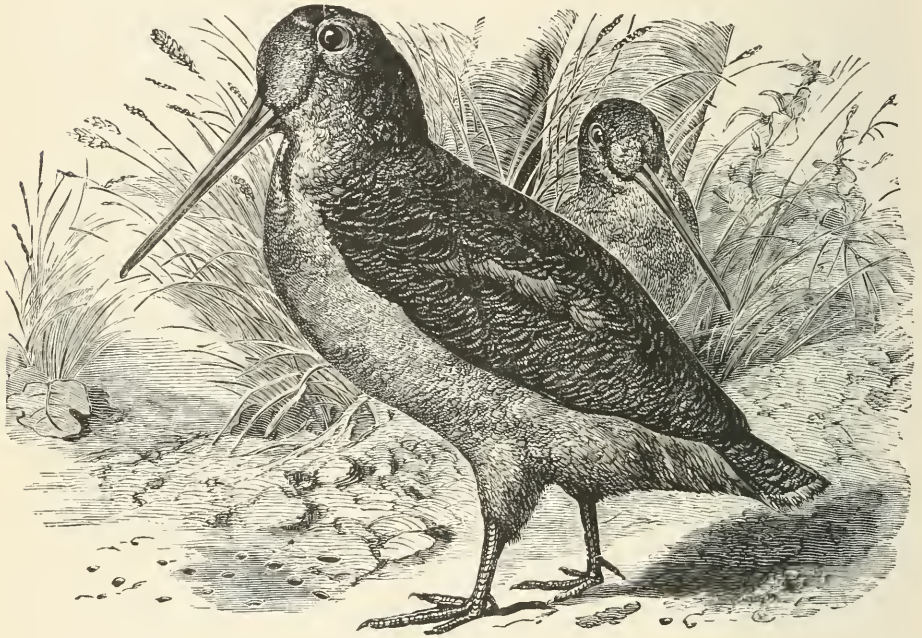


FIG. 556. — American Woodcock, about $\frac{2}{3}$ nat. size. (From American Field.)

the New Holland Snipe, has 18 rectrices, whereof two pairs are narrowed. The ordinary fan-tailed species of *Gallinago*, with 14 or 16 rectrices are, like those just mentioned, exceptional in this family in having but one large, deep emargination of the hinder end of the sternum; but *G. gallinula*, the Jack-snipe of Europe, with only 12 rectrices, conforms to the limicoline rule of two pairs of posterior sternal emarginations, and is hence made type of a genus *Limnocyptes*. The genus *Gallinago* (in a broad sense) is nearly cosmopolitan, and these Snipes are all distinguished from Woodcocks (*Philohela*, *Scolopax*, and *Neoscolopax*) by having the markings of the head longitudinal instead of transverse.

c. The genus *Macrorhamphus* (including *Pseudoscolopax*), containing our species, and one other (*M.* or *P. semipalmatus* of Asia) has the bill exactly as in *Gallinago*, but differs from typical Snipe in more pointed wings, differently proportioned legs, and especially basal webbing of toes. It thus stands exactly between the Snipe proper and

d. The *Godwits* (*Limosa*), in which we find the same very long, wholly grooved, and extremely sensitive bill, which, however, is not dilated at end, nor furrowed on culmen, and is bent *slightly* upward; the gape, as before, is exceedingly constricted. The toes show a basal web. These are rather large birds, with colors and general aspect of Curlews, but bill not decurved, and tarsi scutellate behind. They frequent marshes, bays, and estuaries, and are among the miscellaneous assortment of birds collectively designated "Bay-snipe." There are only 5 or 6 species, of the single genus *Limosa*.

e. *Sandpipers* (*Tringa*, etc.) are a rather extensive group, notable for the variation in minor details of form shown with almost every species—a fact that has caused the erection of a number of unnecessary genera. Here the bill retains much of the sensitiveness of a Snipe's, and the gape is likewise restricted; but the bill is much shorter, averaging about equal

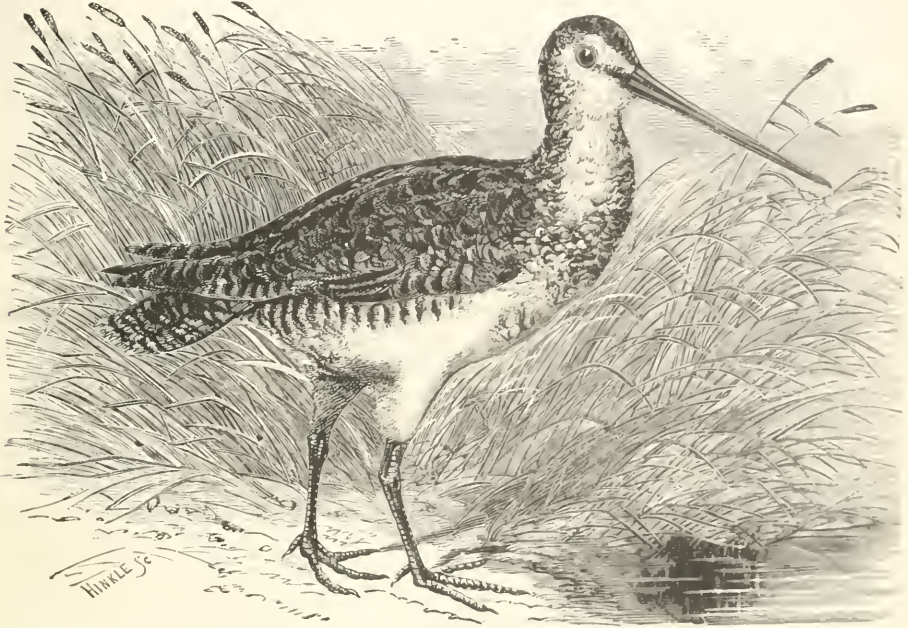


FIG. 557. — American Snipe, about $\frac{2}{3}$ nat. size. (From American Field)

to head. One trivial feature affords a good clew to this group: the tail-feathers are plain-colored, or with simple edgings, while in *almost* all species of other groups these feathers are barred crosswise. In Sandpipers seasonal changes of plumage are very great; proportions of legs and webbing of toes are variable with the species, but the toes are cleft to base (except in *Micropalama* and *Ereunetes*), and 4 in number (except in *Calidris*). Sandpipers belong particularly to the Northern Hemisphere, and breed in high latitudes; they perform extensive migrations, and in winter spread over most of the world. Among them are the most diminutive of waders. They are probably without exception gregarious, and often flock the beach in vast multitudes; they live by preference in *open* wet places, rather than in fens and marshes, and feed by probing, like Snipe; the voice is mellow and piping. They are pretty well distinguished from Snipe and Godwits, though *Micropalama* connects them with *Macrorhamphus* and *Limosa*; but shade directly into Tattlers, through such genera as *Lymptes* and *Actitis*. Nearly all the genera of Sandpipers are described in detail beyond. There are about 25 species. One generic form of true Sandpiper not represented in this country is the Broad-billed *Limicola*

platyrhyncha, the peculiarity of which is expressed in its name. Two isolated and extremely rare Sandpipers are *Æchmorhynchus parvirostris* of some Pacific islands, and *Prosobonia leucoptera* of the Sandwich Islands, the latter probably now extinct; these have the tail barred, as usual in the next group, but the toes cleft to base, as in most of the present group. Their relations appear to be close with our genus *Tryngites*, which serves to connect Sandpipers proper with

f. Tattlers (Totanus, etc.), with which it is ranged, beyond. In this, the largest and most varied group, the bill has comparatively little of the sensitiveness of that of all the foregoing, and the gape is longer, extending obviously beyond base of culmen, sometimes to nearly below eyes. It varies much in length and shape, but it is usually longer than head, very slender, not often grooved to tip, and is either straight, or bent slightly upward. The body and its members are commonly more elongate than in the foregoing; the front toes have a basal web or two, and the hind toe is always present. The tail is usually barred. These are noisy, restless birds of marshes, sand-flats, and mud-bars, and apparently do not probe for food to any extent; they gain their name from their often harsh voice. The Redshanks, Greenshanks, and our Yellowshanks are typical examples of this group; most of the species cluster close about these, and might go in the single genus *Totanus*. But our genera *Tryngites*, *Actitis*, *Heteractitis*, *Symphemia*, and *Bartramia* are pretty well marked; so is the genus *Paroncella*, which enters our fauna as a straggler from Europe; while the extralimital *Terekia cinerea* and *Pseudototanus guttifer* stand somewhat apart from others, both being semipalmate, and the former having a long bill like a Godwit's. There are about 20 species in all, universally distributed.

g. Curlews (Numenius) are distinguished by downward curvature, extreme slenderness, and usually great length of bill, with scutellation of tarsus confined to front (except in one species). In size and general appearance they are near Godwits; they inhabit all parts of the world. They all belong to the genus *Numenius*, which has 10 species (or 9, if *N. minutus* be separated as *Mesoscolopax minutus*, having the tarsi scutellate behind as well as before).

h. Ibidorhyncha struthersi is a remarkable bird of Central Asia, lately made by Dr. Sharpe type and sole member of a subfamily *Ibidorhynchinae*. It has been called an Ibis-billed Curlew with the feet of a Plover, and otherwise styled Ibis-billed Oyster-catcher, Red-billed Erolia, Gorgeted Chlorhynch, etc. The toes are three only; the tarsi are entirely reticulate; the bill is very long and decurved, with extensive furrows; the sternum is notched and fenestrate on each side behind. It is a large bird, over a foot long, with black, gray, and white plumage, and bloody red feet, bill, and eyes.

i. Phegornis mitchelli is a South American species commonly referred to the *Charadriidae*, as it has no hind toe, and in some other respects resembles a Plover; but the toes are cleft to the base, the tarsi are scutellate, and the bird is referred by late authorities to the *Scolopacidae*, in the vicinity of the genera *Æchmorhynchus* and *Prosobonia*.

No other *Scolopacidae* than those above mentioned by name, or indicated by the context, are known to exist.

Artificial Analysis of North American Genera of SCOLOPACIDÆ.

- Toes 3. (Sandpiper) *Calidris*
- Toes 4.
 - Bill spoon-shaped at the end. (Sandpiper) *Eurynorhynchus*
 - Bill not spoon-shaped.
 - One outer primary emarginate, narrowed. (European Woodcock) *Scolopax*
 - Three outer primaries emarginate, narrowly linear. (American Woodcock) *Philohela*
 - No outer primaries emarginate.
 - Toes cleft to the base (or with one minute web in one case)
 - Tarsus shorter than middle toe and claw.
 - Bill about twice as long as head; tibiæ naked below. (Snipe) *Gallinago*
 - Bill little longer than head; tibiæ feathered to suffrago. (Sandpiper) *Arquatella*
 - Tarsus about equal to or longer than middle toe and claw. (Sandpipers.)

- Bill slightly curved, longer than head.
 Tarsus evidently longer than middle toe and claw *Ancylochilus*
 Tarsus equal to or barely longer than middle toe and claw *Pelidna*
 Bill perfectly straight, much shorter than head. Primaries mottled *Tryngites*
 Bill perfectly straight, equal to or longer than head.
 Tarsus longer than middle toe and claw *Tringa*
 Tarsus about equal to middle toe and claw *Actodromas*
 Toes semipalmate, with one or two evident basal webs.
 Tarsus scutellate in front only; bill very long, decurved. (Curlews) *Numenius*
 Tarsus scutellate in front only; bill barely longer than head, straight *Heteractitis*
 Tarsus scutellate in front and behind.
 Tail not barred. One minute web. Primaries mottled *Tryngites*
 Tail not barred. Two full basal webs. Primaries plain. (Sandpipers)
 Bill shorter or scarcely longer than head *Ereunetes*
 Bill much longer than head *Micropalama*
 Tail barred crosswise with light and dark colors.
 Gape not reaching beyond base of bill.
 Culmen furrowed at end. Under a foot long. (Snipe) *Macrorhamphus*
 Culmen not furrowed. Over a foot long. (Godwits) *Limosa*
 Gape longer. Length under 9 inches. (Tattlers.)
 Bill grooved nearly to tip *Actitis*
 Bill grooved about half-way to tip *Helodromas*
 Gape longer. Length over 9 inches. (Tattlers.)
 Bill not longer than head, grooved $\frac{1}{2}$ its length.
 Tail more than half as long as wing *Bortramia*
 Tail not half as long as wing *Pavoncella*
 Bill longer than head.
 Legs bluish. Bill stout. Toes strongly semipalmate. (Willet) . . . *Symphemia*
 Legs green or yellow. Bill slender. (Greenshanks. Yellowshanks) . . *Totanus*

(§ 1. Woodcocks.)

PHILO'HELA. (Gr. φίλος, *philos*, loving; ἔλος, *helos*, a bog.) AMERICAN WOODCOCK. First 3 primaries emarginate, attenuate, and falcate, abruptly shorter and narrower than 4th. Wings short and rounded; when folded, primaries hidden by coverts and inner quills. Legs short; tibiæ feathered to joint; tarsus shorter than middle toe and claw, scutellate before and

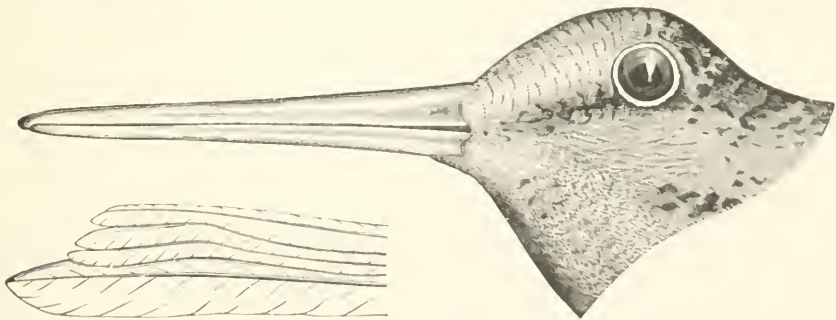


FIG. 558. — Head and attenuate outer 3 primaries of *Philohela*, nat. size. (Ad. nat. del. E. C.)

behind; toes long and slender, cleft to base. Bill very soft and sensitive, much longer than head, perfectly straight, stout at base, where the ridge rises high, knobbed at end of upper mandible, very deeply grooved nearly all its length; culmen and line of gonyes also furrowed toward end; gape very short and narrow. Head large; neck short; ear under eye, which is very full, set in back upper corner of head. Sexes alike; ♀ largest.

P. minor. (Lat. *minor*, smaller — than the European Woodcock. Figs. 556, 557, 559.) AMERICAN WOODCOCK. LITTLE WOODCOCK. LESSER WOODCOCK. WOODHEN. BIG-HEADED SNIPE. BLIND SNIPE. WHISTLING SNIPE. WOODSNIPE. NIGHT PARTRIDGE.

NIGHT-PECK. BOG-SUCKER. BOG-BIRD. TIMBERDOODLE. HOOKUMPAKE. SHRUPS. LABRADOR TWISTER. Colors above harmoniously blended and varied black, brown, gray, and russet; below, pale warm brown of variable shade, not barred. A dark stripe from bill to eye. Crown from opposite eye with black and light bars; along inner edges of wings a bluish-ashy stripe; lining of wings rusty-brown; quills plain fuscous; tail black, spotted, and tipped; bill brownish flesh-color, dusky at end; feet pale reddish flesh-color. The Woodcock is 10 or 11 inches long, and 16 or 17 in extent; wing 4.50–4.75; bill 2.50–2.75; tarsus 1.25; middle toe and claw 1.50; and weighs usually 5, 6, or 7 ounces. The Woodhen, as some prefer to call her, is larger, 11 or 12 inches long; extent 17 or 18; wing 4.75–5.50; bill 2.75–3.00; some good fat ones up to 8 or 9 oz. in weight. Bogs, swamps, wet woodland and fields, eastern U. S. chiefly; N. into southern provinces of Canada; N. W. to eastern Manitoba; the Dakotas, Nebraska, Kansas, Indian Territory, Texas, and

even Colorado, but casual or rare W. of the 97th meridian; no extralimital record except Bermuda; migratory, but breeds throughout its range, most commonly northerly; winters chiefly in the South. This is the game bird, after all, say what you please of Snipe, Quail, or Grouse! But of increasing scarcity in many parts owing to its persistent pursuit in spring and summer, together with the winter shooting in the

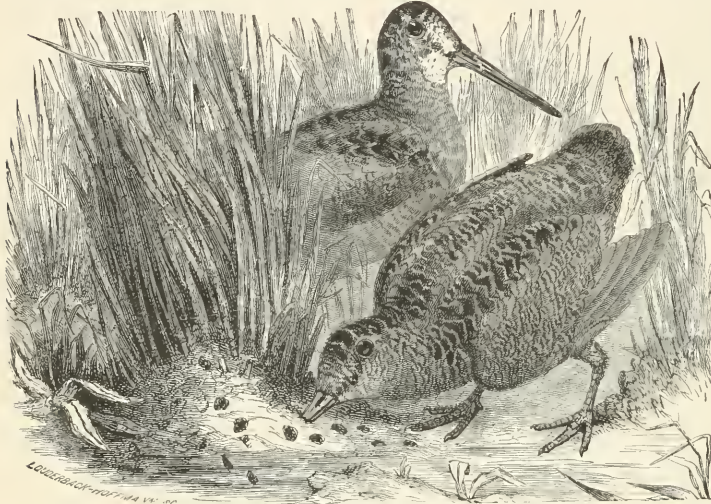


FIG. 559. — American Woodcock, much reduced. (From Lewis.)

South. Eggs usually 4, more rotund than those of most small Waders, corresponding to the plump form of the bird, averaging 1.50×1.18 ; a short broad one 1.40×1.20 ; a long narrow one 1.55×1.15 ; brownish clay-color, more buffy or more grayish, with numberless chocolate-brown surface-markings and stone-gray shell-spots, none very large or bold; size and intensity of markings generally corresponding to depth of ground color; usually laid in April, often March, earlier in the South. Woodcock have many curious actions during the mating season, as their nocturnal "song"-flight. The young are sometimes removed from danger by the parent carrying them with the feet. Very erratic and capricious in its movements — surprises are always in order for the cock-shooter, until he learns to be surprised at nothing this bird does; which is never safe until brought to table on toast, with his insides inside and his bill under his wing — poor thing! and even then the bill is likely to be a surprise, if it is presented in a fashionable restaurant.

SCO'LOPAX. (Gr. *σκολόπαξ*, *skolopax*, Lat. *scolopax*, name of this very bird.) **EUROPEAN WOODCOCK.** No outer primaries shortened or peculiar, 1st narrowed somewhat on inner web near end; 1st and 2d longest, 3d little shorter, 4th much shorter; wings long, comparatively, point of wing extending beyond inner secondaries, which only fold about to end of 5th quill. Generic characters, excepting those of wing, much as in *Philohela*; same style of bill and feet and configuration of body and head; plumage similarly variegated above, but below barred

crosswise throughout; size much superior. Of all Snipe-like birds of this country, loosely called "*Scolopax*," this straggler from Europe is the only one to which the name is strictly applicable.

S. rusti'cula. (Lat. *rusticus*, a rustic; *rusticola*, a little countryman; wrongly spelled *rusticola* by Linnæus and the A. O. U.) EUROPEAN WOODCOCK. Cockbird: Colors above harmoniously blended and varied black, brown, chestnut, and yellowish-gray; under parts brownish-white, regularly wavy-barred throughout with dark brown. A dusky stripe from bill to eye. Top and back of head brownish-black and brown, divided by three or four cross-bars of brownish-white and brown. Each feather of upper parts chestnut and black, in variegation, the black usually forming a large subterminal spot. Yellowish-gray tending to form a scapular stripe on each side of back. Quills and coverts of wing blackish, pretty regularly varied with dark chestnut bars, on the larger quills this chestnut paler and reduced to marginal indentations; outer web of 1st primary plain whitish. Upper tail-coverts rich chestnut, little varied with black, with pale tips. Tail-feathers black, with angular chestnut indentations of outer webs; their tips gray from above, viewed from below glistening silvery-white. Under parts brownish-white, more or less suffused with chestnut-brown on breast, the regular dusky barring only giving way on the whitish throat, changing to lengthwise streaks on under tail-coverts. Hen: Unmistakably similar — substantially the same; grayer above, much of the russet mottling of ♂ replaced by hoary-gray. A much "better" bird than our Woodcock; a third larger; weight 12–15 oz. Over a foot long; wing 7.00 inches or more; tail 3.50; bill not much longer than in our Woodcock; tarsus 1.50; middle toe and claw more. I describe this species with particularity, and sportsmen who get a bird of this sort will do well to report the fact at once. It was formally introduced to our fauna in the original edition of the "Key," 1872. There are occasional instances of its capture in this country, and it is entitled to a place as a straggler from Europe, of which country it is the common Woodcock. See LEWIS, Amer. Sportsm. ed. of 1868, p. 169, footnote (New Jersey); LAWRENCE, Ann. Lye. Nat. Hist. N. Y. 1866, p. 292 (Rhode Island and New Jersey); BAIRD, Am. Journ. Sci. xli, 1866, p. 25 (Newfoundland); COUES, Am. Nat. x, 1876, p. 372 (Virginia).

(§ 2. *Snipes.*)

GALLINA'GO. (Lat. *gallina*, a hen, whence *gallinago*, like *virago* from *vir.*) TRUE SNIPE. Bill much longer than head, perfectly straight, soft to end, where somewhat widened, grooved on top, vascular and sensitive, in dried state pitted; lateral grooves running more than half-way to tip; gape narrow, not reaching beyond base of culmen. Ear under eye. Tibiæ feathered not quite to the joint. Tarsus a little shorter than middle toe and claw; toes perfectly free, cleft to base, slender, and not fringed. Wings rather short and rounded (for this family), less so than in *Scolopax* or *Philohela*; no primaries attenuate. Tail short, rounded, of numerous (in our species normally 16) feathers, of which the lateral are narrowed, all barred crosswise. Sexes alike; seasonal changes of plumage not pronounced. Numerous species of all countries; one North American, and another straggling to Greenland and Bermuda from Europe; a third accidental at Hudson's Bay. For indications of them all, see p. 799.

Analysis of Species.

Tail-feathers 16; the 3 outer pairs mostly white. Straggler only in N. Am.	<i>major</i>
Tail-feathers 14. Straggler only in N. Am.	
Axillars and flanks white, incompletely or imperfectly barred with blackish	<i>gallinago</i>
Tail-feathers 16; the 3 outer pairs not mostly white. N. Am. at large.	
Axillars and flanks fully and regularly barred with white and blackish	<i>delicata</i>

G. ma'jor. (Lat. *major*, greater, *i. e.* than the common European *G. gallinago* or *G. media*.) GREATER SNIPE. DOUBLE SNIPE. Closely resembling the following two species; but easily distinguished by the combination of 16 rectrices, of which the three lateral pairs are narrow,

under 0.25 wide, and white, together with broad white tips of the median wing-coverts. Europe, Asia, and Africa; accidental at Hudson's Bay. The North American record of this species has been overlooked since the bird was described by Swainson in the F. B. A. ii, 1831, p. 501, as a new species under the name of *Scolopax leucurus*, from Hudson's Bay; the type specimen is extant in the British Museum, and has been identified with the well-known *Gallinago major* by Dr. Sharpe, Cat. B. Brit. Mus. xxiv, 1896, p. 626 and p. 631: see COUES, Auk, Apr. 1897, p. 209. A. O. U. Suppl. List, Auk, Jan. 1899, p. 105, No. [230. 1]. Strict application of the law of priority would require the name of this species to be *G. media*, after FRISCH, 1763; GERINI, 1773; and LATR. 1787; but it would be a contradiction in terms to impose upon the "Greater" or "Double" Snipe the designation *media*.

G. gallina'go. (Fig. 555.) EUROPEAN SNIPE. "ENGLISH SNIPE" proper. In size, form, and general coloration indistinguishable from the next described, but tail-feathers normally only 14, and the lateral ones not so narrow as in our Snipe, axillary feathers almost entirely



FIG. 560.—The Snipe's family. (From "Sport with Gun and Rod." The Century Co., N. Y.)

white, with slight and sparse dark markings, and feathers of flanks and sides less frequently and less regularly barred with dark gray. Size of our Snipe, but bill averaging longer — over 2.75. (In the lesser European Snipe, Jack-Snipe, or Judecock, *Gallinago (Limnocyptes) gallinula*, the sides and lining of wings are fully barred as in our *S. delicata*, but the tail-feathers are 12, the outer ones little shorter and not abruptly narrower than the rest.) Europe: Only North American as occurring frequently in Greenland; accidental in Bermuda. (*G. media* of 2d-4th eds. of the Key; but this is the original *Scolopax gallinago* LINN., and therefore *Gallinago gallinago* by A. O. U. rules.)

G. delicata. (Lat. meaning delicate — not in poor health, but dainty, as the bird is when served on toast. Figs. 557, 560, 561.) AMERICAN SNIPE. WILSON'S SNIPE. COM-

MON SNIPE. "ENGLISH" SNIPE (so called). MEADOW SNIPE. MARSII SNIPE. GUTTER-SNIPE. JACK-SNIPE. SHAD-BIRD. ALEWIFE-BIRD. SHAD-SPIRIT. Adult ♂ ♀: Crown black, with a pale ochrey middle stripe. Upper parts brownish-black, varied with bright bay and tawny; scapular feathers smoothly and evenly edged with tawny or whitish, forming two lengthwise stripes on each side when wings are folded. Quills and greater coverts blackish-brown, usually with white tips, and outer web of first primary usually white. Lining of wings and axillars white, fully and regularly barred with black. Rump black, the feathers with white tips. Upper tail-coverts tawny with numerous black bars, and tail-feathers black basally, then bright chestnut, with a narrow subterminal black bar, their tips fading to whitish; some lateral ones white, with little rufous tinge and several instead of one black bar. Belly white; jugulum and fore-breast light brown speckled with dusky brown; chin nearly white; sides of body shaded with brown, and with numerous regular dusky bars throughout; crissum more or less rufous, with numerous dusky bars. Bill greenish-gray, dusky on terminal third; iris brown; feet greenish-gray. Length of ♂ 10.50-11.50; extent 17.50-19.50; wing 4.75-5.25; bill 2.50 (more or less); tail 2.25; tarsus 1.25; middle toe and claw 1.50. ♀ averaging smaller. Weight of various specimens 3 oz. 4 dr. to 4 oz. 3 dr. This is the genuine *Snipe*, of all the birds loosely so called;

its name of "English" Snipe is a misnomer, as it is indigenous to this country, and distinct from any European species, though closely resembling two of them (*G. gallinago* and *G. gallinula*: see above). Its commonest name with sportsmen is "Jack-snipe," which is well enough in this country, though if said in England it would be understood as *G. gallinula*. In our species the tail is normally composed of 16 feathers, the two lateral of which on each side are abruptly smaller, shorter, and much narrower, resembling under coverts somewhat; and whole sides of body from breast to tail, as well as axillars and lining of wings, are completely and regularly barred, as is also crissum. Open wet places of North America,

at large; migratory; breeds from the Northern States northward, but chiefly beyond U. S.: S. into the West Indies and South America in winter, though many remain in the U. S. The general habits of this favorite game-bird are too well known to require remark. Eggs 3-4, 1.55 × 1.15, moderately pyriform, grayish-olive, with more or less brownish shade; markings bold and numerous, most so on the larger end, of varying shades of amber-brown: usually also sharp scratchy lines of black; shell-spots not very noticeable. Nest a mere depression in grass or moss of the bog; chicks mottled with white, ashy, ochrey, and dark brown. (*Scolopax wilsoni* TEMM. 1826; *G. wilsoni* of most authors, as of former editions of the Key; *G. media wilsoni* RIDGW.; *G. calceata wilsoni* STEJ.; *Scolopax delicata* ORD. ed. WILS. 1825; *G. delicata* A. O. U. No. 230.)

MACRORHAMPHUS. (Gr. μακρός, *makros*, long, ῥάμφος, *ramphos*, beak.) WEB-TOED SNIPE. Bill as in *Gallinago*. Wings longer and more pointed, more as in *Tringa*. Tibiæ naked below for a space about $\frac{1}{2}$ the length of tarsus. Tarsus longer than middle toe and claw. Anterior toes webbed at base; webbing most extensive between middle and outer. Tail doubly emarginate, of only 12 feathers, all closely and regularly barred. Sexes alike; summer and winter plumages different (as in Sandpipers). Thoroughly snipe-like in bill, but otherwise like long-legged Sandpipers—near *Micropalama*, for example, and not far from *Limosa*. Two alleged species, or a species and subspecies.

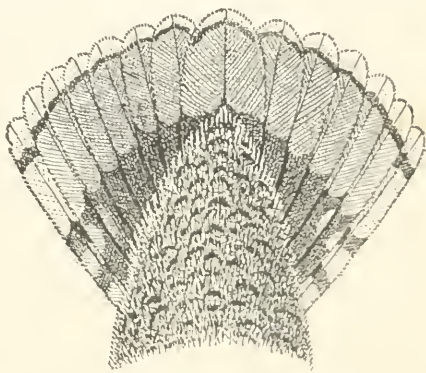


FIG. 561. — Tail of Wilson's Snipe. (From "North American Shore Birds," by D. G. Elliot.)

Analysis of *Macrorhamphus*.

Length 10.00 to 12.50; extent 17.50-20.00; wing 5.30-6.00, average 5.70; bill 2.00-3.00; tarsus 1.25-1.75, average 1.53; middle toe without claw 0.90-1.10, average 1.00.

Wing 5.25-5.90, average 5.65; bill 2.00-2.55, average 2.30; tarsus, average 1.35; middle toe alone, average 0.95.

In summer: Belly whitish; breast and sides speckled with dusky *griseus*

Wing 5.40-6.00, average 5.75; bill 2.20-3.20, average 2.80; tarsus, average 1.60; middle toe alone, average 1.00.

In summer: Belly cinnamon-brown; breast scantily speckled with dusky; sides barred with dusky

g. scolopaceus

Measurements of nine individuals, which I shot out of one flock in N. Dakota, Oct. 1, 1873, formerly supposed to include both species, and to show their perfect gradation in size; now supposed to show individual variation in *M. scolopaceus* alone.

Total length . . .	10.25	10.50	11.00	11.25	11.50	11.75	11.90	12.25	12.50
Extent of wings . .	17.50	18.00	18.50	19.25	19.00	19.50	19.75	20.25	19.50
Wing	5.40	5.50	5.65	5.80	5.75	5.90	6.00	6.10	5.85
Whole naked leg . .	3.40	3.40	3.40	3.35	4.00	4.10	4.00	4.10	4.15
Bill	2.20	2.40	2.50	2.85	2.90	2.90	2.95	3.05	3.25

M. griseus. (Lat. *griseus*, gray. Fig. 562.) RED-BREADED SNIPE (summer). BROWN SNIPE (summer). GRAY SNIPE (winter). ROBIN SNIPE (summer). QUAIL SNIPE. BROWN-BACK (summer). GRAY-BACK (winter). DRIVER. SEA-PIGEON. DOWITCHER or DOWITCH (*i. e.* Deutscher or Deutsch, meaning "Dutch" or "German" Snipe, as distinguished from "English" Snipe; German Snipe was the name of it in former years, from the Dutch traditions of New York; it was the New York Godwit of some books, *Scolopax noreboracensis* of others. G. Trumbull notes also the spellings DOWITCHEE and DOEWITCH). Adult ♀ ♂, in summer: Under parts rich rusty-red, paler or whitish on belly; jugulum, breast, and sides

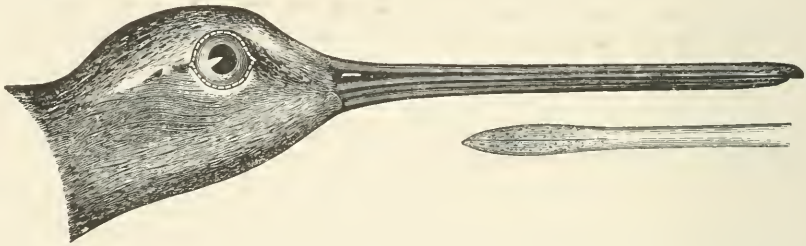


FIG. 562. — Bill of *Macrorhamphus griseus*. nat. size, in profile, and its end from above. (Ad. nat. del. E. C.)

fully speckled with dusky. Axillars and lining of wings white, with angular dusky markings. Wing-quills fuscous, shaft of 1st primary white, of others brown; secondaries conspicuously tipped with white. Above, black, varied everywhere with the reddish color of under parts, and on back and scapulars with white; lower back snowy-white, very conspicuous in flight; rump white spotted with black. Tail and its upper coverts black, closely barred with white or rufous. A dusky line from bill to eye. Bill and feet greenish-black. In winter: Dark gray above, the feathers with dusky centres and pale gray or whitish edges; lower back pure white; superciliary line and spot on under eyelid white; below, white, jugulum, fore-breast, and sides heavily shaded with gray, leaving chin whitish; flanks and crissum with wavy dusky spots or bars. (For dimensions, see above.) This bird is supposed to be restricted to eastern North America, especially along the Atlantic coast, where it abounds during migration, in proportion of 1,000 to 1 of the next variety. This is the official declaration. But we understand privately among ourselves, that it is simply an officiality, for the bird flies where it pleases in North America, to say nothing of the West Indies, Brazil, England, and continental Europe. Breeds in high latitudes. Among shore birds, this is a great favorite with gunners.

M. g. scolopaceus. (Lat. *scolopaceus*, snipe-like. Fig. 563.) WESTERN RED-BREADED SNIPE. RED-BELLIED SNIPE. WESTERN DOWITCHER. WHITE-TAILED DOWITCHER.

GREATER GRAY-BACK. **GREATER LONG-BEAK;** and all the other names of the foregoing. Like the last; more highly colored; averaging larger; bill especially longer (see above). Weight 2 oz. 7 dr. to 4 oz. 4 dr. Entire under parts rich rusty-red, including belly; throat and breast less speckled, sides and flanks thickly barred, with dusky. Winter and immature specimens indistinguishable from the last, excepting those surpassing maximum size of the latter. N. Am. at large, supposed to be rare or casual on the Atlantic side, and declared to be the only representative of the genus in the West — which would be important if it were a fact. Like the last, it is abundant; migratory; breeds in high latitudes, Alaska, British Columbia.

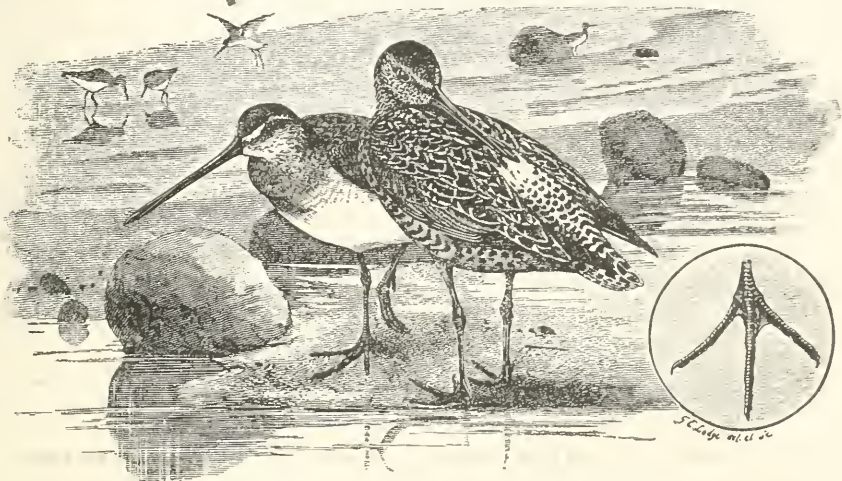


FIG. 563. — Western Red-breasted Snipe. (From Seeborn's Charadriidæ.)

Females of both are larger than males. Both generally fly in large compact flocks, like Sandpipers and shore-birds generally, rather than singly or in wisps like true Snipe; and prefer shores of bays and estuaries, instead of wet meadows. Eggs of this bird and the other are not peculiar among their allies; 3-4 in number; 1.55-1.75 \times 1.10-1.15; ground-color as in *Galinago*, general tone and style of markings the same. The A. O. U. makes this a full species. *M. scolopaceus*, A. O. U. Lists, No. 232.

(§ 3. Sandpipers.)

MICROPALAMA. (Gr. μικρός, *mikros*, small; παλάμη, *palame*, a web.) **STILT SANDPIPERS.** Bill much as in the last genus, but shorter, less evidently widened at end and not so distinctly furrowed on top, sometimes perceptibly curved. Wings long, pointed, 1st primary longest, rest rapidly graduated. Tail about half as long as wing, slightly doubly-emarginate. Legs very long; tibiæ bare an inch; tarsus as long as bill. Feet semipalmate; front toes connected by 2 evident basal webs. Plumage resembling that of *Macrorhamphus* in general character; its changes the same; sexes alike. These two genera are perfect links between Snipe and Sandpipers. One species.

M. himantopus. (Gr. ἱμαντόπους, *himantopus*, strap-legged. Figs. 564, 565.) **STILT SANDPIPER.** Adult ♂ ♀, in summer: Above, blackish, each feather edged and tipped with white and tawny or bay, which on scapulars becomes scalloped. Auriculars chestnut; a dusky line from bill to eye, and a light reddish superciliary one; upper tail-coverts white with dusky bars. Primaries dusky with blackish tips; tail-feathers 12, ashy-gray, their edges and a central field white; under parts mixed reddish, black, and whitish, in streaks on jugulum, elsewhere in bars; bill and feet greenish-black. Length 8.50-9.00; extent 16.00-17.00; wing

5.00–5.25; tail 2.25; bill 1.50–1.70; tarsus the same; middle toe and claw 1.00; tibia bare 1.00. Young, and adults in winter: Ashy gray above, with or without traces of black and bay, the feathers usually with white edging; line over eye and under parts white, jugulum and sides

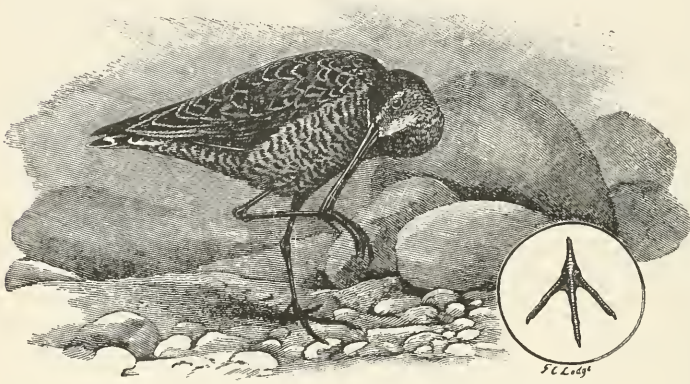


FIG. 564. — Stilt Sandpiper. (From Seeborn's Charadriidæ.)

suffused with color of back, and streaked with dusky; legs usually pale greenish-yellow. Very young birds, before acquiring their first winter garb, are dusky above, most of the feathers there edged with pale buff or whitish, the upper tail-coverts almost entirely white. The full breeding dress is of brief duration; birds are usually ashy and

white from September to April, both inclusive. N. Am., generally; not observed W. of the Rocky Mts.; rare. Breeds in high latitudes; migrates to West Indies and Central and South America in winter. Nesting not peculiar; eggs 3–4, about 1.42×1.00 , pale buff or grayish, with usual surface spots of rich dark brown and neutral tint shell-markings.

EREUNETES. (Gr. *ἐρευνητής*, *ereunetes*, a searcher, prober.) **SEMPALMATED SANDPIPERS.** Bill normally about as long as head, straight, quite stout for this family, both mandibles deeply grooved to the expanded vascular and sensitive tip. Wings long, pointed; secondaries obliquely incised. Tail moderate, doubly-emarginate, with pointed and projecting central feathers. Tarsus rather longer than middle toe and claw, about equal to the normal bill in length. Bare portion of tibia $\frac{2}{3}$ as long as tarsus. Toes connected by 2 broad basal webs, and broadly margined. A true Sandpiper, distinguished from *Actodromas* by semipalmate feet (fig. 48); from *Micropalama*, which is similarly webbed, by shortness of bill and feet. Very small; sexes alike; summer and winter plumages different.

E. pusillus. (Lat. *pusillus*, puerile, petty. Fig. 566.) **SEMPALMATED SANDPIPER.** Bill, tarsus, and middle toe with its claw, *about* equal to each other, an inch or less long, but bill very variable, — 0.66–0.87, averaging 0.75 ♂, 0.85 ♀; feet semipalmate, with two evident webs; length 5.50–6.50; extent about 11.75; wing 3.25–3.75; tail doubly emarginate, central feathers projecting. Adult ♂ ♀, in summer: Above, variegated with black, pale bay, and ashy or white, each feather with a black field, reddish

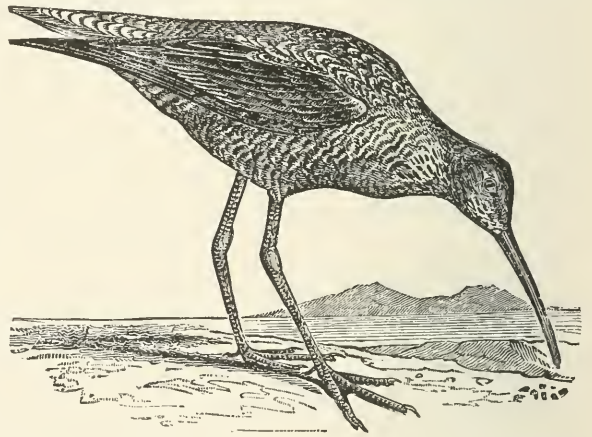


FIG. 565. — Stilt Sandpiper, in breeding dress, reduced. (From Nuttall, after Swainson.)

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edge, and whitish tip: rump and upper tail-coverts, except lateral ones, blackish. Tail-feathers ashy-gray, the central darker: primaries dusky, shaft of 1st white. A dusky line from bill to eye, and a white superciliary line. Below, pure white, usually rufescent on breast, and with more or less dusky

speckling on jugulum and breast. In winter: Upper parts mostly plain ashy-gray; specks beneath faint or obsolete. Young in July and August have scarcely any traces of spots beneath, being there almost entirely white, with a light buff wash across breast; there is also more white edging of feathers of upper parts; but in any plumage and under any variation, the species is

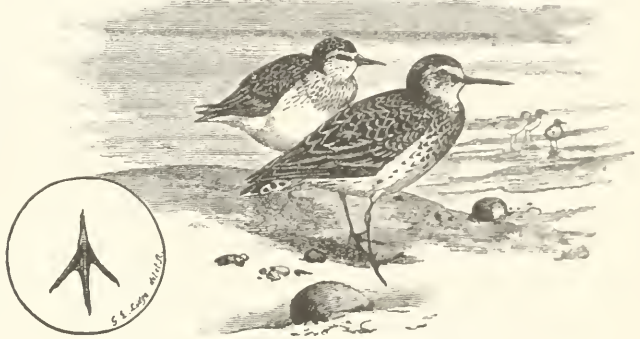


FIG. 566. — Peep. (From Seebohm's Charadriidæ.)

known by its small size and semipalmate feet. North America; an abundant and well-known little bird, thronging our beaches during migrations, which extend S. from the Gulf States to the West Indies and South America. It is only known to breed in high latitudes, from Labrador to Alaska, though it commonly appears in the U. S. in August, and may sometimes be seen in other summer months. The size, general appearance, and changes of plumage are much the same as those of *Actodromas minutilla*, and the habits of these two birds are very similar. Eggs 3-4, 1.22×0.84 , of usual shape; ground from clay-color (usual) to grayish or greenish-drab or decidedly olivaceous, usually boldly spotted and splashed with umber or chocolate brown, massed at larger end; sometimes more uniformly spotted in smaller pattern.

E. p. occidentalis? (Lat. *occidentalis*, western.) WESTERN SEMIPALMATED SANDPIPER. Ascribed to western North America, but also said to be "frequent" or "plentiful" on the Atlantic coast! The extreme variation in length of bill in the genus *Ercunetes* is from 0.50 to 1.25. In *occidentalis* as alleged the bill ranges ♂ 0.85-0.95, average 0.88, ♀ 1.00-1.15, average 1.05; the average of the ♂ being thus over the extreme of the same sex of *pusillus*

proper, and the minimum of the ♂ *occidentalis* equaling the average of ♀ *pusillus*. We also observe in *occidentalis* a tendency to richer rusty or chestnut and black coloration on the back, and heavier black streaks on the breast, sometimes forming arrow-heads which reach along the sides of the belly. *E. p. occidentalis?* "an alleged variety, probably untenable" of former eds. of the Key. A full species in A. O. U. Lists, *E. occidentalis*, No. 247.

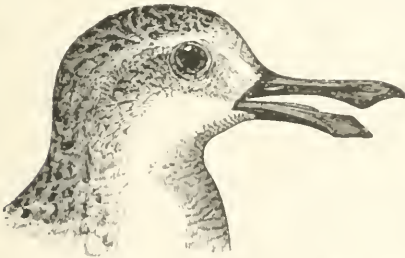


FIG. 567. — Spoon-billed Sandpiper. (From Seebohm's Charadriidæ.)

EURYNORHYNCHUS. (Gr. *εὐρύς*, *eurinos*, I dilate; *ῥύγχος*, *rhugchos*, beak. Fig. 567.) SPOON-BILLED SANDPIPER. Bill about as long as head,

being about as wide as long, lozenge-shaped, with straight, spatulate at end, the "spoon" being about as wide as long, lozenge-shaped, with distal angle well marked, lateral angles rounded off, proximal one of course running into rest of bill; both mandibles share this extraordinary dilation to about equal extent. The expansion is remarkably vascular, doubtless changes somewhat in drying, and may not be quite alike in different specimens. Excepting this prodigy of a bill, the characters are those of ordinary

Sandpipers, especially small species of *Actodromas*. Toes entirely free; hind toe extremely small; middle toe and claw a little shorter than tarsus. One species. (See Harting, *Ibis*, 1869, pp. 426-434; figured also in Newton's *Diet*. 1894, p. 813.)

E. pygmæus. (Lat. *pygmæus*, dwarf. Figs. 568, 569.) SPOON-BILLED SANDPIPER. SPATHEBILL. Adult ♀, in breeding plumage: General appearance of a Stint (as *Actodromas minutilla*, for example), and size little greater.

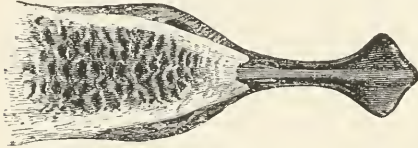


FIG. 568. — Spoon-billed Sandpiper. (From Seebohm's *Charadriidæ*.)

Coloration of upper parts almost exactly as in the species just named, the feathers being black, with indented light chestnut-red edgings, and mostly grayish-white tips; crown simply streaked with reddish and black. Under parts white; whole throat, breast, and sides of neck overlaid with bright chestnut (as in a highly plumaged Sanderling); breast behind this colored area, and sides of body, spotted with dusky. Primaries

plain dusky, with blackish outer webs and ends, and mostly white shafts; secondaries mostly white from the base; greater coverts white-tipped. Bill and feet black. Length about 6.00; wing 3.90; tail (almost gone), probably 1.75; tarsus 0.90; middle toe and claw 0.80; bill 0.90, the spoon 0.45 wide; this singular instrument probably acting as a sifter or strainer rather than as a shovel, in dabbling in soft mire. (Described from No. 92,281, Mus. Smiths. Inst., Plover Bay, E. Siberia, June 26, 1881, E. W. Nelson, figured in colors in Nelson's *Birds of*

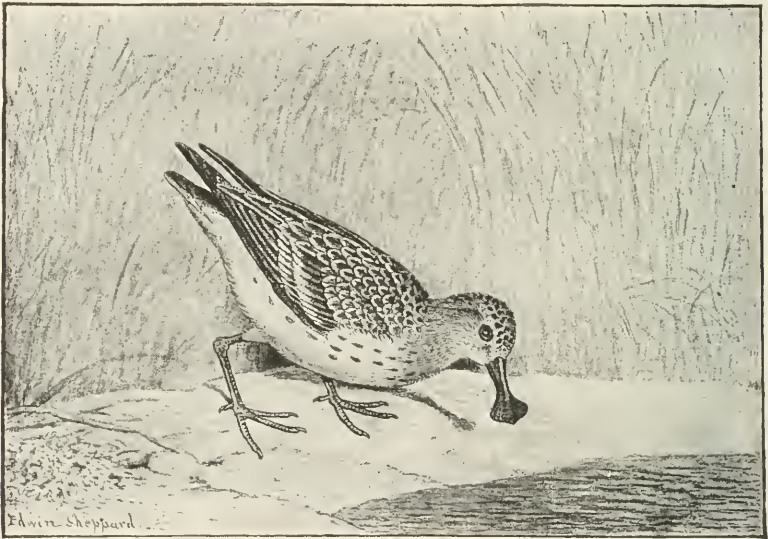


FIG. 569. — Spoon-bill Sandpiper. (From "North American Shore Birds," by D. G. Elliot.)

Bering Sea, etc., "Voyage of the *Corwin*," Washington, 4to, 1883, pl. opp. p. 87; see also Nelson's *Alaska*, 1887, p. 112. Only one other specimen in this plumage was known to exist in 1884, being that figured in *Ibis*, 1869, p. 426, pl. 12; see also Harting, *P. Z. S.* 1871, p. 111, for the original North American record of this specimen, in the Barrow collection, taken in summer of 1849 by Captain Moore of the ship "Plover," on Choris Peninsula, Kotzebue Sound, Alaska.) "Winter plumage: Forehead, cheeks, and entire under parts white; upper parts (except forehead) dusky, the feathers margined with pale grayish. Young: Back and scapulars dusky, the feathers bordered terminally with dull whitish, these borders becoming

rusty on anterior portion of back and scapulars; wing-coverts dusky centrally, with still darker shaft-streaks, and margined with brownish-gray, the greater tipped with white; top of head dull grayish, spotted with dusky, the feathers edged with rusty; rest of head, neck (except behind), and lower parts white, clouded with light grayish-brown, and suffused with dull buffy anteriorly" (RIDGW. Man. 1887, p. 160). Some specimens are smaller than the above; wing down to 3.35; culmen and tarsus each 0.80. Asia, especially India, breeding on the eastern Arctic coast of Siberia, and also on the Arctic coast of Alaska. At the time I wrote the 2d edition of the Key (1884), as then stated, only some 25-30 specimens were known, mostly from India, and there was scarcely another specimen in this country than the adult ♀ I described as above; others have since been taken, but the bird is still a rare one in collections.

ACTODROMAS. (Gr. ἀκτή, *akte*, the seashore; δρομάς, *dromas*, running.) PECTORAL SANDPIPERS. SPOTTY-THROAT SANDPIPERS. Bill about equal to head or tarsus, short, straight, very slender, somewhat compressed, tip punctulate, scarcely expanded, acute. Grooves on both mandibles very deep, and extending nearly to tip. Nostrils situated very near base of bill. Feathers extending on lower mandible much beyond those on upper, and half as far as those between rami. Wings long, pointed; 1st primary usually longest; tertials long, slender, flowing. Tail rather long, deeply doubly-emarginate (in one species cuneate), central feathers much projecting; upper tail-coverts moderately long. Tibia bare for more than half length of tarsus; the feathers very short, making the exposed portion nearly as great. Tarsus about equal to middle toe and claw. Toes long, slender, very narrowly margined, entirely free at base. A group of several species, including the smallest representatives of the family, agreeing in form and also in having the jugulum and fore-breast streaked or spotted, usually also with a brownish or ashy suffusion. Reduced to a subgenus of *Tringa* in A. O. U. Lists. There is much to be said in favor of this; but practically it makes no difference, and it is most convenient to make no change from former editions of the Key among the genera of Sandpipers.

Analysis of Species.

Tail graduated, with acuminate feathers.

Jugulum ruddy brown, with very small sharp dark streaks. Upper tail-coverts and rump with black central field. (Alaska only in N. Am.) *acuminata*

Tail not graduated; its feathers, except central pair, not acuminate.

Jugulum with brownish or ashy suffusion, thickly streaked. Upper tail-coverts and rump with black central field.

Largest; length 9.00; wing 5.25. Crown much darker than hind neck, the transition abrupt. Chin immaculate. Edgings of feathers on upper parts light chestnut-red, not making indentations toward the shaft. Suffusion on jugulum very deep, the darker streaks narrow, distinct. Bill and feet dusky-green *maculata*

Medium; length 7.25; wing 4.80. Crown not conspicuously darker than hind neck. Edgings of feathers on upper parts light reddish-yellow, scarcely brighter on scapulars, making indentations toward shaft. Suffusion on jugulum very light, the darker markings rounded, somewhat obsolete. Bill and feet black.

baridi

Smallest; a miniature of the preceding; length 5.75; wing 3.40. Edges of feathers chestnut-red, usually more or less indented, their tips lighter. Bill black; legs dusky-green; bill, tarsus, and middle toe with claw, each, about 0.75 *minutilla*

Very small, like the last; bill about 0.75; tarsus 0.85-0.90, and middle toe with claw rather longer still *diminutiss*

Jugulum with little or no brownish or ashy suffusion. Upper tail-coverts white.

Medium; length 7.50; wing 4.80. Jugulum thickly streaked with narrow dark lines. Upper tail-coverts immaculate, except outermost. Central tail-feathers nearly black *fusca*

Large; length 9.50; wing 5.75. Jugulum thinly marked with oval spots or streaks. Upper tail-coverts with dark arrow-heads. Central tail-feathers scarcely darker than lateral *impres*

A. minutilla (Lat. *minutilla*, very minute; dim. of *minutus*, small. Fig. 570.) AMERICAN STINT. WILSON'S STINT. LEAST SANDPIPER. PEEP. Smallest of Sandpipers; length 5.50-6.00; extent about 11.00; wing 3.25-3.50; tail 2.00 or less; bill, tarsus, and middle toe

with claw, about 0.75; bill exceptionally up to 0.90. Bill black; legs dusky-greenish. Upper parts in summer with feathers blackish centrally, edged with bright bay and tipped with ashy or white; in winter, in general simply ashy. Quills blackish, secondaries and greater coverts tipped with white. Tail-feathers gray with whitish edges, central ones blackish, usually

with reddish edges. Rump blackish. Crown not conspicuously different from hind neck; an indistinct whitish line over eye, and dusky one from eye to bill. Chestnut edgings of scapulars usually scalloped. Below, white; jugulum and sides of body for some distance with ashy or brownish suffusion, thickly spotted and streaked with dusky. Young with breast faintly streaked as in winter adults. This species and *E. pusillus* are usually confounded under the common name of "sand-

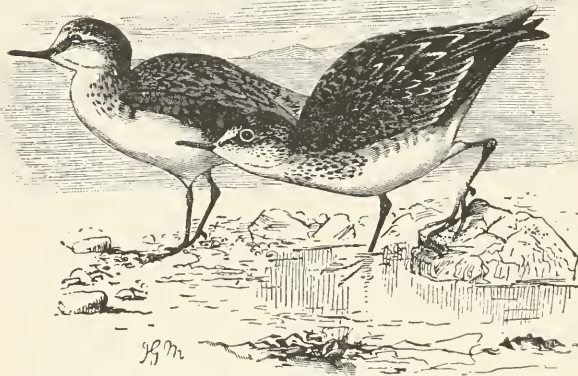


FIG. 570. — Little Stint. (From Seeborn's Charadriidæ.)

peeps," or "peeps," and look much alike; but a glance at the toes is sufficient to distinguish them. North, Central, and S. Am. and West Indies; very abundant during migrations; accidental in Europe. Breeds from Gulf of St. Lawrence and Assiniboia to high latitudes, returning to U. S. in July and August; wintering S. from Gulf States and California. Eggs 3-4, 1.15 × 0.80, of usual shades of pale brownish or grayish buff, marked in variable pattern with dark, rich, reddish-brown surface-spots and dots, and others of neutral tint in the shell.

A. damascen'sis. (Gr. *Δαμασκηνός*, *Damaskenos*, Lat. *Damascenus*, of Damascus, capital of Syria, in Hebrew *Dameseq*, in Arabic *Dameshq*, whence it is evident that *s* should appear in the name; compare *damask*, *damaskeen*, and other words of the same origin.) DAMASCENE SANDPIPER. LONG-TOED STINT. MIDDENDORFF'S STINT. Resembling the last somewhat in coloration, and of about the same size. Shaft of only first primary white; lateral tail-feathers gray; feet brown. Middle toe and claw longer than tarsus or culmen; tips of outstretched toes reaching beyond end of tail; points of folded wings not reaching to end of tail; four outer pairs of rectrices of equal lengths. Length 5.75; wing 3.50; bill 0.75; tarsus 0.85-0.90; middle toe and claw 0.90-0.95. An Asiatic stint, which was taken on Otter Island in Behring's Sea, June 8, 1885. *Totanus damacensis*, HORSFIELD, Trans. Linn. Soc. xiii. 1821, p. 129; *Tringa damacensis* SWINHOE, Ibis. Oct. 1863, p. 413; P. Z. S. 1863, p. 316; RIDGW. Auk, April, 1886, p. 275; Man. 1887, p. 158; *Actodromas damacensis* STEJ. Expl. Kamtschatka, 1885, p. 116; *Tringa damascensis*, COUES, Key, 3d ed. 1887, p. 886; 4th ed. 1890, p. 905; *Tringa (Actodromas) damacensis*, A. O. U. List, 2d ed. 1895, p. 89, No. [242.1.]; *Tringa subminuta* MIDDENDORFF, Reise, ii. 1853, p. 222, and of most authors.

A. bair'di. (To S. F. Baird.) BAIRD'S SANDPIPER. Form and proportions typical of the genus. Bill small, slender, rather shorter than the head, equal to the tarsus, the tip scarcely expanded, its point very acute. Grooves in both mandibles very long and deep, that of the lower very narrow. Feathers extending on side of lower mandible much farther than those on upper, about half as far as those between rami. Wings long; 1st and 2d primaries about equal, but varying, 3d much shorter; inner secondaries long, slender, flowing. Tail rather long, but slightly doubly-emarginate, central feathers rounded, projecting but little. Toes

long, slender, slightly margined, middle with its claw about equal to tarsus. Adult ♂ ♀, in breeding plumage: Entire upper parts very dark brownish-black, deeper on rump and lighter on neck behind, feathers bordered and tipped with light reddish-yellow; on scapulars the tips broader and nearly pure white, and the margins brighter, making several deep indentations toward shaft. Upper tail-coverts long, extending to within 0.50 of tips of central tail-feathers, fuscous (sometimes buff-tipped), except outer series, which are white with dusky markings. Central tail-feathers brownish-black, rest successively lighter, and all with a narrow border of white. Jugulum with a very decided light brownish suffusion, with rounded obsolete spots and streaks of dusky. Throat and under parts generally white, immaculate. Bill, legs, and feet black. Young in August: Dimensions and proportions as in adult. Upper parts a nearly uniform light ashy-brown, deeper on rump, each feather with a central dark field and with a light edge, these whitish edgings usually conspicuous. Traces of the brownish-black of the adult on scapulars. Breast and jugulum with the suffusion very light reddish-brown, the streaks sparse and very indistinct. Length 7.00-7.50; extent 15.25-16.50; wing 4.50-4.80; tail 2.25; bill, tarsus, and middle toe with claw, about 0.87. Colors much as in *minutilla*; edgings of upper plumage rather tawny than chestnut; jugular suffusion pale, rather fulvous, the streaks small and sparse, sometimes almost obsolete. Size of *fuscicollis*, but not easy to confound with that white-rumped species. N. and S. Am.; a few records for the Pacific coast, rare on the Atlantic coast, common in the interior; the most abundant small Sandpiper in some parts of the West, during migrations; S. in winter to Peru and Chili. Breeds in Arctic and subarctic regions, Alaska, Barren Grounds, etc. Eggs 3-4, 1.30 × 0.92, clay-colored, grayer or more buffy in different specimens, spotted with rich umber and chocolate-browns of varying shades; in some cases the markings fine and innumerable, in others massed at the greater end, sometimes with black tracery also; pale shell-spots usually evident. June, July.

A. macula'ta. (Lat. *maculata*, spotted.) PECTORAL SANDPIPER. GRASS-SNIPE. JACK-SNIPE. GRASS-BIRD. MEADOW SNIPE. COW-SNIPE. BROWN-BACK. BROWNIE. DOWITCH. TRIDDLER. HAY-BIRD. FAT-BIRD. SHORT-NECK. SQUAT-SNIPE. SQUATTER. "CREAKER" or Krieker (*i. e.* German *Kriecher*, one who squats, crouches, or cringes.) Bill a little longer than head, moderately stout, straight or very lightly decurved, the tip more expanded and punctulate than in type of the genus. Grooves in both mandibles long and deep. Wings long, pointed, 1st primary decidedly longest; inner secondaries very long, narrow, and flowing. Tarsus equal to middle toe, both about equal to bill. Tail rather long, deeply doubly-emarginate, central feathers pointed and greatly projecting. Adult ♂ ♀ in spring: An ill-defined white line over eye, and a more distinct one of dusky between eye and bill. Crown streaked with brownish-black and light chestnut, conspicuously different from neck behind, which is streaked with dusky and light ochreous. Upper parts generally brownish-black, every feather edged with ashy or dark chestnut-red, brightest on scapulars, tips usually lighter, and margins never making deep indentations toward shaft. Rump and upper tail-coverts black, buff-tipped; outer series of the latter white, with sagittate spots of dusky. Primaries deep dusky, almost black, the shaft of the first white, of the others brown. Secondaries and greater coverts dusky, edged and tipped with white. Lesser coverts dusky, fading into light grayish-ash on edges. Central tail-feathers brownish-black, lighter on edges, the lateral light ashy, margined with white. Jugulum and breast with a heavy wash of ashy-brown, and with numerous well-defined streaks of dusky; the suffusion extending on sides under wings to some distance, where the dusky streaks are mostly shaft-lines. Chin, upper throat, and under parts generally, white, immaculate. Bill and feet dusky-greenish. Young in September: Edges of feathers of upper parts generally, and of inner secondaries and central tail-feathers, light bright chestnut, and the tips pure white. Lesser wing-coverts broadly edged and tipped with light ferruginous. Suffusion on breast and jugulum with a yellowish ochreous tinge not seen in adult, and streaks less distinct. Other parts as in adult. Not known to have a plain

ashy and white winter plumage like most Sandpipers. Length 9.00–9.50 inches; extent 16.50–18.00; wing (average) 5.25; bill, tarsus, and middle toe with claw about 1.10; ♂ notably larger than ♀; ♂ wing nearly or about 5.50; bill and tarsus 1.10; ♀ wing scarcely 5.00; bill and tarsus about 1.05. Three Americas, West Indies, Greenland, Hawaii, and Europe; thus of wide and general dispersion; in U. S. during migrations, when abundant in wet grassy meadows and muddy flats. More common east than west. It goes very far N., quite to the Arctic Ocean, and breeds only in high latitudes; eggs 3–4, only distinguishable from those of the two preceding species by their superior size, about 1.45×1.00 . In some respects of habit it is quite snipe-like; it never flocks on beaches with the smaller Sandpipers, and it has at times a wayward towering flight, like that of a Snipe. During amours, this Sandpiper has the power of inflating the throat to a wonderful extent, forming a swelling which hangs like a great goitre upon the breast (see E. Adams, P. Z. S. 1859, p. 130; NELSON, Auk, 1884, p. 218, and his Alaska, 1887, pl. 8). This action recalls that of Pouter-pigeons, and the appearance is that of the ♂ Ruff under similar excitement. At such times it utters a resonant musical note. “Pectoral Sandpiper” is a book-name, seldom spoken, the bird being better known as the “Grass-snipe,” and “Jack-snipe”; but both these names are objectionable, as it is not a Snipe; and “Jack-snipe” moreover, is the proper name of an English species of *Gallinago* (*G. gallinula*) not found in this country, where *G. delicata* commonly takes the same designation.

A. fuscicollis. (Lat. *fuscus*, fuscous, dusky; *collum*, the neck.) **WHITE-RUMPED SANDPIPER. BONAPARTE'S SANDPIPER.** Bill quite stout, moderately long, equal to head or tarsus, tips somewhat expanded. Grooves on both mandibles long and deep. Feathers extending on lower mandible but little beyond those on upper. Wings long, pointed, 1st primary decidedly longest; inner secondaries long, narrow, and flowing. Tail moderate, quite deeply doubly emarginate, central feathers somewhat pointed and considerably projecting. Tarsus rather longer than middle toe. Toes long, slender, and slightly margined. Crown and upper parts generally light brownish-ash, each feather with a large field of dusky toward its end, and on crown and middle of back edged with light yellowish-red, deepening into bright sienna on scapulars. Superciliary stripe white. Lesser wing-coverts dark brownish-ash, fading into light ashy on edges, and with shaft-lines of blackish. Secondaries and greater coverts light grayish-ash, edged and tipped with white. Inner secondaries very dark brownish-ash, fading into light ashy on edges. Primaries deep dusky, their shafts white in central portions, and innermost edged with white. Rump brownish-black with ashy margins. Upper tail-coverts *white*, their outer series with sagittate spots of dusky. Central tail-feathers brownish-black, the rest very light grayish-ash, broadly edged and tipped with white. Jugulum and breast with a scarcely appreciable wash of light ashy, with numerous, distinct, linear-oblong streaks of dusky brown; these extend as minute dots nearly or quite to the bill, and as narrow shaft-lines along sides to vent. Rest of under parts white, immaculate. Lower mandible flesh-colored for half its length; rest of bill, with legs and feet, black. Length 7.50; extent 15.00; wing 4.90; bill, tarsus, and middle toe with claw, rather less than 1.00. Young in August: Upper parts nearly uniform dark ash, the black of the adults showing at intervals, but principally on scapulars, where also reddish margins of the feathers appear. Jugulum and sides under the wings with an ashy suffusion, more conspicuous than in the adult, but much more restricted, and the streaks more obsolete and indistinct. Central pair of upper tail-coverts usually dusky. Other parts as in the adult. North and South America; Greenland; Europe. Breeds from Labrador northward; Barren Grounds; migratory through the U. S. east of the Rocky Mts.; a common beach bird. Eggs 1.35×0.95 , not distinguishable from those of *A. bairdi*. (*A. bonapartii* of former eds. of the Key; antedated by *T. fuscicollis* VIEILL. 1819.) **A. cooperi?** (To Wm. Cooper.) **COOPER'S SANDPIPER.** Bill considerably longer than head, exceeding tarsus, straight, rather stout, tip scarcely expanded. Feathers extending on side of lower mandible scarcely farther than those on upper. Wings long, pointed, first pri-

mary decidedly longest; inner secondaries moderately long and rather slender. Tail moderate, slightly but decidedly doubly emarginate, central feathers projecting. Tarsus rather longer than middle toe; tibia bare for half the length of tarsus; toes all long, slender, and slightly margined. Adult in spring: Upper parts a nearly uniform light grayish-ash, each feather with a central brownish-black field, deepening into pure black on scapulars, where also the edgings of some feathers have a reddish tinge. Long inner secondaries sooty-brown, fading into light ashy on the edges. Secondaries and greater coverts dark grayish-ash, edged and broadly tipped with white. Primaries deep dusky, almost black on outer vanes and at tips, the innermost edged with white; shafts of all brown at base and black at tip, the central portion white. Upper tail-coverts white, with sagittate spots of dusky. Tail-feathers ashy-brown, the central pair darkest. Under parts white; jugulum, breast, and sides of neck with a slight reddish tinge, and, together with sides, with numerous streaks and oval spots of dusky, which become large and V-shaped on flanks. Length 9.50; wing 5.75; tail 2.75; bill 1.25; tarsus 1.12. Long Island, May 24, 1833; only one specimen known, still extant in U. S. Nat. Mus. It is still uncertain whether this be a good species or an unusual state of *T. canutus* or *A. maculata*; A. O. U. removes it to the Hypothetical List, No. 11.

A. acuminata. (Lat. *acuminata*, acuminate.) SHARP-TAILED SANDPIPER. A large species, of the size and with somewhat the general aspect of the Pectoral Sandpiper. Tail graduated, almost emarginate, all the feathers more or less acuminate, the projecting middle pair particularly so. Bill about as long as head; tarsus equal to middle toe and claw; toes perfectly free. Crown bright chestnut, streaked with black, bounded by decided whitish superciliary lines; different from hind neck. Upper parts with pattern of coloration of those of *maculata*, the feathers being black, with bright chestnut edges, and many of them also with whitish tips, the edgings not making scallops, and particularly straight and firm on the long inner secondaries. Central field of rump and upper tail-coverts black, scarcely or not varied with reddish tips of the feathers, the sides of this area white with dusky touches. Tail-feathers dusky, the middle ones darker or black, all firmly rimmed about with chestnut, buff, or whitish edging. Primaries blackish, their shafts mostly white; secondaries dusky, successively acquiring white tips and edges; greater coverts dusky, white-tipped. Entire under parts white, more or less suffused on jugulum, breast, and sides with a light ruddy brown (much as in *Podasocys montanus*), the jugulum alone with a set of small sharp dusky touches, being an extension across throat of better pronounced streaks of sides of head, neck, and breast, leaving chin definitely pure white. The effect is quite different from that produced by the heavy streaking of *maculata*. Bill changing from greenish-yellow basally to blackish toward tip; feet greenish-yellow. Length 8.00-9.00; wing 5.25-5.50; tail 2.25-2.50; bill 1.00; tarsus 1.10-1.20; middle toe and claw the same. (Described from several late summer and early fall specimens, taken in Alaska. An Australian specimen before me is smaller (wing under 5.00, etc.), and, excepting crown, lacks any reddish of upper parts, all the edgings being simply gray; ruddy suffusion of breast is scarcely seen.) An interesting species, widely diffused in the Old World, found in summer in Alaska, where it is common in some localities, as Saint Michael's, and where it doubtless breeds; extent of migration in America, if any, unknown. Figured in Nelson's Alaska, 1887, pl. 7.

ARQUATEL/LA. (Lat. *arquatella*, dim. of *arquata*, for *arcuata*, bowed.) FEATHER-LEG SANDPIPERS. ROCK SANDPIPERS. Bill, tarsus, and middle toe obviously not of equal lengths. Tarsus shorter than bill or middle toe and claw; tibial feathers reaching suffrago. Toes very long, broadly margined, and flattened underneath. Hind toe very short; claws short and blunt. Tail moderate, wedge-shaped. Bill variable, always longer than head, straight or slightly decurved, very slender, much compressed, tip scarcely expanded, groove on lower mandible shallow or obsolete. A generic group established by BAIRD, 1858, upon the well-known "Purple" Sandpiper, to which two other species have been added: reduced to a subgenus of *Tringa* by the A. O. U. The following analysis is taken from Bull. Nutt. Orn. Club, v, 1880, p. 162.

Analysis of Species.

Breeding dress: Crown streaked with yellowish gray, or grayish-white; scapulars and interscapulars irregularly spotted and indented with dull buff, or whitish, and tipped with white; fore-neck distinctly streaked with dusky; breast dull gray, everywhere spotted with darker. *Winter dress*: Back and scapulars sooty-black strongly glossed with purplish; the feathers bordered terminally with dark plumbeous-gray; fore-neck uniform mouse-gray, or brownish-plumbeous. Wing 5.06; culmen 1.20; tarsus 0.99; middle toe without claw 0.90 . . . *maritima*

Breeding dress: Crown streaked with deep rusty; scapulars and interscapulars broadly bordered with bright ferruginous; fore-neck irregularly clouded with dull pale buff or soiled white and sooty-plumbeous, the breast more coarsely clouded, with more or less of a black patch on each side. *Winter dress*: Like that of *maritima*, but the plumbeous borders of dorsal feathers broader and lighter, or more bluish. Jugulum streaked or otherwise varied with white. Wing 4.86; culmen 1.13; tarsus 0.95; middle toe without claw 0.86 *covesi*

Breeding dress: Crown broadly streaked with ochraceous-buff; scapulars and interscapulars broadly bordered with bright ochraceous-rufous; fore-neck pure white, sparsely streaked with brownish-gray; breast white, streaked anteriorly and clouded posteriorly with dusky, latter forming more or less of a patch on each side. *Winter dress*: Similar to the corresponding stages of each of the foregoing, but very much paler, the whole dorsal aspect being light cinereous, the scapulars and interscapulars with small, nearly concealed, central spots, the wing-coverts very broadly edged with pure white; fore-neck with white largely predominating. Wing 5.16; culmen 1.33; tarsus 0.98; middle toe without claw 0.90 *ptilocnemis*

A. maritima. (Lat. *maritima*, maritime. Fig. 571.) PURPLE SANDPIPER. ROCK SANDPIPER. ROCK-SNIPE. ROCK-BIRD. WINTER ROCK-BIRD. WINTER-SNIPE. Bill little longer than head, much longer than tarsus, straight or nearly so; tibial feathers long, reaching suffrago, though the legs are really bare a little way above; tarsus shorter than middle toe and claw. Length about 9.00; extent about 16.00; wing 5.00; tail 2.66, much rounded; bill 1.20; tarsus 0.90–1.00; middle toe 1.00 or a little more. Breeding dress: Upper parts black, conspicuously varied on head, neck, back, and scapulars, with chestnut or cinnamon and pale buff or whitish, the darker reddish colors edging or indenting the sides of the feathers, the paler colors chiefly tipping their ends; rusty-red also suffusing sides of head, separated from the black and reddish crown by a pale or whitish superciliary stripe. A lighter tawny shade invades jugulum and breast; otherwise, under parts white, streaked on jugulum and breast with blackish, elsewhere nebulated with dusky-gray, but no definite blackish area formed. Rump and upper tail-coverts brownish-black, unmarked. Wings plain fuscous; lesser coverts narrowly, greater broadly, tipped with white, secondaries mostly white in

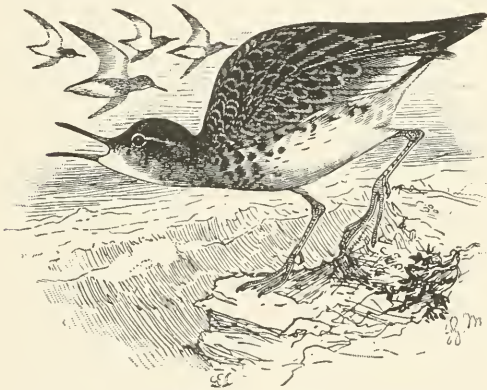


FIG. 571. — Purple Sandpiper. (From Seebohm's Charadriidæ.)

increasing amounts from without inward, and shaft of 1st primary white. Inner tail-feathers plain dusky, outer ashy-gray. Adult in winter: Entire upper parts a lustrous, very dark, bluish- or blackish-ash, with purple and violet reflections, each feather with a lighter border. Greater and lesser wing-coverts, inner secondaries and scapulars edged and tipped with white; secondaries mostly white; primaries deep dusky, the shafts dull white except at tip, where black. Upper tail-coverts and central tail-feathers brownish-black with purplish reflections, the outer pairs of the former white, barred with dusky. Lateral tail-feathers light ashy. Jugulum and breast bluish-ash, each feather of the latter edged with white, and the ash extending along sides beneath wings. Rest of under parts white, immaculate. Legs, feet, and bill at base light flesh-color; rest of bill greenish-black. Most immature birds of first fall and winter resemble this, but are duller, without gloss. Young: Upper parts much the color of adult, but each feather broadly edged and tipped with light buff or reddish yellow. Light edging of

wing-coverts ashy instead of pure white. Under parts everywhere thickly mottled with ashy and dusky, deepest on breast and jugulum. Chicks in down are very pretty: grayish-brown, mottled with black; back, wings, and rump spangled with white points; head grayish-white, tinged with fulvous, variously marked with black; lores with two parallel black stripes; below, grayish-white. A species of circumpolar distribution, breeding and often wintering in high latitudes; in eastern North America S. in winter to the Middle States, casually to Florida; chiefly maritime, but also occurring on the Great Lakes and other inland waters; it prefers rocky shores covered with seaweed. Eggs 3 or 4, of usual pyriform shape, about 1.45×1.00 , clay color with olive shade, with large bold markings of rich amber-brown of varying shade, with neutral tint shell-markings; markings over all the surface, but largest and most massed at greater end.

A. coues'i. (To E. Coues.) ALEUTIAN SANDPIPER. COUES' SANDPIPER. Very near the last. Following is the original description, in substance. Breeding dress, ♂ ♀: Above fuliginous-slate; feathers of crown, back, and scapulars broadly edged with rusty-ochraceous, or bright cinnamon, the central field of each feather nearly black, much darker than wings or rump, some of the scapulars and interscapulars tipped with white in some specimens. Lesser coverts narrowly, greater coverts broadly, bordered terminally with white; greater coverts broadly tipped with white, forming a conspicuous cross-bar; several inner secondaries chiefly white; others, also inner primaries, narrowly skirted and tipped with white. Rump, upper tail-coverts, and middle tail-feathers, uniform fuliginous dusky, other rectrices paler, or dull cinereous. A conspicuous long whitish superciliary stripe, reaching to nape, confluent with whitish of under side of head, thus posteriorly bounding a large sooty-brown auricular area; anterior portion of lores, and forehead, dull smoky-grayish; neck, jugulum, and breast dirty whitish, sometimes soiled with dingy buff, and clouded or spotted with dull slate, sooty-plumbeous, or dusky-blackish, this sometimes forming a large patch on each side of breast. Other under parts pure white, sides with a chain of slaty spots and streaks, crissum streaked with dusky; lining of wing pure white. Bill mostly blackish, lighter on basal third; feet dark greenish, drying blackish; iris brown. Winter plumage: Above, soft smoky-plumbeous, scapulars and interscapulars glossy purplish-dusky centrally, the plumbeous borders of the feathers causing a squamous appearance; head and neck uniform plumbeous, excepting throat and a supra-oral patch, which are streaked whitish; jugulum squamated with white, breast similarly, but more broadly marked. Wing, tail, and rump, as in summer. Young, first plumage: Scapulars and interscapulars black, broadly bordered with bright rusty and buffy-white, the latter chiefly on longer outer scapulars and lower back; wing-coverts broadly bordered with buffy-white; pileum streaked black and ochrey; jugulum and breast pale buff, or buffy-white, streaked with dusky. Downy young: Above, bright rusty-fulvous, irregularly mottled with black; back, wings, and rump flecked with yellowish-white papillæ; head above deep fulvous-brown, striped with velvety black from forehead to occiput, where confluent with a cross-bar of the same; lores with two parallel stripes of same. Lower parts white, distinctly fulvous on sides. Length 8.00-9.00; extent 15.00-16.00; wing 4.50-5.15, average 4.86; tail 2.10-2.35; culmen 0.98-1.25; average 1.13; tarsus 0.88-1.00, average 0.95; middle toe without claw 0.78-0.90, average 0.86. Eggs 1.45×1.00 , indistinguishable from those of *A. maritima*, laid in May and June. Commander Islands, Aleutian Islands, and coast of Alaska, all the year round; extent of migrations unknown, if any. Best biography in Nelson's Alaska, 1887, p. 103, with colored pl. 6.

A. ptiloene'mis. (Gr. *πτίλον*, *ptilon*, a feather; *κνέμις*, *knemis*, a groove: the crus being feathered.) PRYBIL'F SANDPIPER. ELLIOTT'S SANDPIPER. BLACK-BREADED SANDPIPER. Adult ♂ ♀ in breeding dress: With somewhat the appearance of a summer *Ptilinopus alpina*, but the black area pectoral, not abdominal. Crown, interscapulars, and scapulars black, completely variegated with rich chestnut, ochrey, and whitish, the body of each feather

being black, with one or another or all of the lighter markings; coroual separated from dorsal variegation by a grayish-white, dusky-streaked cervical interval. Lower back, rump, and upper tail-coverts blackish, little variegated with chestnut. Secondaries nearly all pure white, a few of the outermost and innermost touched with grayish-brown near end. Primaries grayish-brown with white shafts except at tip, fading to white on inner webs toward base; several inner ones also largely white on outer webs, and tipped with white. Central tail-feathers brownish-black; next pair abruptly paler, grayish; rest white or whitish with pale gray tint. Front and sides of head, superciliary line, tufts of flank-feathers, and entire under parts, white, interrupted on breast with a large but not well defined nor perfectly continuous blackish area, and marked on upper breast and sides with a few sharp blackish shaft-lines. A dusky auricular patch. Legs and bill dark. Length about 9.50-10.00; wing 4.80-5.30; tail 2.30-2.50; bill 1.10-1.40! average 1.30; tarsus 0.90-1.00; middle toe and claw 1.05-1.20. Winter plumage as in *A. couesi*. First plumage: Upper parts much as in adults, but rusty markings in curved rather than angular lines, and much narrower; edges of wing-coverts ochrey. Interior tail-feathers rusty-edged. Throat and breast more or less suffused with rusty; no black pectoral area, but jugulum, breast, and sides suffused with rusty. Chicks in down (July): Below, silvery-white; above, rich reddish-brown, varied with white, with curious little round dots, like mildew. Each such spot is as large as a pin-head, and, under a lens, is seen to be the enlarged brushy end of a down-feather, whence several tiny bristles sprout. Each such plume is white at base, then black, then white-tufted as said; the dotted areas thus correspond to the areas of black variegation, but there are, also, a black undotted frontal line, loreal stripes, and some other markings. These chicks are easily distinguished from those of *A. maritima*, but not from those of *A. couesi*. Pribilof or Fur Seal Islands in Bering Sea, where it breeds, N. to St. Matthew and St. Lawrence Islands; coast of Alaska in winter; common. Resembling both the foregoing, but perfectly distinct from either; larger and lighter colored than *A. couesi*. Eggs 4, 1.50 × 1.07, otherwise like those of the foregoing, laid in June; young on wing early in August.

PELID'NA. (Gr. *πελιδνός*, *pelidnos*, gray, livid.) DUNLIN SANDPIPERS. PURRES. Bill stout, much longer than head or tarsus, slightly decurved, tip somewhat expanded and punctulate; grooves in both mandibles deep and distinct. Wings moderate; inner secondaries long and flowing. Tail moderate, doubly-emarginate, central feathers projecting. Legs rather long; tarsus not shorter than middle toe and claw, if anything longer. Bare portion of tibia more than half the tarsus. Toes rather long, cleft to base, narrowly margined. Contains a few species or subspecies, in summer reddish above, with a great black abdominal area, in winter chiefly ash above and white below. (A. O. U. reduces to a subgenus of *Tringa*.)

Analysis of Subspecies.

Smaller: length about 8.00; bill, average, 1.40; tarsus little if any longer than middle toe and claw; tarsus and middle toe together 1.75 *alpina*
 Larger: length about 8.50; bill, average, 1.70; disproportionately longer, stouter, more decurved; tarsus decidedly longer than middle toe and claw; tarsus and middle toe together 2.00 *a. pacifica*

P. alpina. (Lat. *alpina*, alpine.) EUROPEAN DUNLIN. PURRE. Differing as above said from the North American species. Straggler to Greenland, Hudson's Bay, Long Island, and Washington, D. C. Auk, 1886, p. 140; 1893, p. 78; but the Florida and Texas records dubious (Auk, 1887, p. 186, p. 219).

P. a. pacifica. (Fig. 572.) AMERICAN DUNLIN. BLACK-BELLIED SANDPIPER. RED-BACKED SANDPIPER. BLACK-HEART. RED-BACK. LEAD-BACK. OX-BIRD. BRANT-BIRD. BRANT SNIPE. CROOKED-BILLED SNIPE. FALL SNIPE. WINTER SNIPE. SIMPLETON. STIB. Bill longer than head or tarsus, compressed at base, rather depressed at end, usually appreciably decurved. Length 8.00-9.00; extent 15.00; wing 4.50-5.00; tail 2.00-

2.33; bill 1.50-1.75; tibiæ bare about 0.50; tarsus 1.00 or rather more; middle toe and claw 1.00 or rather less. Adult in summer: Above chestnut-red, each feather with a central black field, and most of them tipped with whitish; tail-feathers and wing-coverts ashy-gray; greater coverts tipped with white; quills dusky with pale shafts; secondaries mostly white, and inner primaries edged with the same; outer webs of primaries blackish, some inner ones white-edged toward base. Under parts white; belly with a broad, jet-black area; chest and jugulum streaked with dusky. Bill and feet black. Adult in winter: Above, plain ashy-gray, with dark shaft-lines. Below, white, jugulum and chest with dusky streaks and an ashy suffusion.

White edgings of inner primaries very conspicuous. Young generally similar. In first plumage somewhat resembling summer adults, with rufous, buffy and black above and coarsely black spotted below. The summer dress is long worn; it is assumed more or less perfectly in April, and many birds come into the U. S. from the North still wearing it in August and September. North America and some of northeastern Asia, breeding only in high latitudes, migrating through U. S. and wintering S. from California and the Gulf and S. Atlantic States, preferably coastwise; common, in flocks, on beaches and elsewhere, and like other shore birds an object of sport to gunners, who give it a great variety of names, some of them shared with other species. Eggs 4, 1.45 × 1.00, buff of a varying olive or brownish shade, fully spotted with rich chestnut-brown. This is altogether a larger and handsomer bird, with a disproportionally longer and more curved bill than the European, from which it was first separated as *T. alpina* var. *americana* by Mr. Cassin in 1858, and named *Pelidna alpina americana* by myself in 1861; it is so given in all former editions of the Key. But the name *americana* is unluckily preoccupied by Brehm for another species; wherefore the A. O. U. adopts for this one the name *pacifica*, which I gave in 1861 to some of the largest and longest-billed specimens I had seen, which I thought might possibly be subspecifically different from the rest. This has not proved to be the case, however, and our common bird is now *Tringa (Pelidna) alpina pacifica*, A. O. U. No. 243 a.

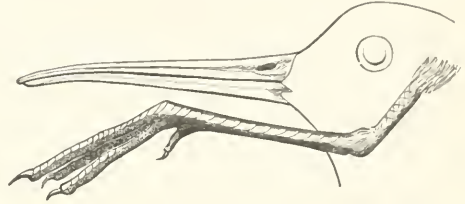


FIG. 572.—Bill and foot of *Pelidna alpina pacifica*, nat. size. (Ad. nat. del. E. C.)

in flocks, on beaches and elsewhere, and like other shore birds an object of sport to gunners, who give it a great variety of names, some of them shared with other species. Eggs 4, 1.45 × 1.00, buff of a varying olive or brownish shade, fully spotted with rich chestnut-brown. This is altogether a larger and handsomer bird, with a disproportionally longer and more curved bill than the European, from which it was first separated as *T. alpina* var. *americana* by Mr. Cassin in 1858, and named *Pelidna alpina americana* by myself in 1861; it is so given in all former editions of the Key. But the name *americana* is unluckily preoccupied by Brehm for another species; wherefore the A. O. U. adopts for this one the name *pacifica*, which I gave in 1861 to some of the largest and longest-billed specimens I had seen, which I thought might possibly be subspecifically different from the rest. This has not proved to be the case, however, and our common bird is now *Tringa (Pelidna) alpina pacifica*, A. O. U. No. 243 a.

ANCYLOCHI'PLUS. (Gr. ἀγκυλόχειλος, *ankulocheilos*, having a curved bill.) CURLEW SANDPIPERS. Bill much longer than head, slender, compressed, considerably decurved, tip not expanded, rather hard. Grooves in both mandibles very narrow but distinct. Wings long, pointed. Tail very short, nearly even. Legs long, slender; tarsus and tibia both lengthened, the latter exposed for nearly or quite half the length of the former, which is nearly as long as bill. Toes moderate, slender, slightly margined, the middle one about $\frac{2}{3}$ the tarsus. One species, noted for its resemblance to a miniature Curlew. (As a subgenus of *Tringa*, "*Ancylocheilus*," in A. O. U. Lists.)

A. ferrugin'eus. (Lat. *ferrugineus*, rusty-red, of the color of *ferrugo*, iron-rust, as the bird is in full dress on the under parts.) CURLEW SANDPIPER. FERRUGINEOUS SANDPIPER. PYGMY CURLEW. Adult: Crown of head and entire upper parts lustrous greenish-black, each feather tipped and deeply indented with bright yellowish-red. Wing-coverts ashy-brown, each feather with a dusky shaft-line and reddish edging. Primaries deep dusky, their shafts brown at base and black at tip, the central portion nearly white. Upper tail-coverts white, with broad bars of dusky, and tinged at their extremity with reddish. Tail light gray with greenish reflections. Sides of neck and entire under parts uniform deep brownish-red. Under tail-coverts barred with dusky. Axillars and under wing-coverts white. Bill and legs greenish-black. Young in autumn: Crown of head and back brownish-black, with a slight greenish lustre, each feather edged with white or reddish-yellow. Rump plain dusky; upper tail-coverts

white. Wing-coverts with broad grayish-white borders. Tail light ashy, edged and tipped with white, central feathers with a subterminal dusky border in addition. Under parts entirely white, breast and sides of neck finely streaked with dusky, former with a light buff tinge. Length about 8.50; wing 4.90–5.20; bill 1.40–1.60, average 1.50; tarsus 1.20; toe 0.90; tibia bare 0.70. Inhabits most of the Old World; in America very rare, little more than a straggler along the Atlantic coast (for particulars of a dozen or more instances of its occurrence, see New England Bird Life, vol. ii, p. 224, and Auk, 1893, p. 293 and p. 296); also known to occur in Alaska (Point Barrow, June 8, 1883). The eggs long remained unknown, and when these special desiderata were discovered, they were found to be indistinguishable from those of some related species, as might have been expected; they measure about 1.50×1.05 . The bird is known to breed on the Yenesei River in Siberia (Popham). *A. subarquatus* of former eds. of the Key; *T. subarquata* of most authors, after *Scolopax subarquata* GÜLD., 1774, antedated by *T. ferruginea* BRÜNN. 1764; *Tringa (Ancylocheilus) ferruginea*, A. O. U. No. 244.

TRINGA. (Gr. τρύγας, *truggas*; Lat. *tryngas*, *trynga*, or *tringa*, a sandpiper.) **ROBIN SANDPIPERS.** **KNOTS.** Bill about as long as, or rather longer than, head, straight, stout, somewhat compressed, widening uniformly from the middle to the slightly expanded, rather hard tip; culmen depressed on terminal half to the expansion at tip, and obsoletely furrowed. Both mandibles deeply grooved to tip. Nostrils very large and placed far forward in the upper groove. Feathers extending on lower mandible much farther than on upper, and nearly as far as those between rami. Wings long, pointed, 1st primary decidedly longest. Secondaries moderately incised. Tertiaries short, broad, and comparatively stiff. Tail rather short, nearly even, central feathers projecting little if any. Legs short and very stout; tarsus usually shorter than bill; longer than middle toe. Tibial feathers reaching nearly to joint; tibiae bare for nearly $\frac{2}{3}$ the tarsus. Toes very short and stout, free at base, widely margined; outer lateral longer than inner. Hind toe present, well developed. Claws short, stout, blunt, much curved, dilated on inner edge. Size large, form stout. (*Tringa* LINN., 1758, formerly used for all the short-billed *Scolopacidae*, now restricted to a few species like the Knot, which is taken as the type by elimination.)

T. canutus. (Named for King Canute by Linnaeus, who accepted the dubious tradition that connected this bird with a story of the Danish king Knut, Cnut, Canut, etc. Newton (Dict. 1893, p. 498) traces the connection to Camden's Britannia, 2d ed. 1607, p. 408: "*Knotts*, i. *Canuti aues*, vt opinor e Dania enim adulari creduntur." The name appears in the poems of Michael Drayton, b. 1563, d. 1631, sub. 1596–1630, and Knotts are named in MSS. of the 16th century. Sir T. Browne has Gnatts or Knots, *ea*. 1672. Edwards has Knot, 1760. Other forms are *Gnat*, *Knat*, *Knet*, etc. Fig. 573.) **KNOT. RED-BREASTED SANDPIPER. RED SANDPIPER. ASH-COLORED SANDPIPER. FRECKLED SANDPIPER. GRISLED SANDPIPER. GRAY-BACK. SILVER-BACK. ROBIN-SNIPE. WHITE ROBIN-SNIPE. ROBIN-BREAST. BEACH-ROBIN. ROBIN. RED-BREAST. BUFF-BREAST. WHITE-BELLIED SNIPE. HORSE-FOOT SNIPE. MAY-BIRD.** Largest of North American *Tringæ*. Adult ♂ ♀, in summer: Upper parts brownish-black, each feather broadly tipped and edged with ashy-white, tinged with reddish-yellow on scapulars. Rump ashy, barred with dusky; upper tail-coverts white, with transverse sagittate or crescentic bars of brownish-black. Tail grayish-ash, edged with ashy-white. Outer webs and tips of primaries deep dusky, inner much lighter. Secondaries and coverts grayish-ash, broadly edged and tipped with ashy-white. Line over eye and most under parts uniform brownish-red, fading into white on flanks and under tail-coverts, which latter are marked with sagittate spots of dusky. Bill and feet greenish-black. Adult ♂ ♀, in winter: Above, plain ashy-gray, only varied by indistinct dusky shaft-lines on most parts, but rump and upper tail-coverts white with dusky bars; below, white, with some dusky markings on the breast and sides; thus quite different from the "Robin" plumage of summer, but easily recognized by the generic characters. Young in autumn: Upper parts a uniform

dark ash, or cinereous, each feather tipped with ashy or pure white, and having a subterminal edging of dusky-black, producing a conspicuous set of black and white semicircles, very characteristic of the species in this plumage. Indistinct line over eye, and whole under parts white, more or less tinged with light reddish; throat, breast, and sides with rather sparse, irregularly disposed lines and spots of dusky, which become transverse waved bars on the latter. Length 10.50; extent 20.50; wing 6.50; tail 2.70; bill about 1.40; tarsus 1.20; middle toe 1.00; tibia bare 0.60.

A large handsome species, inhabiting most of the world in the course of its extensive migrations; in America, chiefly along the Atlantic coast, but also in the interior, about large lakes and rivers; winters from Florida to South America. Breeds only in high latitudes, and thus far only known to do so

on our Arctic coast, where it was first found by Parry's Expedition on the North Georgian or Parry Islands in abundance, in summer; soon afterward by Captain Lyons on Melville Peninsula (*Auk*, July, 1855, p. 312, *Newton*, *Diet.* p. 499); by Col. H. W. Feilden in 1876 on the northern coast of Grinnell Land and the shores of Smith Sound (*Ibis*, 1877, p. 407; *Nares' Narr.*

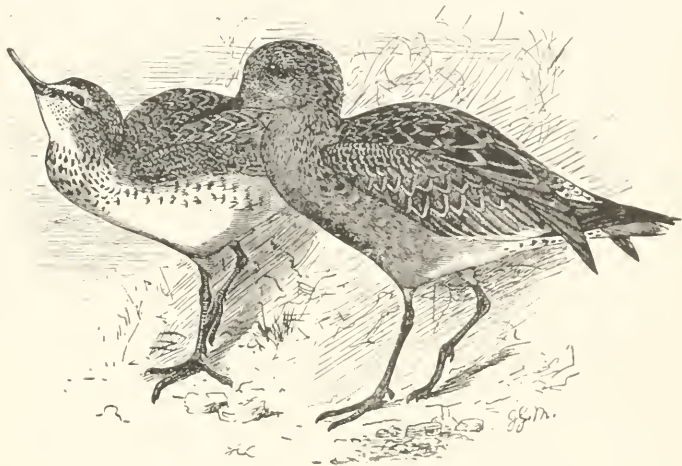


FIG. 573. — Red-breasted Sandpiper. (From Seebohm's *Charadriidæ*.)

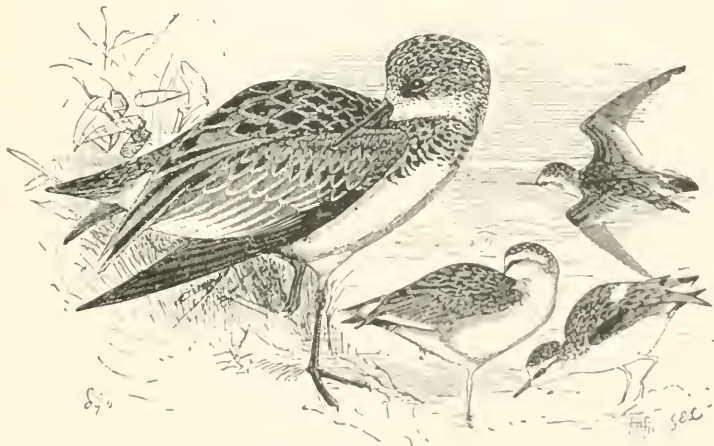


FIG. 574. — Sanderling. (From Seebohm's *Charadriidæ*.)

ii, 1878, p. 211; nestlings on July 30, now in British Museum); and by Gen. A. W. Greely on the northern shore of Lady Franklin Bay, lat. $81^{\circ} 4'$; also, Point Barrow, Alaska (Murdoch), and said to breed S. to lat. 55° on Hudson's Bay (Nelson). No authentic eggs known

to exist to date. Greely's egg, cut from oviduct, later lost, was 1.10×1.00 , sea-green, closely dotted with pin-heads of brown; probably immature.

CALIDRIS. (Gr. *καλίδρις*, *kalidris*, Lat. *calidris*, name of some beach bird, perhaps this one. Fig. 574.) **SANDERLINGS.** Bill stout, straight, about as long as head or tarsus; tip thickened, expanded, and rather hard, culmen just behind it somewhat concave. Nostrils far forward. Wings long, pointed; tail short, doubly emarginate, central feathers projecting. Tibiæ bare for $\frac{2}{3}$ the length of tarsus; toes very short, widely margined. *No hind toe.* (General characters of *Tringa* proper, but 3-toed. See fig. 39.) One species.

C. arena'ria. (Lat. *arenaria*, relating to *arena*, sand. Fig. 575.) **SANDERLING. RUDDY "PLOVER."** Adult ♂ ♀, in summer: Entire upper parts and neck all around variegated with black, light ashy and bright reddish; on back and scapulars each feather having a central black field, and being broadly margined and tipped with ashy or reddish. Under parts white, immaculate. Outer webs and tips of primaries deep brownish-black, inner light ashy. A white spot

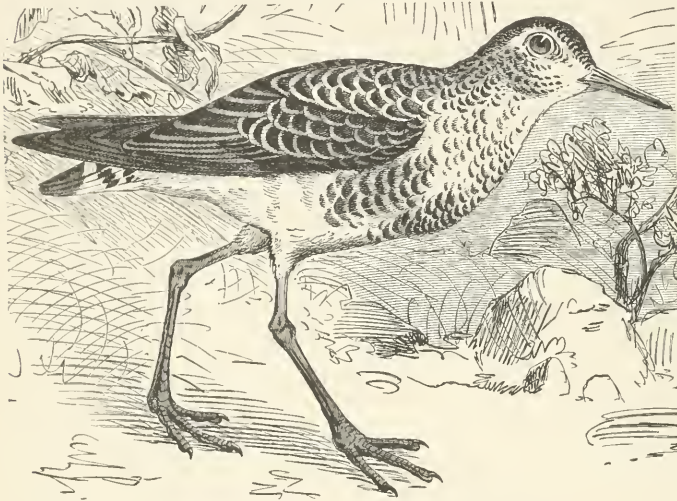


FIG. 575. — Sanderling, $\frac{1}{2}$ nat. size. (From Brehm.)

at base of inner primaries. Secondaries mostly pure white; outer vanes and part of inner on the latter half, dusky. Greater coverts dusky, broadly tipped and narrowly edged with pure white. Rump, upper tail-coverts, and central tail-feathers dusky, tipped and narrowly edged with ashy-white; lateral tail-feathers very light ash, nearly white. Bill and feet black. Length 7.50–8.00; extent 15.00–16.00; wing 4.90; tail 2.25; bill about 1.00; tarsus rather

less; middle toe and claw 0.75. Adults in winter: No traces of reddish. Upper parts very light ash or pale pearly-gray, each feather fading into white on the edge, with a narrow shaft-line of dusky, and some of the wing-coverts usually darker than the rest; scapulars dusky, edged with whitish. Entire under parts pure white. In a usual immature dress (and that of the adults during the spring change) there are traces of the reddish on upper parts generally, and on breast. Each feather above brownish-black, regularly indented and tipped with ashy-white, thus giving to the upper parts the appearance of being evenly mottled. There is a buff tinge on breast, and also on tips of rump feathers; bend of wing is nearly as dark as in adult. At all times the under parts from the jugulum are pure white. But in any plumage the Sanderling is instantly recognized by its having no hind toe. A typical beach bird. Inhabits the sea coasts of nearly all countries at some seasons; North America at large in migrations, and southerly during winter, abundant coastwise, also in the interior on large bodies of water; wintering from California and Virginia to Chili and Patagonia. Breeds only in high latitudes; nest and eggs discovered by R. Macfarlane in June, 1863, near Franklin Bay; one of these (figured by Newton, P. Z. S. 1871, p. 56, pl. 4, fig. 2) measured 1.43×0.98 ; coloration pale olive-brown, finely spotted with dark brown, the markings heavier and more intricate at the butt; other specimens from our Arctic coast (Feilden, Ibis, 1877, p. 406), from east coast of Greenland, and it is believed from Iceland; eggs usually 4.

(§ 4. *Godwits.*)

LIMO'SA. (Lat. *limosa*, muddy, miry; *limus*, mud, slime.) **GODWITS.** Bill much longer than head, longer than tarsus, curved a little upward. Culmen flattened toward end, but not furrowed; end of bill not notably enlarged or punctulated. Lateral groove of both mandibles reaching nearly to end of bill; symphyseal groove less extended. Gape of mouth moderate, scarcely cleft beyond base of culmen, as in Snipes and Sandpipers, not as usual among Tattlers; no frontal antiæ. Wing long and pointed; tail short and square. Tibia denuded below for a moderate space. Tarsus longer than middle toe and claw, scutellate before and behind, reticulate on sides. Toes short and stout, much flattened underneath, and widely margined; outer and middle semipalmate, inner and middle with a slight web. Size large; general aspect Curlew-like, but bill straight or slightly recurved, not decurved. In character of bill intermediate between hard-billed Tattlers on the one hand, and soft-billed Sandpipers and Snipes on the other; especially near *Macrorhamphus*, to which *Limosa* is nearly related in some other respects, as seasonal changes of plumage of most species. Sexes similar in plumage; ♀ larger than ♂, who does duty as an incubator. Two North American species, and two others in Alaska and Greenland, from Asia and Europe respectively.

Analysis of Species.

Bar-tailed Godwits.

Rump, tail, and its upper coverts barred throughout with blackish and rufous. Lining of wings chestnut. No extensive barring on under parts. No great seasonal changes of plumage. Feathers not extending on side of under mandible far beyond those on upper *fedoa*

Rump blackish, tail and its upper coverts barred with white and black. Lining of wings and axillars white, with dusky marks *l. baueri*

Black-tailed Godwits.

Rump blackish, upper tail-coverts mostly white, tail black with white base and tip. Under parts in summer intense ferruginous, barred throughout. Lining of wings mostly blackish. Feathers extending on side of lower mandible to a point beyond those on upper *hæmastica*

Rump, tail, and its coverts substantially the same as in *L. hæmastica*. Lining of wings and axillars mostly white. White spaces on primaries and secondaries *limosa*

L. fed'oa. (Derivation and meaning of *fedoa* unknown, formerly conjectured to be a perversion of Lat. *fæda*, ugly, ungainly, unseemly, and so given in 2d-4th editions of the Key, probably in error. The word goes back to Turner, 1544, p. 38, "Anglorum goduittam, sive fedoam," and has been variously applied to Godwits and some other birds before and since Linnaeus named this species *Scolopax fedoa* in 1758. Newton (Diet., p. 248) regards it as a Latinized form of some English name of the European Godwit, "now lost apparently beyond recovery." Fig. 576.) **GREAT MARBLED GODWIT.** **AMERICAN BAR-TAILED GODWIT.** **COMMON MARLIN.** **RED MARLIN.** **BROWN MARLIN.** **SPIKE-BILLED CURLEW.** **SPIKE-BILL.** **BADGER-BIRD.** Feathers not extending on side of lower mandible to a point far beyond those on upper. Rump, tail, and its coverts barred throughout with blackish and the body-color. Lining of wings chestnut; axillars the same, more or less barred with black. General color rufous or light dull cinnamon-red, nearly uniform on under parts, richer and more chestnut on lining of wings and axillars; usually marked with dusky on jugulum, breast, and sides; chin white; on all upper parts variegated with the brownish-black central field of each feather; blackish predominating.



FIG. 576. — Godwit, greatly reduced. (From Tenney, after Audubon.)

leaving rufous chiefly as scallops and tips of the feathers. This rufous very variable in intensity; usually paler on upper than on under parts, and strongest under wings; in young birds nearly or quite plain, in old ones more or less barred with dusky on the breast and sides. Primaries rufous, successively darkening from last to first, outer webs and ends of the few outer ones blackish, shaft of 1st white. Bill livid flesh-colored, blackish on about terminal third; legs ashy-blackish. Largest of the genus: length 16.00–22.00 inches; extent 30.00–40.00; wing somewhere about 9.00; tail 3.00–4.00; bill 3.50–5.50, generally about 4.00; tarsus 3.00, more or less; middle toe and claw 1.50; few birds vary more in size. Sexes not distinguishable, but ♀ averaging decidedly larger than the ♂; birds at and near the extremes here given are ♀, and conversely. There is no such seasonal difference of plumage as is shown by all the other Godwits. This is the largest of the “bay-birds” excepting the Long-billed Curlew; conspicuous by its size and reddish color among waders that throng shores and muddy or sandy bars of bays and estuaries during migrations. Temperate North America; winters southerly to Cuba and Central America; breeds chiefly in the upper Mississippi and eastern Missouri regions, in Iowa, Nebraska, Minnesota, both Dakotas, and thence to the Saskatchewan plains, Manitoba, and British Columbia; does not appear to go far N. along the Atlantic coast. Nests anywhere on prairie, not necessarily near water; eggs 3–4, about 2.28×1.60 , light olive-drab, numerous but not very boldly spotted with variousumber-brown shades, and the usual stone-gray shell-spots; they thus differ decidedly from those of all other Godwits, and the difference in color is parallel with that of the plumage of the birds themselves. The origin and sense of the name “godwit” are involved in an obscurity that has never been cleared up, and may never be. It is apparently a native English word, and has been in use in some form for over 400 years; some of its by-forms are *godwitta*, *goodwit*, and *godwin*. The derivation from Anglo-Saxon *god*, good, and *wiht*, a wight or creature, is factitious,—too easy to be true; and that which makes it “God’s wit,” is mere juggling with words, though it is soberly translated in Latin *Dei ingenium* by Casaubon, 1611. Almost equally beside the mark is the attempt to derive *godwit* from *goathead* (the English translation of Gr. *αἰγοκέφαλος*, *aigokephalos*, one of the old names of a European Godwit); for this, while not impossible, is far-fetched, and lacks all the links required to connect the two words. See Century Dict. and Newton’s Dict. under the word “goodwit.”

L. lapponica baueri. (Lat. of Lappland. To one Bauer.) PACIFIC BAR-TAILED GODWIT. A subspecies of the common European Bar-tailed Godwit, and closely resembling it, but distinguishable by the general paler and more cinnamon-rufous color of the adults in summer, and especially by the coloration of the rump, upper tail-coverts, and under surface of the wings. In *L. lapponica* proper the rump is white with dusky markings in the central field of most of the feathers; and the upper tail-coverts are white with broad dusky bars. In *L. l. baueri* the rump is blackish, with white edgings, the axillaries are white with distinct dusky bars, and the lining of the wings is more extensively mottled with dusky. Adult ♂ ♀, in summer: Cinnamon-brown, variegated on the upper parts with dusky, tawny, and whitish; wing-coverts gray, with dark shaft-streaks and whitish edgings. Bill light reddish on the basal half, the rest blackish; feet blackish; iris brown. In winter: Grayish-brown above, the feathers with dusky shaft-streaks and paler edges; below, whitish, quite pure on the belly, overcast with gray on the throat and breast, there streaked with dusky, the streaks changing on the sides of the breast to bars which extend along the sides of the body to the erisum; tail-feathers mostly plain gray, but their coverts, the rump, and the under surfaces of the wings retaining the marks of the subspecies. Young birds resemble the winter adults, but are more or less buffy, and have the tail-feathers more like those of the summer adults, the rectrices being blackish with numerous irregular bars and some white edging; rump dusky, and axillaries barred. Smaller than *L. fedoa*, about the size of *L. hæmastica*. Length 14.50–16.00; wing 8.50–9.50; tail 3.00 or more; tarsus 2.00–2.40; bill 3.20 ♂–4.40 ♀; the ♀ is larger than

the ♂, and especially longer billed, as usual in this genus; and she seldom acquires whole-colored under parts. *L. baueri* NAUM. 1836 — rejected as a *nomen nudum* by most authors. *L. lapponica baueri*, A. O. U. Check List, 1886, No. 250; NELSON, Alaska, 1887, pp. 115-117 (best description and account of habits). *L. brevipes*, *L. australasiana*, and *L. novæ-zealandiæ* GRAY, 1844-47; *L. lapponica novæ-zealandiæ* RIDGW. Pr. U. S. Nat. Mus. iii, 1880, p. 200; BD. BREW. and RIDGW. Water Birds, 1884, p. 258. *L. forii* PEALE, 1848. *L. uropygialis* GOULD, 1848, and of most authors, as of all former eds. of the Key. This last is the name under which the bird was originally introduced to our Fauna (Trans. Chicago Acad. 1869, p. 293, p. 320, pl. 32). This Godwit is of wide dispersion in Oceania, New Zealand, Australia, and eastern parts of Asia to Alaska, N. to Point Barrow on the Arctic coast in summer, and casually S. on our Pacific coast even to Lower California; common in Alaska, where it arrives in May or early in June, breeds and departs in August or September; young flying by middle of July. Eggs laid in June; average size about 2.22×1.47 , rather resembling in color those of *L. fedoa* than those of *L. hemastica*.

L. hæmastica. (Gr. *οἰμαστικός*, *haimastikos*, of bloody-red color. Fig. 577.) HUDSONIAN GODWIT. RED-BREASTED GODWIT. AMERICAN BLACK-TAILED GODWIT. BLACK-TAIL. WHITE-RUMP. SPOT-RUMP. RING-TAILED MARLIN. FIELD MARLIN. GOOSE-BIRD.

Feathers on side of lower mandible reaching to a point far in advance of those on upper. Adult ♂ ♀, in summer: Rump blackish. Most upper tail-coverts conspicuously white; longest coverts and the tail-feathers black with white bases, those of the tail-feathers most extensive, and the latter also white-tipped. The appearance of the parts connectedly is therefore of a black rump, then a broad white bar, then a broad black bar, then a narrow white bar. Lining of wings sooty-blackish, mixed with some white; axillaries black. Under parts rich ferruginous or chestnut-red, everywhere crossed with numerous irregular black bars, several on each feather, and usually also crossed, especially behind, with similar white bars, such variegation of black, white, and red most pronounced on under tail-coverts; chin whitish. Upper parts blackish (brownish-black with greenish gloss), intimately mixed with rufous and ochrey or whitish, these lighter colors forming indentations on edges of each feather. Primaries blackish, with white shafts and white basal spaces; their coverts the same, with white tips. Bill



FIG. 577. — Black-tailed Godwit. (From "North American Shore Birds," by D. G. Elliot.)

light orange or reddish, the terminal third black; feet black. Length 14.50–16.50; extent 25.00–28.00; wing 7.50–8.50; tail 3.00–3.50; bill 2.75–3.50; tibia bare 1.00 or more; tarsus 2.25–2.55; middle toe and claw 1.30. ♀ averages larger than ♂; weight 9.00–9.50 oz.; ♂ 7.50–8.00 oz. Adult ♂ ♀, in winter: Specific characters of wings and tail much the same as in summer. General plumage plain dull gray, whitening on the head, neck, and under parts, where more or less shaded with pale buffy gray. Bill flesh-colored with blackish end; feet slaty. Immature and transitional plumages are intermediate between the foregoing. For example: Upper parts dark ash, with black shaft-lines; back varied more or less with black patches and whitish or rufescent markings. Under parts whitish, more or less rufescent, with traces of black barring. Breeds in high latitudes in northern N. Am.; migrates through eastern U. S. but apparently not common anywhere; not W. of Rocky Mts. except Alaska; W. Cuba in migration; winters in southern S. Am. Eggs 4, 2.18 × 1.40, very heavy brownish-olive, with the usual markings obscure, of still darker brownish shades of the ground color, sometimes nearly whole colored; they are strikingly different in tone from those of the Marbled Godwit, but probably indistinguishable from those of the European Black-tailed Godwit, *L. limosa*, of which the Hudsonian Godwit is the strict American representative.

L. limosa. (For etym. see the generic name.) EUROPEAN BLACK-TAILED GODWIT. YARWHELP. SHRIEKER. BARKER. Very like the last; characters of rump and tail substantially the same, but at once distinguished by the mostly *white* (not blackish) lining of wings and axillaries. In full plumaged birds the tail is black, with broad white bases and narrow white

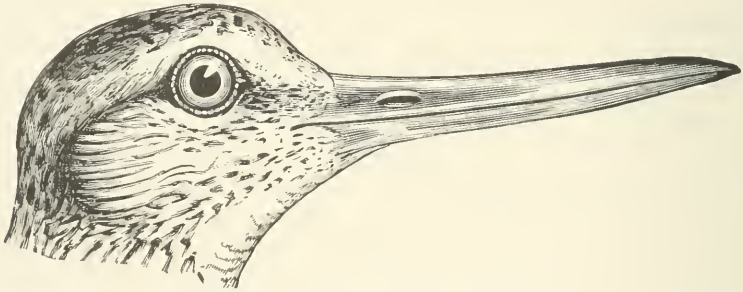


FIG. 578. — Willet, nat. size. (Ad. nat. del. E. C.)

tips of the feathers; the basal white occupying about a third of the middle pair of feathers, increasing in extent on successive ones to two-thirds or more of the lateral pair, and the white tips best marked on the middle pair, very narrow or wanting on the lateral pairs; longest upper coverts black like most of the tail-feathers, shortest ones white like the bases of the tail-feathers and lower rump; upper rump and lower back blackish. Wings with much white, conspicuous in flight; lining of wings and axillaries white, either pure or varied with some dark markings; large white bases of inner primaries and outer secondaries; white tips of the greater coverts. Fore-neck and breast chestnut, shading to white on the chin and belly, barred on the breast and sides with dusky. General plumage of the upper parts rufous and dusky-brown, in streaks and bars. Adults in winter plain gray and white on the body, but wings and tail preserving their specific characters. About the size of the Hudsonian Godwit; bill longer, 3.75–5.00. Europe, Asia, Africa; only North American as occurring casually in Greenland. *Scolopax limosa* LINN. 1758 and 1766; *Limosa limosa* BRISS. 1760: A. O. U. No. [252]. *S. belgica* GM. 1788; *L. belgica* of authors: *Totanus agocephalus* BECHST. 1809; *L. agocephala* of most authors, as of 2d–4th eds. of the Key (but not *Scolopax agocephala* LINN., which is the European Bar-tailed Godwit, his *S. lapponica*, the *L. lapponica* of authors). *L. melanura* LEISLER, 1813, and of many authors.

(§ 5. Tattlers.)

ΣΥΜΦΗΜΙΑ. (Gr. *σύμφημι, symphemi*, I speak with.) **SEMPALMATE TATTLERS.** Bill longer than head, straight, its tip not expanded, knobbed, nor notably sensitive; grooved about half its length only; culmen not furrowed. Gape of mouth reaching beyond base of culmen. Bill much stouter than usual in Tattlers. Legs stout. Feet semipalmate, with decided web between inner and middle as well as outer and middle toes. Tarsus longer than middle toe and claw, scutellate before and behind. (General characters of *Totanus*, but bill and feet stout, latter bluish, and toes semipalmate. See fig. 49.) One North American species.

S. semipalma'ta. (Lat. *semipalmata*, half-webbed. Figs. 578, 579.) **SEMPALMATED TATTLER. SEMPALMATED SNIPE. DUCK-SNIPE. SPANISH PLOVER. STONE CURLEW. PIED-WINGED CURLEW. WILLET. WILL-WILLET. PILL-WILLET. PILL-WILL-WILLET. BILL-WILLIE. HUMILITY.** Adult ♂ ♀, in summer: Upper parts ashy, confoundedly speckled to greater or less extent with blackish; this sometimes giving the prevailing tone, but in lighter-colored cases blackish restricted to an irregular central field on each feather, throwing out angular processes and tending to become transverse bars. When such dark fields prevail, the upper parts become quite blackish, speckled with ashy-white, like *Totanus melanoleucus*, for example. Furthermore, there is often a slight rufescence.



FIG. 579. — Willets. (From Lewis.)

Under parts white, sometimes with a rufous or brownish tinge, jugulum and breast spotted and streaked, sides barred or arrow-headed, with brownish-black. Axillars and lining of wing, edge of wing and primary coverts, sooty-blackish. Primaries blackish, with a great space white at base, partly overlaid and concealed by primary coverts, partly showing conspicuously as a speculum; shafts white along this space. Most secondaries white; most upper tail-coverts white, the shorter ones dark like rump, the longer ones barred like tail. Tail ashy, incompletely barred with blackish; lateral feathers pale, or marbled with white. Bill dark; legs bluish. Length about 16.00; extent about 28.00; wing 8.00; tail 3.00; bill 2.00-2.50; tarsus the same or a little more; middle toe and claw 1.67. ♂ ♀ in winter, and young: Character of wing as before. Above, light ashy, nearly or quite uniform: tail corresponding with this gray state; upper tail-coverts white. Below, white, shaded with ashy on jugulum, breast, and sides. Every stage occurs between the two here described. Younger birds, before the first full winter plumage, have buff or tawny edgings of the grayish-brown feathers of the upper parts; and the sides are mottled with buff and gray. In the down, chicks are brownish-gray marked with dusky above, the front and sides of head and all lower parts whitish, with a dusky spot before the eye and two dusky streaks behind it. Temperate North America at large, N. to 56° at least in the interior, but chiefly U. S.; breeding throughout its U. S. range, but rarely and locally on

the Atlantic coast beyond New Jersey; resident in the Southern States, but in winter also migrating to the West Indies and South America; not common on the Atlantic coast beyond Massachusetts. A large, stout Tattler, known at a glance by its white-mirrored black-lined wings and blue legs, too plentiful (for such a wary, restless, and noisy bird) in marshes for the convenience of gunners, as its shrill reiterated cries, incessant when its breeding places are invaded, alarm the whole neighborhood. Breeds by pairs or in small companies in fresh or salt marshes; nest a slight affair in a tussock of grass or reeds just out of the water; eggs 3-4, 1.90-2.12 × 1.45-1.55, averaging 2.00 × 1.50, less pointedly pyriform than usual in this family, brownish or buffy-olive or clay color, boldly and distinctly spotted and splashed with umber-brown shades, little massed at the great end, with the usual shell-markings.

S. s. inornata. (Lat. *inornatus*, unadorned.) WESTERN WILLET. CANDLESTICK PLOVER. Averaging rather larger than the last, with longer and slenderer bill, fewer and finer markings on a paler ground of the upper parts, and duller, more confused or broken markings on the under parts, which are often suffused with a dull pinkish-salmon color; middle tail-feathers unmarked or only faintly barred. Wing 8.00; tail 3.30; tarsus 2.60; bill 2.25-2.75. Western North America, E. to the Mississippi Valley, breeding from Manitoba to Texas, in migration and during winter occurring sparingly along the S. Atlantic and Gulf States; Mexico, in winter. Neither the physical characters nor the geographical distribution ascribed to this form appear to be well founded. BREWSTER, *Ann.*, Apr. 1887, p. 145; COUES, *Key*, 3d ed. 1887, p. 887; 4th ed. 1890, p. 905. A. O. U. List, 2d ed. 1895, p. 95, No. 258 a.

TOTANUS. (Ital. *totano*, some bird of this kind.) TATTLERS. TELL-TALES. GAMBETS. HORSEMEN. Bill longer than head, straight or nearly so, if anything rather bent up than down, very slender, without expansion at tip or furrow on culmen, lateral grooves little if any more than half its length; gape reaching beyond base of culmen. Wings long, pointed; tail short, even or little rounded, barred in color. Legs very long and slender; tibiæ much denuded below; tarsi longer than middle toe and claw, more than half as long again as middle toe alone, scutellate before and behind. Toes with decided basal webbing between outer and middle toe, that between inner and middle slight. Legs green or yellow (in our species), red in some others (as the Common Redshank of Europe, *T. totanus* or *T. calidris*, type of the genus, and the Spotted Redshank of the same country, *T. fuscus*). In England the birds of this genus share with those of other genera the name Sandpiper; but ours are not so called. We have two well-known species of Yellow-legs, and a third, the Greenshank of Europe, has once occurred as a straggler. The latter is the type of the genus *Glottis*, but does not seem to differ in any respect of form from our Yellow-legs, and all three may well go together in the subgenus *Glottis*, as arranged in the A. O. U. List; the subgenus *Totanus* then being restricted to such species as the Redshank just named, and the Marsh Sandpiper of Europe, *T. stagnatilis*.

Analysis of Species.

- Legs red. (*Subgenus* TOTANUS.) A straggler to Hudson's Bay *totanus*
- Legs not red. (*Subgenus* GLOTTIS.)
- Legs not yellow. A straggler to Florida *nebularius*
- Legs yellow. Two common birds of N. Am.
- Length over 12; wing over 7; tail 3 or more; bill over 2; bent up a little, short-grooved . . . *melanoleucus*
- Length under 12; wing under 7; tail under 3; bill under 2; straight, long-grooved *flavipes*

(*Subgenus* TOTANUS.)

T. totanus. (For etym. see the generic name.) EUROPEAN REDSHANK. COMMON POOL-SNIPE. Of medium size in the subgenus: Length 9.50-10.00; wing about 6.00; bill 1.50; tarsus 1.65. Legs orange-red; bill black, with red base; iris brown. In any plumage distinguished from its allies by the combination of white rump with secondaries nearly all white. Europe, Asia, Africa; in America a straggler to Hudson's Bay. One of the best known Tat-

tlers, strangely overlooked by two generations of American ornithologists since its original description as a bird of this country from a Hudson's Bay specimen in the British Museum in 1831. *Scolopax totanus* LINN. 1758. *Totanus calidris* BECHST. 1803, and of authors; SW. and RICH. F. B.-A. ii, 1831, p. 391; NUTTALL, MAN. ii, 1834, p. 155. See also Edwards' pl. 169 of supposed albino Redshank from Hudson's Bay. Not heretofore taken into the Key. A. O. U. Suppl. List, Auk, Jan. 1899, p. 128, Hypothetical List, No. 11.2. See COUES, Auk, Apr. 1897, p. 211.

(*Subgenus* GLOTTIS.)

T. nebularius. (Lat. like *nebulosus*, nebulous, cloudy, misty, foggy.) EUROPEAN GREENSHANK. Size and form almost exactly as in *T. melanoleucus* (see next); bill with the same upward set or bent about the middle, or rather more so. Length 12.50-14.50; wing 7.00-7.75; tail 3.50; bill 2.15-2.25; tarsus about 2.50. Coloration nearly as in our Yellow-legs, but lower back, rump, tail and its coverts white, with dark markings chiefly restricted to broken bars or other variegation of the tail-feathers alone; legs not bright yellow, but of some obscure color commonly called "green" or greenish, but apparently rather yellowish-gray or grayish-olive, more livid or darker on the joints. Europe, etc.; only North American in one alleged instance of its occurrence in "Florida." Audubon's original specimen is extant, and is the Greenshank; but the record has never been repeated, and is open to suspicion. *T. glottis* AUD. folio pl. 169, 1835, 8vo, pl. 346, 1842, and of most authors, as of previous eds. of the Key; *Glottis floridanus* BP. 1838. Bd. B. N. A. 1858, p. 730. *Scolopax nebularius* GUNN. 1767; *Totanus (Glottis) nebularius*, A. O. U. No. [253].

T. melanoleucus. (Gr. μέλας, *melas*, black; λευκός, *leukos*, white. Figs. 580, 581.) GREATER TELL-TALE. GREATER YELLOW-SHANKS, or YELLOW-LEGS, or YELLOW-SHINS. WINTER YELLOW-LEGS. BIG YELLOW-LEGGED PLOVER. BIG KILL-CU or CUCU. LONG-LEGGED TATTLER, SNIPE, or PLOVER. STONE-SNIPE. STONE-BIRD. YELPER. Bill

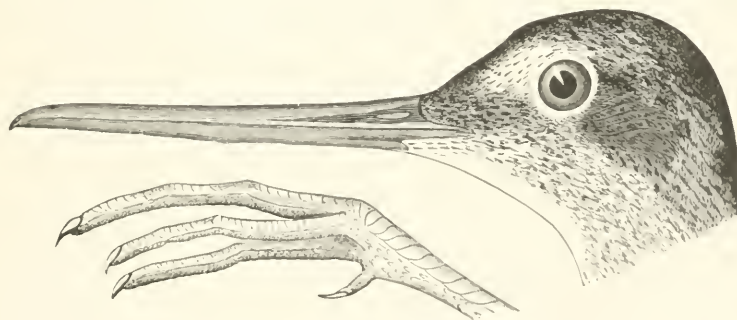


FIG. 580. — Greater Yellow-shanks, nat. size. (Ad. nat. det. E. C.)

straight or slightly inclined upward, not with regular curve, but as if bent near the middle, and grooved for rather less than half its length; black or greenish-black. Legs very long and slender, chrome-yellow. Length usually 13.00-14.00, but ranging 12.50-15.00; extent 23.00-25.00; wing over 7.00, usually nearer 8.00; tail 3.00 or more; bill 2.00 or more; tarsus 2.50; middle toe and claw 1.70. Length from end of bill to end of outstretched feet about 17 or 18 inches. Adult ♂♀: Above, blackish, more or less ashy according to season, everywhere speckled with whitish, in a series of indentations along edge of each feather; the markings spotty on back and wings, streaky on head and neck. A slight white superciliary line. Upper tail-coverts mostly white. Under parts white, jugulum and fore-breast streaked, sides and flanks, lining of wings and axillars, barred and arrow-headed, with the color of back.

Tail like back, with numerous white bars, generally broken on the middle feathers. Primaries blackish, with black shafts, mostly with white tips; secondaries and their coverts the same, but their edges marbled, spotted, or broken-banded with white. The seasonal changes of plumage are inconsiderable, consisting chiefly in the tone of the upper parts — more blackish and white in summer, more gray and ashy in winter and in the young; and in the emphasis of dark markings of under parts. Very young birds have the white speckling somewhat buffy. North America at large; in the U. S. chiefly as a migrant, and in winter in the Gulf States and southern California, though at that season it also extends through Central and much of South America; breeds from Nebraska and middle portions of the Mississippi Valley N. to high latitudes; abundant; like the last and the next species, a noisy, restless denizen of marshes, bays, and estuaries. Eggs 3-4, 1.70×1.25 , grayish or deep buff, irregularly spotted with rich dark brown. Rarely taken.

T. flavipes. (Lat. *fluripes*, yellow-foot. Fig. 581.) LESSER TELL-TALE. LESSER YELLOW-SHANKS. YELLOW-LEGS. COMMON YELLOW-LEGS. SUMMER YELLOW-LEGS. YELLOW-LEGGED PLOVER. LITTLE KILL-CU or CUCU. A miniature of the last; colors

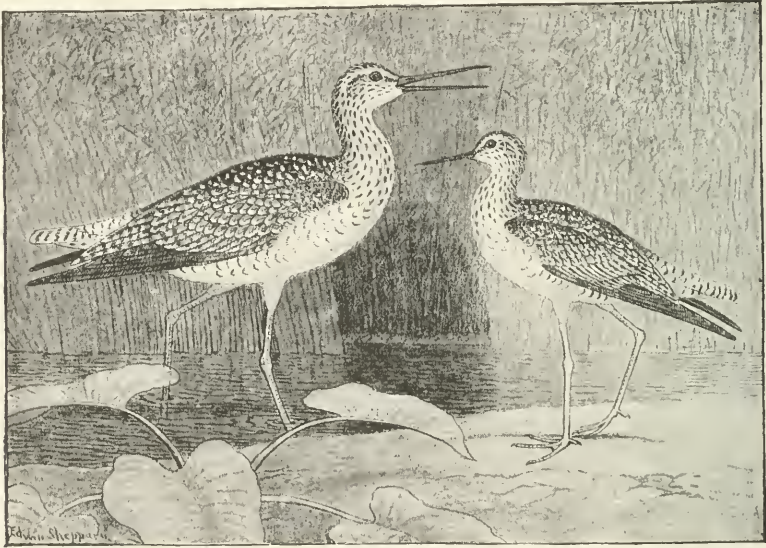


FIG. 581. — Greater Yellow-shanks and Little Yellow-shanks. (From "North American Shore Birds," by D. G. Elliot.)

the same; legs comparatively longer; bill grooved rather farther (more than half its length), perfectly straight. Length under 12.00, usually 10.00-11.00; extent 19.00-21.00; wing under 7.00, averaging about 6.40; tail 2.50; bill always under 2.00, about 1.50; tarsus 2.00; middle toe and claw, and bare tibia, each, 1.25. The legs are thus relatively longer than those of the foregoing, probably at a maximum in its genus and family, and only exceeded proportionally by those of the Stilt (*Himantopus*). In comparison with the dimensions of *T. melanoleucus* the difference in all dimensions is decided; there is a break between the largest *flavipes* and smallest *melanoleucus*; both species hold their characters steadily, with only moderate variability, and no one has seen an equivocal specimen of either one. Each has a profusion of popular names, mostly shared in common but with some qualifying term, as the two species are readily discriminated by gunners. When "Yellow-legs" is said without qualification, the present species is generally meant. North America at large, abundant in eastern portions, less common in western, in some places as last. Nesting reported in some of Northern States, but breeds

chiefly beyond U. S., where it reappears late in the summer or early in the fall; winters in the Gulf States, but also pushes its migration through Central and most of South America, and has occurred casually in Europe. Eggs 3-4, pointedly pyriform, 1.58-1.78 × about 1.16; ground clay-color, buffy or creamy, not olivaceous, the markings showing boldly on the pale ground, but in great diversity, some eggs being heavily splashed with blotches confluent about the great end, others having small clean-edged spots all over the surface; markings rich umber, chocolate, or blackish, with neutral-tint shell-spots.

HELODROMAS. (Gr. *ελος*, *helos*, a marsh, and *δρομας*, *dromas*, running, *i. e.* a runner.) GREEN TATTLERS. Bill moderately longer than head, perfectly straight, very slender, grooved a little beyond its middle. Legs not very long for this group; tarsus little exceeding middle toe and claw; bill and legs both dark-colored. Only the most rudimentary web between inner and middle toe; a moderate one between outer and middle. Upper parts dark-colored; tail rounded, fully barred with white. Small. *Rhyacophilus* of all previous editions of the Key, as of most American authors since BAIRD, 1858; but this has as its type the short-billed Wood Sandpiper of Europe, *R. glareola*. Name therefore changed to *Helodromas* KAUP. Nat. Syst. 1829, p. 144, type *Tringa ochropus* (*sic*) LINN., which is strictly congeneric with our Solitary Sandpiper. *Helodromas* was reduced to a subgenus of *Totanus* in the A. O. U. Lists, 1886-95, but appears to be sufficiently distinct, as I showed in Auk, Apr. 1897, p. 211, and as admitted by A. O. U. Suppl. List, Auk, Jan. 1899, p. 105. Besides some differences in external form, it has the peculiarity, among its immediate all, of a single-notched sternum (compare figs. on pp. 344 and 366 of Seebohm's work); and the European species has long been known to nest in trees, contrary to the rule in the whole order *Limicolæ*; "the hen laying her eggs in the deserted nests of other birds—Jays, Thrushes, or Pigeons—but nearly always at some height (from 3 to 30 feet) from the ground." (P. Z. S. 1863, pp. 529-533; NEWTON, Diet. 1896, p. 812.)

Analysis of Species.

Length 9.00-10.00; upper tail-coverts white; legs grayish-blue	<i>ochropus</i>
Length 8.00-9.00; upper tail-coverts like back; legs greenish, drying blackish	<i>solitarius</i>

H. ochropus. (Gr. *ὀχρός*, *ochros*, pale, sallow, wan; *πῶς*, *pous*, foot. Fig. 582.) EUROPEAN GREEN SANDPIPER. Upper parts blackish-brown, with faint olivaceous metallic gloss, streaked on head and neck, speckled on back and wings, with white; upper tail-coverts white. Tail white at base; lateral pair of rectrices white, others marked with white and blackish in bars. Below, white, jugulum and sides marked with dusky. Bill blackish; iris brown; feet "grayish-blue, greenish on the joints." Length 9.00-10.00; wing about 5.50; tail 2.50; bill 1.30-1.50; tarsus 1.30. Nova Scotia and Hudson's Bay; a straggler from Europe (see Bull. Nat. Club, iii, 1878, p. 49). *Rhyacophilus ochropus* of 2d-4th eds. of the Key; *Totanus* (*Helodromus*) *ochropus*, A. O. U. No. [257]. *Helodromus ochropus* COUES, Auk, Apr. 1897, p. 210; A. O. U. Suppl. List, Auk, Jan. 1899, p. 106.

H. solitarius. (Lat. *solitarius*, solitary; *solus*, alone. Fig. 583.) AMERICAN GREEN SANDPIPER. SOLITARY SANDPIPER. SOLITARY TATTLER. Adult ♂ ♀: Above, dark lustrous olive-brown, streaked on head and neck, elsewhere finely speckled, with white; no cou-

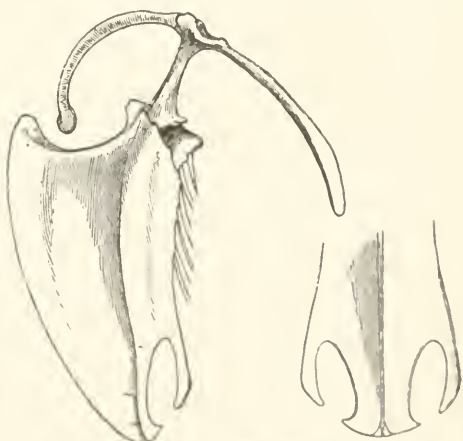


FIG. 582.—Sternum of Green Sandpiper. (From Seebohm's Charadriidae.)

tinuous white on rump or upper tail-coverts. Below, white; jugulum and sides of neck shaded with brownish and streaked with dusky; sides, axillaries, and lining of wings regularly barred with dusky. Tail beautifully and regularly barred throughout with black and white; white prevailing on outer feathers, where the dark bars may be broken, and white reduced to a series of marginal spots on middle feathers. Primaries and edge of wing blackish, unmarked; secondaries like back, mostly unmarked, inner ones gradually gaining white spots. Bill blackish; legs dull greenish (drying quite black, like many scrophulariaceous plants). Length 8.00–9.00, usually between these figures; extent 15.50–17.00; wing 4.75–5.40; tail 2.25; bill 1.12–1.24; tarsus 1.20–1.30; middle toe and claw 1.12–1.20. Little seasonal difference in adult birds; winter plumage lighter and not lustrous, less speckled and streaked.

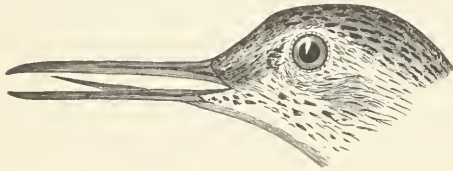


FIG. 583. — Solitary Sandpiper, nat. size. (Ad. nat. del. E. C.)

Young: Above, lighter and less olivaceous brownish, without gloss, the speckling less, or else of a rusty tinge. Suffusion of jugulum paler and more restricted. White around and over eye better defined. Bill and feet ashy-greenish. North America at large, N. to Alaska; the representative of *H. ochropus*.

Breeds from the Northern States northward, if not also through much of its U. S. range; I found a pair in 1883 in the mountains of West Virginia, under circumstances which left no doubt that they were settled for the summer. Winters, chiefly extralimital, in Central and South America, but also in our Southern States. Common during migrations; a shy, quiet inhabitant of wet woods and meadow brooks and ditches and secluded grassy pools, rather than of marshes, with rather sedate manners, except the curious bobbing up and down of the head, which is as habitual with this species as the teetering of the tail of the Tip-up. A more graceful action is that of the bird as it alights; when the long pointed wings are lifted till their tips nearly touch, and then are slowly folded. The note is a mellow and melodious whistle. Authentic eggs have been long special desiderata (see COUES, B. N. W. 1874, p. 499; BREWER, Bull. Nutt. Club, iii, 1878, p. 197; COUES, New England Bird Life, ii, 1883, p. 240; Bull. U. S. Nat. Mus. No. 26, p. 97; RIDGW. Man. 1887, p. 166.) The single egg taken in 1878 in Vermont described as light drab with small round brown markings and faint purplish shell-marks at greater end.

H. s. cinnamomeus? (Lat. cinnamon-colored, as the spots on the back of the young are.) WESTERN SOLITARY SANDPIPER. Young: Similar to the last; "larger, the wings grayer, the light spots on the back, scapulars, and wing-coverts brownish-cinnamon instead of white or buffy whitish; the sides of the head with more whitish, especially on the lores. No well-defined loreal stripe." Wing 5.10–5.49; tarsus 1.22–1.30; bill 1.15–1.30. Lower California. *Tot. s. cinnamomeus* BREWSTER, Auk, Oct. 1890, p. 377; range extended as "Pacific coast region, eastward to the Plains," A. O. U. Check-List, 2d ed. 1895, No. 256 a; *Hel. sol. cinnamomeus*, A. O. U. Suppl. List, Auk, Jan. 1899, p. 105.

ACTITIS. (Gr. ἀκτή, *akte*, a headland, promontory, coast-land, sea-shore, strand, with suffix -ιτις, denoting agency, a doer. Compare *Ægialitis*, of identical meaning. The grammatical gender of both names is feminine. This is the genus *Tringoides* of all former editions of the Key, as of most authors; but *Tringoides* BP. 1831 is a synonym of *Actitis* ILLIGER, 1811, as now restricted; type *Tringa hypoleucos* LINN., the common Spotted Sandpiper of Europe, with which ours is strictly congeneric.) SPOTTED SANDPIPERS. Bill straight, only about as long as head or tarsus, grooved for about $\frac{3}{4}$ its length. Tibiæ scarcely denuded for half length of tarsus. Tarsus about as long as middle toe and claw. Outer and middle toes webbed for length of their first joints; inner cleft. Tail fully half as long as wing. Upper parts glossy, under spotted on white ground; bill and feet pale. Of small size.

A. macula'ria. (Lat. *macularia*, spotted. Figs. 584, 585.) SPOTTED SANDPIPER. SAND-LARK. PEET-WEET. TEETER-TAIL. TIP-UP. TILT-UP. Adult ♂ ♀, in summer: Above, silken ashen-olive (quaker-color—as in our Cuckoos) with a coppery lustre, finely varied with blackish, in streaks on head and neck, elsewhere in wavy or otherwise irregular cross-bars. Line over eye, and entire under parts, pure white, with numerous sharp circular black spots, larger and more crowded in the ♀ than in the ♂. Secondaries and their coverts broadly white-tipped; some white feathers along bend of wing; axillaries and lining of wings white, latter with an oblique dusky bar. Primaries and most secondaries brownish-black, with brown shafts and large white basal spaces, concealed in folded wing, conspicuous in flight. Upper tail-coverts and middle tail-feathers like back; lateral ones successively acquiring white tips; outer with several incomplete white bars. Feet pinkish-white, drying yellowish. Bill flesh-color, black-tipped; sometimes much of culmen dusky; sometimes much of under mandible orange. ♂: Length 7.25-7.60; extent 13.00-13.50; wing 3.80-4.00; bill, tarsus, and middle toe with claw, each 0.95-1.00. ♀: Length 7.60-7.90; extent 13.50-14.00; wing 3.90-4.10. In winter: Above, less glossy, with little if any blackish variegation, chiefly on the wing-coverts; some mere dusky shaft-streaks on other upper parts. Below, white, usually entirely free from spotting, and with a slight gray cast on the breast. Young: Nearly as in winter adults, but with some buffy barring on the wing- and tail-coverts; entirely white below. Downy young: Below, white; above, mottled with dark brown and buff; a sharp black stripe from top of head down middle of back, and another through eye. North America at

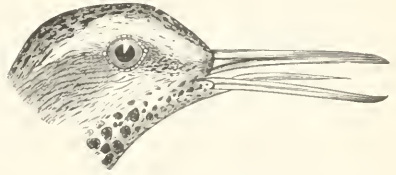


FIG. 584. — Spotted Sandpiper, nat. size. (Ad. nat. del. E. C.)



FIG. 585. — Spotted Sandpiper.

everywhere near water, and breeding throughout the country; winters in the Southern States and beyond to Brazil; casual in Europe. Nest a slight affair of dried grasses, on the ground, often in field or orchard, but generally near water; eggs normally 4, exceptionally 2, 3, or 5, pointed, creamy, buffy, or clay-colored, blotched with blackish and neutral tint; about 1.30×1.00 or rather less. These and Kildeer's eggs are the ones oftenest found in amateur cabinets, doing duty for those of most small waders; and the bird itself is the best known of its tribe, under the familiar names above given, and others equally picturesque, alluding to its habit of balancing on its legs with a see-saw movement of the hind parts of the body. As often as the Teeter-tail stops running, the fore parts are lowered a little, the head is drawn in, the legs are slightly bent, while the tail bobs up with a jerk and is drawn down again with the regularity of clock work — as if the tail were spring-hinged, always liable to fly up, and

the wing-coverts; some mere dusky shaft-streaks on other upper parts. Below, white, usually entirely free from spotting, and with a slight gray cast on the breast. Young: Nearly as in winter adults, but with some buffy barring on the wing- and tail-coverts; entirely white below. Downy young: Below, white; above, mottled with dark brown and buff; a sharp black stripe from top of head down middle of back, and another through eye. North America at large, extremely common

requiring constant presence of mind to keep it down decently. It is amusing to see the male perform during the mating season, swelling with amorousness and self-sufficiency, puffing up his plumage till he looks twice as big as usual, facing about this way and that, saluting all points of the compass with his hinder parts — for such is the original way the Tip-up has of conducting his courtships.

PAVONCEL/LA. (Ital. name of the European Lapwing; the word means “little peacock,” being diminutive form of *parone*, the Peacock, Lat. *pavo*; it was first transferred to the Ruff, and used as a generic name, by Leach in 1816, and in this usage antedates *Macetes* CUV. 1817, the usual name of this genus, as in 2d–4th editions of the Key; 1st edition had *Philomachus*, as adopted by Gray, Baird, and others, after Moehring, 1752.) **FIGHTING SANDPIPERS.** Bill straight, about as long as head, shorter than tarsus, grooved nearly to tip. Gape reaching behind culmen. Outer and middle toe webbed at base; inner cleft. Tarsus longer than middle toe and claw. Tail about half as long as wing, barred. ♂ in breeding season with face bare and beset with papillæ, and neck with an extravagant frill or ruffle of elongated feathers; ♀ without these ornaments. Sternum single-notched. Polygamous — polygynous and polyandrous.

P. pug'nax. (Lat. *pugnax*, pugnacious. Fig. 586.) RUFF, ♂. REEVE, ♀. COMBATANT. CHEVALIER. GAMBETTA. PAON DE MER. EQUESTRIAN SANDPIPER. Adult ♂, in wedding dress: Varied above with black, brown, buff, and chestnut, the sides of rump white; under parts white, breast and sides and crissum black, spotted with white; tail brown, barred with chestnut and white; quills dusky, with white shafts; wing-coverts ashy-brown. Bill blackish, flesh-colored at base; legs dingy yellow; iris dark brown; warty excrecences yellow or pink; feathers of ruff endlessly varied in color — it is hardly possible to find any two specimens exactly alike, and difficult to sort out these frills in even the most general terms; more than a dozen different styles are catalogued by some writers; but it is believed on good grounds that the same individual grows the same kind of a cape each year during his life. Length about 12.00; wing 7.00; tail 3.00; bill 1.50; tarsus 2.00. ♀ much smaller, lacking the ruff and tubercles, etc. A widely distributed bird of the Old World, notorious for pugnacity, salacity, and profligacy; occasionally killed on the coast of New England and the Middle States, etc. (LAWR. Ann. Lye. Nat. Hist. N. Y. v, 1852, p. 220, Long Island; COUES, Pr. Essex Inst. v, 1868, p. 296, New England; BREWSTER, Am. Nat. vi, 1872, p. 306, Massachusetts, and Bull. Nutt. Club, i, 1876, p. 19,



FIG. 586. — The Ruff, ♂, in full feather, $\frac{1}{2}$ nat. size. (From Brehm.)

distributed bird of the Old World, notorious for pugnacity, salacity, and profligacy; occasionally killed on the coast of New England and the Middle States, etc. (LAWR. Ann. Lye. Nat. Hist. N. Y. v, 1852, p. 220, Long Island; COUES, Pr. Essex Inst. v, 1868, p. 296, New England; BREWSTER, Am. Nat. vi, 1872, p. 306, Massachusetts, and Bull. Nutt. Club, i, 1876, p. 19,

Maine; WHEATON, Bull. Nutt. Club, ii, 1877, p. 83, Ohio. Forest and Stream, Oct. 7, 1880, p. 186, Massachusetts; SETON, Auk, Oct. 1885, p. 336, Ontario; BRIMLEY, Auk, July, 1892, p. 299, North Carolina; OSGOOD, Shooting and Fishing, Mar. 26, 1891, p. 432; PALMER, Auk, Oct. 1894, p. 325, Virginia; these being all the records I know of to date. See also FREKE, Zoölogist, Sept. 1881, p. 376, and for a South American record, Ibis, 1875, p. 332.) The names Ruff and Reeve are both very old; of the latter I have found no attempted explanation worth citing; of the former NEWTON has (Diet. p. 798): "It seems to be at present unknown whether the bird was named from the frill, or the frill from the bird. In the latter case the name should possibly be spelt Rough (*cf.* 'rough-footed' as applied to Fowls with feathered legs [and 'rough-legged' to Hawks in like state], as in 1666 Merrett (Pinax, p. 182) had it."

BARTRAMIA. (To Wm. Bartram.) Bill straight, rather shorter than head, much shorter than tarsus, about equal to middle toe; culmen a little concave in most of its length; upper mandible grooved $\frac{2}{3}$ its length. Gape very wide and deep, reaching below eyes. Feathers on side of lower mandible scarcely or not reaching opposite those on upper, and not filling interramal space. Tail very long, more than $\frac{1}{2}$ the wing, graduated. Wings moderate, pointed. Tibiæ denuded for nearly the length of middle toe. Tarsi scutellate before and behind, much longer than middle toe and claw. Outer toe moderately webbed; inner cleft to base. Size medium; neck and legs long; head small; coloration highly variegated; sexes alike; no great seasonal changes. One species.

B. longicauda. (Lat. *longus*, long; *cauda*, tail.) BARTRAMIAN SANDPIPER. BARTRAM'S TATTLER. UPLAND SANDPIPER. UPLAND PLOVER. UPLANDER. HILL-BIRD. HIGHLAND PLOVER. FIELD PLOVER. PASTURE PLOVER. GRASS PLOVER. PRAIRIE PLOVER. PRAIRIE SNIPE. PRAIRIE PIGEON. PAPABOTE. QUAILY. Adult ♂ ♀: Above, blackish, intimately variegated with tawny or whitish edgings of all the feathers; blackish prevailing on crown and back, the lighter colors on neck and wings; on scapulars and long inner secondaries the black resolved in regular angular bars on a greenish-brown field. Rump and most upper tail-coverts brownish-black, unvaried; a few of the longer coverts barred to correspond with tail. Middle tail-feathers dark ashy-brown, with paler or rufescent edges, and irregular or broken bars, throughout; other tail-feathers becoming orange-brown, with numerous irregular or broken bars or spots of black; with one broad, firm, subterminal black bar, and tips white for a distance increasing on successive feathers. Under parts dull soiled white, or tawny-white, rufescence strongest on jugulum and breast, jugulum streaked with blackish, and sides with sharp arrow-heads of the same. Axillars and lining of wings pure white, regularly barred with black. Primaries brownish-black; 1st at least, and sometimes all, barred with white on inner webs; shaft of 1st white, of others brown. Secondaries like primaries, but usually barred with white on both webs, inner ones gradually assimilating with back in character of markings. Bill yellow, with black ridge and tip; feet dull yellowish, drying darker; iris dark brown. Length 11.75-12.75; extent 21.50-23.00; wing 6.25-7.00; tail about 3.50; tarsus 1.75-2.00; bill, and middle toe and claw, 1.00-1.25. Downy young: Variegated above with white, brown, and black; whitish below; bill bluish with dark tip; legs clay-color. They are 5 or 6 inches long before any feathers sprout; in first featherings they are plainer dusky above than the adults, with finer buffy margins, less streaked below, and in general buffier; but they speedily acquire a plumage hardly different from that of old birds, and it never varies much afterward — I know no other wader so much alike at all ages and seasons, in both sexes. North America at large, rare W. of the Rocky Mts., in profusion on prairies of the interior, and common eastward; but less abundant than formerly on the New England coast; N. to Nova Scotia and the Yukon. Breeds N. from the middle districts; winters almost entirely extralimital, pushing far into South America; casual in Europe. A fine game bird; but those who only know it when its fears are excited by incessant persecution have little idea what a

gentle and confiding creature it is when at home on the western prairies. Nest anywhere on prairie, in June; eggs normally 4, averaging 1.75×1.28 ; clay-color or pale creamy-brown without olive shade; spotted all over, but most thickly at large end, with small, sharp, rounded surface-marks of umber-brown, among which are purplish-gray shell-spots; spots rarely if ever larger than a split pea, and seldom confluent.

TRYNGITES. (Gr. *τρύγγας*, *truggas*, a sandpiper, with suffix *-της*, *-tes*.) **MARBLE-WING SANDPIPERS.** Bill shorter than head, very slender, tapering, and acute, grooved nearly its whole length, thus much as in *Tringa*; but gape of mouth extensive, and end of bill not dilated and sensitive. Frontal feathers embracing base of upper mandible in nearly transverse outline, and extending quite to nostrils; those on side of under mandible reaching farther still, those of chin completely filling the interramal space; such extension of feathers making bill appear remarkably short. Wings of ordinary shape. Tail about $\frac{1}{2}$ as long as wings, rounded, with projecting central feathers. Tibiæ denuded below for a space less than length of middle toe. Tarsus longer than middle toe and claw. Toes cleft to base, or with only rudimentary basal webbing. Primaries peculiarly marbled in color. Tail not barred. Related to *Tringa* in many respects; but the acute and hardened tip of the bill, and long gape, are totanine, and on the whole the affinities of the single species seem to be with *Bartramia*, so far as our genera are concerned, though there is an undoubted relationship with *Echmorhynchus cancellatus* and *Prosobonia leucoptera* — those rare and perhaps extinct Sandpipers of the Sandwich and some other Pacific Islands.

T. rufescens. (Lat. *rufescens*, rufescent, reddish. Fig. 587.) **BUFF-BREASTED SANDPIPER.** Adult ♂ ♀, in breeding plumage: Above, brownish-black with a greenish gloss, every feather broadly margined with tawny or yellowish-brown, the latter the prevailing tone. Under parts buff or fawn-colored, without markings except a few small blackish spots on sides of breast. Central tail-feathers greenish-brown, blackening at ends; others paler, often rufescent, with white or tawny tips and subterminal black bar; and usually, also, some black marbling or streaking. Primaries and secondaries ashy-brown, blackening at end, the extreme tip

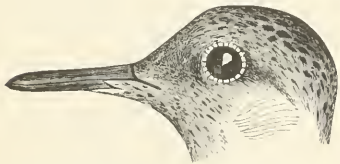


FIG 587. — Buff-breasted Sandpiper, nat. size. (Ad. nat. del. E. C.)

white — most of the inner webs of primaries, and both webs of secondaries, pearly white, speckled and marbled with black. This curious tracery, best seen from below, is diagnostic; though the precise pattern varies interminably. The patch of under coverts at bases of primaries has the same character. Axillars white; lining of wings white or rufescent. Iris brown. Bill brownish-black; legs greenish or yellowish. Length 7.50–8.25; extent about 16.00; wing 5.00–5.25; tail 2.50; bill along

culmen 0.67–0.75, along gape 1.00; tarsus 1.20; middle toe and claw under 1.00. Fall plumage: Under parts less rufescent, frequently simply tawny-whitish; broad ochrey or tawny edgings of feathers of upper parts replaced by narrow whitish streakings, in a set of semicircles. Wings and tail as in spring. North America at large, especially the interior, and a frequent European straggler, but apparently nowhere abundant, unless in the migrations in the Gulf States; only migratory in the U. S.; S. in winter through South America; breeds in high latitudes, quite to the Arctic coast. Eggs usually 4, pointedly pyriform, $1.40-1.50 \times 1.02-1.10$; the ground clay, sometimes slightly olivaceous, often quite grayish; markings extremely bold and sharp, in heavy blotches and indeterminate spots all over the surface, but largest and most numerous at greater end; colors rich umber-brown, of varying shade. Nearest these blotched samples are splashed ones, with markings massed at greater end, elsewhere splattered in small pattern. Others are spotted with narrow markings radiating from large end, almost wreathing about greatest diameter. All with the usual neutral-tint shell-markings; most with scratchy blackish marks over all. (*T. subruficollis* of A. O. U. Lists.)

HETERACTITIS. (Gr. *ἕτερος*, *heteros*, different, otherwise; and *Actitis*, which see, p. 834.) **SHORT-LEGGED TATTLER.** Bill totamine, longer than head or tarsus, straight, rather stout, much compressed, both mandibles grooved for $\frac{1}{2}$ – $\frac{2}{3}$ their length, with inflected tomia beyond. Gape of mouth extending beyond base of culmen; feathers of equal extent on sides of both mandibles, those of chin reaching much farther. Wings long, pointed, folding about to end of tail; 1st and 2d quills subequal and longest. Tail short, less than half the wing, nearly even. Legs short, somewhat rugous, and either reticulate except on front of tarsus where imperfectly or incompletely scutellate, or more completely scutellate both behind and before; tibiae denuded for a space about half as long as tarsus; tarsus little longer than middle toe and claw, shorter than bill; outer lateral toe longer than inner; a large basal web between outer and middle, a rudimentary one between middle and inner; hind toe long, about equalling 1st joint of inner toe. Two species (?) remarkable for variation in character of tarsal envelope and nasal grooves. Ours is the one with tarsi more or less reticulate, and nasal grooves long. (*Heteroscelus* Bp. 1858, of former eds. of the Key, antedated in entomology by *Heteroscelis* LATR. 1825. *Heteractitis* STEJ. Auk. 1884, p. 236, and A. O. U. Lists.

H. inca'na. (Lat. *incanus*, -a, -um, quite gray.) **WANDERING TATTLER.** Adult ♂ ♀: Upper parts perfectly uniform dark plumbeous, or slaty-gray, including the wholly unmarked tail, wing-coverts, and inner quills, longer quills gradually blackening, shaft of first primary nearly all white; a white line over eye. Lining of wings, axillars, and sides of body colored like back, but varied with white. Under parts in general white; in *one* plumage (winter) without markings, but heavily shaded on neck, breast, and sides with color of back; in *another* (summer) heavily marked with blackish-plumbeous—speckled on throat, streaked on neck, wavy-banded on breast, belly, sides, and crissum. Bill said to be dull greenish or dark-horn bluish in life, when dry black, apparently pale at base of under mandible: feet dull greenish-yellow; iris brown. Brownish young like the winter adults, but indistinctly spotted with white on scapulars, inner secondaries and upper tail-coverts, and faintly mottled with white on the sides of the under parts. Length 10.00–11.00; wing 6.50–7.00; tail 3.00; bill 1.50–1.60, with nasal groove reaching its terminal third; tarsus 1.25–1.35, mostly reticulate; middle toe and claw a little less. A species of very wide distribution among the islands of the Pacific, common in summer on the shores of Alaska, and extending thence S. to the Galapagos Islands on the American coast. In Alaska these birds are found from May to October, on the most rugged and rock-ribbed shores both of the islands and the mainland, and doubtless breed in that part of the U. S. “The attempt to distinguish this species is attended with the utmost difficulty,” as Dr. Sharpe says, and may not be satisfactorily accomplished till we know more of their plumages; in spite of the fact that some specimens differ almost generically in some structural characters, as above pointed out, others are intermediate in the same respects. The other supposed species is the Polynesian Tattler, *H. brevipes*, supposed to differ in having short nasal grooves, tarsi mostly scutellate behind as before, upper tail-coverts barred with white, and less dark barring on the under parts than in *H. incanus*, the belly and vent being plain white. This one occurs on the Commander Islands in Bering Sea, and may be expected on the Aleutians. The present species is *Heteroscelus incanus* of former editions of the Key, now *Heteractitis incanus* of the A. O. U. List, No. 259—regardless of the grammatical gender of the new generic name.

(§ 6. *Curlews.*)

NUMENIUS. (Gr. *νέος*, *neos*, new; *μήνη*, *mene*, the moon; the long curved bill, like a crescent. Fig. 588.) **CURLEWS. WHIMBRELS.** Bill of very variable length, always longer than head, probably always exceeding tarsus, sometimes more than length of entire leg; slender, curved downward, tip of upper mandible knobbed and overhanging end of lower; obsolete grooved nearly to end. Gape of mouth extended beyond base of culmen. Feathers reaching about equally far on sides of each mandible. Wings and tail ordinary; latter barred

in color. Legs rather stout; tibiae largely denuded below; tarsus much longer than middle toe and claw, scutellate in front only, elsewhere reticulate, scutellate behind also in *N. minutus*, now made type of *Mesoscolopax* on this account. Toes short and thick, flattened underneath,

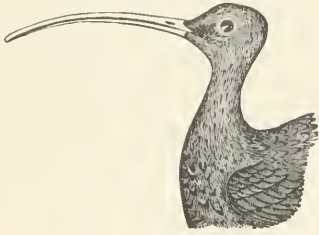


FIG. 588. — Long-billed Curlew, greatly reduced.

well webbed at base and broadly margined on sides. Of large and medium stature, and plump form. Coloration variegated; rufous usually prevailing. Sexes alike; changes of plumage not pronounced. A cosmopolitan genus of about 9 species; in character of bill unique, in that of the legs very similar to *Limosa*. In fact, barring the bill, *Numenius longirostris* closely resembles *Limosa fedoa*. It is a curious fact that some Old and New World representatives of both these genera differ from each other in a similar manner, in respect of the coloring of the wings and tail. Compare *Limosa fedoa* with *L. lapponica*; *L. hæmastica* with *L. limosa*; *Numenius longirostris* with *N. arquata*; *N. hudsonicus* with *N. phæopus*. We have 5 perfectly good species of Curlews, 3 of them common native birds, one a

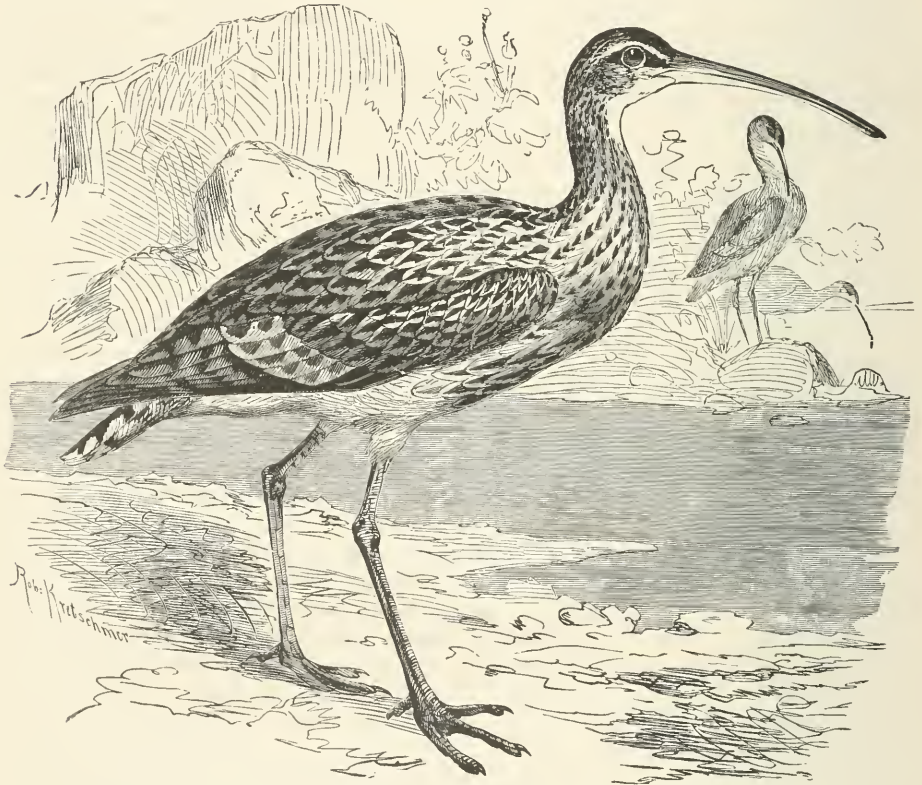


FIG. 589. — The European Curlew, *Numenius arquata*, $\frac{1}{4}$ nat. size. (From Brehm.)

straggler from Europe, one a straggler to the Pacific coast. They well illustrate the whole genus; of which certain species having the crown with a light median stripe between dark lateral areas, as *N. phæopus* and *N. hudsonicus*, are known as Whimbrels.

Analysis of Species.

- Feathers of thighs bristle-tipped *tahitiensis*
- Feathers of thighs normal.
- Rump white, more or less spotted with dusky.
- Upper tail-coverts and under wing-coverts white spotted and barred with dusky *pharopus*
- Rump, upper tail-coverts, and lining of wings not white.
- Primaries varied with rufous. General coloration strongly rufous, especially below; lining of wings deepest rufous, little or not varied. Large; bill 4-6-8 inches *longirostris*
- Primaries varied with rufous or whitish. General coloration scarcely or not rufous; lining of wings entirely varied. Medium-sized; bill 3-4 inches *hudsoniens*
- Primaries not varied with rufous or whitish. General coloration scarcely or not rufous; lining of wings entirely varied. Smallest; bill under 3 inches *borealis*

N. longirostris. (Lat. *longus*, long; *rostrum*, beak. Fig. 590.) LONG-BILLED CURLEW. BIG CURLEW. HEN CURLEW. SICKLE-BILL. SABRE-BILL. SMOKER. MOWYER. Bill of extreme length and curvature, measuring from 4 to 6 or 8 inches, rarely a little more still; in some young birds under 3.00; commonly 5.00-6.00. Of largest size: length 20.00-24.00



FIG. 590. — Curlew.

or more; extent say 33.00; wing 10.00-12.00; tail about 4.00; tarsus 2.75-3.50. Plumage very similar to that of the Godwit, *Limosa fedoa*: prevailing tone rufous, of varying intensity in different specimens, usually deepest on lining of wings, which are little varied with other color. Primaries varied with rufous. Top of head variegated with blackish and rufous or whitish, *without* distinct pale median and lateral lines. Upper parts brownish-black, speckled with tawny or cinnamon-brown, each feather having several indentations or broken bars of this color; rufous prevailing on wing-coverts. Tail-feathers and secondaries cinnamon-brown, with pretty regular dark bars throughout. Under parts rufous or cinnamon of varying intensity, usually deepening to chestnut under wings, fading to whitish on throat; jugulum and fore-breast with dusky streaks which tend on sides of breast and body to arrow-heads or more



FIG. 591. — Whimbrel. (From Seebold's Charadriidæ.)

or less complete bars; lining of wings, axillars, and crissum, mostly unmarked, though some spots may appear. No white on rump, tail, or wings. Bill black, much of under mandible pale flesh-color or yellowish; legs dark bluish-gray, drying darker. Little variation in plumage with sex, age, or season. Chicks hatch in whitish down, tinged with yellow below and buff above, thickly blotched above with brownish-black; bill straight, an inch long. Like

other exceptional developments of parts of birds, this member grows to indeterminate length. Up to the time the bill is not over 3-4 inches long, the species may be distinguished from *N. hudsonicus* by strong rufescence of under parts, which are nearly clear of dark markings, and by lack of pale median stripe on crown, which marks a Whimbrel. This is our representative of

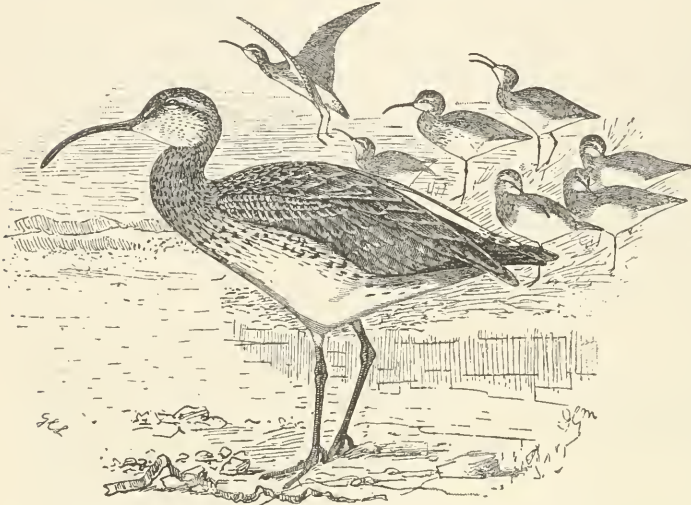


FIG. 592. — European Whimbrel. (From Seebohm's Charadriidæ.)

1.90; clay-colored, tending either to darker olivaceous shades or to buff; spotting generally pretty uniform and of small pattern (in some cases blotched or massed at greater end) of sepia, chocolate, or umber-brown; paler shell-markings usually numerous and evident.

N. phæopus. (Gr. *φαῖός*, *phaíos*, dusky, swarthy; *πούς*, *pous*, foot. Figs. 591, 592.) EUROPEAN WHIMBREL. JACK CURLEW. TITTEL. In stature and general appearance resembling the Hudsonian Curlew; at once distinguished from that species by the white rump, upper tail-coverts, and lining of wings, spotted or barred with dusky. An extensively distributed Old World species, only North American as occurring in Greenland. (Auk, 1889, p. 217.)

N. tahitiensis. (Of Otaohiti. Fig. 593.) PACIFIC WHIMBREL. OTAHITI CURLEW. BRISTLE-BELLIED or BRISTLE-THIGHEd CURLEW. Of medium size, about equalling *N. phæopus*; length 17.00-19.00; extent about 34.00; wing 9.50-10.50; tail 4.00; bill 2.75-3.75; tarsus about 2.25. Crown with light median and superciliary lines dividing dark areas, as in other Whimbrels; upper parts brownish-black with the usual tawny variegation; no white on rump, tail, or lining of wings; tail and its coverts tawny, coverts spotted or streaked with dusky, rectrices pretty regularly and firmly barred with about 6 dusky bands, tipped with tawny-white; lining of wings and axillars fully barred with tawny and dusky. Primaries blackish, varied to some extent on inner webs, shaft of 1st white. Under parts pale tawny, chin white, jugulum thickly streaked, sides more loosely barred, with dusky, but most of under parts immaculate, and many feathers, especially of flanks, ending in long glistening bristles. Bill livid flesh-color and blackish; feet livid

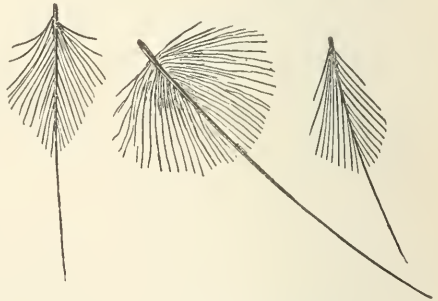


FIG. 593. — Pacific Island Whimbrel.

N. arquata, the common Curlew or Whaup of Europe. Entire temperate North America; breeds in much of range, especially on prairies of Northwest; migratory northward, resident in some of the South, but also south in winter to Central America and some of the West Indies; uncommon in East north of Florida; formerly nested abundantly on the South Atlantic coast. Eggs 3-4, not very pear-shaped, more like hen's eggs; 2.45-2.80 × 1.80-

bluish; iris brown. Alaska, not common, perhaps only a straggler from Asia; a well-known and abundant Whimbrel of various Pacific islands, first added to our Fauna from a specimen taken at Kadiak by F. Bischoff, May 18, 1869, recorded as *N. femoralis* in *Am. Nat.* 1874, p. 435; next found by Nelson, May 24, 1880, noted as *N. tahitiensis* in "Cruise Corwin," 1883, p. 90, and figured in Nelson's Alaska, p. 121, pl. 9; A. O. U. Lists, No. [268]. *N. tahitiensis* COUES, Key, 2d-4th eds. 1884-90, p. 646.

N. hudsonicus. (Of Hudson's Bay. Fig. 594.) AMERICAN WHIMBREL. HUDSONIAN CURLEW. JACK CURLEW. JACK. STRIPED-HEAD. CROOKED-BILLED MARLIN. Of medium size; bill moderate in length, stout,

curved. Bill 3-4 inches long. Length 16.00-18.00; extent about 32.00; wing 9.00-10.00; tail 3.50; tarsus 2.25-2.50. General tone of coloration scarcely rufous; under parts, and variegation of upper, being whitish or ochraceous. No white on rump, tail, or lining of wings. Top of head uniform blackish-brown, with well-defined whitish median and lateral

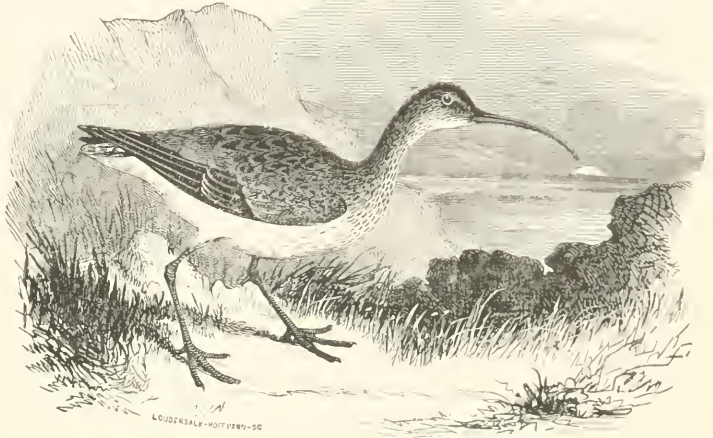


FIG. 594. — Hudsonian Curlew, much reduced. (From Lewis.)

stripes (as in *phaeopus*, but neither *longirostris* nor *borealis*). Upper parts brownish-black, speckled with whitish, ochraceous or pale cinnamon-brown, in same pattern as in *longirostris*, but dark in excess of light colors, and these never strongly rufescent. Tail ashy-brown (not rufous), with numerous narrow blackish bars. Primaries fuscous, marbled or broken-banded with pale color (pattern as in *longirostris*, tone not strongly rufous). Lining of wings and axillars rufescent, but spotted or barred throughout with dusky. Under parts soiled whitish or somewhat ochraceous, only obscurely rufescent on crissum, if anywhere; jugulum and fore-breast with dusky streaks which, as in other species, change to arrow-heads or incomplete bars on sides of breast and body. Bill blackish, some part of lower mandible pale; feet livid bluish, drying dark. The North American representative of *N. phaeopus*, but obviously different; generally distributed, more common, on the whole, than either *longirostris* or *borealis*; more common coastwise than in interior; breeds in high latitudes to extreme northern part of the continent, migratory through the U. S., wintering from L. California, Louisiana, and West Indies through Middle and South America to Patagonia. Eggs usually 4, of intermediate size, not distinguishable with certainty, the markings being as in other species; 2.12-2.30 × about 1.60.

Obs. This Whimbrel is perfectly well known to gunners, who mostly call it "Jack," and never Eskimo or Esquimaux Curlew, the latter being a mistake confined to books, and traceable back through Nuttall and Wilson to Pennant. Neither is it the Dough-bird or Doe-bird of the people, this name belonging to the following species.

N. borealis. (Lat. *borealis*, northern. Fig. 595.) ESQUIMAUX or ESKIMO CURLEW. DOUGH-BIRD or DOE-BIRD. FUTE. Of smallest size; bill short, slender, and little curved. Bill 2.00-2.50. Length 12.00-15.00; extent about 28.00; wing under 9.00; tail 3.00; tar-

sus 2.00 or less. General tone little rufescent, under parts and variegation of upper rather ochraceous than rufous. Top of head variegated throughout, without median light line, but with tolerably well-defined whitish superciliary stripes. Upper parts brownish-black,

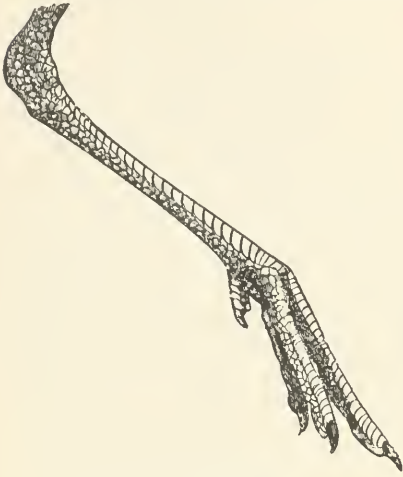


FIG. 595. — Eskimo Curlew.

speckled with ochraceous or very pale cinnamon-brown, the general effect as in *hudsonicus*; dark coloration in excess of the pale. Tail barred much as in *hudsonicus*, the broader light bars often rufescent. Primaries and most secondaries *plain fuscous*, entirely lacking the variegation seen in the foregoing. Under parts ochraceous, or somewhat rufescent, very variable, frequently whitish, marked as in other species with dusky streaks, arrow-heads, or bars, but these more numerous, frequently occupying all the under parts, excepting chin and middle of belly. Axillars and lining of wings rufescent, barred throughout with dark brown. Bill black, with base of lower mandible pale or yellowish; feet greenish-black. In handling perhaps 100 fresh-killed birds, I have noted much variation in tone, but the species is unmistakable. Eastern North America at large, breeding in the Arctic regions, and migrating through the U. S., as far as southern South America. More common in interior than on Atlantic coast of U. S.; west to Kansas and Nebraska. Extraordinarily abundant in some places during migration, as in Labrador, where it fairly swarmed in the past in August. Often occurs with Golden Plover. In northern regions, feeds chiefly on the crow-berry, *Empetrum nigrum*. Nest in open plains. Eggs 4, 1.90-2.12 × 1.33-1.40; olive-drab, tending to green, gray, or brown in different cases, with large, bold, and numerous markings of bistre, chocolate, and sepia, tending to aggregate on the greater end, with ordinary stone-gray shell-marks.

Order PALUDICOLÆ: Marsh Birds.

(ALECTORIDES of the KEY, 1884-90. — PALUDICOLÆ of the A. O. U. 1886-95.)

(Nearly equivalent to GERANOMORPHÆ of Huxley, 1867.)

Like the "order" *Picariæ* (see p. 537), this is a miscellaneous assortment or "polymorphic group" of birds, held together because ornithologists would not know what to do with its members if these were taken apart. It contains all Wading Birds of what may be called the Crane-Rail type, as distinguished from the Plover-Snipe type, which is comprehended by the preceding order *Limicolæ* — the name *Paludicolæ* being now adopted by way of verbal antithesis with *Limicolæ*.

In the present state of ornithology the "order" *Paludicolæ* is insusceptible of satisfactory definition; I have seen no attempts to define it that were not lamentable failures, and am indisposed to add one of my own to the number. This house of refuge — I wish I could say, house of correction for refractory birds — contains a few important families of Waders which cannot be assigned either to *Limicolæ* or to *Herodiones* without spoiling the definition of those orders, and which are consequently inmates of this home for the destitute — this organized charitable institution — called *Paludicolæ* or *Alectorides*.¹ Aside from certain unconformable families, to

¹ The inept name *Alectorides*, which I was driven to adopt in the 2d edition of the Key, 1884, was proposed in 1820 by Temminck for an order containing the genera *Psophia*, *Dicholophus*, *Glaucola*, *Palamedea*, and *Chauna* — not a Crane or a Rail in the lot, and not a gallinaceous bird to justify the etymology of the word (Gr. ἀλεκτωρ, *alektor*, a cock).

be presently specified, Paludicoline birds correspond to Huxley's *Geranomorphæ*; palate schizognathous; nasals schizorhinal in the Crane type, holorhinal in the Rail type; angle of mandible truncate; no basipterygoids; sternum long and narrow, entire or single-notched behind; carotids two; cæca two; no pulviplumes; classificatory muscles of the thigh too variable for utility; connection or relations with *Limicolæ* through *Otidulæ*, with *Herodiones* through *Eurypygidæ*; with *Anseres* through *Anhimidæ*; and probably with Raptores through *Cariamidæ*.

The character of this group may be best developed by analyzing its contents; and in the process of so doing we shall find it much easier to see how the several families differ than how they agree with one another. It will also appear that they differ by different degrees of unlikeness, and hence that certain suborders or superfamilies of *Paludicolæ* must be recognized.

1. *Fam. OTIDIDÆ*. Bustards are an important, well-defined, and circumscribed family of Old World birds, consisting of 12 genera and upward of 30 species. They are the inoculant group by which the present order is linked with *Limicolæ*, having decided relationships with Thick-knees (*Edicnemidæ*; see p. 767). Such combination of characters has caused their alternate reference to each order; but the balance of evidence is in favor of their position under *Paludicolæ*, and the sum of their peculiarities warrants the recognition of a suborder OTIDÆS. Thus, the palate is schizognathous, but the nasals are holorhinal; no basipterygoids; cervical vertebrae 16-18; sternum double-notched on each side of its posterior border: long cæca present; carotid single or double; no oil-gland; no intrinsic syringeal muscles; ambiens present, but not femoroceudal (formula normally B X Y); plumage aftershafted; wing aquitocubital; rectrices 16-20; the stout feet 3-toed, lacking hallux, with reticulated tarsi, and scutellations on top of toes; bill short and stout, somewhat as in gallinaceous birds, with pervious nostrils reached by frontal autiæ. These birds inhabit open places, where they run with velocity, and also fly well; they nest on the ground, lay colored eggs, and the clicks are nidifugous. They are mostly stout birds, some as big as a Turkey, others no larger than Grouse. Some are noted for the possession of a gular air sac, capable of immense inflation, and for the extraordinary appearance they present when "showing-off," under amatory excitement, the effect of which is heightened by curious long whisker-like bristles or other peculiarly modified feathers, and great variegation of the general plumage. The best known species is the great Bustard of Europe, *Otis tarda*; another is the little Bustard of the same country, *Tetrax tetrax*; a third one sometimes found in Europe is *Houbara macqueni*; but all these are also Asiatic. The other species of Bustards inhabit either Asia or Africa or both, the greater number of species occurring in the latter continent.

2. *Fam. CARIAMIDÆ*. This consists of two South American birds, *Cariama cristata* and *Chunga burmeisteri*, so peculiar that they constitute a suborder CARIAMÆ. Some evidence of raptorial relationship is afforded by their resemblance in several respects to the African Serpent-eater or Secretary-bird, *Serpentarius secretarius*; and some ornithologists have gone so far as to classify Cariamæ under *Raptores*. But if the relation in this case could be shown to be one of real affinity, it might be nearer the mark to remove *Serpentarius* from among birds of prey and bring it into the present connection; and to do so would certainly not hurt *Paludicolæ* as an order of birds! The Cariamæ and the Chunga are large birds, with moderately long legs (for this order); four toes; short stout bill; and a helmet-like crest. The myological formula differs in the two species; both lack the femoroceudal, and *Chunga* also lacks the accessory femoroceudal; the palate is not typically schizognathous, and the raptorial characters are exhibited by the osteology. There are two long cæca, and the digestive system in general is Crane-like, as is also the pterylosis (though the wing is quintocubital); the oil-gland is nude. The nest is built on trees, and the eggs are two. The balance of evidence favors the retention of the family in the Crane group, though it is excluded from the *Alectorides* of Selater, Sharpe, and other British authorities.

3. *Fam. ANHIMIDÆ* (commonly called *Palamedidæ*). This is another puzzling family, probably entitled to ordinal rank, and if kept among Paludicoline birds certainly forming a suborder ANHIMÆ. It consists of only three species, of two genera, *Anhima* (or *Palamedea*) *cornuta*, the Horned Screamer or Unicorn-bird; *Chauna chavaria*, of authors, the Crested Screamer or Chaka (now called *C. cristata*); and *C. derbiana* of authors (now called *C. chavaria*). How anomalous is the "all-together" of these birds may be judged from the fact that they offer a point of resemblance to the Jurassic *Archapteryx* in absence of uncinatæ processes of ribs, as is the case with no other living birds; intestinal characters resemble in some respects those of struthious birds; the skeleton is distinctly anserine, in most respects, with some peculiarities of its own besides the one just mentioned, such as position of basipterygoids; the respiratory organs are also somewhat anserine; but the remarkable development of the subcutaneous air-cells produces an emphysematous condition like that of Pelicans; the pterylosis is peculiar, in the almost entire absence of apteria; the myology is equivocal. The external aspect of these birds is hardly less remarkable than their anatomy: bill of gallinaceous appearance; head small; feet large and stout, with tibiae naked below, tarsi reticulate, hallux long and low down, anterior toes connected by small webs, and claws long and strong, especially the hinder one; wings ample, with enlarged secondaries, and a pair

The name was galvanized into something like life by Dr. Selater in 1880, when it was made to cover six families — *Aramidæ*, *Eurypygidæ*, *Gruidæ*, *Psophiidæ*, *Cariamidæ*, *Otididæ*, and at the same time an order *Fulicariæ* was invented for the two families *Rallidæ* (including Rails, Gallinules, and Coots) and *Helionithidæ*. These two orders continue to be sanctioned by Dr. Selater, Dr. Sharpe, and other leaders of the B. O. C. They correspond precisely with my two suborders *Gruiiformes* and *Ralliiformes* of previous editions of the Key, 1884-90; and I continue to uphold them both perforce, *faut de mieux*, under the names *Grues* and *Ralli*, as per A. O. U. — except that I keep *Aramis* with the former, instead of changing it to the latter. These two suborders together constitute my former order *Alectorides* — the present order *Paludicolæ* of the Key; as of the A. O. U.

of horny spurs on each. In *Palamedea* there are 14 rectrices, and a slender horn on the forehead 5-6 inches long; the species of *Chauna* are not unicolors, but crested, with naked lores, and have 12 tail-feathers. These birds range in size 2-3 feet long. Such birds as these can belong to "*Paludicolæ*" under no possible definition of this order, and I only notice them in this, their traditional position, to show that they do not belong here. They would go better with *Anseres*, where they are now usually assigned; and may still better constitute a separate order of birds, as that instituted for their reception by the name of *Palamedææ* by Dr. Sclater in 1880.

4. *Fam. HELIORNITHIDÆ.* This family is another puzzler; the greatest difference of opinion still prevails concerning it, as usual in cases where our information is deficient. It is a small group, consisting of the South American Sun-bird or Pin-foot, *Heliornis julica* (or *Surinamensis*); the African *Podica senegalensis* and another species, and the Asiatic *Heliopais personata*. The question is, whether they are most nearly related to Coots, and thus to Rails, as those ornithologists think who refer them to *Fulicariæ*; or to Grebes, as some suppose. They agree with both these diverse types in their most obvious external feature, which is, that the toes are lobate, being garnished with wide scalloped flaps in their whole length. Thus far the case is equivocal, and the ambiguity does not entirely disappear on anatomical investigation; palate schizognathous without basipterygoids; nasals holorhinal; no occipital fontanelles and no supraorbital fosse; sternum long, single-notched behind, with a low keel, to which the furculum is ankyloused; accessory semitendinosus absent (formula A B X), and biceps cruris peculiar in its relations; cæca moderately developed; oil-gland tufted; plumage not aftershafted; tail well developed, with 18 rectrices; neck long and slim, and head small. These birds are thoroughly aquatic, able to dive as well as to swim. We are insufficiently informed concerning their reproduction; the young of the South American bird are said to hatch naked and to be only two in number. If the birds are properly placed in the present order at all, they certainly belong with its Ralline division.

No doubt attaches to any of the following families, which are evidently members of an order of birds to which Cranes belong:

5. *Fam. EURYPYGIDÆ.* Represented by *Eurypyga helias* and *E. major*, the Sun-bitterns of South America, the first of which formerly called *Ardea helias*, *Scotopax solaris*, and by other names, as *Caurale*, a word coined by Buffon as equivalent to Tailed Rail (*Râle à queue*), and becoming in English *Caural* or *Carle*. This is the form by means of which the present group of birds is related to or even connected with Herons; its general aspect may be called that of a Heron-like Rail. The plumage is very beautifully barred and spotted, somewhat as in Tiger-bitterns, and displayed to great advantage in some of the bird's "showing-off" performances; the legs are rather short, the neck is long and slim, the head small, the bill long and slender; the length is about 18 inches. The wings are very ample, with long aquitocubital secondaries, as in Herons; the tail is likewise long and full. The tibiae are bare below, the tarsi scutellate before and behind; the hallux is fairly well developed. The bill is long-grooved, with linear, pervious, and somewhat operculate nostrils. The muscular formula is A B X Y; palate schizognathous; nasals schizorhinal; no basipterygoids, supraorbital fossæ, or occipital fontanelles; sternum single-notched on each side behind; cæca small; oil-gland nude; the plumage includes pulviplumes; rectrices 12, and primaries 10. The young hatch downy, but stay in the nest, and are long fed by the parents; the nature is therefore altricial or nidicolous, but pilopædic; the eggs are colored.

6. *Fam. RHINOCHETIDÆ.* The Kagu of New Caledonia, *Rhinochetus jubatus*, alone represents this family. The structural characters are very nearly those of *Eurypyga*; the cæca are better developed, and the muscular formula is A X Y. The plumage is aftershafted; the wing quincubital. The nostrils have a remarkable structure, in the presence of an elastic sheath-like operculum; this appears to have some function in connection with the bird's mode of feeding, and it is upon this peculiarity that the generic name was bestowed (*πίς, μύθος, ἥρις, ῥίνας, nostril, and ὄχερος, ochetos*, is a channel, pipe, or tube.) The plumage somewhat resembles that of the foregoing, and the bird has a similar method of showing it off; but its most marked feature is the long pendent crest which hangs down over the neck behind like a sort of mane (whence the specific name *jubatus*, maned). The habits are nocturnal, and in captivity quite frolicsome; the nest, eggs, and mode of propagation are unknown.

7. *Fam. MESITIDÆ.* Another monotypic family, confined to Madagascar and consisting only of *Mesites variegata*. This bird was misunderstood long enough to be misrepresented as a kind of Rail, Pigeon, or Fowl, and even an Oscinine Passerine. Its structure is closely correspondent with that of the Kagu and Sun-bittern. Bill slender, with long, linear, slitlike, and operculate nostrils; 5 pairs of powder-down patches present; tail-feathers 16; a bare space about eye; tarsi scutellate before and behind; hallux long and completely insistent.

The last three families are so obviously well related to one another, and so distinct from the others above described, as well as from the Cranes and Rails proper to be next noticed, that, so long as they are retained under an order *Paludicolæ* or *Alectorides*, they should form one of its suborders; and for this the name *Eurypygæ* may be used, as derived from that of the earliest known genus of the suborder.

All remaining Paludicoline birds are four families, either of the Crane type or of the Rail, and as such represent two suborders of *Paludicolæ*, *Grues*, and *Ralli*; both of which occur in North America. These are more particularly those to which Huxley's term *Geranomorphæ* applies.

SUBORDER GRUES: CRANES, AGAMIS, AND COURLANS.

(GRUIFORMES of the KEY, 1884-90— GRUES of the A. O. U. 1886-95.¹)

Represented in North America by two families, *Gruidæ* and *Aramidæ*, and in South America by a third, *Psophiidæ*. The latter consists of five or six species of the single genus

¹ Except that the A. O. U. places *Aramus* under the other suborder, *Ralli*.

Psophia, of which the best known is *P. crepitans*, the Agami or Trumpeter; they are large birds of Crane-like aspect, with something suggestive of Emus in their form and carriage. A notable anatomical character consists in a number of separate supraorbital bones; the nasals are holorrhinal; the cæca are long; the trachea of the ♂ is immensely elongated, forming a subcutaneous convolution along the abdomen; the plumage is soft; wing quintocubital; rectrices only 10. The Agamis live in flocks in the woods, nest on the ground, and lay two whole-colored eggs; they have such small power of flight that they often drown in trying to cross streams, and the habitat of some of the species is restricted to one or the other side of certain rivers.

Family GRUIDÆ: Cranes.

As already explained, Cranes are related to Rails in essential points of structure, though more resembling Herons in general aspect. All are large birds, some of immense stature; legs and neck extremely long; wings ample, but incised along posterior border, from shortness of outer secondaries; tail short, of 12 broad feathers. The head is generally, in part, naked and papillose or wattled in adult, with a growth of hair-like feathers, or (in *Balearica*) an upright tuft of curiously bushy plumes, like a wisp of straw. The general plumage is compact, in striking contrast to that of Herons; but the inner wing-quills, in most cases, are enlarged and flowing, and the wing is aquintocubital; in some genera feathers of the neck are elongated, as in Herons; there are no powder-down patches. The sternum is enlarged, and its keel is hollowed to receive a fold of the windpipe, as in Swans, and some Storks and Ibises (p. 208), but truncate behind and neither notched nor fenestrate: there are occipital fenestræ, but no basipterygoids, and the supraorbital fossæ are margined; the palate is schizognathous, and the nasals are schizorhinal. The cæca are several inches long, and the oil-gland is tufted. Leg-muscles variable (formula A B X Y, B X Y, or X Y). Details of external form are: Bill equalling or exceeding head in length, straight, rather slender but strong, compressed, contracted opposite nostrils, obtusely pointed; nasal fossæ short, broad, shallow; nostrils near middle of bill, large, broadly open and completely pervious: tibiae naked for a great distance; tarsi scutellate in front; toes short, webbed at base; hallux very short, highly elevated; inner anterior claw large. There are about 18 species of Cranes, of nearly all parts of the world; 3 are American, and these, like most of the family, fall in the single genus *Grus* (in a broad sense; several species represent as many subgenera). Apart from *Grus* may be named *Bucconis carunculatus*, the Wattled Crane of Africa; *Tetraptyx paradisea*, the Stanley Crane of the same continent; *Anthropoides virgo*, the Numidian Crane or Demoiselle, very elegant; and 3 species of Crowned Cranes of Africa, composing the genus *Balearica*, which have a singular tuft of strawy plumes on the nape, like a pompon to whisk-broom: *B. pavonina*, *chrysopetargus*, and *gibbericeps*.

GRUS. (Lat. *grus*, fem., a crane.) CRANES. Of maximum size and length of neck and legs; color white or gray in adults, rusty in the young. Head without crest; more or less bare of feathers in adult, carunculate, with hair-like bristles: forehead low. Character of bill, legs, and wings typically as above said. Tail short, 12-feathered. Tarsus broadly scutellate in front. Toes short, middle about $\frac{1}{2}$ as long as tarsus; inner rather exceeding outer, with enlarged claw. Inner wing-quills lengthened, curved, pendent beyond primaries when the wing is folded. Nest on the ground; eggs few, commonly two, spotted; young pilopedic, covered with copious, persistent down, and able to run about soon after being hatched though long requiring to be fed by the parents. This genus, which formerly included the whole family, is now divided into several subgenera, based on differences in the extent and character of the nakedness of the head. Our Sandhill Cranes belong to *Grus* in the strictest sense; the Whooping Crane to *Limogeranus*. Notable exotic Cranes are *G. grus* of Europe; *G. japonensis*: *G. (Leuco-*

geranus leucogeranus, the great White Crane of Asia; *G. (Antigone) antigone*, of India; *G. (A.) australasianus*; and *G. (Pseudogeranus) leucauchen*, of Asia.

Analysis of Species.

- Adult white, with black primaries. Nakedness extending backward in points on top and sides of head. (*Subgenus LIMNOGERANUS*) *americana*
- Adults gray. Nakedness forked on top of head by a point of feathers, and not reaching on side below eye. (Grus proper.)
- Smaller: wing under 20.00; bill 4.00 or less; tarsus 8.50 or less *canadensis*
- Larger: wing over 20.00; bill 5.00 or more; tarsus 9.00 or more *mexicana*

(*Subgenus LIMNOGERANUS.*)

G. america'na. WHITE CRANE. WHOOPING CRANE. Adult with bare part of head extending in a point on occiput above, on each side below eyes, and hairy. Bill very stout, gonyx convex, ascending, that part of the under mandible as deep as the upper opposite it. Adult plumage pure white, with black primaries, primary coverts and alula; bill dusky greenish; legs black; head carmine, the hair-like feathers blackish; iris yellow. Young with the head feathered; general plumage whitish varied with rusty-brown. Length 50 inches or rather more; extent about 90.00; wing 24.00; tail 9.00; tarsus 12.00; middle toe 5.00; bill 6.00, its depth at base about 1.40. In the adult, the windpipe is quite as long as the bird itself—50 inches or more, and over two feet of it is coiled away in the keel of the breast-bone, which is entirely hollowed out to receive these extraordinary convolutions (fig. 99); the voice is singularly raucous and resonant. Temperate interior North America, but of irregular distribution, not well made out; said to have been common in the South Atlantic and Gulf States, and to have extended up the coast to the Middle States. Now scarcely known in the Eastern and Middle States. The chief line of migration appears to be in the interior, along the Mississippi Valley; Mexico, Florida, and Texas to Minnesota and Dakotas, where the bird breeds (as well as farther southward), and thence spreading in the interior of the Fur Countries, as in Manitoba, Assiniboia, and Saskatchewan. So wild and wary a bird must be much influenced by settlement of the country. Eggs 2 (or 3?), about 3.75–4.05 × 2.50–2.65, light brownish-drab, rather sparsely marked, except at great end, with large irregular spots of dull chocolate-brown and lighter reddish-brown, with paler obscure shell-markings; shell rough, with numerous warty elevations, and punctulate. *G. clamator* BARTR. 1791. *G. struthio* WAGL. 1827. *G. hoyanus* DUDLEY, 1854. *Limnogeranus americanus* SHARPE, 1893.

(*Subgenus GRUS.*)

G. canaden'sis. (Of Canada.) NORTHERN BROWN CRANE. LITTLE BROWN CRANE. General character of the species next to be described; nakedness of head and color of plumage substantially the same. Smaller: length about 3 feet; wing 18.00–19.00; tail 7.00; tarsus 6.75–8.50; bill along culmen 3.00–4.00! its depth at base 0.75; middle toe scarcely 3.00; tibia bare about 3.00. Supposed to be confined in breeding season to Arctic and northern North America from Hudson's Bay to Alaska, thence migrating through western U. S. to western Texas, New Mexico, Arizona, and southward in Mexico. (Supposed to be true *canadensis* LINN. 1758, ex EDW. pl. 133, 1750. *G. fraterculus* CASS.)

G. mexica'na. (Of Mexico.) SOUTHERN BROWN or SAND-HILL CRANE. COMMON BROWN or SAND-HILL CRANE. Adult with bare part of head forking behind to receive a pointed extension of occipital feathers, not reaching on sides below eyes, and sparsely hairy. Bill moderately stout, with nearly straight and scarcely ascending gonyx, that part of under mandible not so deep as the upper at the same place. Adult plumage plumbeous-gray, never whitening; primaries, their coverts, and alula, ashy-brown, little darker than the general plumage, shafts of primaries white. Young with head feathered, and plumage varied with rusty-brown, long persistent in full-grown birds. Nestlings quite reddish. Smaller than *americana*; larger than *canadensis*; length 3½ to 4 feet, averaging about 44.00 inches; extent 80.00; wing 22.00; tail

9.00; tarsus 9.50–10.50; bill along culmen 5.00–6.00, its depth at base 1.00; middle toe 3.50. This species has been said to lack tracheal convolutions, which is not true of the adult. The trachea is at first simple and straight, not entering sternum; in the adult, about 8 inches of windpipe is coiled away in the breast-bone, the anterior half of the keel of which is excavated to receive the folds (fig. 100). The disposition is the same as in *americana*, but much less extensive—8 inches as against about 27—a difference in degree, not of kind. Temperate North America, rare or irregular in the East except Florida and Georgia, abundant in the West and some of South; apparently breeds in sufficiently wild places throughout its range; now hardly on the Atlantic coast N. of Florida and Georgia. Eggs (2) cannot be distinguished from those of *G. americana* by color or texture of shell, or dimensions; the specimens examined average less capacious, and relatively more elongate, from 4.10×2.40 down to 3.65×2.10 , average near 3.90×2.60 ; but this series probably include eggs of *canadensis*. (*G. canadensis* of most authors, apparently not of LINN. 1758; commonly confounded with the foregoing, and by some formerly considered the young of *G. americana*: see AUD. folio pl. 261, 8vo, pl. 314. Probably *G. mexicana* BRISS. Orn. v, 1760, p. 380, and P. L. S. MÜLLER, 1776, p. 110, but this is not certain, though adopted by the A. O. U. The earliest unequivocal name is *G. pratensis* BARTR. 1791, p. 144 and p. 218, which I adopted in 2d–4th eds. of the Key, and now relinquish with reluctance to my colleagues. *G. poliophacu* WAGL. 1827.)

Family ARAMIDÆ: Courlans.

Consisting of a single genus, with two species, of warmer portions of America; closely allied to *Gruidæ* in essential points of structure, and forming a connecting link with *Rallidæ*. Osteological and pterylographic characters completely Crane-like; digestive system as in Rails; cæca 2, situate close together; oil-gland tufted; carotids 2; syringeal muscles one pair; femoro-caudal absent (formula B X Y). The general aspect and whole economy of these birds are as in Rails; the eggs are numerous. (A. O. U. List places this family under the suborder *Ralli*.)

ARAMUS. (Ety. ignot.) COURLANS. Bill twice as long as head, slender but strong, compressed, both mandibles grooved for about $\frac{2}{3}$ their length, contracted opposite nostrils, terminal portion enlarged and deurved. Nostrils long, linear, pervious. Head completely feathered to bill; tibiae half bare; tarsus scutellate anteriorly, as long as bill, longer than middle toe; toes cleft, hinder short, elevated, outer longer than inner; wings short, rounded, with falcate 1st primary clubbed at the end; inner quills folding over primaries when closed; tail short, of 12 broad feathers. The extralimital species is *A. scolopaceus*, smaller than ours, less spotty above and less streaky below.

A. giganteus. (Lat. *giganteus*, gigantic. The bird would be a giant if it were a Rail, but is a pygmy among Cranes.) GREATER COURLAN or COURLIRL. CRYING-BIRD. CLUCKING-HEN. CARAU. LIMPKIN. Chocolate-brown with a slight olivaceous or other gloss, paler on face, chin, and throat, most of the plumage sharply spotted or streaked with white. Downy young black, like the chicks of Rails. Length 24.00–28.00; extent 40.00–44.00; wing 12.00–14.00; tail 6.00–7.00; bill and tarsus, each, 3.50–5.00. Florida, some of the West Indies, and S. to Central America. This remarkable bird lives in marshes like a Rail, and is noted for its hoarse voeiferation; the nest is built on the ground or near it, in masses of reeds, grassy hummocks, or low thick bushes; the eggs are indefinitely numerous, like those of some Rails, about a dozen, subelliptical, 2.30×1.70 on an average but varying much, drab or buffy, spotted and splashed with brown and neutral tints. *Aramus pictus* of 2d–4th eds. of the Key, after *Tantalus pictus* BARTR. 1791, the earliest and best name. *Rallus giganteus* BP. 1825. *Aramus scolopaceus*, of authors, referring to the North American bird. *Aramus giganteus* BD. 1858, and A. O. U. 1886–95.

SUBORDER RALLI: RAILS AND RALLIFORM BIRDS.

(FULICARLE of the B. O. C.—RALLIFORMES of the KEY, 1884-90.—RALLI of the A. O. U.¹)

Represented in North America by the single family *Rallidæ*, and consisting only of this family, with the probable addition of the *Helionithidæ*, for the remarkable characters of which see p. 846. Exclusive of these, the characters of the suborder *Ralli* are those of the family *Rallidæ*.

Family RALLIDÆ: Rails, Crakes, Gallinules, and Coots.

This is a large and important family, abundantly represented in most parts of the world. They are paludicoline or marsh-inhabiting birds of medium to very small size, generally with compressed body and large strong legs (the muscularity of the thighs is very noticeable), enabling them to run rapidly and thread with ease the mazes of reedy marshes to which they are almost exclusively confined; while by means of their long toes they are prevented from sinking in mire or floating vegetation. The wings are never long and pointed as usual in *Limicolæ*, being in fact of the shortest, most rounded and concave form found among Waders; the flight is rarely protracted to any great distance, except during the extensive migrations which some of the species perform; and several of the generic types of Rails or Gallinules now existent have lost the use of their wings altogether. The tail is always very short, generally of 10 or 12 soft feathers, rarely 14. Details of bill and feet vary with the genera; but the former is never sensitive at the tip, as it is in Woodcocks, Snipes, and most true Sandpipers, and the hallux is longer and lower down than it is in Shore-birds. Nostrils pervious, of variable shape. Head completely feathered; general plumage ordinarily of subdued and blended coloration, lacking much of the variegation commonly observed in Shore-birds; sexes usually alike, and changes of plumage not great with age or season. The food, never probed for in the mud, but gathered from the surface of the ground or water, consists of a variety of aquatic animal and vegetable substances. The nest is a rude structure, placed on the ground, or in a tuft of reeds or other herbage; eggs numerous, generally variegated in color; young hatched clothed, and soon able to shift for themselves, these birds being thus ptilopædic and præcocial or nidifugous. The general habit is gregarious, and migratory; many species occur in vast multitudes, though their skulking ways, and the nature of their resorts, withdraw them from casual observation. Some species swim habitually; such being Coots, of the subfamily *Fulicinæ*.

More technical characters of the Rail type, especially in comparison with the Crane type of *Paludicolæ*, are found in the holorrhinal nasal bones, which are schizorhinal in the true Cranes, and in the notched instead of entire posterior border of the sternum. The plumage is normally aftershafted, and the oil-gland tufted. There are a gall-bladder, long caeca, and two carotids; the ambiens is present, the formula otherwise A B X Y. The skull is of course schizognathous, and there are no basiptyergoids. There appear to be upward of 150 species of *Rallidæ*, referred to 50 or more modern genera, and generally divided into 3 sub-families—Rails and Crakes in one, Gallinules in another, and Coots in the third; all three are fairly well represented in this country. But we have none of the strange flightless forms of Rails or Gallinules, to which a wholly exceptional interest attaches in view of the light they throw upon the problem of artificial extermination or natural extinction of birds. Although the ordinary Ralliform birds occur in profusion, some of them dispersed over wide areas, such is not the case with all. The type is an old one, and on the whole degenerate, and in a languishing state. Many fossil remains indicate the recent extinction of species of genera still multitudinously represented by living individuals, and of genera more or less nearly related to

¹ Except that the A. O. U. includes under *Ralli* the genus *Aramus*, which belongs to *Grues*.

those still extant; while some of the existent species appear to be upon the verge of extinction, and certain others have ceased to survive during the last century. The flightlessness which is so marked a cause or concomitant of such fate is an evidence of degeneracy; and this loss of use of the wings is associated with profound structural modifications of the anatomical parts concerned. Thus, in some cases the scapula makes an obtuse angle with the coracoid, as it does in no other carinate bird than the Dodo, and so the shoulder girdle approaches its condition in Ratite birds. Prominent among flightless *Rallidæ* are the Wekas of New Zealand, belonging to the genus *Ocydromus*, and sometimes made types of a subfamily *Ocydrominæ*. There are several species, whose synonymy has become somewhat involved, but one of the best known is that usually called *O. australis*. Another is *O. sylvestris*, lately or still lingering on Lord Howe Island. In similar plight is the Papuan *Megacrex inepta*, a species some 20 inches long, with a very poor tail as well as inept wings, and a frontal shield like a Gallinule's; and closely related is *Habroptila wallacei* of the Moluccan island of Gilolo, a medium-sized blackish species with a small frontal shield and fairly developed wings. *Tricholimnas lafresnayanus* of New Caledonia has by some been considered an Ocydrome. Several extinct birds, whose remains indicate relationship with the languishing forms just named, are *Erythromachus leguati* of Rodriguez, *Aphanapteryx broeckii* of Mauritius, and *A.* (or *Diaphorapteryx*) *hawkinsi* of the Chatham Islands. Among the Gallinules proper *Notornis alba*, late of Lord Howe and Norfolk Islands, a white species of large size with red legs and bill, has disappeared, and only a single specimen is known; but *N. mantelli* survives in New Zealand, though it was first described in 1848 from remains supposed to be those of an extinct species. It is probable that the fossil species of *Aptornis* as *A. otidiformis* have their modern representatives in such Gallinules as these. Two flightless Gallinules form the genus *Porphyriornis*, *P. nesiotis* of Tristan d'Acunha and *P. comeri* of Gough Island, both still living. *Leguatia gigantea* is one of the most remarkable of the recently extinct forms of Mauritius, and appears to have been a long-legged Gallinule or Coot. There are many fossil species of existent genera, and some of the extinct Ralliform birds go back to the Cretaceous, as the *Telmatornis* of our own Fauna. But aside from such peculiar living *Rallidæ* as have been named in this paragraph, our country furnishes excellent examples of the whole family.

Analysis of Subfamilies and Genera.

- RALLINÆ. *Rails and Crakes.* No frontal shield, feathers of forehead reaching bill. Toes simple. Body compressed.
- Bill slender, longer than head, curved, with long narrow nasal groove and linear nostrils *Rallus*
 Bill stout, not longer than head, straight, with broad nasal groove and oblong nostrils *Porzana*
 As in the last; wings longer, folding nearly to end of tail *Crex*
- GALLINULINÆ. *Gallinules.* A bare horny frontal shield. Toes simple or merely margined. Body less compressed.
- Toes without evident lateral margins; nostrils oval *Notornis*
 Toes with lateral margins; nostrils narrow *Gallinula*
- FULICINÆ. *Coots.* A bare horny frontal shield. Toes lobate. Body depressed. Nostrils narrow . . . *Fulica*

Subfamily RALLINÆ: Rails and Crakes.

The largest, and central or typical, group, containing strictly paludicole species. Compression of body is at a maximum; form blunt and thick behind, with a very short tip-up tail, and tapers to a point in front; the whole figure thus adapted to wedge through narrow places. Wings extremely short and rounded, and the ordinary flight appears feeble and vacillating, though the migrations of many species are very extensive. The tail has 12 feathers. The flank-feathers are commonly enlarged and conspicuously colored; thighs very muscular; tibiae generally if not always naked below; tarsi scutellate in front; toes long, cleft, without lobes or any obvious marginal membranes. The bill occurs under two principal modifications: in *Rallus* proper it is longer than head, slender, compressed, slightly curved, long-grooved, with linear nostrils; in *Porzana* and other genera of Crakes it is shorter or not longer than

head, straight, rather stout, with short broad nasal fossæ, and linear-oblong nostrils — altogether somewhat as in gallinaceous birds. The culmen more or less obviously parts antial extension of frontal feathers, but never forms a decided frontal shield, as in the Coots and Gallinules, though such a formation is indicated in the American genus *Linnopardalus*, for example. Of about 35 American species or varieties about one half occur in this country, to which must be added one straggler from Europe. There are some 25 Old World species.

Rails inhabit all temperate countries; they are remarkably distinguished by extreme narrowness or compression of body, which enables them to thread a way through the closest reeds and rushes of marshes where they always live. They are neither swift nor vigorous on wing. When flushed, a matter of some difficulty, they fly in so feeble and vague a way that it is not easy to understand how they make the extensive migrations for which, nevertheless, they are noted. They trust rather to their legs than to their wings in avoiding pursuit or escaping danger; probably no birds are more accomplished pedestrians. There is generally, if not always, a *slight* membrane at base of the toes, but nothing amounting even to semipalmation; nevertheless,

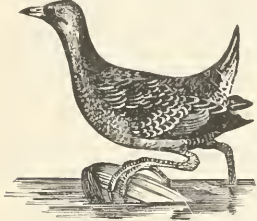


FIG. 596. — Carolina Rail. (From Tenney, after Wilson.)

some species swim short distances with ease. While not exactly gregarious, since they do not go in flocks that are actuated by a common impulse and the instinct of socialism, they nevertheless, through community of tastes and wants, frequent in immense numbers the marshes. Where they breed, and where they appear during migration, particularly the autumnal, the marshes appear full-stocked with them. Their cries are loud, dry, and harsh; in spring-time the marshes resound. They scream piteously when wounded and caught, and fight as well as they can with their strong claws. Their food consists of all sorts of aquatic animals small enough to be swallowed — little crabs, snails and other small mollusks, grubs, worms, and insects. They probably all live at times, and in a measure at least, upon the seeds and tender shoots of aquatic plants. They lay many light-colored but much-spotted, oval or elliptical eggs, in a rude flat nest, built of sticks, rush-stalks, or grasses, upon the ground. The young, of which more than one brood may be annually raised, are generally black in the downy state, whatever the color of adults. They appear to be of somewhat nocturnal habits, and probably migrate mostly by night. The flesh of some of our species is esteemed good eating, and great numbers are annually destroyed for the table, in the fall, when they are generally very fat.

RALLUS. (Low Lat. *rallus*, a rail, from *rasle*, *râle*, a rattling cry.) **RAILS.** **MARSH HENS.** Bill longer than head, slender, compressed, decurved, with long nasal groove extending beyond middle of bill. Nostrils linear, sub-basal. Hind toe not half as long as tarsus; the latter not longer than middle toe and claw. Wings, tail, and legs as in *Rallinæ* at large. Plumage variegated above, plain below, excepting conspicuously barred flanks, and lining of wings and tail. Sexes alike; young little different. Swamps and marshes exclusively. Eggs numerous, buff and spotted. Very clamorous in breeding season. We have 3 perfectly good species (and a fourth reaching the Texan border), and several others which are not so good, the nomenclature of which has incessantly shifted of late years. I present the following list in strict accordance with the 2d edition of the A. O. U. List, 1896, without feeling assured that the names of all the species or subspecies here given will survive the next effort to readjust them to the facts in the case. All changes made since the 2d edition of the Key, 1884, are duly noted.

Analysis of Species and Subspecies.

Large: length 12.00 or more; wing 5.00 or more; bill 2.00 or more.

Flanks gray, with narrow white bars. Above, olive-brown, olive-gray, or quite blackish, without chestnut on wings; below, pale rufous or ashy. (*Clapper Rails.*)

Upper parts olive-brown obscurely varied with olive-gray edges of the feathers; below with little rufous.	
West Indies and Mexico, to Texas only	<i>longirostris caribbæus</i>
Atlantic coast of the U. S. at large	<i>crepitans</i>
Louisiana only	<i>crepitans saturatus</i>
Upper parts olive-gray, with obscure dark stripes; below, breast quite rufous.	Pacific coast
	<i>obsoletus</i>
Upper parts quite blackish, with little grayish variegation.	Florida
	<i>scotti</i>
Flanks dusky, with broad white bars. Above, variegated with olive-brown and blackish; wing-coverts quite chestnut; below, rich rufous. (<i>King Rails</i> .)	
Wing 6.00 or more; tarsus over 2.00.	Eastern U. S.
	<i>elegans</i>
Wing scarcely 6.00; tarsus under 2.00.	Lower California
	<i>beldingi</i>
Small: length under 12.00; wing under 4.50; bill under 2.00.	
Colors as in <i>elegans</i>	<i>virginianus</i>

R. longirostris caribbæus. (Lat. *longirostris*, long-billed; *caribbæus*, of the Caribbæan Islands or Lesser Antilles.) CARIBBEAN CLAPPER RAIL. Above, dull brown and olive-gray in about equal amounts; breast dull cinnamon; flanks and axillaries grayish-brown, with narrow white bars, about 0.10 wide. Size of the common Clapper; bill the same in size and shape. West Indies and Gulf Coast of Mexico, N. to Galveston and Corpus Christi, Texas. This is the Antillean and northern form of true *R. longirostris* of South America, differing mainly in size and shape of the bill; for in *longirostris* proper, notwithstanding the name, the bill is the shortest in this group of "Clapper" Rails, from 1.90 to 2.10 along culmen, averaging not over 2.00, almost straight, and comparatively stout, with a squarish cross-section at base, and greatest width across its under edge; depth at base at least 0.35-0.40. This character of the bill is the basis of *R. crassirostris* LAWR. 1861, a synonym of *longirostris* proper. The northern form barely reaches our Texan border, and is not found on the Atlantic coast. *R. longirostris caribæus* (read *caribbæus*) RIDGW. Bull. Nutt. Orn. Club, July, 1880, p. 140; not admitted in the Key, 2d and 3d eds. 1884-87; COUES, Key, 4th ed. 1890, p. 905; A. O. U. List, 2d ed. 1895, No. [211.2].

R. crepitans. (Lat. *crepitans*, erepitating, clattering. Fig. 597.) CLAPPER RAIL. COMMON CLAPPER. MARSH CLAPPER. SALT-WATER MARSH-HEN. SEDGE-HEN. MEADOW-HEN. MUD-HEN. Adult ♂ ♀: Above, variegated with dark olive-brown and pale olive-ash, the latter edging the feathers, the variegation dull and blended. Below, pale dull ochrey-brown, whitening on throat, frequently ashy-shaded on breast, without decided cinnamon-brown shade. Flanks, axillars, and lining of wings fuscous-gray, with sharp narrow white bars. Quills and tail plain dark brown, without chestnut on coverts. Eyelids and short superciliary line whitish.

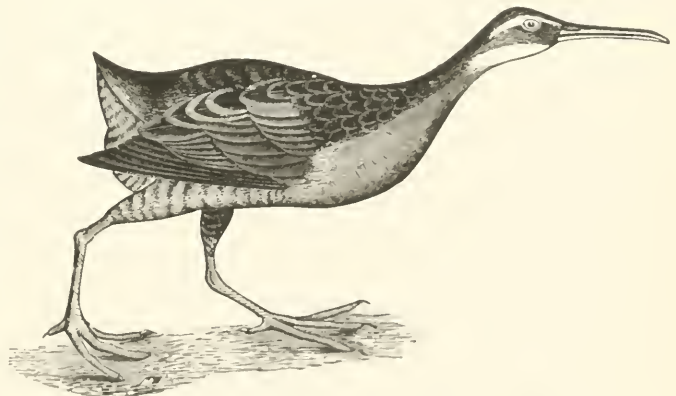


FIG. 597. — Clapper Rail, reduced. (Altered from Lewis.)

The general tone is that of a gray bird, without any reddishness. Young mostly soiled whitish below; when just from the egg entirely sooty-black. Length 14.00-16.00; extent about 20.00; wing 5.00-6.00; tail 2.00-2.50; bill 2.00-2.50; tarsus 1.67-2.00; middle toe and claw 2.00-2.33. ♀ smaller than the ♂. Salt marshes of Atlantic and Gulf States, extremely abundant southerly; N. regularly to the middle districts, sometimes to Massachusetts. Resident from New Jersey southward. Breeds from Connecticut southward, and in profusion in marshes of the Carolinas, etc., where its clattering is almost

incessant during the mating season. Nest a rude platform of reeds and grasses just out of the water. Eggs 6-15, averaging 1.67×1.12 , whitish, creamy, or buff, variously speckled and blotched with reddish-brown, with a few obscure lavender marks. This is the original and only genuine "Clapper" Rail, *R. crepitans* GM. 1788, and of most authors, identified in the Key, 1st ed. 1872, p. 273, with *R. longirostris* BODD. 1783. *R. longirostris crepitans* RIDGW. Bull. Nutt. Orn. Club, v, 1880, p. 140; COUES, Key, 2d and 3d eds. 1884-87, p. 672; A. O. U. List, 1st ed. 1886, No. 211; RIDGW. Man. 1887, p. 137; *R. crepitans* SENNETT, Auk, April, 1889, p. 165; COUES, Key, 4th ed. 1890, p. 905; A. O. U. List, 2d ed. 1895, No. 211.

R. c. waynei. (To Arthur T. Wayne, of Mt. Pleasant, S. C.) WAYNE'S CLAPPER RAIL. Similar to *crepitans*; general color darker; under parts more ashy; under tail-coverts with fewer markings. North Carolina to Florida; evidently a connecting link with the next. BREWSTER, Proc. N. E. Zool. Club, i, June 9, 1899, p. 50; Auk, Oct. 1899, p. 339.

R. scottii. (To W. E. D. Scott, who discovered it.) FLORIDA CLAPPER RAIL. SCOTT'S CLAPPER. BLACK CLAPPER. Above, sooty-blackish, only slightly varied with olive-gray edgings of the feathers; below, dark gray with more or less cinnamon tinge; axillaries and flanks slate-gray, distinctly barred with white. Size of *crepitans* proper, from which distinguished by its blackishness, in which respect it agrees with various other Floridan birds. Salt marshes of W. Florida. *R. longirostris scottii* SENNETT, Auk, July, 1888, p. 305; *R. scottii* ID. *ibid.* Apr. 1889, p. 166; COUES, Key, 4th ed. 1890, p. 905; A. O. U. List, 2d ed. 1895, No. 211. 1.

R. c. saturatus. (Lat. *saturatus*, saturated, satiated, *i. e.* dark-colored.) LOUISIANA CLAPPER RAIL. In general similar to *crepitans*; above, olive-gray or ashy, broadly striped with brownish-black; breast dull cinnamon. "Louisiana": probably untenable even as a subspecies. *R. longirostris saturatus* HENSHAW, MS. RIDGW. Bull. Nutt. Orn. Club, v, 1880, p. 140; COUES, Key, 2d ed. 1884, p. 672; A. O. U. List, 1st ed. 1886, No. 211 *a*; RIDGW. Man. 1887, p. 137. *R. crepitans saturatus* SENNETT, Auk, Apr. 1889, p. 166; COUES, Key, 4th ed. 1890, p. 905; A. O. U. List, 2d ed. 1895, No. 211 *a*.

R. obsoletus. (Lat. *obsoletus*, obsolete; referring to the markings of the upper parts in comparison with those of *R. elegans*.) CALIFORNIA CLAPPER RAIL. Back and scapulars grayish-olive, indistinctly striped with dusky; breast deep cinnamon. General aspect of *crepitans*, but quite reddish below. Wing 6.50; bill 2.25-2.50, its least depth 0.33; tarsus 2.10-2.25. Salt marshes of the Pacific coast, N. to Oregon and probably to Washington, S. to Lower California. *R. elegans* var. *obsoletus* RIDGW. Am. Nat. viii, 1871, p. 111; *R. obsoletus* RIDGW. Bull. Nutt. Orn. Club, v, 1880, p. 139; Man. 1887, p. 137; A. O. U. Lists, 1st and 2d eds. 1886 and 1895, No. 210; SENNETT, Auk, Apr. 1889, p. 166. *R. longirostris obsoletus* COUES, Key, 2d-4th eds. 1884-90, p. 672, probably in error. This is one of the best marked forms, which may be said, in short, to be like *crepitans* above and *elegans* below, and left to stand by itself.

R. le'vipes. (Lat. *levis* or *levis*, smooth; *pes*, foot.) LIGHT-FOOTED RAIL. Described as much smaller than either *obsoletus* or *beldingi*, with slenderer bill. Darker above than *obsoletus*; breast and sides of neck cinnamon-rufous instead of grayish-cinnamon; ground color of flanks darker; superciliary streak white instead of rusty. From *beldingi* it is said to differ in having the back less streaked; breast less pinkish or salmon colored; flanks browner, without dusky bars bordering the broader white ones; and white instead of rusty superciliary streak. A gray postocular patch. Newport Landing, Los Angeles Co., Cal. BANGS, Proc. N. E. Zool. Club, i, June 5, 1899, p. 45; Auk, Oct. 1899, p. 339.

R. e'legans. (Lat. *elegans*, choice.) KING RAIL. GREAT RED-BREASTED RAIL. FRESH-WATER MARSH-HEN. With a general resemblance to *crepitans*, but larger and much more brightly colored. Adult ♂ ♀: Above, distinctly streaked with brownish-black and tawny-olive, the darker color being the central field of each feather; becoming rich chestnut on wing-coverts,

and plain dark brown on hind-neck and top of head. Below, rich rufous or cinnamon-red, brightest on breast, fading on throat and belly; a line of the same over eye, and dusky line through eye; lower eyelid white. Flanks and lining of wings blackish, broadly and distinctly barred with white; some of the crissal feathers similar. Specimens vary much in richness of



FIG. 598. — Virginia Rail.

tints and distinctness of markings, but the reddish and streaky tone is always quite different from the dull blended colors of *crepitans*. Length 17.00-19.00; extent 23.00-25.00; wing 6.00-7.00; bill 2.10-2.50; tarsus 2.30; middle toe and claw about the same. Eastern U. S., rather southerly, Texas to the Middle States regularly, New England and Ontario casually; in the

interior to Missouri, Kansas, Nebraska, Iowa, Wisconsin, and Michigan. Winters in the South. Inhabits preferably swamps and marshes above tide-water. Nesting similar to that of *crepitans*; eggs not distinguishable.

R. bel'dingi. (To Lyman Belding.) BELDING'S RAIL. Most like *R. elegans*, but darker and richer colored throughout, the white bars of the flanks much narrower, the blackish bars very distinct. Wing 5.70; tail 2.50; bill 2.15; tarsus 1.90. Lower California, La Paz, Espiritu Santo Island, Gulf of California. RIDGW. Pr. U. S. Nat. Mus. v, 1882, p. 345; Key, 3d ed. 1887, p. 888; A. O. U. Lists, 1886 and 1895, No. 209.

R. virginianus. (Fig. 598.) VIRGINIA RAIL. LITTLE RED-BREASTED RAIL. SMALL MUD-HEN. Coloration exactly as in *elegans*, of which it is a perfect miniature. Length 8.50-10.50; extent about 14.00; wing 4.00, always under 4.50; tail 1.50; bill 1.35-1.65; tarsus 1.25-1.50; middle toe and claw 1.50-1.75. Temperate North America, chiefly eastern U. S., migratory, abundant, both in fresh and salt marshes. Breeds commonly in New England and corresponding latitudes; winters in Southern States chiefly and S. to Cuba and Guatemala. Although a regular migrant along the Atlantic coast, it never occurs in such immense numbers as the Carolina Rail. Eggs like those of *elegans* in color, but much smaller about 1.25×0.95 . They agree in size nearly with those of *Porzana carolina*, but the latter are greenish or drab or deep buff, not buffy white or creamy. The bird is well known to gunners, who always distinguish it from the King Rail and the Clapper, but sometimes call it by the name of the former, with some qualifying term, and sometimes stoutly maintain that it is the male of the Carolina Rail.

PORZANA. (Ital. *porzana*, Venetian name of *P. porzana*.) CRAKES. Bill shorter or not longer than head, stout, high and compressed at base, tapering, obtuse; nasal fossæ ample. Nostrils linear-oblong, near middle of bill. Otherwise generally as in *Rallus*; hind toe longer. Tarsus moderately shorter than middle toe and claw. Plumage of upper parts spotty as well as streaky. Small. Sexes alike; young different. The three North American species are very different (subgenerically), but *carolina* closely resembles *porzana* of Europe.

Analysis of Subgenera and Species.

Small: length 8.00 or more; wing over 4.00. (*Subgenus* PORZANA.)

Adult with face gray and breast spotted. (European straggler) *porzana*

Adult with face black and breast dark slate-gray, not spotted *carolina*

Smaller: length about 6.50; wing 3.00 or more; yellowish-brown, barred with white. (*Subgenus* COTURNICORS)

noveboracensis

Smallest: length about 5.50; wing scarcely 3.00; blackish, speckled with white and chestnut. (*Subgenus* CRECISCUS)

jamaicensis

P. porzana. EUROPEAN SPOTTED CRAKE. Adult ♂ ♀: Above, dark reddish-brown shaded with olive; hind-neck finely dotted, other upper parts spotted and shortly striped with white, and marked with blackish; no white edging of inner secondaries. Below, slate-gray, fading to whitish on belly, breast spotted and flanks narrowly barred with white, crissum buff, upper throat not blackish. Quills and tail dark olive-brown. Iris reddish-brown; bill orange, red at base and dusky at tip; legs yellowish-green, livid on joints. Length about 8.50; wing 4.50; tail 2.00; bill 0.85; tarsus 1.45; middle toe and claw 1.75. Young have the chin whitish. Europe. Only North American as occurring in Greenland. (*P. maruetta* of former editions of the Key, — the usual name.) See Ank, 1889, p. 217.

P. carolina. (Figs. 599, 600.) CAROLINA CRAKE. CAROLINA RAIL. COMMON RAIL. LITTLE AMERICAN WATER-HEN. CHICKEN-BILLED RAIL. MEADOW CHICKEN. RAIL-BIRD. SORA. SOREE. "ORTOLAN." Above, olive-brown, varied with black, with numerous sharp white streaks and specks; flanks, axillars, and lining of wings barred with white and blackish; belly whitish; crissum rufescent. Adult ♂ ♀: Face and central line of throat black; rest of throat, line over eye, and especially breast, more or less intensely slate-gray;

sides of breast usually also with some obsolete whitish barring and speckling. Young: Without this black, throat whitish, breast brown. Chicks: Blackish, the down bristling with jet, and a beard of orange bristles on the throat. Length 8.00-9.00; extent 12.00-13.00; wing 4.00-



FIG. 599.—Carolina Rail.

4.50; tail about 2.00; bill 0.67-0.75; tarsus 1.33; middle toe and claw 1.67. Temperate North America, exceedingly abundant during the migration in the reedy swamps of the Atlantic States, in August and September, when tens of thousands are killed every year. Breeds

from the Middle States and corresponding latitudes northward, less common on Pacific than Atlantic coast; winters in Illinois, California, and Southern States, even to South America; taken in Greenland and Europe. The eggs are spotted like those of the foregoing

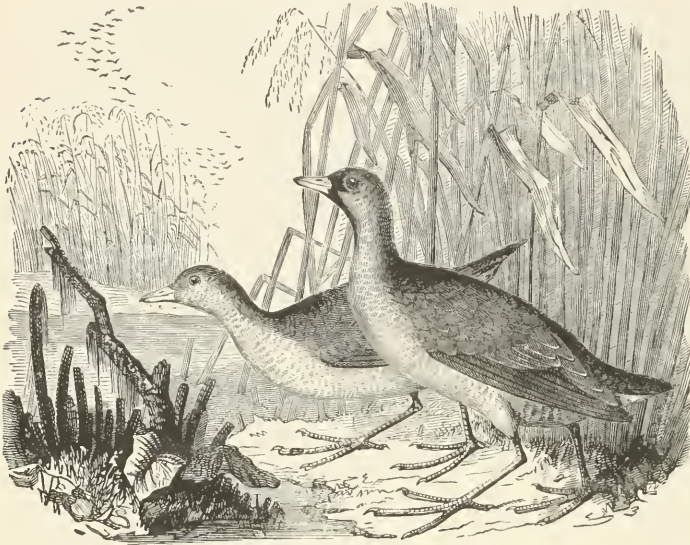


FIG. 600. — Carolina Rail. (From Lewis.)

Ralli, but are readily distinguished by their strong drab ground-color instead of the white or creamy and pale buffy of the former. They are rather smaller than those of *R. virginianus*, and perhaps more obtuse, measuring about 1.20 by 0.90; the number varies from 8 to 15. This is the Rail of sportsmen. It is also called *sora* or *soree*; the word is colloquial and local; *soree* seems to be the older form; it is used by Thomas Jefferson, and goes back to Catesby, 1731,

but *sora* is commoner now, though I have always heard both spoken; origin and meaning unknown. The word *ortolan* has a curious connection with this species. It is Italian and French, equal to the Latin *hortulanus*, relating to a garden: the true *Ortolan* is *Emberiza hortulana*, a European Bunting, esteemed a great delicacy by gourmets; and our Crake has been called "ortolan" for no better reason than that it is also edible and sapid! The same name is frequently applied to the Bobolink or Reed-bird, *Dolichonyx oryzivorus*, because it is found abundantly in the same marshes in fall, and sells in the same restaurants as the same bird as the Rail, the two being brought in together by gunners.

P. noveboracensis. (Low Lat. of *Noreboracum*: *i. e.* New York.) **YELLOW CRAKE** or **RAIL.** Adult ♂ ♀: Above, streaked with blackish and brownish-yellow, thickly marked with narrow white semicircles and transverse bars. Below, pale brownish-yellow fading on belly, deepest on breast, where many feathers are dark tipped; flanks blackish with numerous white bars; erissun varied with black, white, and rufous. Lining of wings and their secondaries white. A brownish-yellow superciliary line, and dark transocular stripe. Small: Length 6.00–7.00; wing about 3.25; tail 1.50; bill 0.50; tarsus 0.87; middle toe and claw 1.12. Eastern North America chiefly, not abundant; N. to Nova Scotia and Hudson's Bay, but seldom observed in New England N. of Massachusetts, or W. of the Mississippi Valley from Texas to Minnesota, though it has been taken in Utah, Nevada, and California; but it is not common, is very secretive like other Rails, readily eludes observation, and its distribution may be more general than it is known to be; it winters in the Southern States, the Bermudas, and Cuba. Eggs about 6, perhaps up to 12, warm, buffy-brown, marked mostly at the great end with reddish-chocolate dots and spots; 1.15×0.85 to 1.05×0.80 ; shape as in the foregoing.

P. jamaicensis. (Of Jamaica.) **LITTLE BLACK CRAKE** or **RAIL.** Adult ♂ ♀: Upper parts blackish, finely speckled and barred with white, hind neck and fore back dark chestnut, with similar white markings. Head and under parts dark slate color, the lower belly, flanks,

and under wing- and tail-coverts barred with white. Quills and tail-feathers with white spots. Young: Similar, paler below than the adults, whitening on the throat, and top of head rather brownish than blackish. Chicks in down said to be entirely blackish. Very small: Length 5.00–6.00; wing 2.75–3.00; tail 1.35; tarsus 0.80; bill 0.50. Central America and the West Indies, not often found in the U. S., being one of our rare birds; although its secretiveness and small size are doubtless responsible in part for its rarity. Observed N. to Massachusetts, southern Ontario, northern Illinois, Minnesota, Nebraska, Kansas, and Oregon, thus extending across to the Pacific. There are breeding records for Kansas and Illinois as well as for the Atlantic States. Eggs from New Jersey and Connecticut are altogether different from those of the Sora, or of the Yellow Crake, being creamy-white, sprinkled all over with fine dots of rich, bright reddish-brown, and with a few spots of some size at the great end; most like the more finely speckled examples of the eggs of the large *Ralli*; dimensions 1.05 × 0.80; number 6–9 or more.

P. j. coturni'eulus. (Lat. dim. of *coturnix*, a quail.) FARALLONE BLACK CRAKE. Like the last; rather smaller, wing 2.50; more uniform in color, back without white specks. Farallone Islands, coast of California, one specimen; perhaps astray from the Galapagos Islands. In any event, the status of the alleged subspecies is dubious among North American birds.

CREX. (Gr. κρέξ, *krex*, Lat. *crex*, a crake; referring to the creaking notes.) LAND RAILS. General character of *Porzana*. Wings much longer, folding nearly to end of tail. Tarsus relatively shorter. Bill stouter, with an angle at gonys. Tail pointed, with narrow rectrices. Plumage above streaky, but not spotty; lining of wings unmarked.

C. crex. EUROPEAN LAND RAIL. CORN CRAKE. DAKER-HEN. Adult ♂ ♀: Upper parts blackish-brown, variegated with brownish-yellow; wing-coverts both above and below rusty-reddish or chestnut; quills rufous-brown. Below, drab or brownish of varying tone, more whitish on throat and belly; flanks and crissum barred with reddish-brown and white. Line over eye like under parts; a dark stripe through eye. Bill, eyes, and legs pale brown. Length 10.00–10.50; wing 5.50–6.00; tail 2.00; bill 0.80–1.00; tarsus 1.60. Europe; casual in Greenland, Nova Scotia, Newfoundland, Maine, New York, New Jersey, and the Bermudas. (WEDDERB. Zool. 1849, p. 2591; CASS. Pr. Phila. Acad. vii, 1855, p. 265; REINH. Ibis, 1861, p. 11; Bd. An. Journ. Sci. xli, 1866, p. 339; FREKE, Zool. v, 1881, p. 374; see also, for records since 2d ed. of the Key, Forest and Stream, xxii, 1884, p. 44 and p. 303; Auk, 1886, p. 435; 1888, p. 177; 1896, p. 173; 1899, p. 75). (*C. pratensis*, p. of former eds. of the Key — the usual name.)

Subfamily GALLINULINÆ: Gallinules.

Forehead shielded by a broad, bare, horny plate, a prolongation and expansion of the culmen. Bill otherwise much as in the shorter-billed Rails or Crakes, like *Porzana*, but generally stouter, in some species extremely deep and heavy; general form much the same, though the body is not so compressed; toes long, simple, or slightly margined. Gallinules are Rail-like birds, of similar habits, inhabiting marshes; they agree with Coots in possessing a frontal shield, but the feet are not lobate, nor is the body depressed, and the species swim no better than Rails. Though quite distinct from *Fulicine*, the *Gallinuline* shade directly into the *Ralline*, so that recognition of the subfamily is somewhat conventional; but most of the species are well marked by the frontal shield, which is hardly approached by any Rails or Crakes, and the grouping of such birds together is a practical convenience. Among the Gallinules are some of the most interesting and notable birds of the Ralline type, as already remarked upon; some of the richest and most elegant coloration, as the Hyacinths, Porphyrios, or Sultanas. *Gallixer cinerea* is carinate as well as galeate. In its current acceptation, the subfamily contains about 30 species still living in various parts of the world, besides some extinct ones, the whole being referred to 12 or more genera; two of which, very distinct from each other, occur in North America.

GALLINULA. (Lat. *gallinula*, dimin. of *gallina*, a hen.) GALLINULES. MOOR-HENS. WATER-HENS. MUD-HENS. Bill not longer than head, stout at base, tapering, compressed,

the culmen running directly up on forehead and expanding into a frontal plate of different shape in different species. Nostrils near middle of bill, *linear*. Feet large and stout; tibiae naked below; tarsus shorter than middle toe without claw, moderately compressed, scutellate, but reticulate on inner posterior part; toes very long, outer longer than inner, *with* an evident though slight marginal membrane; claws long, slender, little curved, acute. Wings short and rounded, but ample. Tail very short, of 12 weak feathers, with long ample under coverts, as in Rails. Plumage not rich blue, etc. Several species of various countries.

G. galeata. (Lat. *galeata*, helmeted. Fig. 602.) COMMON AMERICAN GALLINULE. FLORIDA GALLINULE. RED-BILLED MUD-HEN. Adult ♂ ♀: Head, neck, and under parts grayish-black, darkest on the former, paler or whitening on belly. Back brownish-olive. Wings and tail dusky; crissum, edge of wing, outer web of 1st primary, and stripes on flanks, white. Bill, frontal plate, and ring round tibia red, the former



FIG. 601. — Purple Gallinule. (L. A. Fuertes.)

tipped with yellow; tarsi and toes greenish, the joints bluish; eyes red or brown. Young: Similar, but lacking bright colors of bill and legs, the former simply greenish or brownish; under parts extensively whitish, and consequently the white flank-stripes unmarked; frontal shield undeveloped; chicks in down black, jetty above and sooty below, with silvery beards. Length 12.00–14.00; extent 20.00–22.00; wing 6.50–7.50; tail 3.00; gape of bill about 1.50; the culmen and frontal shield together about 1.75 when full grown; tarsus 2.25. S. Atlantic and Gulf States, resident and abundant coastwise. N. in summer to New England, Ontario, Minnesota, etc., and on the Pacific side to San Francisco; West Indies, Bermuda, Central America, and much of South America. Nidification exactly that of the coot (beyond). Eggs 8–12–14, 1.75 × 1.20, buff or brown of variable shade, spotted with dark brown. This is a well-known bird of the marshes, with a great number of local names, too much mixed up with those of Rails and Coots to be worth spreading on my page; it is occasionally called “King Ortalan,” but with most natives passes for a Mud-hen.

IONORNIS. (Gr. *ἰον*, *ion*, a violet; *ὄρνις*, *ornis*, a bird; alluding to the rich blue color.)
SULTANA GALLINULES. **HYACINTHIS.** **PORPHYRIOS.** General character of *Gallinula*; bill very stout and high, shorter than head, the small nostrils near its middle, *oval*. Tarsi longer than in *Gallinula*, in comparison with the toes, and scutellate on inner posterior aspect. Toes

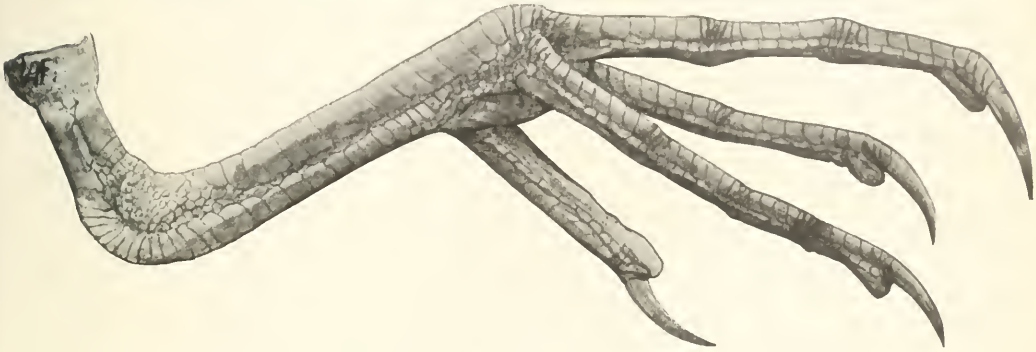


FIG. 602. — Florida Gallinule. (L. A. Fuertes.)

without lateral margins. Plumage beautiful with rich blue, etc. A small genus of two American species, closely related to the larger genus *Porphyrio*, which contains several Old World species of Purple Water-hens or Sultanas.

I. martí'nica. (Of Martinique. Fig. 601.) **PURPLE GALLINULE.** Adult ♂ ♀: Head, neck, and under parts beautiful purplish-blue, blackening on belly; sides and lining of wings bluish-green; crissum white. Above, olivaceous green, cervix and wing-coverts tinted with blue. Quills and tail-feathers blackish, glossed on outer webs with greenish. Frontal shield blue; bill carmine, tipped with yellow; legs yellow. The frontal shield is obovate, with a point behind. Young with head, neck, and lower back brownish; under parts mostly white, mixed with ochrey. Length 12.00–14.00; extent about 22.00; wing 6.50–7.50; tail 2.50–3.00; bill from gape about 1.25; along culmen, and including frontal shield about 1.90, but very variable in this measurement; tarsus 2.25 or more; middle toe and claw about 3.00. S. Atlantic and Gulf States, N. usually to Nova Scotia, New England, Ontario, Nebraska, Wisconsin, etc.; resident southerly. Also inhabits much of Central and South America, and the West Indies. Eggs 6–10 or more, creamy or very pale buff, sparingly spotted and dotted with brown and neutral tint, especially about the larger end; 1.55 × 1.15.



FIG. 603. — Frontal shield of a species of Coot.

Subfamily FULICINÆ: Coots.

Bill and frontal plate much as in Gallinules. Body depressed; under plumage thick and duck-like, to resist water. Feet highly natatorial; toes, including hinder, *lobate*, being furnished with large semicircular membranous flaps. Coots are eminently aquatic birds, swimming with ease, by means of their lobate feet, like Phalaropes and Grebes; but this ability results from very slight modification of a structure shared by Rails and Gallinules. There are about 12 species, of both hemispheres, distinguished, among other characters, by size and shape of the frontal shield. That figured (fig. 603) is of an exotic species, much larger than that of *Fulica americana*, and differently shaped. One species (*F. cornuta*) is remarkable for

having the forehead singularly carunculate; in another (*F. cristata*) the shield is corrugated into a crest; the others more or less closely resemble ours.

FULICA. (Lat. *fulica*, or *fulix*, a coat, from the sooty color; *fuligo*, soot.) Character as above. Tarsi shorter than middle toe, stout, very broadly scutellate. Nostrils linear, in a

broad fossa, toward middle of bill. Tibiæ bare below. Wings moderate, rounded, the 2d and 3d quills usually longest. Tail very short, 12-feathered. Plumage dark slaty color; sexes alike.

F. americana. (Figs. 604, 605.) AMERICAN COOT. WATER-HEN. MUD-HEN. MARSH-HEN. MOOR-HEN. MEADOW-HEN. POND-HEN. MUD-COOT. WHITE-BILLED COOT or MUD-HEN. IVORY-BILLED COOT. WHITE-BILL. HEN-BILL. CROW-BILL. SEA-CROW. POND-CROW. CROW-DUCK. BLUE PETER. FLUSTERER.



FIG. 604. — American Coot, nat. size. (L. A. Fuertes.)

SPLATERER. SHUFFLER. PELICK. PULL-DOO (POULE D'EAU). Adult ♂ ♀: Dark slate-color, paler or grayish below, blackening on head and neck, tinged with olive on the back.

Crissum, whole edge of wing, and tips of secondaries, white. Quills dusky; outer edge of 1st primary white. Tail blackish. Bill white or flesh-color, marked with reddish-black near end and at base of frontal plate; feet dull olivaceous or livid yellowish-green; iris carmine; claws black. Young similar, paler and duller, with much white on under parts; the shield undeveloped; the bill obscured with a dingy shade, and without the reddish spots. Length 14.00–16.00; extent 23.00–27.00; wing 7.00–8.00; tail 2.00; bill from gape 1.25–1.50; tarsus about 2.00; middle toe and claw about 3.00. The frontal plate is much smaller in this than in some other species, in which it covers all the forehead; it is said to swell in the breeding season after a shrunken winter state. Entire temperate North America, even to Alaska and sometimes Greenland; Mexico, Central America, and West Indies; abundant; breeds throughout its range; migratory northerly; resident in the South. Inhabits during the breeding season, and mostly at other times, reedy sloughs, pools, and sluggish streams, seeking safety in concealment rather than by flight. Nesting most like that of Grebes; a hollowed heap of bits of dead reeds, just out of the water, sometimes "floating" in the sense that the mass of broken-down reeds upon which it rests lies on the water, but sometimes on dry ground a little away from water. Eggs about a

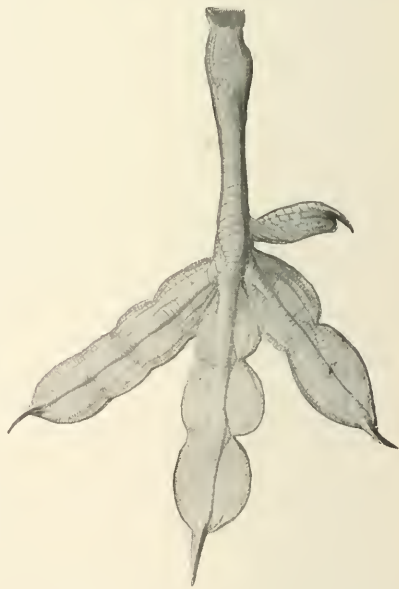


FIG. 605. — American Coot, right foot. (L. A. Fuertes.)

dozen, $1.75-2.00 \times 1.20-1.35$, shaped like an average hen's egg, clear clay-color, uniformly and minutely dotted with dark brown and neutral tint, usually like pin-heads, sometimes in larger blotches. The young hatch covered with black down, fantastically striped with bright orange-red, the bill vermilion tipped with black.

F. a'tra. (Lat. *ater, atra, atrum*, black.) EUROPEAN COOT. Like the last: bill and frontal shield entirely white; edge of wing and of 1st primary white, but no white on the crissum. Europe, etc.; only North American as casual in Greenland.

Order HERODIONES: Herons and their Allies.

Altricial Grallatores: including Herons, Storks, Ibises, Spoonbills, and related birds. The species average of large size, some standing among the tallest of Carinate birds, with compressed body and extremely long neck and legs. The neck has usually 15-17 vertebræ, and is capable of very strong flexion in S-shape. The tibiæ are naked below; the podotheca varies. The general pterylosis is peculiar, in the presence, in central groups of this order, of powder-down tracts, and in some other respects. The oil-gland is present, and tufted. A part if not the whole of the head is naked as a rule, as much of the neck also frequently is. The toes, usually long and slender, are never fully webbed. The hallux is more or less lengthened, and either little elevated, or else perfectly insensory. A foot of insessorial character results; the species frequently perch on trees, where the nest is usually placed. The physiological nature is altricial and usually psilopædic; the young hatch naked, unable to stand, and being fed in the nest. The food is fish, reptiles, mollusks, and other animal matters, generally procured by spearing with a quick thrust of the bill, given as the birds stand in wait, or stalk stealthily along; hence they are sometimes called *Gradatores* (stalkers). The bill normally represents the "cultirostral" pattern; it is as a rule of lengthened wedge shape, hard and acute at end if not hard throughout, with sharp cutting edges; enlarging regularly to the base, where the skull contracts gradually in sloping down to meet it; but deviations from such typical shape are frequent and striking. It is firmly affixed to the skull, and always longer than the head. The nostrils are small, elevated, surrounded by bone and a horny sheath, with little if any soft skin. The wings normally show a striking difference from those of *Limicola*, in being long, broad, and ample. The tail is short and few-feathered, usually having 12 rectrices.

The cranial characters, though varying to some extent, agree in several important respects: palatal structure desmognathous, but without keel along line of junction; maxillo-



FIG. 606. — The Bittern's Bog. (From Michelet.)

palatines large and spongy; nasal bones typically holorhinal (schizorhinal in *Ibides*, in which, also, the angle of the mandible is produced and recurved, being normally truncate). Sternum ample, once or twice notched on each side behind; cervical vertebræ numerous, usually 15-17. The trachea and bronchi present some remarkable dispositions, but here and there only, such conformations being therefore not characteristic of the order; carotids double (in *Botaurus* (fig. 93) unique, as far as known, in uniting at once); intestinal cæcum or two cæca present. Different genera vary in the classificatory muscles of the leg, the ambiens, femoroceadal, and its accessory being present or absent.

The group here noted corresponds to *Pelargomorpha* of Huxley, *Ciconiiformes* of Garrod (minus *Cathartidæ*!), *Grallatores altinæ* of Sundeval, and includes *Herodiæ*, *Pelargi*, and *Hemiglottides* of Nitzsch, — respectively the *Heron* series, the *Stork* series, and the series of *Ibises* and *Spoonbills*. The first of these differs more from the others than these do from one another. As usual, there are certain outlying genera, types of families or subfamilies, the position of which is not assured. But appearances are that the questionable forms will fall in one or another of the three series indicated. All of these series, to be conventionally rated as suborders or superfamilies, are represented in North America, where also all the families occur, excepting *Balænicipitidæ* and *Scopidæ*.

SUBORDER IBIDES: IBIS SERIES.

Skull schizorhinal; angle of mandible produced and recurved; no basipterygoids; occipital foramina. Ambiens, femoroceadal and accessory, semiteudinosus and accessory, and postacetabular portion of tensor fasciæ, present; pectoralis major simple; biceps cubiti connected with tensor patagi longus. Sternum double-notched on each side; carotids double, normal; 2 cæca; tufted oil-gland. Tongue extremely small. Plumage without powder-down; feathered tracts broad; spinal pterygia not defined on back. Tarsi reticulate (rarely scutellate); hallux not fairly insistent; claws resting upon a horny "shoe;" inner edge of middle claw scarcely pectinate. Side of upper mandible with a deep narrow groove for its whole length; bill otherwise very differently shaped in the two families, *Ibididæ* and *Platalidæ*, of which this series consists.

Family IBIDIDÆ: Ibises.

Bill very long and slender, compressed-cylindric, curved throughout, deeply grooved nearly or quite to tip, which is rather obtuse, not notched; end of culmen rather broad and depressed, in the rest of its extent the culmen narrow and rounded; interramal space narrow, acute, produced nearly to tip of bill. (Whole bill thus closely resembling a Curlew's; one of our species is frequently called "Spanish Curlew.") Legs rather short (for *Herodiones*). Claws compressed, acute; the middle may be dilated and jagged, but is not fairly pectinate. Hallux sub-insistent. Tarsi reticulate, or scutellate in front only. Anterior toes more or less webbed at base. Pterylosis more or less completely Stork-like, lacking powder-down; head more or less extensively denuded. Birds of medium and large size (among *Herodiones*), long-legged, long-necked, and small-bodied, with ample, more or less rounded wings, of which the inner quills are very large; tail very short, usually if not always of 12 broad rectrices. Chiefly lacustrine and palustrine inhabitants of the warmer parts of the globe, feeding on fish, reptiles, and other animals. Sexes alike; young different. There are about 32 species of Ibises, among which minor details of form vary considerably, nearly every one of them having been made type of some genus, according to shape of bill, character of head-feathering, condition of tarsal envelop, etc. Some 18 genera are now in use. The two leading modifications are, tarsus entirely reticulate, and tarsus scutellate in front; our genera illustrate the latter.

Obs. Our Wood "Ibis," so-called, is a Stork. See beyond, p. 869.

Analysis of Genera and Species.

Head bare on sides and beneath. Claws scarcely curved. Colors dark, metallic, greenish and chestnut	PLEGADIS
Face without white feathers in adult	<i>autumnalis</i>
Face surrounded by white feathers in adult	<i>guarauana</i>
Head extensively bare on front, sides, and beneath. Claws curved. Colors light, red or white	GUARA
Adults white	<i>alba</i>
Adults scarlet	<i>rubra</i>

PLE'GADIS. (Gr. πλῆγᾰς, *plegas*, a scythe, sickle.) GLOSSY IBISES. Bill twice as long as head, or more, regularly decurved; both mandibles grooved on sides for their whole length; culmen prominent from near base for most of its length, flattened and grooved on terminal two-fifths; symphysis of lower mandible grooved to tip. Thus each mandible, toward end of bill, has 3 grooves, one median and two lateral; 6 in all. Nostrils linear, in advance of base of upper mandible, in its lateral grooves. Frontal feathers sweeping with strongly convex outline across forehead, near but not quite at base of bill; lores broadly naked, the bare space embracing eyes; a pointed projection of feathers on side of lower mandible; another median one advancing farther and more acutely on bare space of chin, which is thus forked behind. Tibiæ bare for a distance equal to half or more of the length of tarsus; mostly reticulate, but with smooth bare skin for a space above in front. Tarsus longer than middle toe and claw, reticulate, scutellate in front. Lateral toes unequal, inner shortest. Hind toe somewhat elevated, without claw not half as long as middle toe without claw. Claws all long and slightly curved; inner edge of middle one dilated and cut three or four times, but without the regular "comb" of a Heron's. Wings and tail ordinary, latter of 12 feathers. Colors dark glossy-green and chestnut; bill and feet dark. Sexes alike; young different. Eggs whole-colored. Three species, one cosmopolitan, two confined to America.

P. autumnalis. (Lat. autumnal; *auctumnus* or *autumnus*, autumn, fall.) GLOSSY IBIS. BAY IBIS. GREEN IBIS. ORD'S IBIS. LIVER. Adult ♂ ♀: No white feathers around face. General color rich dark purplish-chestnut, opaque, changing on head, back, wings (excepting lesser coverts), and tail, to glossy dark purplish-green; sides and lining of wings and crissum dusky greenish; primaries greenish-black. Bill blackish; legs grayish-black; iris brown; bare skin of head slaty-blue. Young: Head, neck, and under parts grayish-brown, the two former streaked with whitish; upper parts glossy dusky-green. Downy young blackish, with white coronal band; bill yellowish and black; feet yellowish. Length about 2 feet; extent about 3 feet; wing 10.00-11.50; tail 4.00; bill 4.50-5.50; tibiæ bare about 2.50; tarsus 3.50; middle toe and claw rather less. This bird is chiefly Old World, not common or regular in America, found occasionally anywhere east of the Mississippi, especially coastwise and southerly; West Indies; north casually to New England; straggling also to Nebraska, Colorado, and Arizona. The next species is much more abundant in its proper range. Egg rougher and heavier than that of a Heron, ovoidal, not elliptical, greenish-blue, 1.90-2.10 × about 1.48. *P. falcinellus* of 2d-4th eds. of Key. *Ibis falcinellus* var. *ordii*, of 1st ed.; *Tantalus falcinellus* LINN. 1766, unfortunately antedated by *Tringa autumnalis* HASSELO. 1762. A. O. U. No. 186.

P. guarau'na. (Vox barb., S. Am.) WHITE-FACED GLOSSY IBIS. Adult ♂: A white margin of feathers surrounding bare space on head. Head otherwise, neck, and entire under parts of body, including tibiæ, rich purplish-chestnut, quite uniform on under parts, obscured with dusky on head and nape, there iridescent with violet. Back and wings intensely iridescent with various metallic tints; back, wing-coverts, and inner quills shining with violet, green, and purple; scapulars more like under parts, being of a rich deep wine-red and less lustrous than wing-coverts. Primaries green, with brassy or almost golden lustre. Rump, upper tail-coverts and tail chiefly green, but with various violet and purple reflections; lower tail-coverts similar, contrasting with chestnut of belly. Lining of wings brassy-green, like primaries; axillars violet, like upper wing-coverts. Bare facial area lake-red, drying dingy;

bill blackish, reddening toward end; legs and feet dusky-reddish; claws blackish; iris red. Length 22.00–24.00; extent 38.00–40.00; wing 10.00–11.00; tail 3.75–4.25; bill 5.00–5.50; tibia bare 2.50; tarsus 3.75; middle toe and claw 3.25; inner do. 2.50; outer do. 2.90; hind do. 1.60. ♀ similar, averaging smaller; length 21.50; extent 36.00, etc. In this beautiful species, the feathers sweep down on forehead with regular convexity, nearly but not quite to base of culmen, thence retreating around back of eye, which is wholly in bare skin, then running forward to a point on side of lower mandible; retreating again, then running forward in a point on middle line of chin, farther than on jaw or forehead; there being thus enclosed, on each side of head, a broad naked space, widest forward, narrowing behind to embrace eye; and between rami of jaw another bare space, forked behind to receive projecting feathers of chin, not quite separated from bare loreal space, because feathers on side of jaw stop a little short of hard base of mandible. Young, first plumage (with traces of down still): Remarkably lustrous. Plumage entirely green; legs black; bill blackish, irregularly blotched or regularly banded with pinkish-white. This green unicolor plumage, so-called *thalassinus* of Ridgway, is retained till full growth, gradually giving way through a brownish or grayish to the purple-chestnut and iridescent plumage. Chicks hatch clothed in black down, with whitish bill. Southwestern U. S., especially Texas; E. to Florida (breeding); N. to Kansas and Colorado; W. through New Mexico and Arizona to California, Wyoming, Oregon, and casually to British Columbia; Lower California; S. through tropical America. Swarming by thousands at some points along the Rio Grande. Nests in vast iberies with various Herons, in beds of reeds and



FIG. 607. — White Ibis. (L. A. Fuertes.)

rushes, rising in air by "hundreds of acres" when a gun is fired. Nest strongly and compactly woven of dead reeds, affixed by twining to broken down or upright living ones, about a foot in diameter and nearly as deep, well cupped, thus unlike the frail platform Herons build. Eggs 3–4, rarely 5, deep bluish-green, not elliptical, from 1.72×1.30 to 2.20×1.50 , averaging 1.99×1.42 .

GUA'RA. (Vox barb., S. Am.) WHITE and SCARLET IBISES. General character of *Plegadis*. Face more denuded (whole chin bare in adults). Claws stout, obtuse, curved. Plumage not metallic. Color white or red; wings black-tipped. Eggs spotted. (*Eudocimus* of 2d–4th eds. of Key. *Guara* REICH. 1852.)

G. al'ba. (Lat. white. Fig. 607.) WHITE IBIS. "SPANISH CURLEW." Adult ♂ ♀: Plumage pure white; tips of several outer primaries glossy black. Bare face, most of bill, and legs orange, red, or earmine; bill tipped with dusky; iris pearly blue. Length about 26.00; extent 40.00; wing 11.50–12.50; tail 5.00; bill 5.00–7.00; tarsus 3.50; middle toe and claw 2.50. Sexes alike; ♀ averaging smaller. Young: Dull brown, rump, base of tail, and under parts white; bare parts of head of less extent, yellowish, bill the same; legs bluish; iris brown. Younger: Dull brown all over, with whitish rump and gray tail. S. Atlantic and Gulf States, S. to West Indies and South America, N. to the Ohio, rarely to the Middle

States, casually to New England and S. Dakota; W. to Utah and Lower California; resident in Florida. Breeds in communities by thousands in tangle and brake and tulé of the south coast; nest similar to that above described, but of twigs, etc. Eggs 3-5, 2.25×1.60 , dull chalky white, blotched and spotted with pale yellowish and dark reddish-brown. (*Eudocimus albus* of 2d-4th eds. of Key; *Guara alba*, A. O. U. No. 184.)

G. ru'bra. (Lat. red.) SCARLET IBIS. Adult ♂ ♀: Plumage scarlet; tips of several outer primaries glossy black. Bare parts of head, bill, and legs pale lake-red. Young: Brownish-



FIG. 608. — European Spoonbill, *Platalea leucorodia*, $\frac{1}{2}$ nat. size. (From Brehm.)

gray, darker above, paler or whitish below. Size and proportions nearly as in *alba*. This splendid bird, whose feathers are prized by anglers for making flies, is a native of Tropical America: casual or very rare in the U. S. (Seen at a distance, not procured, Louisiana, July, 1821, *Audubon*; fragment of a specimen examined, Los Pinos, N. M., on the Rio Grande, June, 1864, *Cones*; "Florida," specimen in Museum of Charleston College, S. C., *Brewster*; Wet Mts., Colorado, May, 1876, *W. P. Lowe*, *Auk*, 1894, p. 324; *W. W. Cooke*, *Bull.* 37, Agric. Coll. of Colorado, 1897, p. 60. But the Arkansaw River record in *Auk*, July, 1897, p. 316, is a mistake. "A small flock" is reported from old Fort Lowell, Arizona, *H. Brown*, *Auk*, July, 1899, p. 270.) *Eudocimus ruber* of 2d-4th eds. of Key; *Guara rubra*, A. O. U. No. [185].

Family PLATALEIDÆ: Spoonbills.

Bill long, flat, remarkably widened, rounded, and spoon-shaped at end. Birds of this group are known at a glance, by singularity of bill; they closely resemble *Ibididæ* in structure and habit, being simply spoon-billed Ibises. Three genera, with 6 species, of various countries. The American *Ajaja* differs notably from type of *Platalea*, having trachea simple, bifurcating into bronchi high in neck; bronchi with fusiform, partly membranous dilatation before entering thorax. In *Platalea leucorodia* (fig. 608) the trachea is peculiarly convoluted within the thorax.

Aja'ja. (Vox barb., S. Am.) AMERICAN SPOONBILLS. Character as above said. In addition: Head entirely bald, in adult. Throat somewhat pouched. Nostrils basal, linear-oblong. Tibiæ and tarsi reticulate with hexagonal plates. Toes semipalmate; hind toe well down. Tail of 12 feathers. Bill broader than head at greatest width of the spoon; lateral groove the whole length of upper mandible; nail at end of bill; much of bill rugous and skinny. Recurved tuft of feathers on fore-neck below. Colors white and red. Sexes alike; young different. One species.

A. aja'ja. ROSEATE SPOONBILL. Adult ♂ ♀: White; back and wings delicate rose-color; under parts more rosy; plumes of lower fore-neck, lesser wing-coverts, upper and under tail-coverts, rich carmine; shafts of wing- and tail-feathers carmine. Tail brownish-yellow, and a patch of same color on sides of breast. Bald head varied with green, yellow, orange, and black; bill varied with greenish, bluish, yellowish, and blackish tints; legs lake red; iris carmine; claws blackish. Length of ♂ 31.00–35.00; extent 50.00–55.00; wing 15.00–16.00; tail 4.00–5.00; bill 7.00, 2.00 or more across the spoon; tibia bare 3.00; tarsus 4.00; middle toe and claw 3.50; hind do. 2.00. ♀ smaller; length 30.00 or less; extent 48.00. Young: Head mostly feathered; general color white, more or less tinged with pink on wings, tail, and belly; outer border of wings dark brown; more white and rosy 2d year; full plumage 3d. Weight of adults 3 or 4 pounds. This bird, so singular in form and magnificent in color, inhabits the Gulf States, and most of South America; resident in southern Florida, but numbers much lessened by persecution; N. to the Carolinas; casually to southern Illinois, Colorado, and California. Breeds in communities in trees and bushes of tangled swamps. Nest a platform of sticks like a Heron's; eggs usually 3, laid in April or earlier, nearly elliptical, 2.60 × 1.90, white or buff, with various brown markings. *Platalea ajaja* LINN. of most authors; COUES, Key, 1872, p. 264, and Check-List, 1st ed. 1873, No. 488. *P. rosea* REICHENOW, 1877. *Ajaja rosea* COUES, Key, 2d–4th eds. 1884, p. 651, and Check-List, 2d ed. 1882, No. 653. *Ajaja ajaja* REICH. Syst. Av. 1852, p. xvi; A. O. U. Lists, 1886–95, No. 183.

SUBORDER CICONIÆ: STORK SERIES.

(*Pelargi* of 2d–4th eds. of Key.)

Skull holorrhinal; angle of mandible truncate. Accessory femorocaudal absent; femorocaudal present or absent; semitendinosus and its accessory present; pectoralis major double; biceps cubiti and tensor patagii longus disconnected. Carotids double, normal; 2 intestinal cœca; tufted oil-gland. Plumage without powder-down; ventral feathered tracts broad. Tarsi normally reticulate; hallux not fairly insistent; claws resting upon a horny "shoe;" inner edge of middle claw not pectinate. Side of upper mandible ungrooved, without nasal fossa; nostrils bored directly in its substance; bill very stout, compressed, tapering, straight or recurved or decurved; interramal feathering restricted.

Storks belong chiefly to warm and temperate portions of the Old World. There are about 18 species, representing nearly as many genera of authors, of which 11 or 12 are in common

use; among these *Anastomus* and *Hiator* are remarkable for a wide interval between cutting edges of bill, which only come into apposition at base and tip. The singular African *Scopus umbretta*, type of the family *Scopidae*, is now placed among Herons, though its pterylosis is that of Storks.

Family CICONIIDÆ: Storks.

Bill longer than head, very stout at base, not grooved, tapering to the straight, recurved or decurved tip. Nostrils pierced directly in the horny substance, without nasal scale or membrane, high up in the bill, close to its base. Legs reticulate. Hallux hardly insistent. Claws not acute.

The family falls in two North American subfamilies, that of Storks proper, and that of so-called Wood Ibises. Both are represented in North America.

Subfamily TANTALINÆ: Wood Ibises.

Bill long, extremely stout at base, where as broad as face, gradually tapering to *decurved* tip, without nasal groove or membrane, nostrils directly perforating its substance, high up at base of upper mandible. Toes lengthened; middle not less than half as long as tarsus, outer longer than inner; hind toe nearly insistent; claws less nail-like than in *Ciconiinae*. One American genus and species, and one genus (*Pseudotantalus*) with 3 species of Africa, southern Asia, and part of the East Indies. As these birds are Storks, it is unfortunate that the name of "Ibis," tending to promote confusion, should be too firmly attached to them to leave any hope of its being abolished from such connection.

As the American Spoonbill (*Ajaja*) is distinguished from Old World *Platalea*, so does the American Wood Ibis differ from Old World *Pseudotantalus* to a marked degree in structure of windpipe; our bird having that organ simple, it being remarkably complicated in the other. In *Pseudotantalus ibis*, typical of the genus, the trachea is several times folded and doubled upon itself in the thorax. In *Tantalus loculator*, the trachea is short, straight, and simple in its lower part, with numerous reduced and modified rings, and flattened from side to side, producing a ridge in front.

TANTALUS. (Gr. *Τάνταλος*, Lat. *Tantalus*, a mythical character.) AMERICAN WOOD STORK or WOOD "IBIS." GOURDHHEAD. Character as above. In addition: Whole head and part of neck bare, rugous and scaly in adult, crowned with a horny plate. Nasal fossæ not continued beyond nostrils. Anterior toes webbed at base. Tibiæ bare for half their length. Claws compressed, but obtuse. Head feathered in young. Sexes alike. Color white and black. (*Tantalops* of 2d-4th eds. of Key.)

T. loculator. (Lat. *locus*, a place; *loculus*, a little place, but qu. *loculator* in its application to this bird? Fig. 609.) AMERICAN WOOD STORK. WOOD IBIS. "COLORADO TURKEY." Adult ♂ ♀: Plumage white; wing-quills, primary coverts, alula, and tail glossy black; lining of wings pinkish in high plumage. Bald head livid bluish and yellowish; bill dingy yellowish. Legs blue; toes blackish; webs tinged with yellow. Iris dark brown. Length ♂



FIG. 609. — Wood Ibis, greatly reduced. (From Tenney, after Audubon.)

nearly 4 feet; extent 5.50 feet; wing 18.00–19.50 inches; tail 6.00; bill 9.00, 2.00 or more deep at base; tibiae bare 6.00; tarsus 8.00; middle toe and claw 4.75. Weight 10 or 12 pounds. ♀ smaller than ♂. Young: Head and neck downy-feathered; plumage dark gray, with blackish wings and tail; whitening and head becoming bald after 1st moult. S. Atlantic and Gulf States, and across in corresponding latitudes to the Colorado River, where abundant; N. regularly coastwise to the Carolinas, and up the Mississippi to the Ohio; casually to Pennsylvania, New York, Wisconsin, and New England (the alleged New England case, Bull. Nutt. Club, viii, July, 1883, p. 187, may be erroneous, but see Auk, Oct. 1896, p. 341, for Massachusetts; Osprey, Jan. 1897, p. 67, for Rhode Island; Auk, 1893, p. 91, 1897, p. 208, for Maryland, Virginia, and Washington, D. C.). West Indies, Mexico, Central and South America. Resident in Florida and the Gulf States; abundant; gregarious; frequents the most thickly wooded swamps and bayous, fairly swarming in its breeding-places; flight performed with alternate flapping and sailing; at times mounts high in air and performs the most beautiful evolutions, with motionless wings, like a Turkey-buzzard. Nest a platform of sticks in trees. Eggs 2–3, 2.75 × 1.75, elliptical, rough with flaky substance, dead white with various brownish stains.

Subfamily CICONIINÆ: True Storks.

Bill as above described, but end not decurved (straight or recurved). Nostrils nearly lateral. Toes short; middle less than half the tarsus; lateral toes nearly equal. Hind toe not insistent. Claws short, broad, obtuse, flattened like nails. There are 10 genera and 14 species of this subfamily. The leading Old World forms are *Abdimia abdimii* of Africa and Arabia; the Episcopal Stork, *Dissura episcopus* of Africa, India, etc.; the Common White and Black Storks, *Ciconia alba* and *C. nigra*, of Europe, Asia, and Africa; the Open-bill Storks, *Anastomus oscitans* of Asia and *Hiator lamelligrus* of Africa; the Indian Jabiru, *Xenorhynchus asiaticus*; the Saddle-billed Stork, *Ephippiorhynchus senegalensis*; and several species of Marabouts of the genus *Leptoptilus*, which are Indian and Indo-malayan. The American representatives are *Euxenura maguari* of South America, and the following:

MYCTERIA. (Gr. *μυκτήρ*, *mukter*, the snout; *μυκτηρίζω*, *mukterizo*, I turn up the nose.) **JABIRUS.** Bill immensely large, recurved. Whole head and neck bare, except a hairy patch on occiput. Tail not peculiar. (In *Euxenura*, bill moderate, straight, head mostly feathered, tail forked, and its under coverts stiffened and lengthened, resembling rectrices.)

M. americana. AMERICAN JABIRU. COLLARED BAGUARI. Adult: Plumage entirely white. Bill, legs, feet, and bare skin of head and neck, black; neck with a broad bright red collar round the lower portion. Immature (transition plumage): Rump, upper tail-coverts, and tail white; rest of upper parts, including feathered portion of lower neck, light brownish-gray, irregularly mixed, except on lower neck, with white feathers of the adult livery; lower parts entirely white. Bill, etc., colored as in adult. Young: Mostly brownish; hind head tufted with bushy blackish feathers. Length about 50.00; wing 24.50–26.00; tail 9.50; culmen 9.75–12.30; depth of bill through base about 2.50; tarsus 11.25–12.50; middle toe 4.20–4.50. Tropical America, N. to Texas.

SUBORDER HERODII: HERON SERIES.

Skull holorrhinal; angle of mandible truncate. Ambians and accessory femoro-caudal absent; femoro-caudal, semitendinosus, and its accessory present. Carotids double, sometimes abnormal (p. 204); one intestinal cœcum; tufted oil-gland. Plumage with 2–4 pairs of powder-down tracts; feathered tracts very narrow. Tarsi normally scutellate; hallux long and perfectly insistent, with long claw; inner edge of middle claw distinctly pectinate. Bill variable with the families, normally narrow and wedged, with long nasal fossæ; feathers extending far between the mandibular rami. Tongue moderate.

Baleniceps rex, the extraordinary Shoe-bill or Whale-head of Africa, with enormous head and bill, thick neck, and one pair of powder-down tracts, is type of a family *Balenicipidae*, which may belong here; but it approaches Storks, and its peculiarities are so great that it may constitute a separate superfamily group. The Boat-bill of Central America, with a singular shape of bill that has suggested the name, and 4 pairs of powder-down tracts, constitutes another family of *Herodii* (*Cochleariidae*). The disputed cases of *Eurypyga* and *Scopus* have already been mentioned. These and some other doubtful forms aside, the Heron series is represented by the single.

Family ARDEIDÆ: Herons.

In this family, as in *Cochleariidae*, powder-down tracts reach their highest development; although these peculiar feathers occur in some other birds, there appears to be then only a single pair; so that presence of 2 or 3 pairs is probably diagnostic of *Ardeidæ*. In the genus *Ardea* and its immediate allies (*Ardeinæ*) there are 3 pairs, the normal number; one on lower back over hips, one on lower belly under hips, and one on breast, along track of furcula. In Bitterns (*Botaurinæ*) the 2d of these is wanting. (In the Boat-bill, *Cochlearius cochlearius*, there is still another pair, over the shoulder-blades.) There are other pterylographic characters; in general, the tracts are extremely narrow, often only two feathers wide; there are lateral neck tracts: the lower neck is frequently bare behind. More obvious characters are, complete feathering of head (as compared with Storks, etc.), except definite nakedness of lores alone — the bill appearing to run directly into the eyes; a general looseness of plumage (as compared with *Limicola*), and especially frequent development of remarkably lengthened, or otherwise modified, feathers, constituting the beautiful crests and dorsal plumes that ornament many species, but which, as a rule, are worn only during the breeding season. These features will suffice to determine *Ardeidæ*, taken in connection with the more general ones indicated under head of *Herodiones*, and the following details:

Bill longer than head, usually about as long as tarsus, straight, or very nearly so, more or less compressed, acute, cultrate (with sharp cutting edges): upper mandible with a long groove. Nostrils more or less linear, pervious. Head narrow and elongate, sloping down to bill, its sides flattened. Lores naked; rest of head feathered, the frontal feathers extending in a rounded outline on base of culmen, generally to nostrils. Wings broad and ample: inner quills usually as long as primaries, folding over them when the wing is closed. Tail very short, of 12 (usually) or 10 (in *Botaurinæ*) soft broad feathers. Tibiæ naked below (with rare exceptions), sometimes for a great distance. Tarsi scutellate in front (with rare exceptions), and sometimes behind, generally reticulate there and on sides. Toes long and slender; outer usually connected with middle by a basal web, hinder very long (for wading birds), inserted on the level of the rest. Hind claw larger and more curved than middle one (always?): middle claw *pectinate*.

The group thus defined offers comparatively little variation in form; the very numerous genera now in vogue have been successively detached from *Ardea*, the typical one, with which some of them should be reunited. Night Herons (*Nycticorax* and *Nycticorax*) differ somewhat in shortness and especially stoutness of bill; while Bitterns (*Botaurus* and *Ardetta*), the South American genera *Tigrisoma*, *Zebrius*, and a few others, are still better marked. There are about 100 species, of some 35 genera, very generally distributed over the globe, especially abounding in torrid and temperate zones. Those that penetrate to cold countries in summer are regular migrants; others are generally stationary. They are maritime, lacustrine, and paludicole birds, drawing their chief sustenance from animal substances taken from the water, or from soft ground in its vicinity; such as fish, reptiles, testaceans, and insects, captured by a quick thrust of the spear-like bill, given as the bird stands in wait or wades stealthily along.

In conformity with this, the gullet is capacious, but without special dilatation, the stomach is small and little muscular, the intestines are long and extremely slender, with a large globular



FIG. 610. — Herons, idealized from *Ardea cinerea*. (From Michelet.)

cloaca and a cœcum. Herons are altricial, and generally nest in trees or bushes (where their insessorial feet enable them to perch with ease), in swampy or other places near the water,

often in large communities, building a large flat rude structure of sticks. The eggs vary in number, coincidentally, to some extent, with *size* of the species; large *Herons* generally lay 2-3-4, smaller kinds 5-6; the eggs are somewhat elliptical in shape, and usually of an unvariegated bluish or greenish shade. The voice is a rough croak. The sexes are nearly always alike in color (remarkable exception in *Ardetta*); but species in which, as in the Bittern, the plumage is nearly unchangeable, are very few. Probably no birds show greater changes of plumage, with age and season, than nearly all *Herons*. Their beautiful plumes are only worn during the breeding season; the young invariably lack them. There are still more remarkable differences of plumage in many cases, constituting *dichromatism*, or permanent normal difference in color, like that of "red" and "gray" specimens of *Megascops*. Thus, some species are pure white at all ages and seasons, in both sexes, other individuals of the same species being variously colored. Such dichromatism appears in our *Ardea occidentalis*, *Dichromanassa rufta*, and *Florida carulea*. It was formerly believed, in the cases of the two latter, that the white were the *young*, the colored the adults; but it now appears that the difference is permanent, and independent of age, sex, or season. Many species are pure white at all times, and to these the name of Egret more particularly belongs; but I should correct a prevalent impression that an Egret is anything particularly different from other *Herons*. The name, a corruption of the French word "aigrette," simply refers to the plumes that ornament most *Herons*, white or otherwise, and has no classificatory meaning; its application, in any given instance, is purely conventional. The colors of the bill, lores, and feet are extremely variable, not only with age or season, but as individual peculiarities; sometimes the two legs of the same specimen are not colored exactly alike. The ♀ is commonly smaller than the ♂. Normal individual variability in stature and relative length of parts is very great: and it has even been noted that a specimen may have one leg larger than the other, and the toes of one foot longer than those of the other — a circumstance perhaps resulting from the common habit of these birds of standing for a long time on one leg.

North American *Ardeide*, if not the whole family, are divisible into 2 subfamilies — *Ardeinæ* or *Herons proper*, and *Botaurinæ* or *Bitterns*.

Analysis of Subfamilies, Genera, and Subgenera.

BOTAURINÆ. Tail-feathers 10. Two pairs of powder-down tracts. (*Bitterns*.)

Very small; length about a foot. Sexes unlike *Ardetta*
 Medium sized; length 2 feet or more. Sexes alike *Botaurus*

ARDEINÆ. Tail-feathers 12. Three pairs of powder-down tracts. (*Herons*.)

Bill stout and comparatively short, not longer than very short tarsus, which is not perfectly scutellate in front. (*Night Herons*.)

Gonys convex, like culmen; tarsus longer than middle toe and claw *Nyctanassa*
 Gonys about straight; tarsus about equal to middle toe and claw *Nycticorax*

Bill ordinary. Tarsus scutellate in front. (*Day Herons*.)

Length under 20 inches. Tarsus about equal to middle toe and claw. Green *Butorides*
 Length over 20 inches, under 30. Blue, white, or variegated.

Blue or white. Adult without decomposed feathers on back *Florida*
 Always white. Adult with decomposed recurved feathers on back *Garzetta*

Ashy-blue, white below. Bill longer than tarsus *Hydranassa*

Length 30, not 36 inches. Blue or white. Tarsus twice as long as middle toe. Bill shorter than tarsus
Dichromanassa

Length 36 or more. Entirely white; no crest; long decomposed feathers on back *Herodias*

Length 42 or more; of dark varied colors, or white; crested, without dorsal plumes *Ardea*

Subfamily ARDEINÆ: True Herons.

Tail-feathers 12 (in all North American genera), broad and stiffish. Powder-down tracts 3 pairs. Tibiæ naked below. Outer toe not shorter than inner. Claws moderate, curved. (Embracing most species of the family, and all ours except Bitterns.)

ARDEA. (Lat. *ardea*, a heron.) GREAT HERONS. Of largest size. Neck and legs very long, former well feathered all around. Tibiæ extensively denuded below. Tarsus longer



FIG. 611. — Great Blue Heron, greatly reduced. (From Teuney, after Audubon.)

than middle toe and claw; outer toe longer than inner. Bill slender, at least 5 times as long as its depth at base, but shorter than tarsus, equal to or longer than middle toe and claw. Colors dark and varied, exceptionally pure white. Back without lengthened loosened plumes in breeding season, the long scapulars being lanceolate, not loosened; lower fore-neck with lengthened feathers; head crested in breeding season with two long, slender, flowing, occipital plumes. Sexes alike; young similar, but lacking all lengthened feathers. This restricted genus contains the very largest Herons, as the African Goliath, *A. goliath*; the Malay Typhon, *A. sumatrana*; the South American Soco or Coco, *A. cocoi*, and a few others, besides those given below. Though I said in the Key, 2d edition, 1884, p. 657, that our other genera of Day Herons "should be reduced to subgenera of *Ardea*" — a statement which was promptly acted upon by the A. O. U. Committee — attentive reconsideration of the case induces

me to make no change from my former presentation, which has received the unqualified support of Dr. Sharpe, the latest monographer of the family.

Analysis of Species. (Adults in breeding plumage.)

Whole plumage not white; bill not entirely yellow.

Tibiæ and edge of wing white; occiput and plumes black; neck ash. Europe *cinerea*
Tibiæ and edge of wing rufous.

Under parts dark, with white streaks. Occiput and plumes black Bill 6.00 or less; tarsus 8.00 or less.
N. Am. *herodias*

Under parts white, with black streaks. Bill 6.00 or more; tarsus 8 or more.
Occiput and plumes black. Florida *wardi*

Occiput and plumes white. Florida *wuerdemanni*

Whole plumage pure white; bill entirely yellow. Bill 6.00 or more; tarsus 8.00 or more. Florida and Cuba
occidentalis

A. cinerea. (Lat. *cinerea*, ashy.) COMMON HERON of Europe. ASHY HERON. JOHANNA HERON. HERONSHAW, HERNSHAW, HERONSEW, HERNSEW, HERNSER, and "HANDSAW" of literature. Type of the restricted genus *Ardea*. Similar to *herodias* (see next); easily distinguished by the white (not rufous) tibiæ and edge of wing, and ashy neck. Europe, Asia, Africa; only North American as a straggler to Greenland. FABRICIUS, Fn. Grœnl. 1780, p. 106; REINH. Ibis, 1861, p. 9, Nenortalik; COUES, Key, 2d-4th eds. 1884-90, p. 658; A. O. U. Lists, 1886-95, No. [195].

A. hero'dias. (Gr. ἑρωδιός, *erodios*, Lat. *herodius*, more properly *erodius*, a heron, probably *Ardea cinerea* of Europe. The form *herodias* seems to have been affected from the Biblical proper name of a notorious woman, Ἡρωδίας, Lat. *Herodias*, ♀ patronymic from Ἡρῶνας. This is probably the Linnæan sense of the word. Fig. 611.) GREAT BLUE HERON. RED-SHOULDERED HERON. BLUE CRANE of the people. Of large size, and varied dark colors; not dichromatic; never white. In breeding season scapulars lengthened and lanceolate, but not decomposed; an occipital crest, two deciduous feathers of which are long and filamentous; long loose feathers on lower neck. Length 42.00-50.00; extent about 70.00; wing 18.00-20.00; tail 7.00-8.00; bill 4.50-6.25, usually 5.00-6.00; tibiæ bare 3.00-4.00; tarsus 6.00-8.00; usually 6.50-7.00; middle toe and claw about 5.00. ♀ average smaller than ♂. Weight 6 or 8 lbs. Adult ♂ ♀, in breeding dress: Bill yellow, more or less blackened on culmen; lores blue; iris chrome-yellow; legs and feet blackish, soles yellowish. Tibiæ and edge of wing chestnut-brown. Forehead and middle of crown white; sides of crown and occipital crest black. Neck pale purplish-gray, with a mixed white, black, and rusty throat-line, yielding to white on chin and cheeks. Plumes of lower neck, breast, and belly, black, more or less interrupted with white streaks on middle line; erisum white. Upper parts in general slaty-blue; tail the same; long scapular feathers more pearly gray; wing-quills deepening from this color to the black primaries. Young: without any long feathers. Crown and front without white; whole top of head blackish. Tibiæ and edge of wing paler rufous, or whitish. General color of upper parts paler and more grayish-blue, more or less tinged with rusty. Black of under parts replaced by ashy. Upper mandible mostly blackish; lores and most of lower mandible greenish, rest of the latter, and eyes, yellow; tibiæ greenish. There are endless variations in plumage and colors of soft parts, but this large species cannot be mistaken, being only closely related to the next. North America at large, and much of Central and northern South America, and West Indies; N. to Labrador, Hudson's Bay, and Sitka in Alaska; northerly migratory; elsewhere resident. Breeds in suitable places throughout its range, sometimes singly, oftener in heronries to which the birds resort year after year, shared usually with other species of its tribe. Nest usually in trees or bushes, sometimes on the ground; in the West sometimes on cliffs; eggs 3-6, oftenest 3-4, pale dull greenish-blue, ellipsoidal, about 2.50 × 1.50.

A. ward'i. (To Chas. W. Ward, of Pontiac, Mich.) WARD'S HERON. Larger than *herodias*: Length 48.00-54.00; extent about 80.00; wing 20.00-21.00; bill 6.00-7.00; tibiæ bare 5.50-6.00; tarsus 8.00-9.00. Adult ♂ ♀, in breeding plumage: General appearance of *herodias*; head-markings the same, the occiput and plumes very black, the forehead and middle of crown white; but white prevailing on under parts, which are only narrowly streaked with black; legs and feet olivaceous rather than blackish; bill olivaceous. Young not satisfactorily distinguished from *weerdeumanni*: rather larger than *herodias*. Eggs 3-4, 2.60 × 1.80. Florida, resident. *A. wardi* RIDGW. Bull. Nutt. Club, vii, Jan 1882, p. 5; admitted to Key, 2d-4th eds., 1884-90, p. 658, with reservation; RIDGW. Man. 1887, p. 129; A. O. U. Lists, 1886-95, No. 193. The status of the supposed species is dubious. Birds of the character here assigned abound in Florida, and are easily recognized; they may be a local race of *herodias*, or the result of interbreeding between *herodias* and *occidentalis*. A slight strain of *occidentalis* running in *herodias* might produce *wardi*; and subsequent admixture of *wardi* with *occidentalis* might result in *weerdeumanni*. But doubtless this form should stand as *A. h. wardi*.

A. wuerdeman'ni. (To Gustavus Würdemann of the U. S. Coast Survey.) WÜRDEMANN'S HERON. Like *wardi* in size and coloration, but markings of head different. Length 48.00–50.00; extent 70.00 or more; wing 20.00–21.00; culmen 6.00–6.50; tibiæ bare 5.50; tarsus 8.00. Adult in breeding plumage: Head and crest white, only the forehead streaked with black edges of the feathers. Under parts white, streaked on sides with black; plumes of lower fore-neck white, mostly streaked with black edges of the feathers. Neck purplish-gray, darker than in *herodias*, with a similar throat-line of white, black, and rufous. Under wing-coverts streaked with white; rufous edge of wing less extensive than in *herodias*; tibiæ paler rufous. Tibiæ and soles yellow; tarsi and tops of toes yellowish-green. Young: Like young *herodias*; top of head dusky, the feathers with whitish shaft-lines; wing-coverts spotted with buff and white. Eggs 3 or more, 2.70×1.80 . Southern Florida; "accidental in Indiana and Illinois, Sept. 1876." Status of the species questionable. It is described correctly in the Key, original edition, 1872, p. 267; in later editions, 1884–90, p. 658, treated as the colored phase of *occidentalis*; it may be such, or a possible hybrid between *occidentalis* and *herodias*. It is relegated to the Hypothetical List of the A. O. U. 1886–95, No. 9, as "believed to be either the colored phase of *A. occidentalis* AUD., or an abnormal specimen of *A. wardi* RIDGW." Equally conclusive statements may be read in Bull. U. S. Geol. Surv. iv, 1878, pp. 227–236; Bull. Nutt. Orn. Club, vii, 1882, pp. 1–6; Auk, i, 1884, pp. 161–163; Water B. N. A. i, 1884, pp. 7–13.

A. occident'lis. (Lat. *occidentalis*, westeru.) GREAT WHITE HERON. AUDUBON'S HERON. Type of genus *Audubonia* BP. Like *wardi* and *wuerdemanni* in size, or rather at their maximum dimensions. Plumage pure white at all ages. Bill and eyes yellow; culmen



FIG. 612. — Great Egret. (L. A. Fuertes.)

greenish at base; lores bluish; legs and feet yellow, greenish on front of tarsus and tops of toes. Southern Florida; Cuba; Jamaica. *A. occidentalis*, AUD. 1835; folio pl. 281, 8vo pl. 368; COUES, Key, orig. ed. 1872, p. 267; A. O. U. Lists, 1886–95, No. 192. *Audubonia occidentalis* BP. 1855; BD. 1858. Treated as the white phase of *wuerdemanni* in Key, 2d–4th eds. 1884–90, p. 658. Nest in mangroves; eggs 2–4.

HERODIAS. (Lat. *Herodias*; see above under *Ardea herodias*. Fig. 613.) GREAT EGRET HERONS. Character of *Ardea* proper, excepting in plumage; color white; no crest; a long depending train of stiff-shafted, loose-webbed, scapular feathers in breeding season; sides of lower mandible extensively feathered. Size large, only exceeded by species of *Ardea* proper. Subgenus *Herodias* of A. O. U. Lists.

H. egret'ta. (Latinized directly from Fr. *aigrette*, a sort of heron, also a plume; Eng. *aigret*, *egret*, cognate with Prov. *aigrón*, Ital. *aghirone*, etc.; the word is a diminutive in form, and in ultimate analysis identical with *heron*. Fig. 612.) GREAT WHITE EGRET. WHITE HERON. Adult ♂ ♀: No obviously lengthened feathers on head at any time; in breeding season, back with a magnificent train of very long plumes of decomposed, fastigate feathers of scapulars

drooping far beyond tail; neck closely feathered. The plumes have stiff elastic shafts, thus keeping their shape, though the barbs are soft and lack barbules; those of the corresponding European bird, *H. alba*, are said to be known by the name of "ospreys," perhaps from their spray-like character. Plumage entirely white at all seasons. Bill, lores, and eyes yellow; legs and feet black. Length 36.00–42.00 (not including dorsal train, which when fully developed



FIG. 613. — European Great White Egret, *Herodias alba*, $\frac{1}{3}$ nat. size. (From Brehm.)

extends 10.00–12.00 or more beyond tail); extent 55.00; wing 16.00–17.00; tail 5.50–6.50; bill 4.50–5.00; tarsus about 6.00; tibiae bare 3.50. ♀ averaging smaller than ♂. Young: White like adults, but no lengthened plumes; bill in part black. Most birds at any age have some black on the bill, usually near the tip; and the lores may be tinged with greenish. U. S., southerly, and much of West Indies, Central and South America; straggling N. to Nova Scotia, Minnesota, Manitoba, Oregon, etc.; on Pacific coast from Oregon to Patagonia; resident in the South. Like the next, the victim of the plume-hunter who in the interest of the "gentle" sex has depopulated its rookeries. Breeds like other Herons; eggs 3–5, 2.20 × 1.55.

GARZETTA. (Ital. *garzetta*, Span. *garceta*, Port. *garçota*, a small or young heron, dimin. of Ital. and Span. *garza*, a heron. Fig. 614.) SMALL EGRET HERONS. Form of the preceding, but size small; length about 24.00. Mandibular feathers not reaching as far forward as those on culmen. Plumage always white; an occipital crest, and short recurved train of



FIG. 614. — European Little White Egret, *Garzetta nivea*, $\frac{1}{2}$ nat. size. (From Brehm.)

stiff-shafted, loose-webbed feathers in the breeding season; lower neck-feathers lengthened, depending. (See figure of the European species, *G. nivea*.) Our species is generically separated from *Garzetta* by the name of *Leucophoyx* SHARPE, 1894. Given as subgenus of *Ardea* in A. O. U. Lists.

G. candidissima. (Lat. *candidissima*, very white; *candida*, white.) LITTLE WHITE EGRET. SNOWY HERON. BONNET MARTYR. Adult ♂ ♀, in breeding dress: Long occipital crest of decomposed feathers, and similar scapular plumes, latter recurved when perfect; similar, but not recurved plumes on lower neck, which is bare behind. Lores, eyes, and toes yellow; bill and legs black, former yellow at base, latter yellow on lower part behind; claws black. Plumage always entirely white. Young like adult in color, but lacking plumes. Length about 24.00; extent 36.00–40.00; wing 9.50–11.00; tail 4.00; bill 3.00 or more; tibiae bare 2.50; tarsus 3.75; middle toe 2.75. Southern United States; Middle States, in summer; N. occasionally to New England, Nova Scotia, Ontario, and southern British Columbia; only occasional in most of the West; formerly common on the coast of southern California. Was abundant in its regular range. Resident in the South and beyond through Mexico, Central

and much of South America; breeds throughout its regular range. Eggs 3–5, 1.67×1.25 . This is the Egret which has suffered most martyrdom from the plume-hunters, who have mercilessly invaded and depopulated its heronries in the breeding season, threatening extermination of the species in some places where it formerly abounded, as in Florida.

HYDRANASSA. (Gr. *ὑδωρ*, *hudor*, water, giving in Lat. *hydr-*; *ἄνασσα*, *anassa*, a queen.) AMERICAN DEMIEGRETS. DEMOISELLE EGRETS. Of medium size: length under 30.00 or 36.00. Bill very slender, contracted from base toward middle, with almost a little concave upper and under outline, then tapering to a point; in length equalling or exceeding tarsus. Toes comparatively short, the middle little more than half the tarsus. Adult with feathers of head and neck lengthened, lanceolate, not decomposed, but with well-defined edges; an occipital crest of several, long, lanceolate plumes, not decomposed, and splendid scapular train of decomposed, fringe-like feathers depending beyond tail. Not dichromatic, not white. As subgenus of *Ardea* in A. O. U. Lists.

H. tri'color ruficol'lis. (Lat. *tricolor*, three-colored; *ruficollis*, rufous-necked; *rufus*, rufous, *collum*, neck. Fig. 615.) LOUISIANA EGRET. DEMOISELLE. "LADY OF THE

WATERS." Adult ♂♀: Slaty-blue on back and wings, mostly white below and along throat-line; crest and most of neck reddish-purple, mixed below with slaty; longest narrow feathers of crest white; lower back and rump white, but concealed by the dull purplish-brown feathers of the train, which whiten toward end. Bill black and blue, more lilac at base and to lores; legs and feet slate color; iris red. Adults in winter lack the plumes, and have the bill black and yellow; lores yellow; legs yellowish-green, dusky in front; iris red. Young variously different, but never white; lacking long occipital plumes and dorsal train; neck and back bright brownish-red; rump, throat-line, and under parts white; quills and tail pale purplish-blue; legs dusky-greenish. Length 24.00-27.00 (exclusive of the long train); extent 37.00-39.00; wing 10.00-11.00; tail 3.50; bill 4.00-5.00; tibiae bare 2.25; tarsus 4.00; middle toe and claw 3.00. S. Atlantic and Gulf States, chiefly maritime, rarely N. to the Middle districts, as New Jersey, Indiana, etc.; Lower California, S. in Mexico, West Indies, and Central America. Resident along our southern coasts; common. Breeds in communities like other Herons. Nest and eggs scarcely distinguishable from those of the Snowy Heron; eggs rather less elliptical, usually 4 in number, averaging 1.78×1.30 . *Ardea ludoriciana* WILS. Am. Orn. viii, 1814, p. 13, pl. 14, fig. 1, *nee* GM. 1788; NUTT. Man. ii, 1834, p. 51; AUD. Orn. Biog. iii, 1835, p. 136, folio pl. 217; B. Am. vi. 1843, p. 156, 8vo, pl. 373. *Egretta ludoriciana* Bp. 1838. *Demi-*



FIG. 615. — Louisiana Egret. (L. A. Fuertes.)

egretta ludoriciana Bd. B. N. A. 1858, p. 663. *Herodias ludoriciana* BREWER, 1860. *Hydranassa ludoriciana* HEINE and REICH. 1890. — *Ardea leucogaster* ORD ed. WILS. viii, 1825, p. 13 *nee* BODD. 1783. *Herodias leucogaster* GRAY, 1844. — *Egretta leucopyrmyna* LICHT. 1854. *Herodias leucopyrmyna* Bp. 1855. *Ardea leucopyrmyna* GRAY, 1871. *Ardea leucogastra* var. *leucopyrmyna* COUES, Key, 1872, p. 268. *Demi egretta leucopyrmyna* LAWR. 1874. *Demi egretta leucogastra* var. *leucopyrmyna* LAWR. 1876. — *Egretta ruficollis* GOSSE, B. Jam. 1847, p. 338, pl. 93. *Herodias ruficollis* CAB. 1856. *Demi egretta ruficollis* GUNDEL. 1866. *Hydranassa tricolor* COUES ed. SENNETT, Bull. U. S. Geol. Surv. iv, 1878, p. 60; Check List, 1882, p. 106; Key, 2d-4th eds. 1884-99, p. 661; *nee* *Ardea tricolor* MÜLL. 1776. — *Hydranassa tricolor ludoriciana* BELDING, 1882; RIDGW. 1885. *Ardea tricolor ruficollis* RIDGW. 1885. *Ardea tricolor* CORY, 1885. *Ardea (Hydranassa) tricolor ruficollis*, A. O. U. Check Lists, 1886-95, No. 199. *Hydranassa ruficollis* SHARPE, Cat. B. Brit. Mus. xxvi, 1898, p. 127. *Ardea cyanirostris* CORY, B. Bah. 1880, p. 168. This intricacy is mainly due to the facts that *ludoriciana* WILS. is antedated for another species; that *tricolor* MÜLL. and *leucogaster* BODD. are both based on the South American bird, from which ours is only a subspecies; that *leucopyrmyna* LICHT. is antedated by *ruficollis* GOSSE; and that the generic standing of the bird has been in question. Synonyms multiply fast when four terms, of genus and subgenus, species and subspecies, occur in various combinations. Our North American subspecies is type of genus *Hydranassa* Bd. B. N. A. 1858, p. 660, in text. My present designation, *Hydranassa tricolor ruficollis*, which is a new one, results from giving *Hydranassa* full generic rank, taking *tricolor* as the species, and *ruficollis* as the subspecies.

DICHROMANAS'SA. (Gr. *dis*, *dis*, twice; *χρῶμα*, *chroma*, color; and *ἄνασσα*; alluding to the dichromatism of *D. rufa*.) **DICHOIC EGRETS.** Of medium size: length about 30.00. Bill slender, much as in the last, but shorter than the very long tarsus, which is about twice as long as middle toe. Toes extremely short (for this family). Feathers of head and neck elongate, lance-linear and stiffish, distinct; the longest forming occipital and jugular tufts. A scapular train of long decomposed feathers, with stiffened shafts. Dichromatic; pure white or colored; in latter state, without the white throat-line of most Herons. As subgenus of *Ardea* in A. O. U. Lists.

D. ru'fa. (Lat. *rufa*, reddish.) **REDDISH EGRET. PEALE'S EGRET.** Adult ♂ ♀, colored phase: Grayish-blue, rather paler below; no white throat-line; head and neck lilac-brown; ends of train yellowish. Bill black on terminal third, rest flesh-colored, like lores; iris white; legs blue, scales of tarsus blackish. Young: Plain grayish, with some rusty touches. Adults and young, white phase: Plumage entirely pure white. Bill, lores, and eyes as before; legs dark greenish, soles yellowish. In this state the bird is "Peale's Egret," long held for a distinct species, then long supposed to be only the young; but some individuals are white, and others colored, throughout their lives. Length 28.00–31.00; extent about 46.00; wing 12.50–13.50; tail 4.50; bill 4.00; tibiae bare 4.00; tarsus 5.50–6.00; middle toe and claw 3.00. Gulf States strictly, Texas to Florida; maritime; resident; N. casually to Illinois and Colorado; Mexico, Lower California, Cuba, Jamaica, Guatemala, northern South America. Nests in communities, with other species, upon low bushes, sometimes on the ground; eggs 3–4, of usual shape and color, from 1.90 × 1.48 to 2.12 × 1.55, averaging 2.00 × 1.50. *Ardea rufa* BODD, 1783; COUES, Key, 1872, p. 268; A. O. U. List, 1886, No. 198. *Ardea rufescens* GM. 1788; A. O. U. List, 2d ed. 1895, No. 198. *Ardea pealei* BP. 1826; A. O. U. Hypothetical List, No. 10. *Demi egretta rufa* and *D. pealei* BD. B. N. A. 1858, pp. 661, 662. *Dichromanassa rufa* RIDGW. 1878; COUES, Key, 2d–4th eds. 1884–90, p. 661. *Ardea* (*Dichromanassa*) *rufa* and *A. (D.) pealei* RIDGW. Man. 1887, p. 131.

FLOR'IDA. (Named for the State, which was originally called *Pascua florida* or *Pascua de flores* by Ponce de Leon, because discovered on Easter Sunday of 1512.) **SMALL BLUE AND WHITE HERONS.** Of small size; length about 2 feet. Bill about as long as tarsus, slender, very acute; culmen gently curved from near base; under outline straight or slightly concave. Head of adult with lengthened decomposed feathers; those of lower neck, and scapulars, lengthened and linear-lanceolate, but compact-webbed; no scapular train of fringed feathers. Neck bare behind below. Dichromatic; color blue or white, or both. As subgenus of *Ardea* in A. O. U. Lists.

F. cœru'lea. (Lat. *cœrulea*, blue.) **LITTLE BLUE HERON. LITTLE WHITE HERON** (not to be confused with Little White Egret). Adult ♂ ♀, colored phase: Slaty-blue or dark grayish-blue, becoming purplish-red or maroon-colored on neck and head. Bill and loreal space blue, shading to black toward end; legs and feet black; eyes yellow. Length about 24.00; extent 40.00–42.00; wing about 10.50; tail 4.25; bill 3.00–3.40, tarsus the same, or rather more; tibiae bare 2.00. In another phase, entirely white; but generally showing traces of blue here and there, especially on ends of primaries. Pure white birds require a second glance to distinguish them from immature *Garzetta candidissima*, as they are of same size, and not strikingly different in form: notice lores and basal half of bill greenish-blue, the rest blackish; most of lower mandible yellowish; legs greenish-blue, with yellow traces, or bluish-black (the Snowy Heron has no bluishness about the soft parts, and the Little Blue Heron always has traces of bluish, at least on the ends of the primaries, in the plumage, even from the nest). S. Atlantic and Gulf States, resident, abundant; N. in summer often to the Middle States, casually to New England and Nova Scotia; W. to Kansas and Nebraska; S. through West Indies and Central America to South America. Nesting as usual; eggs 3–4, 1.75 × 1.25, of usual shape and color.

BUTORIDES. (Lat. *butor*, a bittern; Gr. εἶδος, *eidos*, resemblance.) GREEN HERONS. Size small; length one and a half feet. Bill moderate, longer than tarsus, with gently convex culmen and gonys. Legs short: tibiæ little denuded; tarsus scarcely or not longer than middle toe and claw. An occipital crest of lengthened, lanceolate, not decomposed, feathers: neck-feathers long but blended, those below depending in a tuft, those on sides hiding an extensive bare space behind. In breeding season, feathers of back lengthened, lance-linear, but compact-webbed, not forming a train. Upper parts glossy green. As subgenus of *Ardea* in A. O. U. Lists.

Analysis of Subspecies.

The stock form.	U. S.	<i>virescens</i>
The pale desert form.	Western U. S.	<i>v. anthonyi</i>
The dark coast form.	L. Cala.	<i>v. frazari</i>

B. virescens. (Lat. *virescens*, growing green.) GREEN HERON. FLY-UP-THE-CREEK. CHALK-LINE. No white phase. Adult ♂ ♀, in breeding dress: Crown, long soft occipital crest, and lengthened narrow feathers of back, lustrous dark green, sometimes with a bronzy iridescence; dorsal plumes in high plumage with a glaucous bluish cast. Wing-coverts green, with conspicuous tawny edgings; neck rich dark purplish-chestnut, the throat-line variegated with dusky and white. Under parts mostly dark brownish-ash; belly variegated with white. Quills and tail greenish-dusky with a glaucous shade; edge of wing white; some quills usually white-tipped. Bill greenish-black, much of under mandible yellow; lores and iris yellow; legs greenish-yellow. Young: Head less crested; back without long narrow plumes, but glossy-greenish; neck merely reddish-brown; whole under parts white, variegated with tawny and dark brown. Length 16.00-18.00; extent about 25.00; wing 6.50-7.50; bill 2.50; tarsus 2.00; middle toe and claw about the same; tibiæ bare 1.00 or less. U. S. and a little beyond (Ontario, Manitoba), abundant in summer; resident in the South, and beyond in the West Indies and Central and northern South America. This is a very pretty and engaging little Heron, in spite of the ridiculous nicknames by which it is so well known to the great unwashed democracy of America. Breeds anywhere in its range, sometimes in heronries with larger species, often by itself in pairs. Nest a platform of twigs, on tree or bush; rude as a rule, though neatly made nests occur; eggs 3-6, elliptical, 1.37 × 1.12, pale greenish.

B. v. anthonyi. (To A. W. Anthony of San Diego, Cal.) ANTHONY'S GREEN HERON. Like the foregoing; slightly larger; paler in color, with the light markings of wings and throat less restricted. A desert form, from the arid interior of southwestern U. S.; S. into Mexico. *Ardea virescens anthonyi* MEARNS, Auk, July, 1895, p. 257; A. O. U. Suppl. List, Auk, Jan. 1897, p. 119, No. 201 *c*, by error for 201 *b*; see Auk, Jan. 1899, p. 105. This and the next are included under *B. virescens* in all former editions of the Key.

B. v. frazari. (To M. A. Frazar.) FRAZAR'S GREEN HERON. Larger than *B. virescens*, on an average, darker and more uniform in color; neck more purplish, its sides as well as the forehead strongly glaucous; light throat-line more restricted. Wing 7.00; tarsus 2.25; culmen 2.50. Lower California; type from vicinity of La Paz. *Ardea virescens frazari* BREWST. Auk, Jan. 1888, p. 83; A. O. U. List, 2d ed. 1895, No. 201 *a*. *Butorides virescens frazari* COUES, Key, 4th ed. 1890, p. 905.

NYCTICORAX. (Gr. νυκτικώραξ, *nyktikorax*, Lat. *nycticorax*, the night-raven, a classic name of the Night Heron of Europe, of which our bird is a subspecies; νύξ, gen. νυκτός, *nyx*, *nyktos*, night; κόραξ, *corax*, the raven.) NIGHT HERONS. Of medium size; length about 24.00. Bill very stout for this family; culmen not more than four times depth of bill at base; lateral outlines rather concave; gonys about straight; bill, tarsus, and middle toe with claw, of approximately equal lengths. Tarsus reticulate in front below. Tibiæ briefly naked below. Neck comparatively short, like the legs; body stout. No peculiar plumes, excepting 2-3 extremely long filamentous feathers springing from hind head, generally imbricated in one bundle.

Scapulars neither lengthened nor narrowed. Sexes alike; young very different. A well-marked genus, almost cosmopolitan, containing about eight species; our Night Heron is a subspecies of *N. nycticorax*, a species wide-ranging in Europe, Asia, and Africa. *Nycticorax* of all previous eds. of the Key, after SWAINS. Class. B. ii, 1837, p. 354, antedated by *Nycticorax* RAFIN. Anal. 1815, p. 71; FORSTER, Syn. Cat. Brit. B. 1817, p. 59; STEPH. Gen. Zoöl. xi, pt. ii, 1819, p. 608.

N. nycticorax *nævius*. (Lat. *nycticorax*: see under the genus; and *nævius*, having a *nævus* or birth-mark, *i. e.* spotted.) AMERICAN NIGHT HERON. BLACK-CROWNED NIGHT HERON. GARDENIAN HERON. QUA-BIRD. SQUAWK. QUAWK. Adult ♂ ♀, breeding dress: Crown, scapulars, and interscapulars glossy greenish-black; other upper parts, wings, and tail pale bluish-gray with a lilac or lavender tinge, most decided on neck. Forehead, sides of head, and throat-line white, shading into lilaceous of neck; under parts whitish, tinged with lilac. Long occipital plumes white. Eyes red; lores greenish; bill black; legs yellow; claws brown. Length 23.00-26.00; extent about 44.00; wing 12.00-13.00; tail 5.00; bill, tarsus, middle toe with claw, each 3.00 or a little more; tibiae bare about 1.00. Young very different: Grayish-brown above, the feathers with paler edges, rusty here and there, conspicuously spotted with white; lower parts paler or dull whitish, streaky with darker; greenish-black of head replaced by chocolate-brown; quills chocolate-brown, white-tipped; no occipital plumes. U. S. and



FIG. 616. — Yellow-crowned Night Heron. (L. A. Fuertes.)

British Provinces, common; migratory: resident in the South: most of West Indies and South America. Breeds in heronries, sometimes of vast extent, resorted to year after year. Nest large and frail; in trees, sometimes in bushes, or on ground, especially in marshes of West; eggs 3-6, often 4, very pale sea-green, averaging 2.00×1.50 . Our Night Heron is only a subspecies of European *N. nycticorax*, whence the trinomial name; "*nævius*" is only applicable to young in spotted stage. *Nycticorax grisea naria* of all previous eds. of the Key; *Nycticorax nycticorax nævius*, A. O. U. Lists, 1st and 2d eds. 1886 and 1895, No. 202.

NYCTANAS'SA. (Gr. *νύξ*, *nuξ*, night; *ἀνασσα*, *anassa*, a queen.) THICK-BILL NIGHT HERONS. Of medium size; length about 2 feet. Bill extremely stout for this family; culmen curved throughout; gonyx convex, ascending; commissure and lateral outlines of bill straight or rather convex; bill much shorter than tarsus. Tarsus longer than middle toe and claw, reticulate excepting above in front. Feathers of occiput lengthened, the longest of great extent, and linear, forming a hanging crest; scapulars lengthened and lanceolate, the longest loose-webbed, extending beyond tail. Sexes alike; colors variegated; young very different. Genus *Nycticorax*, in part, of 1st ed. of the Key. 1872, p. 269, after SWAINS. Class. B. ii, 1837, p. 354; *Nycterodius* of 2d and 3d eds. 1884 and 1887, p. 663, after *Nycterodius* REICH. Syst. Av. 1852, p. xvi; A. O. U. List, 1st ed. 1886, p. 138, as subgenus; *Nyctinassa* of 4th ed. of Key, 1890, p. 905, misprint for *Nyctanassa* STEJ. Proc. U. S. Nat. Mus. x, 1887,

p. 295: REICHENBACH'S name being inadmissible, as antedated by *Nycticorax* MACG. Man. Orn. ii, 1842, p. 126, type *Ardea nycticorax* LINN. As subgenus of *Nycticorax* in A. O. U. List, 2d ed. 1895.

N. viola'cea. (Lat. *violacea*, violet-colored: straining a point. Fig. 616.) YELLOW-CROWNED NIGHT HERON. Adult ♂ ♀ in breeding plumage: General color grayish-plumbeous, or light grayish-blue, darker on back, where the feathers have black centres and pale edges, and rather paler below. Head and upper neck behind black, with cheek-patch, crown, and most of crest, white, more or less tinged with tawny. Quills and tail dusky plumbeous. Bill black; eyes orange; lores greenish; feet black and yellow. Length about 24.00; extent 44.00; wing 12.00; tail 5.00; bill scarcely 3.00, over 0.50 deep at base; tibiae bare 2.00; tarsus 4.00; middle toe and claw 2.75. Young: Above, grayish-brown, with an olive shade, streaked and spotted with brownish-yellow; below, streaked with brown and whitish; sides of head and neck yellowish-brown, streaked with darker; top of head and neck above behind blackish, variegated with white. Bill blackish, with much of lower mandible, and lores, greenish-yellow; legs the same, obscured on front of tarsus; iris yellow. Chiefly S. Atlantic and Gulf States, and S. to West Indies, Central and northern South America, occasionally N. to the Middle States, rarely to New England, casually even to Nova Scotia; not abundant, and chiefly confined to the coast, but regularly up the Mississippi valley to the Ohio; Colorado casually; Lower California; resident in Florida. Nest as usual in trees or bushes; eggs 3-4-5-6, pale greenish-blue, 2.00 × 1.45.

Subfamily BOTOURINÆ: Bitterns.

Tail-feathers 10, broad and soft. Powder-down tracts 2 pairs. Bill with tomia somewhat serrate. Outer toe shorter than inner. Claws long and little curved. No special plumes in the breeding season; no dichromatism; plumage never white; adults and young alike.

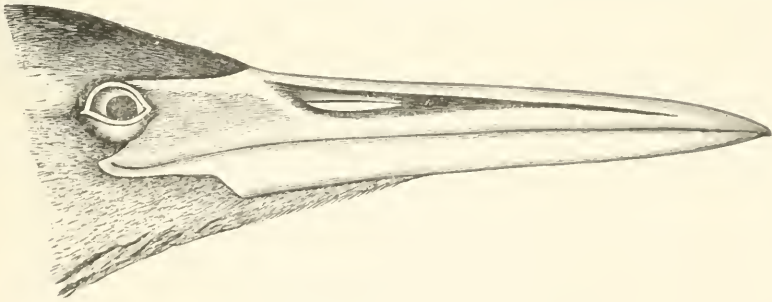


FIG. 617. — Bill of Bittern, nat. size. (Ad. nat. del. E. C.)

Bitterns form a well-marked subfamily of *Ardeide*. They are retiring and solitary birds of the marsh, not gregarious, not nesting in communities on trees, but by separate pairs, on the ground; the eggs have not the characteristic color of those of true Herons. There is something about Bitterns suggestive of Rails. The genera are several, and the species numerous; ours are excellent representatives of the subfamily.

Analysis of Genera.

Large; wing over 9.00. Plumage freckled; sexes and ages alike *Botaurus*
 Very small; wing under 6.00. Plumage parti colored; sexes distinguishable *Arletta*

BOTOURUS. (Mid. Lat. *butorius*, New Lat. *botaurus*, a bittern, applied by Pliny to the European species; erroneously said to be equal to *bos*, ox, + *taurus*, bull; but an onomatopœia, from the hollow guttural cry.) **BITTERNs.** Of medium size; length about 2½ feet.

Bill moderately longer than head, shorter than tarsus, which is shorter than middle toe and claw. Tarsus broadly scutellate in front. No crests or peculiar dorsal plumes; neck-feathers long and loose; plumage blended, spotty, and streaky. Neck in part bare behind. Sexes and young alike. Eggs drab.

B. lentiginosus. (Lat. *lentiginosus*, freckled; *lentigo*, a freckle. Figs. 617, 618, 619.) AMERICAN BITTERN. INDIAN HEN. STAKE-DRIVER. THUNDER-PUMPER. BUTTER-BUMP.

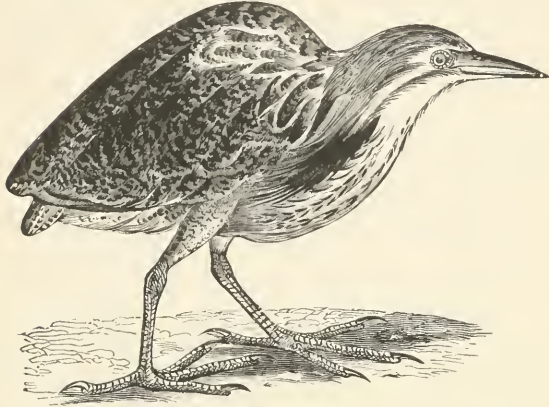


FIG. 618. — American Bittern. (From Tenney, after Audubon.)

MIRE-DRUM. BOG-BULL. Plumage of upper parts singularly freckled with brown of various shades, blackish, tawny, and whitish; neck and under parts ochrey or tawny-white, each feather marked with a brown dark-edged stripe; throat-line white, with brown streaks. A velvety-black patch on each side of neck above. Crown dull brown, with buff superciliary stripe. Tail brown. Quills greenish-black, with a glaucous shade, brown-tipped. Iris yellow. Bill pale yellowish, the ridge brownish-black; a dark brown loreal stripe. Legs dull yellowish-green; claws

brown. Length 23.00–34.00! extent 32.00–45.00! wing 9.50–13.00; bill about 3.00; tarsus about 3.50; middle toe without claw about the same; its claw above 1.00. ♀ smaller than ♂;



FIG. 619. — American Bittern's Eggs.

but few birds differ so much in size, independently of sex. Entire temperate North America, N. to 58° or 60°, S. to Central America and West Indies; accidental in Europe. Regularly migratory; resident in the South. The Bittern is a bird of very marked character. It inhabits bog and brake and wet grassy meadow, singly or in pairs; has a hoarse gurgling outcry

of alarm, and a note sounding like strokes of a mallet on a stake, or the noise made by a wooden pump. Nests on the ground; eggs 3-5, brownish-drab with a gray (*not green*) shade, 1.90-2.00 × 1.45-1.50. (*B. mugitans* COUES, 2d-4th eds. of Key, 1884-90, p. 664, after BARTRAM, whose names are still disallowed by the A. O. U. *A. lentiginosa* MONTAGU, 1813. *B. lentiginosus* STEPH. 1819, and of most authors. A. O. U. No. 190.)

ARDE'ITA. (Ital., diminutive of *Ardea*.) DWARF BITTERNÆ. Very small, least of the whole family; length about a foot. In form very nearly as in *Botaurus*. Bill slender. Tarsus about equal to middle toe and claw, with hardly any naked space. No peculiar feathers; those of lower neck long and loose; head slightly crested. Colors of back in large areas. Sexes dissimilar; young similar. There are 9 species of these queer dwarf Bitterns, of America and the Old World; they mostly inhabit reedy swamps, and somewhat approach Rails.

Analysis of Species.

Under tail-coverts like other lower parts; quills rufous-tipped; buff scapular stripe ♂ *exilis*
 Under tail-coverts black; quills not rufous tipped; no scapular stripe ♂ *neorena*

A. exi'lis. (Lat. *exilis*, for *exigilis*, exiguous, slight, small. Figs. 620, 621.) LEAST BITTERN. Adult ♂: Slightly crested crown, back, and tail, glossy greenish-black. Neck behind,



FIG. 620. — Least Bittern's Eggs.

most of the wing-coverts, and outer edges of inner quills, rich chestnut; other wing-coverts brownish-yellow; quills rufous tipped. Front and sides of neck, and under parts, including lower tail-coverts, brownish-yellow, varied with white along throat-line; sides of breast with a blackish-brown patch. Bill mostly pale yellow, culmen blackish; lores light green; eyes and toes yellow; legs green, the hinder scales yellow. ♀: Black of back entirely, that of crown mostly or wholly, replaced by rich purplish-chestnut; edges of scapulars forming a brownish-white stripe on each side, broader than in ♂. Young similar to ♀, but dorsal and scapular feathers buff-tipped. Length 11.00-14.00; extent about 18.00; wing 4.00-5.00; tail, bill, tarsus, middle toe and claw, each, 2.00 or less. U. S. and British Provinces, common; migratory; resident in the South; breeds throughout its range. Found also in West Indies.

Mexico, Central and South America to Brazil. Inhabits cat-tail marshes and reedy swamps,

such as Rails frequent; nest a mere platform of dead rushes or reeds, placed among the living ones, which are bent over it by the bird; nest sometimes in a bush. Eggs 3-6, about 1.22×0.92 , elliptical, white with a faint greenish tinge.

A. neoxe'na. (Gr. *νέος*, *neos*, new, and *ξένος*, *xenos*, a guest, stranger, foreigner.) FLORIDA DWARF BITTERN.

CORVY'S LEAST BITTERN. Adult ♂: Crown, back, and tail, black, glossed with green; no buff stripe along scapulars. Sides of head and throat chestnut; feathers of back of neck tipped with greenish-black. Breast and under parts rufous-chestnut, nearly uniform, shading into blackish on sides; under tail-coverts and lesser wing-coverts black; other upper wing-coverts rufous-chestnut, under ones paler chestnut; the remiges slaty-plumbeous, without rufous tips; inner secondaries black. Legs and feet greenish-yellow, soles yellow. Length 11.00; wing 4.50; tail and tarsus 1.60; culmen 1.75-1.80. Florida to Ontario, Michigan, and Minnesota. About 15 specimens of this interesting species are now known, showing no intergradation with *exilis*. This is a much more heavily colored bird, with less variegation, black or blackish in several places where *exilis* is not, and the general tone of other parts chestnut instead of rufous or buff. The ♀ differs little from ♂, and the young closely resemble the ♀; black duller, and a little scapular chestnut. CORV, Auk, Apr. 1886, p. 262, and July, 1886, p. 408; COUES, Key, 3d ed. 1887, p. 888; 4th ed. 1890,



FIG. 621. — Least Bittern.

p. 905; A. O. U. Check List, 2d ed. 1895, p. 70, No. 191.1. For criticism, bibliography, etc., see CHAPM. Auk, Jan. 1896, pp. 11-19, pl. 1.

Order LAMELLIROSTRES: Anserine Birds.

Bill lamellate: that is, both mandibles furnished along tomial edges with series of laminar or teeth-like projections, alternating and fitting within each other. Covering of bill membranous, wholly or in greatest part. Tongue fleshy, usually with horny tip on under side, and serrate or papillate edges corresponding to denticulations of bill. Feet palmate; hallux elevated, free, simple, or lobed (rarely absent). Wings never exceedingly long, rarely very short. Tail generally short and many-feathered. Oesophagus narrower than in lower flesh-eating orders, usually with a more or less specially formed crop; gizzard strongly muscular; intestines and their cœca long; cloaca capacious. Legs near centre of equilibrium; position of body in walking horizontal or nearly so. Reproduction præcocial. Sexual habit frequently polygamous. Diet various, commonly rather vegetarian than animal. There are in North America two remarkably diverse types of lamellirostral birds, of more than family value, by some now made the bases of separate orders, as in the A. O. U. List. Their ordinal recognition may prove advisable, especially in view of the fact that the refractory family *Anhimidæ* (or *Palamedeidæ*) has marked affinities with Anserine birds, though it is not lamellirostral, and if it were brought as a suborder into the present connection, the name of the order would cease to be pertinent, and its ascribed characters would have to be much modified accordingly. But the *Anhimidæ* are not North American; the disputed question of their chromomorphic relationship (for which see p. 845) may be waived in the present instance; and the matter at issue may continue to be compromised by recognition for our Lamellirostral Birds of two series, or suborders, as in the somewhat parallel cases of *Columbæ*, *Gallinæ*, and *Paludicolæ*.

SUBORDER ODONTOGLOSSÆ: GRALLATORIAL ANSERES.

(ORDER ODONTOGLOSSÆ of the A. O. U.)

Consisting of the single surviving family of Flamingoes; *Odontoglossæ* of Nitzsch, *Amphimorphæ* of Huxley, *Phanicopteridæ* of most authors. "The genus *Phanicopterus* is so completely intermediate between the Anserine birds on the one side, and the Storks and Herons on the other, that it can be ranged with neither of these groups, but must stand as the type of a division by itself. Thus the skull has the long lacrymo-nasal region, the basiptyergoid facets, the prolonged and recurved angle of the mandible, the laminated horny sheath of the *Chenomorphæ* [*Anatidæ*]; but the maxillo-palatines are spongy, and the general structure of the rostrum is quite similar to that found in Storks and Herons. The lower end of the crus is bare, but the feet are fully webbed; and the pterylosis is said by Nitzsch to be completely Stork-like" (Huxley). Anserine cranial characters are also found in the constriction of the frontal bone in the orbital region, so that the orbits are not much roofed over: and in the presence of fossæ for the supraorbital glands; basiptyergoids appear, however small: and the construction of the shoulder-girdle is rather anserine than otherwise. The plumage is aftershafted, and has a ventral apterium. Cervical vertebrae 18 or 19, of which 2 are cervico-dorsal; palate desmognathous; carotids present, but the right much larger than the left, which joins it low down in the neck (unique in detail, but similar to the disposition found in Bitterns and certain Parrots; fig. 94); femoro-caudal absent; ambiens, accessory femoro-caudal, semitendinosus and accessory semitendinosus present (formula BXY, differing from that of *Herodiones* and of *Anatidæ*). Tongue thick, fleshy, papillate, with terminal nail, and closely tied down; oesophagus extremely narrow, with special crop; gizzard very muscular; intestines ample, both in length and calibre; 2 long cœca, constricted at base; a capacious cloaca. Bill of unique shape, but perfectly lamellate. General configuration of body and members grallatorial; legs and very slender neck exceedingly long, exhibiting even an exaggeration of the proportions of Cranes, Storks, and Herons; but toes webbed. The palmation is like that of the Avocet, and mainly

subserve the identical purpose of supporting the birds on the soft mud at the bottom of the shallow water in which they both wade habitually; neither of these genera contains swimming birds, though both Avocets and Flamingoes can swim if put to it, and are able to rise on wing from the surface of deep water. The external characters are so nicely balanced between those of wading and swimming birds, that Flamingoes have been placed indifferently in both groups; but nearly the whole organization corresponds essentially with that of the Duck tribe, the grallatorial relationship, in form and habits, though so evident, being rather of analogy than of affinity. The physiological nature is præcocial; the young are nidifugous, hatching clothed and taking directly to the water.

The interesting fossil species of *Palælodus* are Miocene Flamingoes, with straight bills, constituting the family *Palælodontidæ*. Some other flamingo-like genera are indicated by remains of Eocene age.

Family PHŒNICOPTERIDÆ: Flamingoes.

Bill unique in shape, abruptly bent at middle, so that the upper surface faces the ground in the act of feeding and the bird then looks backward; in length much exceeding head, very large and thick, entirely invested with membrane (without the distinct terminal horny nail of *Anatidæ*). Mandible narrower than maxilla at base, broader in the rest of its extent, ridged near end. Upper mandible freely movable, fitted into the other like a lid of a box, furnished along its edges with a great number (some 150) of oblique laminae; edges of lower mandible incurved, similarly furnished. Nostrils sub-basal, nearer commissure than culmen, linear, long. Tibiæ bare below for a great distance, and like the tarsi broadly scutellate before and behind; the latter about three times as long as the femora. Toes short, the anterior palmate, with incised webs; hallux elevated, free, very small, or absent. Wings aquitoeubital, moderately long, ample, with enlarged inner secondaries folding over and beyond primaries when closed; the latter 11 functional, morphologically 12. Tail short, of 14 rectrices. There are about 7 species of Flamingoes, inhabiting the warmer parts of both Hemispheres; 3 of America besides ours, and 3 or 4 Old World. They represent several genera of late systematists, the most marked being *Phaniciparrus*, typified by *P. andinus*, which is 3-toed; *Phæniconais minor* is African, 4-toed. Our species falls in the subgenus *Phænicrodias* of Gray, which is identical with *Phænicopterus* in a restricted sense.

PHŒNICOPTERUS. (Gr. φωνικόπτερος, *phoinikopteros*, Lat. *phænicopterus*, a flamingo: *i. e.* red-wing.) FLAMINGOES. Character as above. Head bare between bill and eyes; throat bare. Hind toe present. Claws flattened, obtuse. Wings ample, pointed; 1st three primaries subequal and longest; inner secondaries elongated and tapering.

P. ruber. (Lat. *ruber*, red. Fig. 622.) AMERICAN RED FLAMINGO. Adult ♂ ♀: Plumage scarlet; primaries and most secondaries black. Legs lake red. Bill black on terminal part, orange in the middle, the base and bare skin of head yellow. Stature nearly 5 feet; weight 6 or 8 lbs. Length about 4 feet; extent 5 feet or more; wing 16.00 inches; tail 6.00; bill 5.00; tibia bare 9.00; tarsus 13.00; middle toe and claw 3.50. ♀ like ♂ in color, but smaller. Young hatch clothed in white down, with straight bill; the latter gradually acquires its bent or set. The first plumage is grayish-white, more gray and dusky on wings, and passes through pink, rosy, and earmine, or vermilion tints to its full scarlet, the latter being usually most intense on wings. Several years are required to perfect the plumage, and it is found in best order in winter; the birds become faded and dingy in April, breed in that state in May and June, and when in moult are unable to fly from loss of the remiges, like other Anserine birds. Bahamas, Florida and Gulf Coast, and southward; said to have been N. to S. Carolina; now scarce and local in U. S. even in Florida, where confined to some of the shallow lagoons of the southern part of the peninsula, difficult of access, in flocks sometimes numbering hundreds or a

thousand. Eggs 2, 3 $2.5-3.55 \times 2.10-2.25$, long, oval, with thick shell, roughened with white flaky substance, bluish when this is scraped away. The nest is made of mud scraped up into the shape of the frustum of a cone, about 18 or 20 inches or less across at the base, of less diameter at the top, and from a few inches to more than a foot high; the eggs are laid in a slight hollow, on the bare earth, which cakes and hardens on drying, keeps its shape for years, and may be used over and over again — probably not by the same birds by which it was first erected, but by some members of the colony which resorts to the same spot to breed year after year. The nests are repaired by the addition of fresh mud, till they may become over two feet high. On such a pedestal as this the bird sits with her long legs bent double horizontally



FIG. 622. — American Flamingoes. (From a photograph of a group mounted by F. S. Webster.)

under her, the heels and tail sticking far out behind, the long neck bent so that the head nestles closely, and the eggs under the breast rather than under the belly. The food, both of an animal and vegetable kind, is procured by scooping up and sifting the extremely soft, sticky ooze or slime which composes the bottom of the shallow salt-water bays and salt or brackish lagoons which are alike the feeding-grounds and the nesting-places of these singular birds; they are generally found fat, but their flesh is rank, oily, and unfit to be eaten. They fly well, with their long legs stretched out behind, like Herons, but the long neck also stretched out straight before, like Geese or Swans, and not like Herons, which latter double the neck in upon the shoulders. The voice is a hoarse guttural outcry of one syllable, uttered instantly on alarm: the birds are extremely wary and watchful, when feeding or resting, and on this account, as well as from the nature of their haunts, are difficult to approach within gunshot range. The flocks at times go through for their amusement some extraordinary performances known as the "dress

parade;" and the long line of flaming red they present has been likened to the appearance of a prairie-fire at night (see Ingraham's excellent article in World's Congress Papers, Chicago, 1896, pp. 59-69). The accompanying illustration, continued from 2d-4th editions of the Key, is erroneous as regards the attitude of a Flamingo upon the nest, unless she be just in the act of stepping down off it; but it will serve to accentuate the fable which came down to us from Dampier, 1683, was never doubted till 1844, nor positively refuted till 1884 in the case of the European *P. antiquorum* (Ibis, 1884, p. 88, pl. 4; Key, 2d ed. 1884, p. 679), and for our species only set entirely right in 1888 (Ibis, p. 151); but see also Maynard's Naturalist in Florida, No. 1, 1884.

SUBORDER ANSERES: ANSERINE BIRDS PROPER.

(ORDER ANSERES of the A. O. U.)

Simply equivalent to Lamellirostres as above defined (p. 887), *minus* the Grallatorial type (Flamingoes). For further characters, see on, under head of the single

Family ANATIDÆ: Swans, Geese, Ducks, and Mergansers.

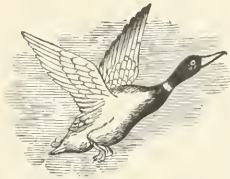


FIG. 623. — Wild Duck.

Bill lamellate, stout, more or less elevated and compressed at base, widened or flattened at obtuse tip, invested with soft, tough, leathery membrane, except at end, which is furnished with a hard, horny "nail," or *dertrum*, generally somewhat overhanging, sometimes small and distinct, sometimes large and fused—that is, changing insensibly into the general covering. (This soft covering is regarded by some as a prolonged cere, especially well marked in the genus *Cercopsis*; but this is purely theoretical.) The bill

has a slenderer, more cylindric form only in Mergansers and certain related diving Ducks. Body full, heavy, flattened beneath; neck of variable length; head large; eyes small. No antiae; frontal feathers encroaching on culmen with a convex or pointed outline, and forming other projections on sides of bill and in interramal space, which latter is broad and long, the mandibular crura being united only at the end by a broad short bridge; no culminal ridge nor keel of gonys. Nostrils subbasal, median, or subterminal, elevated, open, naked, usually broadly oval. Wings of moderate length, stiff, strong, pointed, conferring rapid, vigorous, whistling flight; a wild Duck at full speed is said to make 90 miles an hour, and ordinarily flies at the rate of 50 an hour. In a few cases the wings are exceptionally so reduced that power of flight is lost. Functional primaries 10, as usual, with a remicle, making the morphological total 11, whereof the 6 inner ones are borne upon the metacarpal bones, 1 is borne on 3d digital bone, 2 on 1st phalanx of 2d digit, and 2 on 2d phalanx of the same digit (one of these two last being the remicle). Secondaries or cubitals about 19; 5th wanting, the wing being thus aquinoorbital. The wing is also spurred in certain Geese (as it is in the Anhima). Tail of variable shape, but usually short and rounded, never forked, sometimes emneate, of 12-24 feathers, usually 14-16; under coverts very long and full, forming a conspicuous crissal tuft. Legs short; femora, tibiae and tarsi of approximately equal or not very disproportionate lengths; knees buried in general integument; tibiae feathered nearly or quite to suffrago; tarsi reticulate or scutellate, or both; toes palmate, the anterior ones normally full-webbed, exceptionally semipalmate; hinder always present and free, simple or lobate.

Like the Gallinaceous, the Anserine type is a familiar one, comprising all kinds of "water-fowl," among which are the originals of all our domestic breeds of Swans, Geese, and Ducks, that vie with poultry in point of economic consequence, ornament our parks, or furnish exquisite material for wearing apparel, as well as the filling of our pillows and couches. But

additional information respecting the structure of this, the largest and most important family of swimming birds, may be desirable. It is definitely characterized by many important points besides those external features just stated. In palatal structure, *Anatidæ* are desmognathous (fig. 78); "the lacrymal region of the skull is remarkably long [the lacrymal bone itself is large]. The basisphenoidal rostrum has oval sessile basiptyergoid facets [situated very far forward]. The flat and lamellar maxillo-palatines unite and form a bridge across the palate. The angle of the mandible is produced and greatly recurved" (*Huxley*). Interorbital septum is more or less completely ossified, and orbits are better defined than in many birds, by well-developed lacrymal and post-frontal processes. Premaxillary large; its 3 prongs so extensively fused that only a slight nasal aperture remains. Sometimes the top of the skull shows crescentic depressions for lodgment of the supraorbital gland, the secretion of which lubricates the nasal passages; but this feature is never so marked as in most piscivorous swimmers (fig. 63). Sternum long and broad, more or less transverse posteriorly, with a simple notch or fenestra on each side; sometimes its keel is curiously hollowed out for a purpose stated beyond. The vertebrae vary a good deal in number, owing to variability of cervicals, which run up to 23 or 24 in some Swans (including 2 cervico-dorsals; a Goose has 18 + 2). The ribs bear uncinate processes, as usual in birds (these being absent in somewhat related or echenomorphic *Anhimidæ*). Pelvis ample, arched, and extensively ossified, with small foramina, showing nothing of the straight, constricted, largely fenestrated figure prevalent among lower water-birds. Oil-gland present, tufted; carotids 2; ambiens, femoroceudal and its accessory, and semi-tendinosus, present. Tongue large and fleshy; its main bone (*glossohyal*; fig. 72) highly developed; its sides show processes corresponding to the lamellæ of the bill. Gullet not so ample as in flesh-eating swimmers: gizzard like that of a fowl in shape and great muscularity; the muscles are deep-colored, and well show the typical disposition of large hemispherical lateral masses converging to central tendons. The cæca vary with the genera according to food; they are very long — 12 or 15 inches — in some herbivorous species. The male genital armature merits special notice. "In some *Natatores* which copulate on the water there is provision for more efficient coitus than by simple contact of everted cloacæ; and in the *Anatidæ* a long penis is developed. It is essentially a sacular production of a highly vascular part of the living membrane of the cloaca. . . . In the passive state it is coiled up like a screw by the elasticity of associated ligamentous structure. . . . A groove commencing widely at the base follows the spiral turns of the sac to its termination: the sperm ducts open upon papillæ at the base of this groove. This form of penis has a muscle by which it can be everted, protruded and raised" (*Owen*). Among the most interesting structures of *Anatidæ* are curious modifications of the windpipe, prevailing almost throughout the family. In a number of Swans, this organ enters a cavity in the keel of the sternum, doubles on itself and then emerges to pass to the lungs, forming either a horizontal or a vertical coil. In *Anseranus* the windpipe coils between the pectoral muscles and the skin. (These vagaries of the windpipe are not, however, confined to the present family, occurring in some Cranes, Ibises, Arganis, certain *Gallinæ*, and those curious Snipe, the *Rostratulinæ*.) In most Ducks, furthermore, and in Mergansers, the lower larynx is singularly enlarged and complicated; several lower rings of the trachea being soldered together and greatly magnified to produce a large irregularly-shaped capsule, the so-called bulla ossea or tracheal tympanum. Its use is not known beyond its obvious effect in modifying the timbre or quality of the voice; in some sense it is a sexual character, since it is only fully developed in the ♂ as a rule, though present in the ♀ of *Virago castanea*; it varies greatly in size and shape in different species (figs. 3, 98), as well as in the relative extent to which hard gristle and soft membrane enter into its composition. Finally, it should be added, the pterylosis of the family is perfectly definite, a certain type of tract-formation prevailing throughout, with very slight minor modifications, and always presenting a ventral apertium.

It is not easy to overrate the economic importance of this large family. It is true that

Mergansers, some Sea Ducks, and certain maritime Geese, that feed chiefly upon animal substances, are scarcely fit for food; but the great majority of the *Anatidæ* afford a bounteous supply of sapid meat, a chief dependence, indeed, with the population of some inhospitable regions. Such is the case, for example, in the boreal parts of this continent, whither vast bands of water-fowl resort to breed during the fleeting arctic summer. Their coming marks a season of comparative plenty in places where hunger often pinches the belly, and their warm downy covering is patched into garments almost cold-proof.

The general traits of Anserine birds are too well known to require more than passing notice. They are salacious to a degree remarkable even in the hot-blooded, passionate class of birds; a circumstance rendering the production of hybrids frequent, and favoring the study of this subject. Probably a hundred identified hybrids have been recorded, some of them between different genera, some even between birds we are accustomed to place in different subfamilies; and in these cases fertility of the mongrel progeny is the rule. If we recall the peculiar actions of Geese nipping herbage, and of Ducks "dabbling" in the water, and know that some species, as Mergansers, pursue fish, and other live prey under water, we have the principal modes of feeding. Nidification is usually on the ground; sometimes in a hollow tree; the nest is often warmly lined with live feathers, though otherwise rude; the eggs are smooth, with a peculiar look and feel, as if greasy, and usually of some plain pale color, as greenish, drab, or creamy, less often quite white; the clutch varies in number, commonly ranging 6-18. The young are clothed with stiffish down, and swim at once. Among Ducks and Mergansers, marked sexual diversity in color is the rule; the reverse is the case with Swans and Geese. A noteworthy coloration of many species, especially of Ducks, is the *speculum*; a brightly colored, generally iridescent, area on the secondary quills, sometimes called the "beauty-spot." Most species are migratory, particularly those of the Northern Hemisphere; the flight is performed in bands, that seem to preserve discipline as well as companionship; and with such regularity that no birds are better entitled to the claim of weather-prophets.

There are just about 200 well-determined species of *Anatidæ*, inhabiting all parts of the world. They differ a good deal in minor details, and represent a number of peculiar genera aside from the ordinary types, though none are so aberrant as to endanger the integrity of the group. It is difficult to establish divisions higher than generic, because Swans, Geese, Ducks, and Mergansers are closely united by intermediate genera. But the 5 groups presented as subfamilies in the following pages, and representing nearly the whole of the family, may be conveniently recognized, and are readily distinguished, so far as our species are concerned. Eleven subfamilies, not all of which are so well marked as our five, are given by the latest monographer (SALVADORI, Cat. B. Brit. Mus. vol. xxvii, pp. 23-493, 1895). I may here briefly note the most unconformable exotic types, some of which stand for separate families with certain writers, to whom some things are revealed that it is not given to common mortals to know. 1. The New Zealand fossil genus *Cnemiornis* is anserine, though first referred to struthious birds, like the Moas, in association with remains of which its own were originally found; this type is of a separate family *Cnemiornithidæ*, characterized by the almost ecarinate sternum, the epicnemial process of the tibia, as in the Loons, and other peculiarities. 2. The most remarkable living member of the *Anatidæ* is *Cereopsis novæ-hollandiæ*, a sort of a Goose, but representing a special subfamily *Cereopsinae*. In this Australian bird the soft skin of the bill may be called a true cere, reaching to the nail at the end, with the nostrils in its anterior part; the form of the body and its members is remarkably stocky; the webs of the toes are incised, and the bird avoids the water, living on dry plains like a Bustard, and subsisting on herbage. 3. Another notable Australian type is *Anseranas semipalmata*; likewise a kind of Goose, type of the subfamily *Anseranatinae*, characterized by the slight webbing of the anterior toes, the long hallux on a level with the other digits, the carunculation of the bill and face, the extreme subcutaneous convolution of the immensely long windpipe (over four

fect), etc. This is the member of the *Anatidæ* to which the Horned Screamer (*Anhima cornuta*) makes its nearest approach, and indeed their resemblance in several respects is evident; it is a large black and white bird, with the strut of a Crane rather than the waddle of a Goose.

4. The Spur-winged Geese of the African genus *Plectropterus*, with certain of their allies, may form another subfamily *Plectropterinæ*. There are several species or subspecies of the genus, all having the wings spurred, the lores naked, and a curious fleshy knob on the forehead, best marked in *P. rupeelli* of Abyssinia. The limits of this subfamily are wholly in question; some writers consider that the Egyptian Goose, *Chenalopex ægyptiaca*, and the similar South American *C. jubatus* belong to it, while others refer *Chenalopex* to ordinary *Anatinæ*, and bring under *Plectropterinæ* a number of other genera, among them *Sarcidiornis*, the ♂ of which has a large fleshy comb at the base of the upper mandible. But in any event, in considering these birds we are already come upon quite ordinary forms of *Anatidæ*, further remarks concerning which will be found under heads of the five subfamilies to be formally presented in the present work.

Analysis of North American Subfamilies.

CYGNINÆ. *Swans*. Lores partly naked. Neck very long. Tarsi reticulate. Hallux simple. Sexes alike.

ANSERINÆ. *Geese*. Lores feathered. Neck moderate. Tarsi reticulate. Hallux simple. Bill high at base. Sexes alike.

ANATINÆ. *River Ducks*. Lores feathered. Tarsi scutellate in front. Hallux simple. Bill flattened. Sexes unlike.

FULIGULINÆ. *Sea Ducks*. Lores feathered. Tarsi scutellate in front. Hallux lobate. Bill flattened. Sexes unlike.

MERGINÆ. *Mergansers*. Lores feathered. Tarsi scutellate in front. Hallux lobate. Bill cylindrical. Sexes unlike.

Subfamily CYGNINÆ: Swans.

*A strip of bare skin between eye and bill; tarsi reticulate, shorter than middle toe and claw; hind toe simple, or with very slight lobe. Neck of extreme length and flexibility, exceeding the trunk, with 22-24 vertebrae; the movements and attitudes of Swans on the water are elegant and graceful, especially in those species which bend the neck in a regular sigmoid curve. The bill equals or exceeds head in length; it is high and compressed at base (where sometimes tuberculate), flatter and widened at end, on the whole more duck-like than goose-like; the nostrils are median. Lores naked in adults, feathered in young. Some of the inner remiges are usually enlarged, and when elevated in a peculiar position of the wing act as sails to help the course of the bird over the water. The legs are placed rather far back, so that the gait is awkward and constrained on land, in striking contrast with the stately grace with which these birds swim; they waddle worse than Geese, quite as badly as any Ducks, and "a Swan on a turnpike" is proverbially ill at ease. Tail short, of 20 to 24 feathers. The sexes are alike throughout the group. Although the voice of most species is sonorous at times, an habitual reticence of Swans, especially of the mute Swan, contrasts strongly with the noisy gabbling of Geese and Ducks; it is hardly necessary to add, that their fancied musical ability, either in health or at the approach of death, is feigned by poets but not confirmed by examination of their vocal apparatus. The trachea is in several species convoluted as already described, but there are no syringeal muscles nor other apparatus for modulating the voice musically. There are 8 or 10 species, of various countries, among them the celebrated Black Swan of Australia, *Chenopsis atrata*, with peculiarly crisp, curly, inner wing-feathers, and the Black-necked Swan of South America, *Sthenelides melanocorypha* (*Cygnus nigricollis**



FIG. 624. — Mute Swan. *Cygnus olor*. (From Dixon.)

Although the voice of most species is sonorous at times, an habitual reticence of Swans, especially of the mute Swan, contrasts strongly with the noisy gabbling of Geese and Ducks; it is hardly necessary to add, that their fancied musical ability, either in health or at the approach of death, is feigned by poets but not confirmed by examination of their vocal apparatus. The trachea is in several species convoluted as already described, but there are no syringeal muscles nor other apparatus for modulating the voice musically. There are 8 or 10 species, of various countries, among them the celebrated Black Swan of Australia, *Chenopsis atrata*, with peculiarly crisp, curly, inner wing-feathers, and the Black-necked Swan of South America, *Sthenelides melanocorypha* (*Cygnus nigricollis*

of authors), which is white except as said, and has the bill knobbed. *Coscoroba coscoroba*, *candida*, or *anatoïdes* of the same country, a white species with black-tipped wings and feathered lores, often referred here, is perhaps better placed among *Anatina*. In none of these three named does the trachea enter the breast-bone. *Palæocygnus falconeri* is a large fossil species from Malta. Our two native species, like our straggler from Europe, belong to the restricted genus *Olor*, distinguished from *Cygnus* proper by having sternal convolutions of the trachea, but no tubercle at base of bill (seen in fig. 624).

CYGNUS. (Gr. *κύκνος*, *kuknos*, Lat. *cygnus* or *cygnus*, a swan.) WHITE SWANS. Neck of extreme length. Trachea entering sternum (except in one species). Bill tuberculate (in *Cygnus* proper) or not (in *Olor*), the skinny covering in adults reaching eyes; not shorter than head, very high at base, where deeper than wide, broader and flattening toward the rounded end; culminal ridge at base about horizontal, very broad and flat or even excavated; sides of

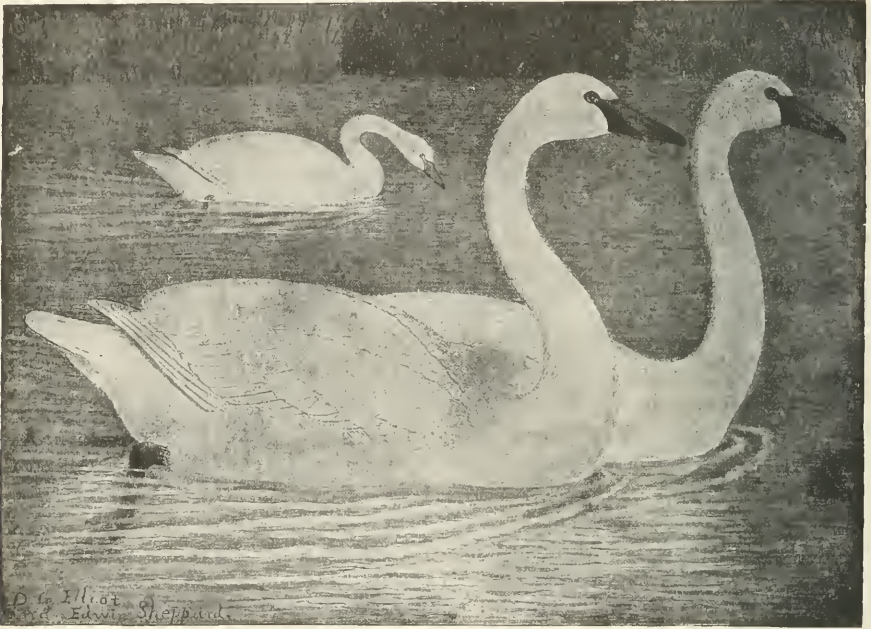


FIG. 625. — Trumpeter Swan. (From "Wild Fowl of North America," by D. G. Elliot.)

bill there nearly vertical. Nostrils near middle of bill, high up. Legs behind centre of equilibrium when the body is horizontal. Tibiæ bare below. Tarsus shorter than middle toe and claw, entirely reticulate; toes long, with full webs, the anterior reticulate on top for a distance, then scutellate. Hallux small, elevate, with slight lobe. Wings very long and ample. Tail short, rounded (in *Olor*) or wedged (in *Cygnus* proper), of 20 or 24 feathers. Size large: adults entirely white, with black bill and feet, former usually in part yellow; young rusty on head; younger gray or ashy. Sexes alike. Our species 4-5 feet long. They all belong to *Olor*, having a convoluted trachea, non-tuberculate bill, rounded tail, the young with down on sides of bill forming distinct antiæ; and inner webs of outer 3 primaries, with outer webs of 2d, 3d, and 4th, sinuated. The type of *Cygnus* proper of authors (after BECHSTEIN, 1803) is the Tame or Mute Swan of Europe, whose ♂ is a *Cob*, ♀ a *Pen*: it is variously called *C. mansuetus*, *C. gibbus*, *C. olor*, *C. mutus*, *C. sibilus*, and by other names; this is the Swan with a red bill and black knob (the "berry"). The unfortunate way in which the generic

term *Olor* is used for a division which does not contain the species *C. olor* is confusing, and would be obviated if we took from BARTRAM, 1791, the generic name *Cygnus*, with our common Swan as its type.

Analysis of Species.

Tail of 24 feathers (normally). Bill always entirely black, rather longer than head, with nostrils situated fairly in its basal half	<i>buccinator</i>
Tail of 20 feathers (normally). Bill usually with a small yellow spot not reaching nostrils, scarcely or not longer than head, nostrils at the middle	<i>columbianus</i>
Tail of 20 feathers (normally). Bill with a great yellow space extending beyond nostrils, scarcely or not longer than head, nostrils at the middle	<i>cygnus</i>

C. *buccinator*. (Lat. *buccinator*, a trumpeter; *buccina*, a trumpet; *bucca*, the cheek. Fig. 625.) TRUMPETER SWAN. Adult ♂ ♀: Plumage white, with or without wash of rusty on head. Bill and feet entirely black; iris brown. Bill more developed in the terminal portion than that of *columbianus*, throwing nostrils fairly within basal half, and making distance from anterior angle of eye to hind edge of nostril not greater than distance thence to end of bill. Tail-feathers normally 24. Largest: Length 5 feet or more when full grown; extent 8 feet or more; wing about 2 feet or rather more; tail 8-9 inches. Bill about 4.50 inches along culmen, from eye to tip nearly 6.00; tarsus 4.50-5.00; middle toe and claw 5.50-6.50. Young smaller; bill and feet not perfectly black; plumage grayish, the head and upper neck rusty-brown. Eggs 2-7, white or whitish, about 4.50 × 3.00. The trachea is more convoluted in the sternum than that of *columbianus*, having a vertical bend besides the horizontal one; and the bone which contains the convolutions is correspondingly more bulbous. This magnificent Swan chiefly inhabits interior North America from the Mississippi valley westward; N. to the Fur countries; Great Lakes; Hudson's Bay; Ontario; casual on Atlantic coast. Breeds N. from Wyoming and the Dakotas; winters



FIG. 626. — Whistling Swan. (From Lewis.)

from Washington to Arizona, Gulf of Mexico and southern California. It was discovered in 1805-6 on the Columbia River by Lewis and Clark, who described it as distinct from the common Swan (orig. ed. 1814; see my ed. of 1893, p. 885); but it was not technically named till 1831: *C. buccinator* RICH.; *Olor buccinator* WAGL. 1832; A. O. U. Lists, No. 181.

C. *columbianus*. (Of the Columbia River. Fig. 626.) COMMON AMERICAN SWAN. WHISTLING SWAN. Adult ♂ ♀: Plumage as before. Bill with a yellow spot or blotch in front of eye, usually small, sometimes wanting; feet black; iris brown. Bill less lengthened and expanded terminally than in *buccinator*: nostrils placed across its middle; distance from anterior angle of eye to hind edge of nostril more than thence to end of bill. Tail-feathers normally 20. Length under 5 feet (about 4½); extent 6 or 7 feet; wing under 2 feet (about 21.00-22.00 inches); tail 7.00-8.00; bill about 4.00 along culmen; from eye to tip of bill

under 5.00; tarsus 4.00–4.35; middle toe and claw 5.50–6.00. ♀ smaller than ♂. Young smaller than adults; plumage ashy-gray, with reddish-brown wash on head and upper neck; bill in part flesh-colored, the lores plumulose; feet yellowish flesh-color. The yellow spot on the bill, when present, instantly distinguishes this species from the foregoing; in its absence, distinctive characters are the lesser size, shorter and differently shaped bill with nostrils in different relative position, fewer tail-feathers, and lack of the extra vertical fold of the windpipe in the breast-bone. North America at large, U. S. in winter and during migration; the usual species along the Atlantic coast, and more numerous on either coast, Atlantic or Pacific, than in interior U. S.; rare or casual in New England and eastward; Kamtschatka; accidental in Europe. Breeds in the high North. Eggs 2–7, 4.00 × 2.25–4.50 × 2.50, rough, dull white, with more or less brownish discoloration. (? *C. ferus* BARTR. 1791 (*nee auct.*)). *Whistling Swan* LEWIS and CLARK, whence *Anas columbianus* ORD. 1815. *C. musicus* BP. 1826. *C. americanus* SHARPL. 1830. *C. columbianus* COUES, 1876. *Olor columbianus* A. O. U. Lists, No. 180.)

C. cygnus. EUROPEAN WILD or WHISTLING SWAN. WHOOPING SWAN. WHOOPER. HOOPER. ELK. Similar to *columbianus*, and having same shape of bill, but instead of a small yellow spot behind nostrils there is a great yellow blotch, occupying one half or more of bill and extending beyond nostrils. Only North American as occurring casually in Greenland: REINH. Ibis, 1861, p. 13 of the reprint; FREKE, Zool. v, Sept. 1881, p. 372. (*Anas cygnus* LINN. 1758. *C. ferus* BRISS. 1760, and of authors. *C. musicus* BECHST. 1809, and of most authors, as of 2d–4th eds. of the Key. *C. cygnus* LESS. 1828. *Olor musicus* WAGL. 1832. *Olor cygnus* GRAY, 1855; A. O. U. Lists, No. [179].)

OBS. — BEWICK'S SWAN, *C. bewicki*, is a European species, incorrectly attributed to North America in SW. and RICH. Fd. Bor.-Am. ii, 1831, p. 465; NUTT. Man. ii, 1834, p. 372. This old record, which simply means *C. columbianus*, was revived by RIDOW, Pr. U. S. Nat. Mus. iii, 1880, p. 222, who gives the bird as *Olor minor* there and in his Cat. *ibid.*, p. 202, No. [587]: see NEWTON, Man. Nat. Hist. Greenl. 1875, p. 113; FREKE, Zool. Sept. 1881, p. 366; COUES, Check-List, 2d ed. 1882, p. 111, No. 691, and Key, 2d ed. 1884, p. 683.

Subfamily ANSERINÆ: Geese.

Lores completely feathered; tarsi entirely reticulate; hind toe simple. Neck in length between that of Swans and of Ducks; cervical vertebræ proper about 16, with 2 cervico-dorsals. Body elevated and not so much flattened as in Ducks; legs relatively longer; tarsus generally exceeding, or at least not shorter than, middle toe; bill generally rather short, high and compressed at base, rapidly tapering to tip, which is less widened and flattened than is usual among Ducks, and almost wholly occupied by the broad nail. No tracheal tympanum in typical *Anserinæ* (though present in many forms which are commonly included in this subfamily). The species as a rule are more terrestrial, and walk better, than Ducks; they are generally herbivorous, although several maritime species (*Phalacrocorax*, and an allied South American group) are animal-feeders, and their flesh is rank. Both sexes attend to the young. A notable trait, shared by Swans, is their mode of resenting intrusion or aggression by hissing with outstretched neck, and striking with the wings. With some exceptions the plumage is not so bright and variegated as that of Ducks, and the speculum is wanting; there is only an annual moult, and no great seasonal change of plumage; the sexes are generally alike (unlike in some species of *Chloephaga*, etc.). Most true Geese fall in or near our genera

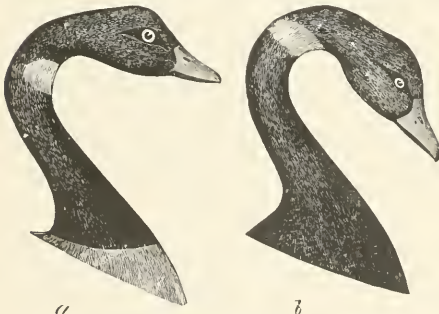


FIG. 627. — Common (a) and Black (b) Brant.

Chen, *Anser*, and *Branta*, and are modelled in the likeness of the domestic breeds. Notable exotic forms, which used to be referred to this subfamily but are now kept apart, are: the Australian *Anseranas semipalmata* and *Cereopsis nova-hollandiæ*, and the African species of *Plectropterus* (for all of which see p. 892). The Asiatic *Cygnopsis cygnoides*, frequently domesticated, is a true Goose with a Swan-like aspect. The Egyptian Goose, *Chenalopex ægyptiaca*, and its South American ally, *C. jubatus*, are Duck-like Geese related in some particulars to the Spur-winged Geese; their true position is in question. The Geese are directly connected with Ducks through the rather large Sheldrake group, the species of which resemble Geese in some external features, but are more essentially like Ducks. Characteristic examples of this group are the European *Tadorna cornuta* and *Casarea casarea*. There are several other Duck-like Geese, as the African *Cyanochen cyanopterus*, the Australian *Chenonetta jubata*, and about 6 species of *Chloëphaga*, all South American, like *C. melanoptera*; these are sometimes grouped as a subfamily apart. Our long-legged arboricole genus *Dendrocygna* belongs in the immediate vicinity, while the domesticated Musk Duck, *Cairina moschata*, is not far removed. Through such forms as these we are brought directly among the Ducks proper. Some notable exotic Geese of very small size, not larger than Teal, are the Goslets composing the genus *Nettionus*, with 4 species — *N. uiritæ* of Africa, *N. coromandelianus* and *N. pulchellus* of Asia, etc., and *N. albipennis* of Australia. Among typical exotic Geese, hardly separable generically from *Branta* or *Anser*, may be named *Nesochen sandvicensis* of the islands whence its generic and specific designations are both derived; *Rufibrenta ruficollis*, the Red-breasted Goose of Asia; and *Eulabeia indica*, the Indian Bar-headed Goose. The character of the subfamily would appear to much better advantage if it were restricted to such genera as the three last named in connection with *Anser*, *Chen*, *Branta*, *Philacte*, and *Cygnoides*, as is done by Salvadori.

Analysis of Genera.

Bill pink; feet yellow; under parts extensively black. Bill tapering, not longer than head. Lamellæ moderately exposed		Anser
Bill and feet pink. Plumage white, or much varied. Bill tapering, not longer than head. Lamellæ completely exposed		Chen
Bill and feet black; head and neck black, with white spaces. Bill tapering, shorter than head. Lamellæ hidden		Branta
Bill and feet light; plumage bluish, with black crescents. Bill tapering, not longer than head. Lamellæ partly exposed		Philacte
Bill and feet various; plumage much variegated. Bill scarcely tapering, longer than head		Dendrocygna
Obs. — These characters only indicate the North American species.		

ANSER. (Lat. *anser*, a goose.) GRAY GEESE. LAND GEESE. Bill shorter or not longer than head, very stout, tapering to obtuse tip, at base rather higher than broad. Lateral lamellæ somewhat exposed by bevelling of tomia. Nostrils in basal half of bill, their anterior edge only reaching its middle. Tibiæ naked below. Tarsus rather shorter than middle toe and claw, entirely reticulate. Anterior toes full-webbed, on top reticulate at base, then scutellate. Hind toe moderate, reaching the ground. Tail of 16 + feathers. Color not white, nor with black head, neck, bill, or feet. This genus contains the most typical Geese, among them being the wild original of the domestic Goose, *A. anser, ferus*, or *cinereus*, commonly called the Gray Lag Goose; the Bean Goose, *A. fabalis* or *segetum*, now to be introduced to our Fauna on good evidence; the Greater Bean Goose, *A. grandis*; the Pink-footed Goose, *A. brachyrhynchus*; and *A. erythropus*, which latter is closely related to our White-fronted Goose, but is not much larger than a Mallard.

Analysis of Species and Subspecies.

Nail of bill black or dusky. Face not white. (Straggler from Europe)		fabalis
Nail of bill white or pink. Face of adult white.		
Smaller: length about 27.00-28.00; culmen 1.50-1.75. (Straggler from Europe)		albifrons
Larger: length about 28.00-30.00; culmen 1.75-2.00 or more. (N. Am.)		a gambels

A. fabalis. (Lat. *fabalis*, relating to beans; *faba*, a bean.) EUROPEAN BEAN GOOSE. Bill long, black and orange, the nail black or dusky; feet orange; claws black. Head and neck grayish-brown; back darker grayish-brown, the feathers margined with grayish-white; rump blackish; upper tail-coverts white; wings brown, more gray on the coverts, these and the secondaries edged with white. Below from the breast plain brownish-gray, fading to white on the vent and crissum. Sexes alike, and young little different. Large: length 30.00 or more; wing 18.00-19.00; tail 6.50; tarsus about 3.00; bill along culmen 2.25 or more. Europe, Asia, and Africa; only North American as casually occurring in Greenland, and only recently established as such, though long ago given hypothetically as a bird of this country; e. g. Bean Goose, *A. segetum* NUTT. Man. ii, 1834, p. 348; RIDGW. Man. 1887, p. 116. *Anser fabalis* SALVAD. Cat. B. Brit. Mus. xxvii, 1895, p. 99; A. O. U. List, Eighth Suppl. in Auk, Jan. 1897, p. 118, No. [171.1]. See Auk, July, 1896, p. 244.

A. albifrons. (Lat. *albus*, white; *frons*, forehead.) EUROPEAN WHITE-FRONTED GOOSE. Exactly like the next to be described (*gambeli*), but latter rather larger, with especially larger bill, as given in the above analysis. The intergradation is complete, but average dimensions constantly differ. Length perhaps never 30.00; wing not over 16.00; tarsus under 3.00; bill under 2.00, usually under 1.75, along culmen, and depth of its upper mandible at base under 1.00. Only North American as occurring in Greenland.

A. a. gambeli. (To Wm. Gambel.) AMERICAN WHITE-FRONTED GOOSE. LAUGHING GOOSE. YELLOW-LEGGED GOOSE. HARLEQUIN BRANT. GRAY BRANT. PIED BRANT. PRAIRIE BRANT. SPECKLED BRANT. SPECKLE-BELLY. Tail normally 16-feathered. Bill smooth; the laminae moderately exposed. Adult ♂ ♀: Bill pink (very pale lake or carmine), the nails white, a small space on culmen, a space on lower mandible, and edges of nostrils, chrome-yellow. Feet chrome-yellow, webs rather paler. Eyes dark brown. Claws white. A white band along base of upper mandible, bordered behind by blackish. Upper tail-coverts white. Under parts whitish; breast and belly more or less extensively patched or blotched with black, in high plumage mostly black; sides of rump, and the crissum, white. Head and neck dark grayish-brown, paler on lower neck in front, where passing into the whitish black-blotched breast, darker on the front, where sharply contrasted with the white face. Back dark ashy-gray, the feathers anteriorly tipped with brown, farther back with pale gray. Secondaries and ends of primaries dusky, more ashy toward base; primary coverts and outer webs of primaries ashy; greater coverts and secondaries bordered with whitish; primaries and coverts edged and tipped with white; shafts of quills white. Young (*A. frontalis* Bd.): Darker, browner; the gray and ashy colors rather brown; base of tail not pure white; no white on face, which is darker than rest of head; no black on under parts; bill obscured, the nail brown or blackish; feet pale. Length 27.00-30.00; extent about 60.00; wing 16.00-17.00; tail 5.50; tarsus 2.75-3.10; middle toe and claw rather more; bill up to 2.00 or more along culmen, with depth of upper mandible at base averaging 1.00. ♀ averaging rather less than ♂. North America at large, breeding in the far North, even to the Arctic coast, wintering in the U. S., in greater numbers on the Pacific side than in the interior or along the Atlantic (where rare), and extending at that season into Mexico, Lower California, and Cuba; also on the Asiatic side of Bering Sea, and S. to Japan. Eggs 6-7, 2.90-3.30 × about 2.10, elliptical, smooth, dull yellowish with an olive shade, in places discolored with a darker tint.

CHEN. (Gr. *χην*, *chen*, a goose.) SNOW GEESE. Bill about as long as head, very stout and high at base, where higher than broad, the under mandible very deep; tomial edges much bevelled off, and receding from each other, leaving an elliptical space, in which the large prominent teeth are fully exposed. Nostrils in basal half of bill. Feet as in *Anser*, but tarsus if anything longer than middle toe and claw. Color of adults white, at least on head, usually all white except black-tipped wings; bill and feet reddish. (Grammatical gender of the name common, masculine preferred.)

Analysis of Species and Subspecies.

Not white in main body-color. Nearly the size of the next	<i>cœrulescens</i>
Pure white, with black wing-tips; head rusty or not.	
Large: length 30.00; wing 17.00 or more. Bill smooth	<i>hyperboreus nivalis</i>
Small: length about 25.00; wing 16.00 or less. Bill smooth	<i>hyperboreus</i>
Very small: length under 24.00; wing 15.00 or less. Bill studded with papillæ. (<i>Eranthemops</i> .)	<i>rossi</i>

(Subgenus CHEN.)

C. cœrulescens. (Lat. *cœrulescens*, bluish. Fig. 628.) BLUE SNOW GOOSE. BLUE GOOSE. BLUE-WINGED GOOSE. BLUE WAVEY. BLUE BRANT. WHITE-HEADED GOOSE. BALD-HEADED BRANT. WHITE-HEADED BALD BRANT. Adult ♂ ♀: Bill and feet flesh-pink, former with the recess between the mandibles black, the nails whitish; iris dark brown;

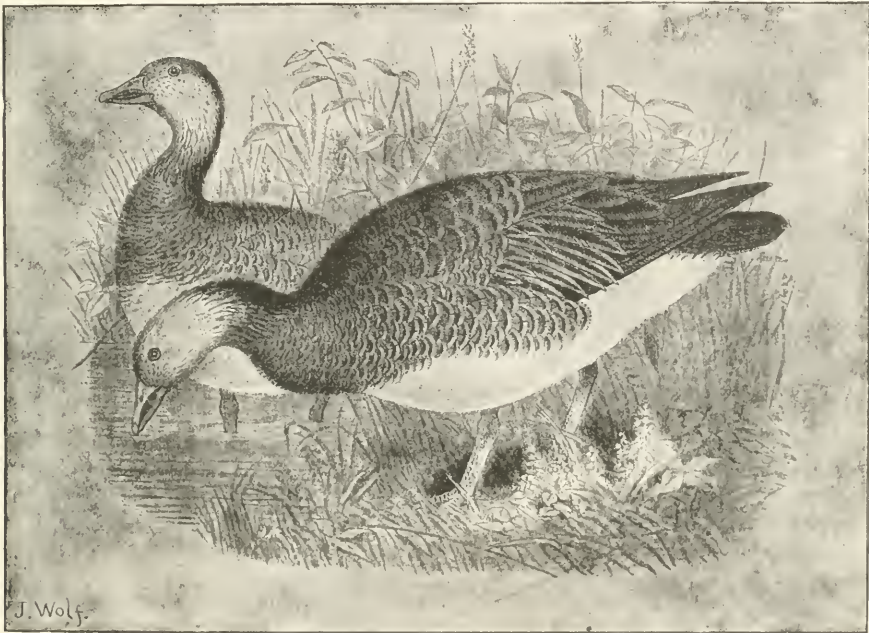


FIG. 628. — Blue Goose. (From "Wild Fowl of North America," by D. G. Elliot.)

claws dusky. Head and neck above white; neck below, passing on to back and breast, dusky-gray, then fading into whitish on under parts, changing on wings into fine bluish-gray, or silvery-ash; rump and upper tail-coverts whitish; quills and tail-feathers dusky, edged with whitish; primaries black. Young similar, but head mostly dark grayish-brown; bill and feet dusky. Nearly the size of the larger Snow Goose, and resembling the young of that species. Length 25.00-28.00; wing 16.00; bill 2.25; tarsus 3.00. North America, chiefly in the interior from its breeding grounds about Hudson's Bay to the Gulf of Mexico, occasionally on the Atlantic coast; Bahamas; Cuba; Lake Umbagog, Maine; not very common, but well known enough to have acquired a gunner's synonymy (see above). This is a perfectly good species, which I have retained throughout my editions of the Key without question, though it was banished to the A. O. U. Hypothetical List, 1st ed. 1886, p. 351, No. 8. The taboo was afterward taken off, and the species restored to full communion in A. O. U. List, 2d ed. 1895, No. 169.1.

C. hyperbo'reus. (Lat. *hyperboreus*, beyond the north wind.) LESSER SNOW GOOSE. LITTLE WAVEY. Form and coloration precisely as in the next to be described (*h. nivalis*); average size less, but grading up to that of the next. Length about 25.00; wing 14.50–17.00; tail 5.50; tarsus 2.75–3.25; bill 2.00–2.12. Chiefly western North America, but E. commonly in the Mississippi valley, less regularly to New England (Auk, Apr. 1897, p. 207) and along the Atlantic coast; breeds in N. W. British America and Alaska; U. S. in winter and migration; Japan; accidental in Ireland. (Co. Wexford, Nov. 1871; SAUNDERS, P. Z. S. 1872, p. 519; Co. Mayo, Oct. 1877; see Harting, Zool. 1878, p. 419.) Eggs about 3.00 × 2.00, yellowish-white. *Anser hyperboreus* PALL. 1769; *Chen hyperborea* BOIE, 1822; A. O. U. No. 169. *Anser albatus* CASS. 1856; *Chen albatus* ELLIOT, 1867; *C. hyperboreus albatus* of 2d–4th eds. of the Key.

C. h. niva'lis. (Lat. *nivalis*, like snow, snowy, relating to *nivis*, snow.) GREATER SNOW GOOSE. RED GOOSE. WHITE BRANT. YELLOW WAVEY. COMMON WAVEY. Adult ♂ ♀:



FIG. 629. — Ross's Snow Goose. (From "Wild Fowl of North America," by D. G. Elliot.)

Bill carmine-red or pale purplish with a salmon tinge, the nails white, the "grinning" recess between the mandibles black. Eyes dark brown. Feet dull lake-red; claws blackish. Plumage pure white, the head usually found washed or stained with rusty-brown, like a Swan's; ends of primaries black, their bases gray, like their coverts and spurious quills of thumb. Young: Resembling *C. caerulescens*, but head not white while other parts are colored; tail and its coverts white; head, neck, and upper parts generally light gray, with darker shaft-streaks and lighter edgings of the feathers, especially noticeable on the wing-coverts and inner secondaries; most under parts whitish, unmarked; bill and feet dark. Large: Length 27.00–31.00 or more; extent 57.00–62.00; wing 17.00 or more; tail 6.50; bill 2.35–2.65; tarsus 3.00–3.50; middle toe and claw the same. Weight 5 or 6 lbs. The dimensions grade down to those of the preceding; both vary much, and are specifically inseparable; but their extremes are far apart,

and there is generally a difference which enables us to refer specimens to one or the other. North America; breeds in high latitudes, migrating and wintering in the U. S.; S. to Cuba; chiefly along the Atlantic coast. It is a mistake to suppose that these large white Brant are confined to "eastern" North America. Casual in Europe. (*C. hyperboreus* of most authors, as of former editions of the Key.)

(*Subgenus* EXANTHEMOPS.)

C. (E.) ros'si. (To Bernard R. Ross, Chief Factor Hudson's Bay Co. Fig. 629.) ROSS' GOOSE. HORNED WAVEY. LEAST SNOW GOOSE. Coloration as in the foregoing. Bill small, outline of feathers on side of upper mandible nearly straight instead of strongly convex, studded at base with numerous papillæ, and much less exposure of teeth in a blackish recess than in any of the other species. Very small — no larger than a Mallard. Length about 21.00; wing 14.50; tail 5.00; bill 1.50; tarsus 2.50. Arctic America, in the interior; western U. S. in winter, S. to southern California; not yet known E. of the Mississippi in the U. S. A curious little white Goose, so different from other species of *Chen* as to have been made type of a genus *Exanthemops*. It was discovered by Samuel Hearne about 1769-72, and first described in his "Journey," original edition, 1795, p. 442, but not technically named till 1861. The A. O. U. declined to recognize this subgenus till 1899 (A. O. U. Suppl. List, Ank, Jan. p. 104).

PHILAC'TE. (Gr. φίλος, *philos*, loving; ἀκτή, *akte*, the seashore.) PAINTED GEESE. Superficial aspect of *Chen*. Skull with superorbital depressions (wanting in other North American Geese). Teeth of bill only exposed posteriorly; nail prominent; the nostrils in lower fore part of their fossæ: bill moderately robust. Tarsus not longer than middle toe and claw. Plumage variegated, but no metallic tints; bill and feet light-colored. Webbing of toes incised. Sexes alike. Arctic and maritime.

P. cana'gica. (Of the island of Kanaga or Kyktak. Fig. 630.) PAINTED GOOSE. EMPEROR GOOSE. Adult ♂ ♀: Wavy bluish-gray, with lavender or lilac tinting, and black and

white crescentic marks more sharply defined on the upper than on the under parts; head, nape, and tail white, former often washed with amber-yellow, base of the latter dark ash; throat blackish, plain or white-speckled; primaries and their coverts plain slate-gray; secondaries and their coverts dusky slate-color, with white edgings. Eye hazel-brown; feet orange-yellow; bill livid flesh-color, with whitish, dark-edged nail, livid bluish nasal mem-

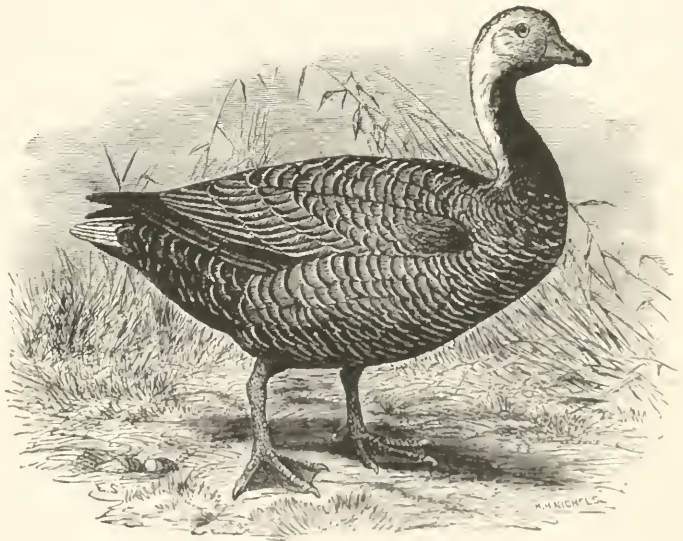


FIG. 630. — Emperor Goose. (From Dall.)

brane; lower mandible darker, with a pair of white spots on the rami. Young: Similar; bill and feet obscured with dusky; the black and white crescents less distinct; head and neck

dusky, more or less speckled with white. Length 25.00–28.00; extent 48.00–56.00; wing 15.00–17.00; tail 5.00–6.00; bill 1.50; tarsus 3.00. Northwest coast; abundant at mouth of Yukon; wintering chiefly in southern Alaska and the Aleutian Islands, but sometimes reaching California; breeding N. to Bering Strait at least; also on the Siberian side. A remarkable species, unlike any other Goose of our country; strictly maritime. Its flesh is rank, scarcely fit for food. Eggs 5–8, 3.00–3.25 × 2.00–2.25, white, generally with stains, giving a pale dirty-brown color, laid in June. Best biography in Nelson's Alaska, 1887, p. 89, colored pl. 4.

BRANTA. (Corrupted, as by SCOPOLI, 1769, from Gr. βρένθος or βρίνθος, *brenthos* or *brinthos*, Aristotelian name of an unknown bird; name corrected *Brenthus* by SUND. Tent. 1873, p. 145. This is the genus *Bernicla* STEPH. 1824, ex BRISS. 1760, as Latinized by GESNER, 1555, from English *barnacle*. The name "barnacle" commemorates the fable that these birds sprouted from the little cirripeds called barnacles. "Brent" or "brant" is of uncertain etymological relation to *Brenthus*, and commonly supposed to mean simply "burnt" goose, from the dark color, as if branded or charred.) BARNACLE GEESE. BRANT GEESE. BLACK GEESE. BRANT. Bill short, small, the nail prominent from depression of culmen behind it; nostrils at its middle. Laminae of bill not exposed except just at base, the commissure being straight and not bevelled off. Head and neck black, with white spaces; upper and under tail-coverts white. Bill and feet black. Hind toe very small. Tail of 14–20, usually 16–18 feathers. Sexes alike. Several species, of both hemispheres. (*Bernicla* is the name I used for this genus in 2d–4th eds. of the Key; but I now follow the A. O. U. in reverting to *Branta* of the original edition of the Key, 1872.)

Analysis of Species and Subspecies.

Forehead, cheeks, and chin white. (European.)	<i>leucopsis</i>
Forehead, cheeks, and chin black; white stripes on neck.	
Black of neck well defined against light lower parts	<i>b. glaucogastra</i>
Black of neck extending over breast	<i>nigricans</i>
Forehead black; cheeks and chin white; no white stripes on neck.	
Tail normally 18–20-feathered. Large.	
No white collar in black of lower neck	<i>canadensis</i>
A white collar in black of lower neck	<i>c. occidentalis</i>
Tail normally 16-feathered. Small.	
No white collar in black of lower neck (usually).	<i>c. hutchinsii</i>
Tail normally 14–16-feathered. Smallest.	
A white collar in black of lower neck	<i>c. minima</i>

B. leucop'sis. (Gr. λευκός, *leucos*, white; ὄψις, *opsis*, appearance: the face white.) BARNACLE GOOSE. BARNICLE. BERNICLE. BERNACLE. CLAKIS. Tail normally of 16 feathers. Adult ♂ ♀: Bill, feet, and claws black. Iris hazel-brown. Front and sides of head and chin white, with a dark line at base of bill, and thence to eye. Rest of head and neck all around black, prolonged on back and fore breast; scapulars, wing-coverts, and inner secondaries gray, with subterminal black crescents and edged with whitish; rump and tail black. Upper and under tail-coverts, sides of rump, belly, and hind breast, white or whitish, the sides shaded with gray. Quills dusky, blackening at ends, tinged on exposed surfaces with ashy. Sexes similar; ♀ duller colored than ♂. Young: White of face speckled with black, and general plumage suffused with rufous-brown, more or less marked according to age. Downy young are gray above, whitish below. Length of ♂ 28.00; extent 55.00; wing 17.00; tail 6.00; bill 1.50; tarsus 2.75; middle toe and claw the same. ♀ much smaller; both sexes very variable. Europe; very rare and casual in North America excepting Greenland, where regular. (Hudson's Bay, Am. Nat. ii, 1868, p. 49. N. Carolina, Am. Nat. v, 1871, p. 10. Long Island, Bull. Nutt. Club, ii, 1877, p. 18. Illinois, Forest and Stream, Nov. 23, 1876.) (*Bernicla leucopsis* of 2d–4th eds. of Key.)

B. ber'niela glaucogas'tra (Old English *bernekke*, Latinized *bernaca* about 1175, and found in uncounted forms in various languages; ultimate origin and meaning unknown. The cirriped *Lepas anatifera* is said by some to have been named *barnacle* from the bird — not the bird from the cirriped. See Century Dict. p. 455, and Newton's Dict. p. 31. — Gr. γλαυκός, *glaukos*, glaucous, and γαστήρ, *gaster*, belly. Fig. 631.) BRANT GOOSE. BRENT GOOSE. BRANT. BRENT. BLACK BRANT (in distinction from White Brant as applied to Wavneys of the genus *Chen*). HORRA GOOSE (Shetland). RODE, ROOD, ROAD, ROTT, or RAT GOOSE (all from German *Rotgans*: Newton.) CLATTER GOOSE. CROCKER. QUINCKOR. QUINK. Adult ♂ ♀: Bill, feet, and claws black; iris brown. Head and neck all around, and a little of fore part of body, glossy-black, well defined against color of breast; on each side of neck a small patch of white streaks; frequently also white touches on eyelids and chin. Breast light ashy-gray, beginning abruptly from the black, fading on belly and crissum into white, shaded along sides of body. Upper parts brownish-gray; feathers of dorsal region with paler gray tips; rump darker; upper tail-coverts white. Tail-feathers, wing-quills, and primary coverts blackish; inner quills whitish toward base. Young: Similar; general cast of plumage browner, with

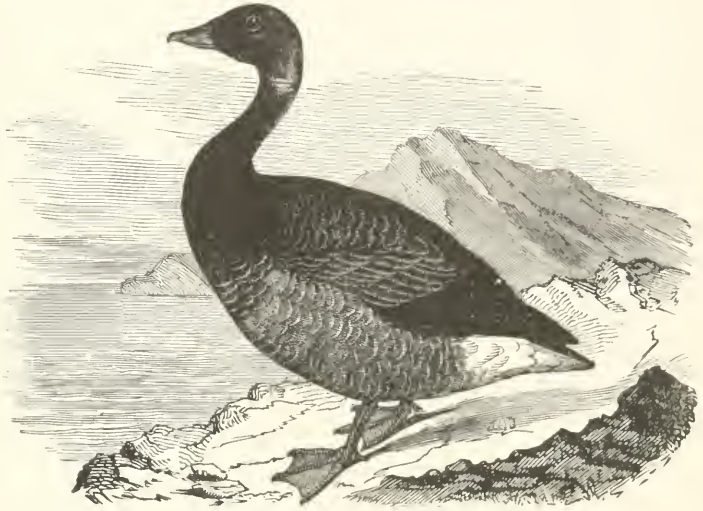


FIG. 631. — Common Brant. (From Lewis.)

more pronounced white edging on the wing-coverts, and tips of secondaries quite white; less distinction between colors of breast and belly; black of head and neck rather brownish-dusky, and the patch of white streaks slight or wanting. Length 24.00; extent 48.00; wing 13.00; tail 4.50; bill 1.33; tarsus 2.25; middle toe and claw about the same. Europe. In North America, chiefly along the Atlantic coast, being more maritime than other U. S. Geese, but also found inland on the great lakes and rivers. U. S. only in winter and during the migrations, when abundant. Breeds only within the Arctic Circle, on our coasts from Greenland W. to the Parry Islands, and as far north as our explorers have gone. According to Feilden it reaches lat. 82° 30' early in June; nest on ground, of grass and moss, lined with down; eggs late in June, 4 or 5 in number, 2.65–2.87 × 1.75–1.95, creamy white, finely granulated, slightly glossy, indistinguishable from those of *B. leucopsis*. Moults late in July, when the birds are unable to fly. Our bird is the lightest-bellied form, entitled to rank as *Branta bernicla glaucogastra*. COOKS, Auk, Apr. 1897, p. 207; A. O. U. Suppl. List, Auk, Jan. 1899, p. 105, No. 173a (*Bernicla brenta* of 2d–4th eds. of Key).

B. nigricans. (Lat. *nigricans*, being blackish. Fig. 632.) BLACK BRANT (as distinguished from the foregoing species). Similar to the last; darker above; black of jugulum extending over most of under parts, fading on belly and crissum, without abrupt line of demarcation on breast; white neck-patches usually larger and meeting in front, thus making a clean white collar only open at the back of the neck; vent and crissum conspicuously white in con-

trast with black belly. Size of the last, and difference between young and old the same. Both coasts; very abundant on the Pacific side, casual on the Atlantic. Migrations and breeding resorts the same in latitude, usually with the difference in longitude just indicated; nesting the same, and eggs indistinguishable. (*Bernicla brenta nigricans* of 2d-4th eds. of Key.)

B. canadensis. (Of Canada. Fig. 633.) CANADA GOOSE. COMMON WILD GOOSE. CRAVAT GOOSE. COMMON or BIG GRAY GOOSE. BAY GOOSE. REEF GOOSE. BLACK-HEADED GOOSE. CANADA BRANT. HONKER. BUSTARD (from old Canadian-French *outarde*). Tail normally 18-20-feathered. Adult ♂ ♀: Bill, feet, head, and neck black; on chin a broad white patch or "cravat" mounting on sides of head behind eyes, sometimes broken on



FIG. 632. — Black Brant. (From American Field.)

chin; not extending forward to jaws; white touches usually on eyelids. Upper tail-coverts definitely white; rump blackish; tail-feathers black. General color brownish-gray, paler or more ashy-gray below, all the feathers with paler gray or whitish edges, those of sides of body usually darker than rest of under parts; lower belly and crissum definitely white, with a very well marked line of demarcation. Iris brown. Length 3 feet or more; extent 5 feet; wing 18-20 inches; tail 7.00; tarsus 3.00-3.50; middle toe and claw more; bill about 2.00. North America at large. The most generally distributed and on the whole most abundant Goose of our country. It breeds in various parts of the northern U. S., sometimes *in trees*, but many individuals pass

farther north to nest. Eggs 5-9, usually 5 or 6, ellipsoidal, smooth, pale dull greenish or whitish, about 3.50×2.50 . **B. c. occidentalis.** (Lat. *occidentalis*, western.) LARGER WHITE-CHEEKED GOOSE. Similar to the last; of equal size or nearly so, and tail 18-20-feathered. Coloration averaging darker than in the last, on under parts especially, against which the white of anal and crissal region is very well defined. Black of neck bounded below in front by a white half-collar, and white cravat apt to be untied in front, making a pair of white cheek-patches. Bill averaging shorter, perhaps never 2.00 along culmen, and tarsus relatively longer. The best samples are well marked; others shade into the common form inextricably. Pacific coast, especially

Alaska (to Sitka), S. in winter to California. The bird here indicated is *Bernicla occidentalis* BD. B. N. A. 1858, p. 766, in text under the unfortunate heading of *B. leucoparvia* CASS., whence by error my *Branta canadensis leucoparvia* of the Key, orig. ed. 1872, p. 284. But it is not *B. leucoparvia* of CASSIN, nor yet *Anser leucoparvius* of BRANDT. It is *Bernicla canadensis occidentalis* of the Key, 2d-4th eds., 1884-90, p. 688, and *Branta canadensis occidentalis* of the A. O. U. List, No. 172 b.

B. c. hut'chinsi. (To Mr. Hutchins of the H. B. Co.) HUTCHINS'S GOOSE. LESSER CANADA GOOSE. SMALL GRAY GOOSE. LITTLE WILD GOOSE. WINTER GOOSE. FLIGHT GOOSE. PRAIRIE GOOSE. MARSH GOOSE. MUD GOOSE. ESKIMO GOOSE. APISTISKEESH or PISKASISH. Tail normally 16-feathered. Coloration exactly as in the Canada Goose. Size much less. Length 25.00-30.00; extent about 4 feet; wing 15.00-17.00; tail 5.00-6.00; bill 1.50; tarsus under 3.00. These are fair measurements of average individuals; some run up to length 34.00; wing 17.75; bill 1.90; tarsus 3.20; and such can hardly if at all be distinguished from small *canadensis* proper, especially if they happen to have 18 tail-feathers. Other indi-

viduals run down to wing 14.75; bill 1.20; tarsus 2.25; and such probably cannot be distinguished from *minima*, especially from an individual of the latter which happens to have 16 tail-feathers, unless by the color-marks which ordinarily distinguish both *minima* and *occidentalis* from both *hutchinsi* and *canadensis* proper. There is in fact some question whether Dr. Richardson's original *hutchinsi*, type from Melville peninsula, was not what we are now calling *minima*; for it is described as



FIG 633 — Canada Goose. (From Lewis.)

length 25.00; wing 14.00! tail 14-feathered; "breast . . . all white," etc.; but it might make confusion worse confounded to insist upon the point now. Hutchins's Goose, as we understand the subspecies, ranges over North America at large, U. S. in winter and migration, less commonly along the Atlantic coast than in the interior and on the Pacific coast; breeds in high latitudes; and occurs on the Asiatic side, Siberia to Japan. This appears to be BRANDT'S *Anser leucoparvius* as described from the Aleutians (but it is *B. leucoparvia* neither of CASSIN, nor of BAIRD, nor of COPES, 1872). It is *Branta canadensis hutchinsi* of the Key, 1st ed. 1872, p. 284, where first reduced to its proper rank of subspecies; A. O. U. No. 172 a. *Bernicla c. hutchinsi* of later eds. of the Key. See next article.

B. c. minima. (Lat. smallest, least, used as superlative degree of the different word *parvus*, small.) LEAST CANADA GOOSE. CACKLING GOOSE. CASSIN'S GOOSE. Tail normally

14-16-feathered. Coloration exactly as in the western subspecies of *canadensis* (*occidentalis*) — that is, general tone dark, especially on under parts, where usually sharply contrasted with a white half-collar on the lower neck or fore breast and the white crissum; and white cravat on cheeks tending to break up in a pair of patches. Size at the minimum of *hutchinsi*, and generally still less, the bird being ordinarily about the size of a Mallard. Length 23.00-25.00; wing 13.75-14.75; culmen hardly over one inch. Eggs about 3.00 × 2.00. Chiefly western North America, especially the Pacific coast region, breeding in Alaska, about the Yukon delta, etc., S. in winter to California and Colorado; E. occasionally to the Mississippi, but unknown on the Atlantic side of the Alleghanies. On the Pacific side it bears the same relation to *occidentalis* that is borne in eastern North America by *hutchinsi* to *canadensis* proper. It is curious to remark how size is correlated with presence or absence of the white collar at the bottom of the neck of these four Geese: thus *canadensis*, large, collarless; *hutchinsi*, small, collarless; *occidentalis*, large, collared; *minima*, small, collared. Furthermore, each one has just about as many inches in length of wing as there are feathers in the tail! This is the little "White-necked" Goose figured by CASSIN, Ill. 1855, pl. 45, p. 272, as *B. "leucopareia* BRANDT," but it is not Brandt's bird; Mr. Cassin himself thought it was probably identical with *hutchinsi*, and cites the latter name in his synonymy without a query. It is not *B. "leucopareia* CASS." of BAIRD, 1858, which is *B. c. occidentalis*, nor *Branta c. leucopareia* of the Key, 1872, which is also *occidentalis*. But it is *Branta c. leucopareia* of my Check-List, 1873, No. 485 a; of COUES in Elliott's Alaska, 1875, p. 190; *Bernicla c. leucoparia* of my Check-List, 2d ed. 1882, No. 703; and of the Key, 2d-4th eds. 1884-90, p. 689, No. 703; of RIDGW. Check-List, 1881, No. 594 b; *Bernicla c. leucopareia* RIDGW. in BD. BREW. RIDGW. Water-Birds, i, 1884, pp. 456, 459. It is *Branta cassini* of my MSS. 1885, never published; *Branta minima* RIDGW. Pr. U. S. N. M. viii, Apr. 1885, p. 22; *Branta c. minima* ID. ibid. p. 355; A. O. U. No. 172 c.

DENDROCYG'NA. (Gr. δένδρον, *dendron*, a tree; Lat. *cygnus*, a swan.) TREE DUCKS. Duck-like arboricole species, with bill longer than head, terminated by a prominent decurved nail; lamellæ not projecting; nostrils small, oval, in basal half of bill. Legs very long; tibiæ extensively denuded below; hind toe lengthened, more than $\frac{1}{2}$ as long as tarsus; tarsi reticulate, as in Geese proper. Wings ample, rounded: 1st quill shorter than 4th. Coloration variegated. Sexes similar. Nest in trees. In addition to the two following species, a third, *D. arborea*, of the West Indies, may occur in the South. The genus contains about 9 species (including *D. (Leptotarsus) eytoni*), almost universally represented in tropical and warm-temperate regions of the globe. Its character is somewhat equivocal, as between *Anserinæ* and *Anatinæ*. I think it really belongs to the latter subfamily, in the vicinity of the Sheldrake group; with which expression of my views I leave it in the position it has occupied in former editions of the Key, as also in the A. O. U. Lists.

Analysis of Species.

- Bill and feet blackish; coloration largely cinnamon; no white wing-patch *fulva*
- Bill and feet reddish; coloration largely blackish; a large white wing-patch *autumnalis*

D. ful'va. (Lat. *fulva*, fulvous, reddish. Fig. 634.) FULVOUS TREE DUCK. Adult ♂ ♀: Bill bluish-black; feet slaty-blue; iris brown. Pale cinnamon or yellowish-brown, extensive and nearly uniform on lower parts, darker on head, streaked with lighter on flanks; nape and hind-neck with a black line; scapulars and fore back blackish with pale cinnamon edgings of the feathers. Rump and tail black; upper and under tail-coverts white. No white speculum on wing; lesser wing-coverts chocolate-brown; rest of wing black on both surfaces. Length about 20.00; extent 36.00; wing 9.50; tail 3.25; tarsus 2.25; bill 1.50, with hooked nail. Young similar; less chestnut on the wing-coverts; lower parts paler fulvous; upper tail-coverts not purely white. Ducklings in down above grayish-brown, below whitish; head striped with

brown and white; a white wing-bar. Nidification variable, in hollow of a tree, or on ground; many nests, built of grass, lined sparsely with down and feathers, have been found on the ground in a marsh in central California. Eggs indefinitely numerous, 17 to (in one nest) 32, also sometimes laid in nests of other Ducks, and of Coots; size 1.35-1.65 \times 1.98-2.20; shell dead white, somewhat rough, not as elliptical as usual in this family; laid late in June or in July (SHIELDS, Bull. Cooper Club, i, No. 1, Jan. 1899, p. 9). Southwestern U. S. and southward, in summer Louisiana to Nevada and California, in winter Texas and Louisiana; casually in Missouri and North Carolina; common on the Rio Grande. It also inhabits most of South America, and the identical species is accredited to Africa and India.

D. autumnalis. (Lat. *autumnalis* or *auctumnalis*, of the period of *increase*, of harvest; *auctus*, increased, augmented. Fig. 635.) AUTUMNAL TREE DUCK. BLACK-BELLIED TREE DUCK. CORN-FIELD DUCK (Texas). Adult ♂ ♀: Bill coral-red, with orange above, and bluish nail; feet pinkish-white; iris brown. A large white speculum, consisting of greater wing-coverts and basal parts of most of the quills, as well as spurious quills and outer webs of one or two primaries. Head and neck reddish-chocolate, paler on cheeks and chin, with black stripe down nape and hind-neck, passing through more yellowish-brown on fore parts of body to black on lower back, rump, tail, belly, sides of body and lining of wings; flanks and crissum mostly white. Length about 20.00; extent 36.00-38.00; wing 9.50-10.50; tail 3.00; bill along gape 2.00; tarsus 2.25. Young similar, duller, the reddish-brown mostly dingy or rusty gray, the black of the belly replaced by whitish with dusky waving; bill and feet dusky. Ducklings

in down dusky brown above, spotted with sulphur yellow on sides of back and rump, the head with buff bands; below pale buff, bleaching on belly. South and Central America and Mexico to Texas, abundant from April to October on the Rio Grande; a common market-bird in some places. Nest in hollows of trees, often at a great distance from water, to which the young are transported by the parents in the bill. Eggs 12-16, 2.10 \times 1.50, of usual shape, buffy-white.

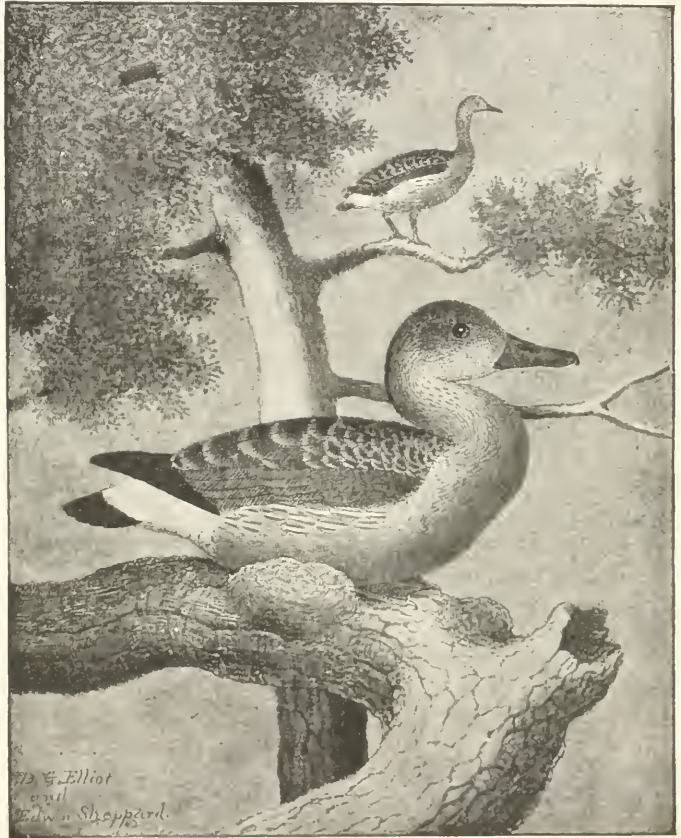


FIG. 634.—Fulvous Tree Duck. (From "Wild Fowl of North America," by D. G. Elliot.)

in down dusky brown above, spotted with sulphur yellow on sides of back and rump, the head with buff bands; below pale buff, bleaching on belly. South and Central America and Mexico to Texas, abundant from April to October on the Rio Grande; a common market-bird in some places. Nest in hollows of trees, often at a great distance from water, to which the young are transported by the parents in the bill. Eggs 12-16, 2.10 \times 1.50, of usual shape, buffy-white.

Subfamily ANATINÆ: River Ducks.

Tarsi scutellate in front; hind toe simple (in *Fuliginæ*, hind toe with a flap or lobe). This expression separates the present group from all North American examples of foregoing and succeeding subfamilies, although it is not a perfect diagnosis. The neck and legs are shorter than they average in Geese, while the feet are smaller than in Sea-ducks, the toes and their webs not being so highly developed. No *Anatinæ* are so exclusively maritime as most

Fuliginæ; yet they are by no means confined to fresh waters, and some species constantly associate with Sea-ducks. They feed extensively, like most Geese, upon succulent aquatic herbage, but also upon various animal substances; their flesh is almost without exception excellent. They do not dive for food. The sexes are almost invariably markedly distinct in color; the young resemble the ♀; the wing has usually a brilliant speculum, which, like other wing-markings, is alike in both sexes. In various of the River- and Sea-Ducks the ♂ assumes in summer a temporary, dull, protective plumage more or less like that of the ♀. The ♀ incubates, and cares for the young. As compared with *Anserinæ*, a good anatomical character is the very general presence in *Anatinæ* (as



FIG. 635.—Black-bellied Tree Duck. (From "Wild Fowl of North America," by D. G. Elliot.)

also in *Fuliginæ*) of the tracheal tympanum or bulla ossea already mentioned (p. 891); it usually marks the drakes only, but may occur in the other sex, and its variations in structure afford a generic distinction in some cases. Although the difference between any ordinary Duck and a true Goose is obvious at a glance, there is no sharp line of distinction between the two subfamilies. We have a connecting link in the genus *Dendrocygna*, as already stated; and though the Shieldrakes themselves are undoubtedly anatine rather than anserine, some of their near relatives occupy an ambiguous position. The genus *Casarca*, which I now first introduce to the Key, is a true Shieldrake, and some related exotic forms will be found noted beyond. Of genuine *Anatinæ* there are rather more than 60 species, generally distributed over

the world. They are split into a large number (about 15) of modern genera, some of which indicate little more than specific characters; the leading types are represented in this country. Of those here following, *Casarca*, *Cairina*, *Ær*, and *Spatula* represent decided structural peculiarity; *Dafila* is also fairly well marked; but *Mareca*, *Chaulelasmus*, *Nettion*, and *Querquedula* might all be referred to *Anas*, type of the group, as subgenera. *Malacorhynchus membrana-ceus*, of Australia, is a notable exotic form.

Analysis of Genera.

Wing over 12.00, its coverts white.	
Sides of head closely feathered, no crest. (Straggler.)	<i>Casarca</i>
Sides of head extensively naked; base of bill carunculate; crested. (Domesticated.)	<i>Cairina</i>
Wing under 12.00.	
Head crested; bill narrow, tip formed widely by nail	<i>Ær</i>
Head not crested; bill greatly wider at end than at base	<i>Spatula</i>
Head not crested; bill not spoon-shaped.	
Tail cuneate, with narrow central feathers more than half as long as wing	♂ <i>Dafila</i>
Tail not cuneate, not half as long as wing.	
Bill shorter than head; tail-feathers lance-acute; head not white; belly white	yg. and ♀ <i>Dafila</i>
Bill shorter than head; tail-feathers not acute; crown and belly white	<i>Mareca</i>
Bill about as long as head, or longer.	
Wing-speculum white; wing-coverts chestnut; bill dark; feet orange	<i>Chaulelasmus</i>
Wing-speculum green; bill dark. Very small.	
Lesser coverts blue	<i>Querquedula</i>
Lesser coverts gray	<i>Nettion</i>
Wing-speculum violet; black-bordered; bill greenish, or dusky and orange; feet orange	<i>Anas</i>

Obs. — Old males of all our species are unmistakable, having strong marks of color, size, and form; but females and young may not always be recognized at a glance. In examining any "Duck" of which you are in doubt, first notice the bill; if it is narrow and cylindrical, with sharp saw-like teeth, very conspicuous, the bird is one of the *Mergansers*, or "Fishing Ducks," scarcely fit for food. Next, examine the hind toe; if it has a flap or lobe hanging free, the bird is one of the *Fuliginae*, which may or may not be good for the table; if the hind toe is simple and slender, the bird is one of the *Anatinae*, and sure to make a good dish, if in order. All our red- or orange-footed species are *Anatinae* (excepting *Mergansers*); but not all *Anatinae* have the feet thus colored. In determining ♀ and young *Anatinae*, look to wing-markings rather than body-colors. The species of *Querquedula* and *Nettion* are very small "teal" Ducks, 16 inches or less in length.

CASARCA. (Russian *cacharka*, name of the following species or some other bird.) SHIELD-DRAKES. Bill of moderate length, not widening from base to tip, the culmen nearly straight; the lamellæ prominent, those of the lower mandible projecting outward, those of upper mandible all alike. Size large; wing over 14.00. Sexes dissimilar. Wing with speculum, its upper coverts white. An Old World genus of probably 4 species, one of which is a straggler to our fauna.

C. casarca. RUDDY SHIELDRAKE, SHIELD-DRAKE, SHIELDRAKE, or SHIELD-DRAKE. Adult ♂: Head buff, passing on neck, back, and under parts to ruddy-brown or foxy; a black ring around neck; upper tail-coverts, tail, and quills black; rump variegated with black and fulvous. Wing-coverts white; speculum green and purple; inner secondaries more or less tawny or foxy. Bill and feet blackish; iris brown. ♀ similar; lacking the black collar; young like ♀; duller; white of wings impure or grayish; inner secondaries and scapulars brown, marked with tawny. ♂ in winter said to lack the black collar. Europe, Asia, Africa; only North America as accidental in Greenland. See J. f. O. Oct. 1895; Ank, July, 1896, p. 243; A. O. U. Suppl. List, Jan. 1897, p. 118, No. [1411].

CAIRINA. (Name supposed to be derived from *Cairo* in Egypt; if so, it is as much of a misnomer for this American genus as *Muscory* is for its species.) MUSK DUCKS. Bill carunculate at base (as in *Plectropterus*, but no spurs on wings). Sides of head more or less extensively naked on the lores. Of large size; plumage metallic; head crested; sexes subsimilar. One species.

C. moschata. (Lat. musky; *moschus*, musk.) MUSK DUCK. MUSCOVY. Adult ♂: Glossy black, with green and purple iridescence on upper parts; upper and under wing-

coverts white. Bill pink and black; caruncles and naked skin of head rosy; feet black. Length about 30.00; wing 14.50 or more; culmen 2.50; tarsus 2.25. ♀ similar, less brilliant, with much less white on the wing; caruncles less developed or lacking altogether; size less; length about 24.00; wing 12.50, etc. A very well known Duck, native of South and Central America, now domesticated everywhere, and in domestication varying indefinitely. It is not known to have occurred wild in North America, though that is not improbable, but has been doubtfully attributed to Louisiana: see also observation under *Anas boscas*. (Not in former editions of the Key; nor in A. O. U. Lists.)

ÆX. (Gr. *αἴξ*, *aix*, a kind of water-fowl in Aristotle; the proper spelling in Lat. is *Æx*.)

BRIDAL DUCKS. Head crested. Bill shorter than head, no longer than tarsus, very high at base; re-entrances at sides of culmen much prolonged toward forehead. Nostrils large, oval, set little in advance of feathers on culmen. Terminal nail occupying whole end of bill, and much curved downward. Lamellæ small, few, and distant. Tarsus incompletely scutellate in front, much shorter than middle toe. Claws compressed, curved, and acute, that of the middle toe dilated on inner edge. Tail half as long as wing, rounded, of 16 rounded feathers, and very long coverts. A peculiar as well as most beautiful genus; the Chinese Mandarin Duck, *A. (Dendronessa) galericulata*, is still more remarkably, though not more elegantly, colored than ours. The proper position of the genus is in question; it is more nearly related to some of the foregoing forms than to any of the following Ducks, and some authors take it out of the sub-family *Anatinae*.

A. spon'sa. (Lat. *sponsa*, betrothed: *i. e.*, as if in wedding dress. Fig. 636.) **WOOD DUCK.** **SUMMER DUCK.** "THE BRIDE." Adult ♂: Bill pinkish-white, with lake-red base, black



FIG. 636. — Wood Duck. (From Tenney, after Audubon.)

ridge, tip, and under mandible; iris and edges of eyelids red; feet orange, with black claws. Upper part of head, including crest, glistening green and purple; a narrow white line over eye from bill to occiput, and another behind eye to nape, these white lines mixing in the crest. A broad white patch on throat, forking behind, one branch mounting head behind eye, the other passing to side of neck. Sides and front of lower neck and fore breast rich purplish-chestnut, prettily marked with several chains of angular white spots. A large white black-edged crescent of enlarged feathers in front of wing. Under parts pure white; sides yellowish-gray vermiculated with black and white wavy bars; enlarged flank-feathers broadly rayed with black and white; lining of wings white barred with grayish-brown, of which color is the crissum. Upper parts generally lustrous with bronzy-green and purple; scapulars and inner secondaries velvet-black, glossed with purple and green; a green speculum, succeeded by white tips of secondaries; primaries frosted on outer webs near end. Adult ♀: Little or no crest, but lengthened feathers on nape; no enlargement or special colorings of feathers about the wings. Bill dusky; feet yellowish-dusky. Head and neck gray, darker on crown, chin and parts about bill and eyes white. Fore-neck, breast, and sides of body yellowish-brown, mottled with dark gray; breast spotted with brown; belly white. Upper parts dark brown with considerable gloss; wings much as in ♂, but the velvety-black reduced. Length 18.00–20.00; extent about 28.00; wing 9.00; tail 4.50; bill 1.40; tarsus the same; middle toe and claw 2.00. Temperate North America, but especially U. S., breeding nearly throughout its range, wintering

chiefly in the South; Cuba; casually in Europe. This exquisite bird is commonly dispersed in wooded portions of the country near water; it nests usually in hollows of trees, whence the young scramble and drop out, or are transported in the bill of the parent. Eggs about 12, but very variable in number (8-15), of pale buff or creamy color and the usual smooth shell and elliptical shape, about 2.00×1.50 . In confinement or semi-domestication, as the bird is often kept for its beauty, it hybridizes freely with various other species, some of a different subfamily. The pernicious spring shooting of the bird on its breeding grounds has made it rare in many places where it was once common.

SPATULA. (Lat. *spatula* or *spathula*, a spoon, spathe, spatula: shape of bill.) **SPOON-BILL DUCKS.** Bill much longer than head or tarsus, twice as wide at end as at base, broadly rounded spoon-fashion at end; nail narrow and prominent; laminae very numerous and protrusive.

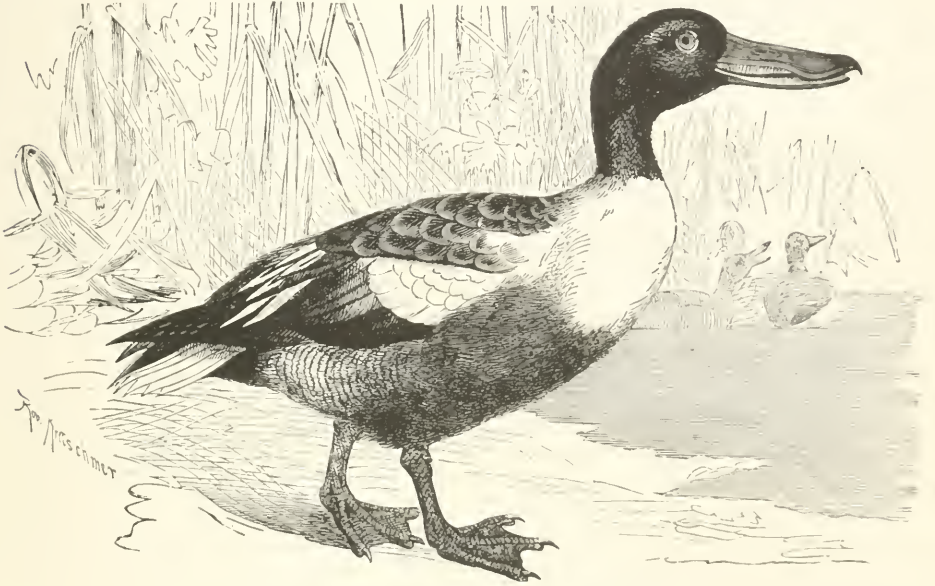


FIG. 637. — Shoveller Duck, $\frac{1}{2}$ nat. size. (From Brehm.)

Tail short, pointed, of 14 acute feathers. Feet small, red. The peculiarity of the bill characterizes this genus almost as strongly as does *Platolca* among Ibises, or *Eurymorhynchus* among Sandpipers; form otherwise that of ordinary *Anatina*. There are several species, one North American, one South American, *S. platalea*; one African, *S. capensis*; one Australian, *S. rhynchotis*.

S. clypeata. (Lat. *clypeum*, a shield: shape of bill. Fig. 637.) **SHOVELLER. BLUE-WING SHOVELLER. RED-BREASTED SHOVELLER. SHOVEL-BILL. SPOON-BILL. SWADDLE-BILL. BROAD-BILL. BROADY. "BUTTER DUCK." "COW-FROG."** Adult ♂: Bill black; iris orange or yellow; feet vermilion or orange-red. Head and neck dark glossy green, like the Mallard's. Lower neck and fore breast pure white. Abdomen purplish-chestnut. Wing-coverts sky-blue; speculum rich green, set between white tips of greater coverts, and black sub-tips and white tips of secondaries; inner secondaries greenish-black, with long white stripe; long scapulars blue on outer webs, striped with white and greenish-black on inner; short anterior scapulars white. Rump and upper and under tail-coverts black; a white patch on each side at root of tail. Adult ♀: Bill dull greenish-brown above, orange below and at base; iris yellow; feet orange. Wing-markings similar to those of ♂, though imperfect; traces of chestnut on belly. Head and neck brownish-yellow, speckled with dusky. Young ♀ has the wing-

coverts rather slate-gray than blue, and little trace of the green mirror. In any plumage the species is at once recognized by the peculiar bill. Length 17.00–21.00; extent 30.00–33.00; wing 9.50; tail 3.00; bill about 2.70, along commissure 3.00; tarsus 1.33. Northern Hemisphere; in North America at large, breeding from Alaska and Hudson's Bay to Texas; wintering in abundance from the middle districts to Central America, and on the Pacific coast S. from the Columbia River; rare on the Atlantic coast north of the middle districts. Eggs usually 7–9, sometimes 12 or more, averaging 2.10×1.50 , smooth, elliptical, dull pale greenish-gray or pale olive buffy, sometimes faintly bluish; nest on ground, not peculiar; down which may cover the eggs dark gray, with lighter centre and white tip; period of incubation 22 or 23 days. In full dress, which is comparatively infrequent, since it characterizes only the breeding season, this is a very smart and jaunty drake, tricked out in parti-color; most specimens, however, are found in a plumage more like that of the ♀. The bird is among the best of the Ducks for the table.

DA'FLA. (A non-sense word.) PINTAIL-DUCKS. Tail (in adult ♂) narrow, cuneate, when fully developed nearly as long as wing, 2 central feathers long-exserted, linear-acute; in

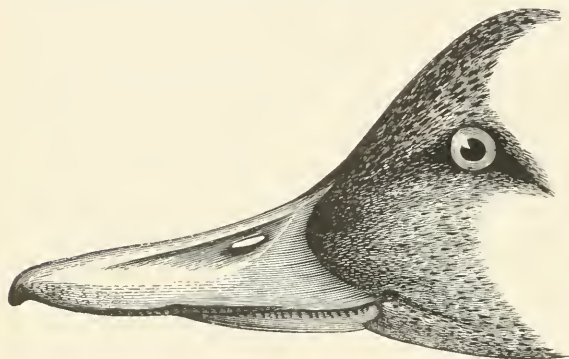


FIG. 638. — Head of *Dafila*, ♀, nat. size. (Ad. nat. del. E. C.)

♀ and young, tail merely tapering, with acute feathers; tail-feathers 16, including long middle pair. Bill shorter than head, longer than tarsus, nearly parallel-sided, widening a little to end; nail small; nostrils narrow, high up in basal third of bill. Feathers of cheeks sweeping in strongly convex outline along side of upper mandible, beyond those on side of lower mandible. Wing acute; 1st and 2d primaries subequal and longest, rest rapidly graduated. Neck unusually long and slender;

form less "stocky" than that of most Ducks. Sexes and young very unlike in color, even to wing-markings, as well as in shape of tail. Bill and feet dark. Under parts white or whitish. Speculum of ♂ framed in buff, white, and black. A small genus of large handsome Ducks, in its main section including only the following species and *D. spinicauda* of South America. In the section *Pacilonetta* are *D. bahamensis* and *D. galapagensis*, with the African *D. erythrorhyncha*. The Kerguelen island Teal, referred to *Dafila* by Salvadori, is type of my subgenus *Dafilula*.

D. acu'ta. (Lat. *acuta*, acute, as the tail is. Figs. 638, 639.) PIN-TAIL. SPRIG-TAIL. SPLIT-TAIL. SPIKE-TAIL. PIKE-TAIL. PICKET-TAIL. PEAK-TAIL. SHARP-TAIL. SPRIT TAIL. SPINDLE-TAIL. KITE-TAIL. PIGEON-TAIL (such names, generally of the ♂ only, often turned into adjectives with "Duck" or "Widgeon" added). PHEASANT DUCK. SEA-PHEASANT. WATER-PHEASANT. These also for the ♂; while for the ♀ we have: GRAY DUCK. PIED GRAY DUCK. PIED WIGEON. SEA WIDGEON. Also for either sex: WINTER DUCK. LADY-BIRD. LONG-NECK CRACKER. HARLAN. SMEE, SMEATH or SMETHE (properly belonging to the Merganser, *Mergus albellus*). Adult ♂: Bill black, with grayish-blue edge of upper mandible; feet grayish-blue; claws black; iris brown. Head and neck above rich dark brown, glossed with green and purple; side of neck with a long white stripe running up from white under parts; back of neck with a black stripe passing below into gray color of back; lower fore-neck, breast, and under parts white; sides finely waved with black; crissum black, white-bordered. Fore back finely waved with narrow bars of black and white or whitish; scapulars and long inner secondaries firmly striped lengthwise with velvety-black and

silvery-gray. Lesser wing-coverts plain gray; greater tipped with reddish-buff or cinnamon, framing speculum anteriorly; this beauty-spot is of coppery- or purplish-violet iridescence, framed posteriorly with black sub-tips and white tips of secondaries, internally with silvery and black stripes. Tail-feathers gray, the long central ones blackish: sides and roots of tail varied with blackish and buff. It is thus a very handsome Duck in full plumage, aside from the trim and clipper-like build. Length very variable, up to 30.00, according to development of tail, which is sometimes 9.00 long, usually 5.00–6.00; extent 36.00; wing 11.00; bill 2.25; tarsus 1.67; middle toe and claw 2.25. Adult ♀: Smaller; lacking special development of tail; length 24.00 or less; wing 10.00 or less; tail 4.00–5.00. Only traces of speculum, in green specks on a brown area between white or whitish tips of secondaries and those of greater coverts. Bill blackish; feet dull grayish-blue; iris brown. Whole head finely speckled, and whole neck finely streaked, with dusky-brown and grayish-brown or yellowish-brown; under parts pale ochrey, or dingy whitish, freckled with dusky at least on the belly, flanks, and crissum; upper parts variegated with brownish-black and yellowish-brown, on the fore parts the lighter color in angular or rounded bars on each feather. Young ♂ like ♀. The ♀ and young are thus plainly dressed "gray" Ducks, generally resembling some other species; observe color of bill and feet, light tips of secondaries and greater coverts, and couple these marks with size and generic characters. Northern Hemisphere: North America at large, wintering and migrating in U. S. and beyond, to Cuba and Panama: breeding from N. W. border of U. S. to far north; also Iowa, Illinois, Missouri, Arizona, etc.; more numerous in the interior than along either coast. I have found it breeding abundantly in parts of North Dakota and Montana. Nest on ground; eggs 6–10–12, smooth, elongated ellipsoidal, 2.10–2.30 × about 1.50; uniform dull grayish-olive; larger than those of the Shoveller.

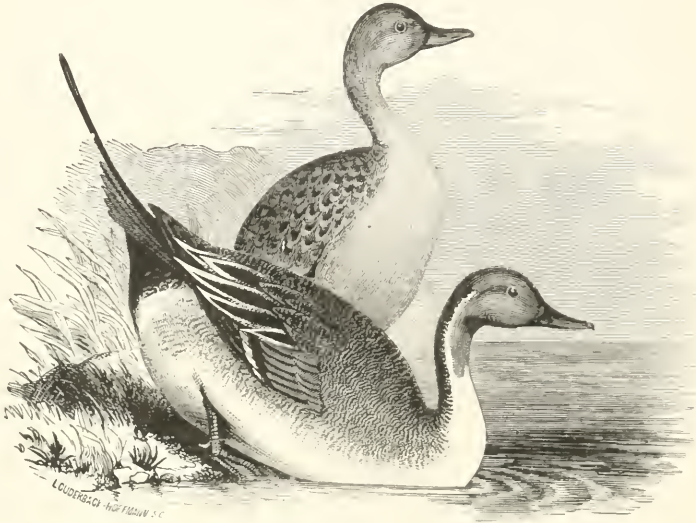


FIG. 630. — Pin-tail Duck, ♂. (From Lewis.)

Young ♂ like ♀. The ♀ and young are thus plainly dressed "gray" Ducks, generally resembling some other species; observe color of bill and feet, light tips of secondaries and greater coverts, and couple these marks with size and generic characters. Northern Hemisphere: North America at large, wintering and migrating in U. S. and beyond, to Cuba and Panama: breeding from N. W. border of U. S. to far north; also Iowa, Illinois, Missouri, Arizona, etc.; more numerous in the interior than along either coast. I have found it breeding abundantly in parts of North Dakota and Montana. Nest on ground; eggs 6–10–12, smooth, elongated ellipsoidal, 2.10–2.30 × about 1.50; uniform dull grayish-olive; larger than those of the Shoveller.

ANAS. (Lat. *anas*, a Duck.) STOCK DUCKS. COMMON DUCKS. MALLARDS, BLACK DUCKS, etc. Bill not shorter than head, rather longer than tarsus, broad and about parallel-sided, higher than wide at base, then much depressed and flattened, the end rounded; nail narrow, less than $\frac{1}{2}$ as wide as end of bill. Nostrils high up, in basal half of bill. Feathers reaching to about the same distance on forehead, cheeks, and chin. Tail rounded, less than $\frac{1}{2}$ as long as wing, of 16–18 pointed feathers. Bill greenish, or blackish blotched with orange. Feet bright-colored. Speculum violet, etc., framed in black and white (in both sexes). Sexes unlike (*boscas*) or alike (*obscura*). Of the genus *Anas* in its thus most restricted sense we have two strongly marked species, and a third closely resembling one of these; there are about 15 others of various parts of the world.

Analysis of Species.

- ♂ Head and neck green, neck with white ring, breast purplish-chesnut, etc. ♀ variegated with dusky and yellowish-brown. ♂ ♀ wing with two black-and-white bars *boscas*
- ♂ ♀ entirely dusky, variegated with yellowish-brown; lining of wings white; no white wing-bars, or only a very slight one. *obscura*
- No black spot at base of upper mandible; throat streaky *fulvigula*
- A black spot at base of upper mandible; throat plain *fulvigula*

A. bos'cas. (Gr. *βοσκός*, *boskas*; Lat. *boscas* or *boscis*, probably this very species. Fig. 640.) MALLARD. COMMON WILD DUCK and DRAKE. DOMESTIC DUCK and DRAKE. DUCKIN-MALLARD (*i. e.*, Duck ♀ and ♂, "mallard" being same word as *male*.) STOCK DUCK. "ENGLISH" DUCK. "FRENCH" DUCK. GRAY DUCK (♀). GRAY MALLARD (♀). GREEN-HEAD (♂). Adult ♂: Bill greenish-yellow. Feet orange-red. Iris brown. Head and upper neck glossy-green, succeeded by a white ring. Breast purplish-chestnut. Lower back, rump, and tail-coverts glossy-black. Tail-feathers mostly whitish. Under parts from breast,

and scapulars, silvery-gray, finely undulated with dusky; erissum black. Speculum violet, purplish, and greenish, framed in black and white tips of greater coverts and black and white tips of the secondaries concerned in its formation, making altogether 2 white and 2 black bars; lesser wing-coverts plain grayish or slaty, without variegation; long inner secondaries without light edgings. Adult ♀: Feet and wings as in the ♂.

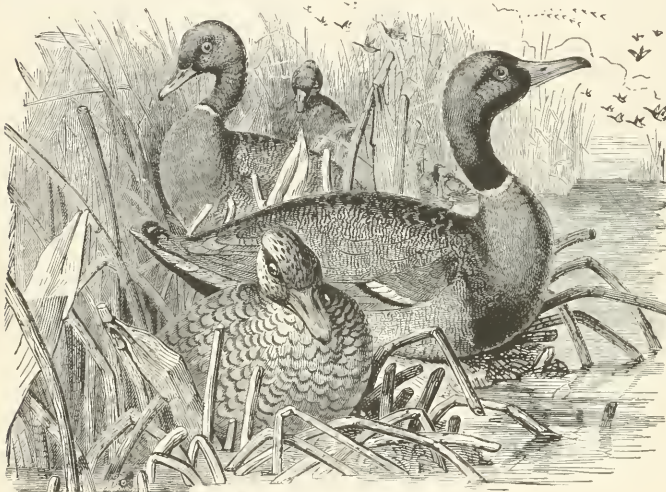


FIG. 640. — Mallards. (From Lewis.)

Bill blackish, blotched with orange, especially at base, tip, and along edges. Entire body-colors variegated with dusky-brown and tawny-brown; the tone paler and in finer pattern on head, neck, and under parts than on back; the general effect that of the ♂ ♀ of the next species, but not nearly so dark: observe also the particular wing-markings, same as those of the ♂. Length 22.00–24.00; extent 32.00–36.00; wing 10.00–11.00; tail 3.00–4.00; bill about 2.00; tarsus rather less; middle toe and claw more. In the drake, a tuft of curly feathers on tail; and in one of his moults a plumage like that of the duck. Weight 2 or 3 pounds. Northern Hemisphere; nearly everywhere domesticated, being the well-known original of the barnyard Duck. Wild in abundance nearly throughout North America, breeding in much of U. S. as well as farther north; uncommon in New England, and not known to breed, being replaced there and farther northeast by the Dusky Duck. Nest on ground, of trash and feathers; eggs usually 6–10, 2.35 × 1.65, smooth, yellowish-drab or some similar dingy color.

Obs. — An anomalous Duck, with the general aspect of a Mallard, but nearly as large as a Goose, is occasionally taken on the Atlantic coast; it is unquestionably part Mallard, the balance of its parentage believed to be Muscovy; *Anas marima* GOSSE; *Fuligula viola* BELL. A supposed hybrid of Mallard × Gadwall is *Anas gloeitans* or *A. breweri* Aud. folio pl. 338; *A. auduboni* Ep. The Mallard is known to × with various other species, including the Dusky Duck, *A. obscura*; Pintail, *Dafla acuta*; Shoveller, *Spatula clypeata*; Gadwall, *Chauelasmus streperus*; Green-winged Teal, *Nettion crecca*; and even with the Merganser!

A. obscu'ra. (Lat. *obscura*, dark.) DUSKY DUCK. BLACK DUCK. BLACK MALLARD (♂ ♀). Size of the Mallard, and resembling ♀ of that species, but darker and without white anywhere except on lining of wings, and a narrow white line along border of speculum of ♂. Sexes alike. Bill yellowish-green, with dusky nail but no distinct black spot on side of upper mandible at its base (compare *fulvigula*). Feet orange-red, with dusky webs. Iris brown. General plumage dusky-brown, paler below than above, variegated with pale rusty-brown edgings of the feathers; top of head darker than its sides and throat, the former blackish with pale brown streaking in fine pattern, the latter grayish-brown with dark streaking, not plain buff as in *fulvigula*. Wing-coverts dusky-gray, the lesser ones not plain, but varied with lighter edgings, as are also the inner secondaries; the greater tipped with black, edging the purplish-blue or violet speculum. The general blackish color, contrasting with white lining of wings, and the violet speculum framed in velvety-black, are diagnostic. ♀ *boscas* is much lighter in tone, more variegated with tawny-brown, and has black-and-white frame of the "beauty-spot;" ♂ ♀ *fulvigula* have plain buff throat, and basal black spot on bill. Chiefly Eastern North America; W. only to the Mississippi Valley at large, as far as known (Kansas, Iowa, etc.). Abundant along the Atlantic coast to Labrador. One of the commonest Ducks in summer in New England and northeastward. Nest on ground, of weeds, grass, and feathers; eggs 8-12, dirty pale yellowish-drab or other dingy color, about 2.40×1.75 . One of the best table Ducks.

A. fulvi'gula. (Lat. *fulvus*, reddish; *gula*, throat.) FLORIDA DUSKY DUCK. Similar to *A. obscura*; lighter-colored, the buff or ochrey markings prevailing over the dusky ones and giving the general tone; cheeks, chin, and throat plain pale buff; bill olive, with black nail and spot at base of commissure. Eggs 2.15×1.60 , dull buff. Resident in Florida. The species is now restricted, on paper at least, to Florida, its formerly given range thence to Texas and Kansas being now assigned to the following subspecies. *A. obscura* var. *fulvigula* RIDGW. Am. Nat. Feb. 1874, p. 111; COUES, Key, 2d-4th eds. 1884-90, p. 692; *A. fulvigula* RIDGW. Pr. U. S. Nat. Mus. Aug. 1880, p. 203, and Man. 1887, p. 92; A. O. U. Lists, 1st and 2d eds. 1886-95, No. 134.

A. f. maculo'sa. (Lat. *spotted*, full of *macula*, spots.) TEXAS DUSKY DUCK. MOTTLED DUCK. Adult ♂: Top of head blackish-brown, the feathers edged with pale buff; chin and throat isabella color; cheeks buffy-white with narrow dark-brown streaks; upper parts, wings, breast, and flanks blackish-brown, the feathers margined with pale white; under parts buffy white, each feather with a broad blackish-brown spot near the tip; under tail-coverts blackish, varied with whitish and reddish buff; 4 middle tail-feathers blackish-brown, the others fuscous edged with pale buff, having a V-shaped mark as in *A. fulvigula*; lining of wing white; speculum purple with white border; feet reddish-orange; a small black basal spot on lower edge of upper mandible, lacking in the ♀; sexes otherwise alike. Eastern Texas to Kansas. *A. maculosa* SENNETT, Auk, July, 1889, p. 263; *A. obscura maculosa* COUES, Key, 4th ed. 1890, p. 905; *A. fulvigula maculosa* A. O. U. List, 2d ed. 1895, No. 134a.

CHAULELAS MUS. (Gr. *χαίλιος*, *chaílios*, protuberant (only classic in *χαυλιόδους*, *chaíliodous*, having protrusive teeth, or, of teeth protrusive, tusky, like those of the Crocodile); *ελασμός*, *elasmos*, a layer, plate; referring to teeth of bill.) GADWALLS. Bill about as long as head, rather exceeding tarsus, but shorter than middle toe alone, the sides parallel to rounded tip; lamellæ not concealed; nostrils high up near the base; re-entrance between feathers on culmen and those on side of bill short and open, in advance of feathers on side of lower mandible. Wings pointed, 1st primary longest. Tail short, rounded or cuneate, with 16 pointed feathers. ♂ with most of the plumage barred or half-ringed with black and white, or whitish; middle wing-coverts *chestnut*, greater coverts *black*, *speculum white*; ♀ with similar *white* speculum. Feet yellowish. The genus is very near *Anas* proper, chiefly differing in the fineness and great number (about 50) of the lamellæ of the bill,

some 30 or more of which are protrusive in our species; in *C. couesi* of the Fanning islands they are still finer, more closely packed, and about 75 on a side—like a fine-tooth comb. (A. O. U. reduced to subgenus of *Anas*, 1886-95, reverting to nomenclature of Key in Suppl. List, Auk, Jan. 1899, p. 103.)

C. streperus. (Lat. *streperus*, noisy, "obstreperous.") GADWALL. GRAY DUCK. GRAY WIDGEON. CREEK DUCK. BLEATING DUCK. SPECKLE-BELLY. Adult ♂: Bill blue-black; feet dull orange, with dusky webs and claws; iris reddish-brown. Head and neck brownish-white, darker on crown and nape, barred and specked with dusky. Lower neck, breast, sides of body and fore back waved with crescentic bars of blackish and white, giving a scaly appearance, most distinct on neck and breast, elsewhere finer, more undulatory and transverse; in high plumage the black marks tending to coalesce in a collar between neck and breast. Lower back dusky, passing to black on rump and upper tail-coverts. Belly white, minutely marbled with gray; crissum velvety black. Scapulars tinged with rusty brown; long-est inner quills hoary gray; lining of wings white; lesser upper coverts gray; middle coverts chestnut-red or maroon (color of unpolished mahogany); speculum white, formed by part or the whole of outer webs of secondaries, framed in velvet black of greater coverts, terminally bordered with black and hoary gray. Length 20.00-22.00; extent 34.00; wing 10.50-11.00; tail 4.50; tarsus 1.60; bill 1.75; middle toe and claw 2.20. Adult ♀: Smaller than ♂: Length about 18.00; wing 10.00; bill 1.60. Bill dusky, blotched with orange. Feet dingy yellowish, with dusky webs and claws. Lacking the regular crescentic and wavy markings of ♂; variegated above with dusky and tawny brown, like ♀ of other species; breast and belly white, with more or less dusky spotting (whence the name "speckle-belly"). Chestnut of ♂ wanting or restricted; but wing-markings otherwise sufficiently distinctive. Young ♂ resembling ♀. One of the most widely diffused of Ducks, in most parts of the world; nearly throughout North America, and not specially arctic in the breeding season, nesting in much of Western U. S., especially in the interior. Nest on ground, sometimes in trees; eggs 8-12, oval, creamy-white, a trifle over 2.00 by about 1.55. (The name Gadwall was formerly also Gaddel (Merrett, 1667), Gadwal, Gadwale, Gadwell; origin obscure and etymology unknown.) **MARE'CA.** (S. Am. *mareca*, Brazilian name of a kind of teal.) WIDGEON or WIGEON. Bill shorter than head, rather high and narrow at base, parallel-sided, with rounded end; nail occupying its middle third; upper lateral re-entrance short and open; nostrils high up and not very near base; lamellæ few and coarse, only 15 or fewer fairly protrusive on side view. Tail pointed, of 14-15 feathers, not half as long as wing. Bill and feet dark-colored; belly and middle and greater wing-coverts white; top of head white or light; speculum green, black-bordered. (As subgenus of *Anas* in A. O. U. Lists, 1886-95; as full genus in 1899 (9th Suppl. List), as it has always been in the Key.)

Obs. — The student who may be perplexed by the continual recurrence of the name "Widgeon" or "Wigeon" in different connections, may be here reminded that the English name is now properly applied only to birds of this genus, *Mareca*; but that in popular parlance, with or without a qualifying term, it means almost any kind of Duck except the Mallard — just as "Brant" in the mouths of the people means any kind of Goose except the regular old Honker, *Branta canadensis*.

Analysis of Species.

Head and neck cinnamon-red, scarcely varied; with mere traces of green, if any; top of head creamy or white
penelope
Head and neck grayish, speckled with dusky; sides of head with a broad patch of green, top white or nearly so
americana

M. penel'ope. (Gr. Πηνελόπη, *Penelope*, Lat. *Penelope* or *Penelopa*, a mythological character, daughter of Icarus and Peribœa, wife of Ulysses, and mother of Telemachus, celebrated for her virtue. But the use of the name in ornithology may be a mistake for Πηνελόψ, *penelops*, Lat. *penelops*, a kind of Duck so called by Pliny.) EUROPEAN WIDGEON. WHISTLER. WHEWER. WHEW. WHIM. Size and general character of the next species; differing as

above. Europe; Greenland; rare or casual along the whole Atlantic Coast; more numerous on the N. Pacific coast and S. to California. Records since the 2d edition of the Key are: Forest and Stream, xxv, 1886, p. 426, California; Auk, 1889, p. 64, Nova Scotia; p. 302, New Jersey; 1890, p. 88, Virginia, p. 204, p. 283, each, Maryland; Forest and Stream, xxxix, 1890, p. 308, North Carolina; Auk, 1895, p. 179, p. 292, and 1896, p. 255, four cases, Indiana; Orn. and Acl., vii, p. 133, Auburn, N. Y.; Forest and Stream, xlvi, 1897, p. 165, North Carolina; Auk, July, 1899, p. 270, Indiana. Nearly all obligingly furnished to me by Mr. William Dutcher.

M. americana. (Fig. 641.) AMERICAN WIGEON. GREEN-HEADED WIGEON. WHITE-BELLY. BALD-HEAD. BALD-PATE. BALL-FACE. BALD-CROWN. SMOKING DUCK. WHEAT DUCK. POACHER. (As between the spellings *widgeon* and *wigeon*, the former is more frequent in this country and is preferred by such high authority as the Century

Dictionary; *wigeon* is better English (derived from Lat. *vipio*, like *pigeon* from *pipio*) and supported by such great scholarship as that of Newton's Dictionary.) Adult ♂: Bill grayish-blue, with black tip and extreme base; feet similar, duller, with dusky webs and claws; iris brown. Top of head white, or nearly so; sides the same, or more buffy, speckled with dusky-green, purer



FIG. 641. — American Wigeon. (From Lewis.)

green forming a broad patch from and below eye to hind head: chin dusky. Fore neck and breast light brownish-red, or very pale purplish-cinnamon, each feather with paler grayish edge; along sides of body the same, finely waved with dusky; breast and belly pure white; crissum abruptly black. Lower hind neck, fore back, and scapulars finely waved with the same reddish color and with dusky; lower back and rump similarly waved with dusky and whitish. Lesser wing-coverts plain gray; middle and greater coverts pure white, forming a large area; greater black-tipped, forming fore border of speculum, which is glossy green, bordered behind by velvety black, internally by black and white stripes on inner secondaries. Tail brownish-gray; lateral upper coverts black; axillary feathers white. Only old drakes have the crown immaculate white, chin dusky, and auricular patch definitely green; generally the whole head and upper neck are pale brownish-yellow or reddish-white, speckled with greenish-dusky. ♀: Resembling immature ♂ on head; the peculiar brownish-red is interrupted with dusky and whitish bars; wing-pattern nearly as in ♂, but white is restricted or interrupted with gray, greater coverts may lack black tips, speculum faint, and black stripes of inner secondaries replaced by brown. The normal variability in coloration, aside from age or sex, is great, but the bird cannot be mistaken under any conditions; the extensive white of under parts and wings is recognizable at gun-shot range. Length 18.00–21.00; extent 30.00–35.00; wing 10.00–11.00; tail 4.00–4.50; bill 1.50; tarsus 1.50; middle toe and claw more.

North America at large, breeding from Texas to N. Dakota, Minnesota, Illinois, etc., and N. of the U. S. to high latitudes; in its breeding range chiefly northerly; winters to Central America and some of the West Indies; Europe, casually in several recorded instances. Eggs 6-12, 9 or 10 very commonly, 2.00-2.25 × 1.50, dull pale buff or cream color to nearly white, without any drab or olive shade.

NETTUM. (Gr. *νήπιον*, *nettion*, a duckling; dimin. of *νήτρα*, *netta*, a duck.) **GREEN-WINGED TEALS.** Size very small; wing under 8.00. Head sub-crested. Bill nearly as long as head, longer than tarsus, very narrow, parallel-sided, blackish; nail about $\frac{1}{2}$ its tip. Re-entrance of feathers on sides of culmen in advance of base of bill below. Head and neck chestnut, with a broad glossy green band on each side behind eye, bordered with whitish, blackening where meeting on nape. Under parts white, with circular black spots; crissum black, varied with white or creamy; upper parts and sides of body closely waved with black and white. Speculum rich green bordered in front with buff tips of coverts, behind with white tips of secondaries; no blue on wing; feet dark; bill black. ♀ differing especially in head markings, those of wings similar. About 15 species, of which we have two. As subgenus of *Querquedula* in former editions of Key, and as subgenus of *Anas* in A. O. U. Lists, 1886-95; raised to full genus in Suppl. List, Auk, Jan. 1899, p. 103.

Analysis of Species.

No white on side of body in front of wing; long scapulars black externally, creamy-white internally *crecca*
 A white crescent on side of body before wing; scapulars plain *carolinensis*

N. crec'ca. (Lat. *crecca*, formed like *crex*, crake, quack, etc., to express the sound.) **EUROPEAN GREEN-WINGED TEAL.** Like the next to be described: No white crescent before wing; green band in chestnut of side of head bordered with decided whitish; barring of sides and upper parts broader and coarser; long scapulars as well as inner secondaries creamy white, black-bordered externally. Europe; Greenland; casually on North American Atlantic coast (New York, *J. G. Bell*, several specimens, 1858 or earlier; Labrador, *Coues*, 1860), and also on the Pacific (Aleutian Islands and California). Late records are: Washington, D. C. Auk, 1886, p. 140; Massachusetts, Auk, 1890, p. 294; Connecticut, Auk, 1891, p. 112; New Jersey, dubious, Auk, 1895, p. 171.

N. carolinensis. (Fig. 642.) **AMERICAN GREEN-WINGED TEAL. GREEN-WING. RED-HEADED TEAL. WINTER TEAL.** Adult ♂: Bill black; feet bluish-gray; iris brown. A white crescent in front of wing. Head and upper neck rich chestnut, blackening on chin, with a glossy green patch behind each eye blackening on its lower border and on nape where it meets its fellow among the lengthened feathers of the parts, bordered below by a more or less evident whitish line, which may often be traced to angle of mouth. Upper parts and flanks waved with narrow black bars on a whitish ground. Under parts white, becoming buff or fawn-colored on breast, nebulated with gray, on breast with numerous sharp circular black spots; fore-neck and sides of breast waved like upper parts. Crissum black, with a buff or creamy patch on each side. Primaries and wing-coverts leaden-gray; speculum velvety purplish-black on outer half, inner half rich green; bordered in front with chestnut, fawn, or whitish tips of greater coverts, behind by white tips of secondaries, interiorly with purplish-black stripes on outer webs of lengthened secondaries. Adult ♀: Nearly like ♂ on wings; green speculum less perfect; no crest; head and neck streaked with light reddish-brown on a dark brown ground; upper parts mottled with dark brown, barred and streaked with tawny or grayish; lower parts white, more or less buffy-tinged on lower fore-neck and breast, which have nebulous dusky spotting. A very small species, one of the most prettily colored of all, and unsurpassed in excellence of flesh: length about 14.00; extent 23.00; wing 7.00-7.50; tail 3.00; bill 1.50; tarsus 1.20. North America at large, extremely abundant; casual in Europe. Breeds from the northern borders of the U. S. northward, chiefly N. of the boundary

line; but also in Colorado, California, Wyoming, etc.; winter range extends to Cuba and Central America. It is one of the earliest arrivals among hordes of water-fowl that come thronging from the North in fall. Nest on the ground, of weeds, grass, and down; eggs 8-12, sometimes more, $1.75-1.90 \times 1.20-1.30$, pale dull buff with a faint greenish tinge.

QUERQUED'ULA. (Lat. *querquedula*, a kind of small duck.) BLUE-WINGED TEALS. GARGANEYS. Size small; wing 8.00 or less. Head close-feathered. Bill broader than in *Nettion*, parallel-sided, blackish; nail about $\frac{1}{3}$ its tip. Re-entrance of feathers on sides of culmen not in advance of base of bill below. Speculum glossy-green; wing-coverts of ♂ ♀ sky-blue; greater coverts white-tipped; scapulars of ♂ striped with blue and buff. A small genus of small Ducks, with 5 species, including *Q. circaia*, the European Garganey. We have two species. (As subgenus of *Anas* in A. O. U. Lists, 1886-95; as full genus in Suppl. List, Auk, Jan. 1899, p. 104, thus returning to the regular nomenclature of the Key.)

Analysis of Species.

- ♂ Head and neck blackish-plumbeous; large white crescent before eye *discors*
 ♂ General color purplish-chestnut; no white on head *cyanoptera*

Q. dis'cors. (Lat. *discors*, discordant.) BLUE-WINGED TEAL. BLUE-WING. WHITE-FACED TEAL. SUMMER TEAL. Adult ♂: Bill grayish-black; feet dingy yellow, with dusky webs and claws; iris brown. Head deep leaden-gray, with purplish gloss, blackening on top; a large, white, black-edged crescent in front of eye. Under parts purplish-gray, with innumerable black spots, rounded or oval on breast, changing to bars on flanks, becoming nebulous on belly. Crissum black; a patch on each side of rump, axillars and most of lining of wings, white. Lower hind neck and fore back varied with brownish-black and yellowish-brown;



FIG. 642. — American Green-winged Teal. (From Lewis.)

lower back and rump dark brown with a greenish tinge. Wing-coverts and outer webs of some of the scapulars sky-blue; speculum rich green, set between white tips of greater coverts and secondaries, some of the inner secondaries and longest scapulars velvety greenish-black on outer web, greenish-brown on inner web, striped lengthwise with reddish-buff. ♀ retaining sky-blue on wing-coverts and much of the other wing-markings, hence easily distinguished among our Ducks (excepting ♀ *cyanoptera*). Bill greenish-dusky; feet very pale or flesh-tinted. Head and neck streaked with brownish-black on a dull buff ground; cheeks and chin whitish, unmarked. Above, dark brown, with pale edges of the feathers; below whitish-gray, mottled with obscure spots. Length 15.00-16.00; extent 26.00-30.00; wing 7.00-7.50; tail 3.50; bill 1.50; tarsus 1.20. North America, chiefly E. of the Rocky Mts.; scarce on the Pacific coast; winters S. and to West Indies and northern South America; in summer N. to high latitudes, but also breeds indefinitely in its U. S. range; like Pintail and Shoveller nests

abundantly in N. Dakota; abundant in the U. S. southerly in winter and at large during the migrations; casual in Europe. Nest on the ground, of weeds, grass, and down; eggs 8-10 or more, 1.75-1.90 \times 1.30-1.40, pale buff or creamy. They are indistinguishable from those of the European Garganey, of which our bird is the American representative, and probably not to be told apart with certainty from those of the Green-wing; but it is said that the down lining the Garganey nest has white tips, lacking in the case of *N. crecca*, and very likely there is the same difference in our Blue-wing and Green-wing down.

Q. cyano'ptera. (Gr. *κυανός*, *kuanos*, blue; *πτερον*, *pteron*, wing.) CINNAMON TEAL. Adult ♂: Bill black; feet orange, joints and webs dusky; iris orange. Head, neck, and entire under parts rich purplish-chestnut, darkening on crown and chin, blackening on middle of belly; crissum dark brown. Fore back lighter cinnamon, varied with brown curved bars, several on each feather; lower back and rump greenish-brown, the feathers edged with paler. Wing-coverts sky-blue, as in *discors*; some of the scapulars blue on outer webs and with a central buff stripe, others dark green with buff stripe. Speculum green, set between white tips of greater coverts and white ends of secondaries. Wing thus quite as in *discors*, but body-colors and head entirely different; rather larger; length 16.00-17.00; extent 25.00; wing 7.50-8.00; bill 1.60-1.75, along commissure about 2.00. Adult ♀: Similar to ♀ *discors*, and not easy to distinguish; larger; bill longer; under parts at least with a tinge of the peculiar chestnut color; head and especially chin more speckled, without the immaculate whiteness of those parts of ♀ *discors*. Bill dusky, paler below and along edges; iris brown; feet yellowish-drab. A generally distributed South American Teal, abundant in U. S. west of the Rocky Mts., and of casual occurrence in the Gulf States, Texas to Florida; Illinois; Nebraska; British Columbia. Nest on ground, of grass and feathers, nearly anywhere in its U. S. range; Colorado, Utah, Nevada, California, Idaho, Oregon, etc. Eggs 8-14, laid in June, oval, one end smaller than other, creamy or pale buff; 1.90 \times 1.30 to 2.10 \times 1.40.

Subfamily FULICULINÆ: Sea Ducks.

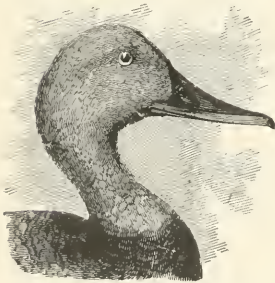


FIG. 643. — Canvas-back. (From Lewis.)



FIG. 644. — Red-head. (From Lewis.)

Tarsi scutellate in front; hind toe lobate. The large membranous flap depending from the hind toe distinguishes this group from the preceding, probably without exception. While the general form is the same as that of *Anatinae*, the feet are notably larger, with relatively shorter tarsi, longer toes (outer scarcely or not shorter than middle), and broader webs; they are also placed somewhat farther back, in consequence of which the gait is

still more awkward and constrained than the "waddle" of ordinary Ducks; but swimming powers are enhanced, and diving is facilitated. A large number of the species are exclusively maritime, but this is no more the case with all of them than is the reverse with the River Ducks. These birds feed more upon mollusks and other animal substances (not, however, upon fish, like Mergansers) than River Ducks do, and their flesh, as a rule, is coarser, if not entirely too rank to be eaten; there are, however, signal exceptions to this, as in the case of the Canvas-back. The sexes are unlike, as among *Anatinae*; and besides the difference in color, the ♀ is often distinguished by absence or slight development of certain tuberosities of bill that the ♂ of several species, as of Scoters and Eiders, possesses. The tracheal tympanum

is present in *Fuligulina*, as a rule, and differs from its ordinary type in *Anatina* by greater irregularity of figure as well as by the imperfection of its solid walls, which may present several fenestræ or vacuities closed up only by membrane. A large majority of the species inhabit the Northern Hemisphere; and there are rather more than 50 in all, exhibiting a good deal of diversity in minor details, and thus requiring recognition of many genera, most of which are well represented in North America. Among notable exotics are the soft-billed *Hymenolæmus malacorhynchus* of New Zealand, and the short-winged *Tachyeres cinereus* of South America, related to our genus *Camptolæmus*. The latter is the Logger-head or Steamer Duck, notable for losing the power of flight. There are but few others. *Erismatura* is type of a small group remarkable for the character of the tail, as described beyond, and sometimes considered as a subfamily apart. *Biziura lobata* of Australia, with a fleshy appendage under the bill, the African *Thalassornis leucanota*, and several species of our genera *Erismatura* and *Nonomyx*, compose the *Erismaturina*. The South American Torrent Ducks, about six species of the genus *Merganetta*, resemble *Mergansers* in some respects, and appear to be a link between the *Fuligulina* and *Mergina*: but the wing is spurred, the bill is of peculiar character with regard to the lamina, the tail is long and stiff, and altogether these birds are so peculiar that a subfamily *Merganettina* has been provided for their accommodation; to which the remarkable Papuan *Salvadorina waigionensis*, together with the above-named *Hymenolæmus malacorhynchus* have been doubtfully referred.

Analysis of Genera and Subgenera.

- Tail-feathers rigid, narrow, linear, exposed to their bases by shortness of coverts. (ERISMATURINÆ.)
 - Nail of bill ordinary *Nonomyx*
 - Nail of bill narrow above, overhanging and widened beneath tip of bill *Erismatura*
- Tail-feathers and their coverts ordinary (central pair very long in *Harelda* ♂). (FULIGULINÆ proper.)
 - Bill variously gibbous, or appendaged, or feathered beyond nostrils.
 - Bill gibbous at base, then broad, depressed, with large fused nail, without frontal processes.
 - Gibbosity of bill superior, circumscribed; feathers not projected on culmen.
 - Tail 16-feathered. ♂: Color entirely black (Edemia) } *Edemia*
 - Gibbosity of bill superior, circumscribed; feathers projected on culmen. Tail 14-feathered.
 - ♂: Color black or dark, with white wing-patch (Melanetta) }
 - Gibbosity lateral as well as superior; feathers projected on culmen.
 - Tail 14-feathered. ♂: Color black, with white head-patches (Pelionetta) }
 - Bill gibbous at base, with large frontal processes.
 - Frontal processes in line with culmen (Somateria proper) } *Somateria*
 - Frontal processes bulging out of line with culmen (Erionetta) }
 - Bill not gibbous, but feathered on culmen beyond nostrils *Arctonetta*
 - Bill not gibbous, but appendaged with leathery expansion of side of upper mandible, cheeks not bristly *Heniconetta*
 - Bill not gibbous, but appendaged with a lobe at base of commissure *Histrionicus*
 - Bill not gibbous, but appendaged with a leathery expansion of side of upper mandible; cheeks bristly *Camptolæmus*
 - Bill ordinary.
 - Nail of bill large, fused. Tail (of ♂) about as long as wing *Harelda*
 - Nail of bill narrow, distinct. Tail of ordinary length and shape.
 - Bill shorter than head, high at base. Head of ♂ puffy or crested, iridescent, with white patches; crissum white; colors black and white, in masses *Clangula*
 - ♂, white spot before eye. (*Clangula* proper.)
 - ♂, white patch behind eye. (*Charitonetta*.)
 - Bill about as long as head. Head of ♂ black, red, or brown, without spots; crissum dark.
 - Bill bluish or blackish. Head of ♂ black *Fuligula*
 - Head of ♂ reddish *Althya*
 - Bill red. Head red, crested (European) *Netta*

NETTA. (Gr *νήττα*, *netta*, or *νήσσα*, *nessa*, a duck; equivalent to Lat. *anas*.) General characters of *Nettiona* and *Fuligula*, as noted beyond. Bill of ordinary shape, much as in Scaps and Poehards, but with more prominent lamella, and wider nail, occupying more than $\frac{1}{2}$ width of bill; feathering of sides of upper mandible nearly straight, rather concave than

convex. Bill and feet bright-colored; head red, as in Pochards, fully crested in ♂, less so in ♀. One species, of Europe, Asia, and Africa. (Included in *Fuligula* in 2d-4th eds. of the Key.) **N. rufina.** (Lat. *rufina*, reddish.) RED-CRESTED POCHARD. Adult ♂: Conspicuously crested. Bill vermillion, white-tipped; feet orange-red with dusky webs; eyes brown. Head and upper neck rusty-red, with a rosy tint. Lower and hind neck, fore back, breast, and middle of belly black. Back grayish-brown, with a large white patch on each side, blackening on rump and upper tail-coverts. Tail ashy-gray. Primaries whitish, edged and tipped with dusky-gray; speculum white, very large, formed by the secondaries, which have a dark band near their ends; lining of wings, their anterior border, and a large flank-patch, white. Length 21.00-22.00; wing 10.00; bill 2.00; tarsus 1.50. ♀: Bill dusky with pink tip, and feet pinkish, with dusky webs. Upper parts generally rufous-brown; under parts brownish-white; throat and upper fore-neck whitish; crown and rump darker than other upper parts; dorsal feathers with pale edges; quills brown, edged and tipped with darker; speculum gray, bounded terminally with brown. Europe, etc. One specimen found in Fulton market, New York, Feb. 1872: see RIDGW. Bull. U. S. Nat. Mus. No. 21, 1881, p. 85; ALLEN, Bull. Nat. Club, vi, 1881, p. 173; COUES, Check-List, 2d ed. 1882, p. 136. (*Fuligula rufina* COUES, Key, 2d-4th eds. 1884-90, p. 700; *Netta rufina* KAUP; A. O. U. List, No. [145].)

FULIGULA. (Lat. *fuligula* or *fulicula*, dim. of *fulix* or *fulica*, a coot; *fuligo*, soot.) BLACK-HEADS. SCAUPS. Bill ordinary, without special gibbosity or peculiar outline of feathers at base, where the feathers sweep the sides of the upper mandible with gently convex outline; nail at end distinct, decurved, narrow, less than $\frac{1}{2}$ as wide as end of bill; frontal feathers extending to approximately equal distances on top and sides of upper mandible, with a well-marked re-entrance between them reaching back to about opposite angle of mouth, those of chin advancing rather farther. Nostrils in basal $\frac{2}{3}$ of bill. Outline of upper mandible gently concave to the decurved nail: sides nearly parallel, or widening toward end (whole bill much as in ordinary *Anatinae*). Tail short, rounded, less than $\frac{1}{2}$ as long as wing, 14-16-feathered. Tarsus less than $\frac{2}{3}$ ($\frac{1}{2}$ - $\frac{2}{3}$) as long as middle toe and claw. Head not crested (in our species). Head and neck black ♂ or brown ♀. Sides or back or both finely waved with black and white. Axillaries white. Crissum black. Speculum white or gray. Bill blackish, or black and blue. Legs dark. (As subgenus of *Aythya* in A. O. U. List.)

Obs.—The type of the restricted genus *Fuligula* STEPH. 1824, is the crested Scaup of Europe, *F. fuligula*, or *cristata*; *Fulix* SUND. 1836, and *Nettarion* BD. 1858, have both the same type, and are strictly synonymous. In modifying the generic arrangement of the Scaups and Pochards from the 2d-4th eds. of the Key, I do so rather in deference to the A. O. U. than in accordance with my own judgment. In 1884 I put them all under *Fuligula*, with 3 subgenera—equivalent to *Fulix*, *Aythya*, and *Aristonetta* of BAIRD, and stating that *Fuligula* in this broad sense seemed to be separable into three full genera—one for the Red-crested Pochard of Europe, one for the Black-heads and Red-heads together, and one for the Canvas-back alone. I still think that the latter is quite as distinct from the Red-heads proper as these are from the Black-heads, though it resembles the Pochards more than it does the Scaups in the color of the head; and that therefore our three genera should be: (1) *Netta*, for the Red-crested Pochard alone; (2) *Fuligula*, for the Scaups and ordinary Pochards together, with two subgenera (*a*) *Fuligula* for Scaups proper, (*b*) *Æthyia* for Pochards proper; and (3) *Aristonetta*, for the Canvas-back alone. Here, however, I follow the A. O. U. in adopting (1) *Netta*; (2) *Fuligula*; (3) *Æthyia*.

Analysis of Species.

Black-heads: ♂ with head, neck, body anteriorly, lower back, rump, tail, and its coverts, black, the head glossy; below, including lining of wings, white, with fine black waving on sides and lower belly; bill black and blue, or dusky; feet dark. ♀ with head and neck brown, with or without white around bill, and other black parts of ♂ rather brown.

No ring around neck.

♂ Speculum white; back and sides finely waved in zig-zag with black and whitish; bill blue, with black nail. ♀ with the face white.

Length about 20.00; wing 9.00; gloss of head green *marila*

Length about 16.00; wing 8.00; gloss of head purple *affinis*

An orange-brown ring round neck of ♂.

Speculum gray; back nearly uniform blackish; bill black, pale at base and near end; ♀ without collar; lores and chin whitish, and ring round eye *collaris*

F. marila. (Qu. proper name? Qu. Gr. *μαριλη*, *marile*, charcoal, from the pitch-black fore-parts?) GREATER SCAUP DUCK. MUSSEL DUCK. BIG BLACK-HEAD. GREEN-HEAD. BLACK-NECK. GRAY-BACK. BLUE-BILL. BROAD-BILL. RAFT DUCK. FLOCK DUCK. FLOCKING FOWL. SHUFFLER. (These names also with several different qualifying terms, when the present is distinguished from the following species.) Adult ♂: No ring around neck. Speculum white. Bill dull blue or pale bluish-gray, with black hooked nail; broad and flat at end, where rounded out considerably wider than at base. Iris yellow. Feet livid plumbeous, with blackish webs. Whole head, neck, and fore parts of body pitch-black, on head with chiefly green iridescence. Lower back, rump, tail, with both upper and under coverts, black or blackish. Middle of back, scapulars, and most of under parts, white; inter-scapulars, scapulars, sides of body, and lower belly waved with fine zigzag cross-lines of black, quite in "canvas-back" style; flanks similar, more plainly white. Upper wing-coverts similar to back, but darker and more obscurely grizzled; greater coverts tipped with black, framing anterior border of white speculum, which is formed by secondaries; white extending quite across these, but their tips more or less perfectly black. Primaries brownish-black, becoming gray for a space on the inner webs of all but the four outer ones (this gray space on the six inner primaries, instead of a whitish space on the same six, being the alleged character of the North American *nearectica* in comparison with typical European *marila*). Axillars and most under wing-coverts white, the marginal ones more or less mottled with dark gray. Adult ♀: Bill and feet as before, but rather darker; eyes yellow. The black parts of ♂ replaced by dusky or dark snuffy brown, which latter is the color of head, except a broad belt of pure white around base of upper mandible, forming a conspicuous white face; chin also white. The black-and-white vermiculation less distinctly developed or hardly apparent and the general plumage more sordid or obscure: observe, however, the white mask on the snuff-colored head, the yellow eyes and dark livid feet, and you will not mistake your bird for any other (except *F. affinis*). The young ♂ is like the adult ♀, the old ♂ in moult has a similar dress, and there are various intermediate plumages. Length of ♂ ♀ 18.00-20.00; extent 30.00-35.00, usually over 30.00; wing 8.50-9.00; tail 3.00; tarsus 1.50; middle toe and claw 2.60; bill 2.00 on an average in length of culmen, ranging 1.90-2.10, and just about 1.00 in greatest breadth. Northern Hemisphere; North America at large; on the whole more northerly than *F. affinis*, though breeding no farther north — from near, possibly over, northern border of U. S., as Michigan and northwestern states, to far northward. Ranges in winter to Guatemala and West Indies. The more frequent U. S. Scaup is *F. affinis*. Nest on ground, in June and July, lined with dark brown down with obscurely paler centres but no pale tips; eggs 6-12, greenish-gray or -brown, or drab-colored, 2.50-2.70 × about 1.72. This is a true Sea-Duck, flocking in "rafts" in tidal estuaries in winter, but by no means exclusively maritime; whether it is a good table-duck or not depends upon its state of flesh when it is killed, and its food for some time previously. Its name is the same as that of the scaups or scapls, upon which it feeds much, *i. e.* of the low banks whereon mussels and other marine mollusks grow, and such diet tends to make the meat rank. *Aythya marila* of A. O. U. (The common American Scaup was attempted to be distinguished as "*Aythya marila nearectica*" by Dr. Stejneger, Orn. Expl. Kamtsch. 1885, p. 161; A. O. U. Lists, 1886-95, No. 148; but North American specimens are absolutely identical with the European: see Bishop, Auk, July, 1895, pp. 293-295; SHARPE, Cat. B. Brit. Mus. xxvii, 1895, 359; ELLIOT, Wild Fowl, 1898, p. 286; A. O. U. Suppl. List, Auk, Jan. 1899, p. 104 — as held in every edition of the Key since 1872.)

F. affinis. (Lat. *affinis*, allied, affined; *ad* and *finis*.) LESSER SCAUP DUCK. LITTLE BLACK-HEAD (and other names of the foregoing, with or without qualifying terms). Extremely similar to the last; gloss of head chiefly purple; sides and flanks less closely waved with black? Flank feathers said to be always waved, and those of *F. marila* to be always white, in adult ♂. Smaller: Length 15.00-17.00; extent under 30.00; wing 8.00 or less,

down to 7.50; tail 2.50; tarsus 1.50; middle toe and claw 2.30; bill averaging 1.75 along culmen, ranging 1.60–1.90; its greatest width probably never 1.00. It is difficult to define this bird specifically, but it appears to preserve its characters, though constantly associated with the last. North America at large; breeds from the northern borders of the U. S. northward, nesting commonly in parts of N. Dakota; winters in and migrates through the U. S. to Central America and West Indies. This is the common Scaup in winter in most parts of the U. S. — in Florida often in “rafts” of thousands. Its nest and eggs (6–12) are indistinguishable from those of the foregoing, but the eggs average smaller, about 2.25×1.60 . *Aythya affinis* of A. O. U.

F. collaris. (Lat. *collaris*, pertaining to *collum*, the neck: collared.) RING-NECKED DUCK. RING-NECKED SCAUP. RING-NECKED BLACK-HEAD. RING-BILLED BLACK-HEAD. RING-BILLED SHUFFLER. RING-BILL. MOON-BILL. MARSH BLUE-BILL. BASTARD BROAD-BILL. BLACK-JACK. BUNTY. (Popular fancy has thus seized upon the peculiar parti-colored *bill*, and not the ring round the neck, for most names of the bird.) Adult ♂: A chestnut or orange-brown ring round neck. Speculum bluish-gray (not white). Bill dark slate, broadly black at end, the base and edges, and a belt near end of upper mandible, pale bluish. Iris yellow. Feet grayish-blue, with dusky webs. Head and neck above collar lustrous black, with green, violet, and purple iridescence; extreme chin white. Lower neck, fore breast, and upper parts generally, blackish; scapulars scarcely waved or only dotted with grayish. Crissum black; under parts generally, including axillaries, and most of the lining of wings, white; lower belly and sides finely waved with black; the white solid on breast, where sharp-edged against black, but behind gradually passing into black of crissum through wavy markings; under wing-coverts mixed gray and white. Wings plain dark brown or fuscous, the gray speculum formed by outer webs of some of the secondaries, which may be uniform, or a little darker at their ends, and very narrowly tipped with white; primaries blackish on outer webs and tips, otherwise dark gray. Tail of 16 blackish feathers. Adult ♀: No collar; head umber-brown, darker on top, with whitish cheeks and chin, and white eye-ring; other black parts of ♂ dark brownish; under parts less extensively and less purely white without any of the fine vermiculation of the ♂, only a space on the breast and belly white, the fore breast, sides, and flanks being plain light umber-brown; wing and its speculum as before; markings of bill obscure; eyes and feet as before. Young ♂ resembling the ♀. In some ♀ or immature plumages this bird closely resembles the corresponding states of the Red-head; but it is much smaller, to say nothing of its generic distinctions. Downy ducklings grayish-brown above, with a buff spot in median line of fore back, on each side of back and of rump, and along hind border of winglets; forehead, sides of head, and under parts dingy buff, with a spot of grayish-brown on the ear-coverts and a brown bar across flanks. Length 16.00–18.00; extent 30.00 or less; wing 7.50–8.00; tail 2.75; tarsus 1.25; bill 1.75, not so much widened at end as that of the Scaups. North America at large; breeds from some of northern interior and Western U. S., but chiefly beyond, to far north; one Maine record; winters in and migrates through U. S. to Central America and West Indies; accidental in Europe. Eggs 6–12, 2.25×1.60 , pale greenish-gray or drab, indistinguishable from those of the foregoing. This very distinct Scaup, which represents in this country the European Tufted Duck, *F. fuligula*, and consequently comes nearest to being the type of the genus, was originally discovered by LEWIS and CLARK on the Columbia River at Deer Island, March 28, 1806, and fully described from a specimen in the dress of the ♀ or young ♂: see my edition of the History of the Expedition, 1803, p. 888. It was first named *Anas collaris*, and figured from a specimen taken in England: see DONOVAN, Brit. B. vi, pl. 147, 1809. *A. fuligula* WILS. 1814, pl. 67, fig. 5. *A. rufitorques*, ORD, 1825. *Aythya collaris* of A. O. U.

ÆTHY'IA. (Gr. *æthua*, *æthua*, a kind of water-bird in Homer's Odyssey and Aristotle's Natural History first rendered in modern ornithology *Aythya* BOIE, Isis, 1822, p. 564, type

by elimination *Anas ferina* LINN. I am willing to follow the A. O. U. in adopting the genus, but not in violating plain rules for the transliteration from the Greek to the Latin, which give us neither *AYTHYA* BOIE, nor *Aithya* KAUP, nor *Aithya* BP., nor anything but *Æthyia*.) POCHARDS. RED-HEADS. Little different from *Fuligula*. Bill more moderate, parallel-sided, not obviously widening out toward end. Head of adult ♂ not black, but chestnut-red in most species, darker brownish-red in the Canvas-back, which, also, in shape of bill and its set on the head, differs more from typical Pochards than these do from Scaups. Hence the genus is divisible into *Æthyia* proper and *Aristonetta*. (Included under *Fuligula* in 2d-4th eds. of the Key.)

Analysis of Subgenera and Species.

Bill shorter than middle toe without claw, not longer than head, nearly $\frac{1}{2}$ as wide as long, with concave culmen not rising notably high on forehead and out of line therewith; chord of culmen not over 2.25. Nostrils fairly in basal half of bill. Nail of bill well hooked. (*Æthyia* proper.)

Red-head: ♂ with head and neck chestnut, in ♀ plain brown; body anteriorly, rump, tail, and its coverts, black, in ♀ brown; back, scapulars, and sides finely waved with black and white or ashy-white in equal amounts; speculum gray. Bill blue with black belt at end. Back distinctly vermiculated with black on an ashy-white ground

americana

Bill equal to middle toe without claw, longer than head, about $\frac{1}{2}$ as wide as long, with scarcely concave culmen rising high on forehead in line therewith; chord of culmen up to 2.50. Nostrils reaching middle of bill. Nail of bill little hooked. (*Aristonetta*.)

Canvas-back: ♂ head dark chestnut-brown, much obscured with dusky on top and about bill. Silvery-whitish of back prevailing over the black waved lines, which are narrow and much broken into chains of dots. *vallisneria*

Æ. americana. (Figs. 644, 645, 646.) AMERICAN POCHARD. RED-HEADED BROADBILL. RED-HEADED RAFT DUCK. AMERICAN RED-HEAD. Adult ♂: Feathers of head somewhat full and puffy, though forming no crest. Bill broad and flattened, little widened toward end, running into forehead, which arches abruptly over and away from it; not rising gradually into line with forehead; shorter or not longer than head, 2.25 inches or less in length along culmen, the same along gape; nostrils within its basal half, the forward end of nostril about $\frac{2}{5}$ distance from upper corner to end of bill. Bill dull blue with a black belt at end. (Compare head and bill of Canvas-back.) Iris orange. Feet dull grayish-blue, with dusky webs and black claws. Head and neck all around rich pure chestnut, not obscured with dusky-brown, but with bronzy or coppery red reflections. Lower neck and fore parts of body above and below, with rump and tail-coverts above and below, blackish. Back mixed whitish and blackish in about equal amounts, the dark wavy lines distinct and unbroken. (In the European Pochard, *Æ. ferina*, from which our bird differs, the back is also distinctly and completely waved with black, but the ground is quite white, as in our Canvas-back, in which the dark lines are much broken up, the white thus prevailing. This fine vermiculation, when not too closely examined, gives a delicate silvery-gray tone, of different shade in the different species.) Sides of body under wings vermiculated much like back, the undulations subsiding in grayish-white on middle under parts. Wing-coverts ashy-gray, minutely dotted with white; speculum hoary-ash, bordered internally with black; lining of wings mostly white. ♀: Bill obscured bluish, with black belt near end; iris yellow; feet as in ♂. Same shape of bill and head. Head and upper neck dull reddish-brown, paler or whitish on

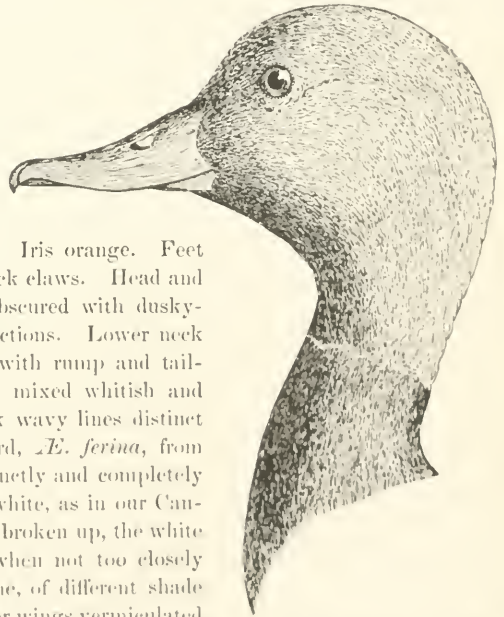


FIG. 645.—Red-head. $\frac{1}{2}$ nat. size. (From nature, by J. L. Ridgway.)

cheeks, chin, and behind eye; upper parts brownish, the feathers paler edged; breast and sides brownish. Wings much as in ♂; white lining restricted. Length 20.00–23.00; extent about 33.00; wing 9.00–10.00; tail 3.00, of 14 feathers; tarsus 1.50; middle toe and claw 2.75; greatest width of bill 0.87 or less. North America at large, but particularly E. of the

Rocky Mts.; breeds from Michigan, Missouri, Nebraska, Utah, Nevada, and California N. to the fur countries, most abundantly in British America; one Maine breeding record; winters from U. S. to the West Indies and Mexico. One of the commonest market Ducks in eastern cities in winter, selling readily for Canvas-back, and more likely to be distinguished therefrom with the feathers on than off! Nest of



FIG. 646. — Red-heads. (From Lewis.)

this slough-breeding duck on ground near water, or among reeds over water like a Coot's, often bulky and well made, lined with more or less down; eggs 7–10 or more, even to a baker's dozen and over, 2.30–2.45 × 1.65–1.75, buff with an olive or drab tinge, or light buff; shell smooth, hard, thick.

The names Red-head and Gray-back, applied to this species, are goodly distinctive from the darker-headed and whiter-backed Canvas-back. The name "Washington Canvas-back" which Mr. Gurdon Trumbull quotes with relish from Coles and Prentiss' *Avifauna Columbiana*, is simply a political witticism of the latter authors, who say that it is at the Capital "one of the commonest

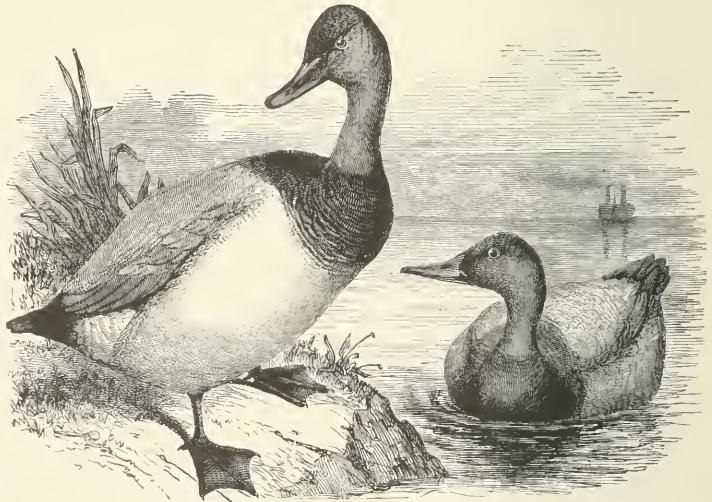


FIG. 647. — Canvas-backs. (From Lewis.)

market Ducks, passing about half the time for Canvas-back, and equally available for promoting Congressional legislation." (*Fuligula ferina americana*, of 2d–4th eds. of the Key.)

(Subgenus ARISTONETTA.)

Æ. (A.) vallisneria. (Name of a genus of aquatic plants, the wild celery, *V. spiralis*, dedicated to Antonio Vallisneri, an Italian naturalist. Figs. 643, 647, 648.) CANVAS-BACK. WHITE-BACK. BULL-NECK. "CAN." Adult ♂: Head close-feathered. Bill high at base and narrow throughout or scarcely widened toward end, sloping gradually up to top of head in line with sweep of forehead, altogether somewhat like a Goose's in shape; decidedly longer than head, $2\frac{1}{2}$ inches to nearly or quite 3 in length, measured along culmen; nostrils reaching middle of bill, their fore end half-way from upper corner to end of bill. Bill not blue, black-belted, but blackish throughout.

Eyes red. Feet grayish-blue. Head and upper neck not coppery brownish-red, but dark reddish-brown, further much obscured with dusky or quite blackish about the bill and on top. Ground color of back white, very finely vermiculated with zigzag blackish bars much narrower than the intervening spaces, and tending to break up, or mostly broken up, into little chains of dots across the feathers; the resulting silvery-gray tone consequently several shades lighter than in the Red-head. Other characters substantially as in that species. ♀ differs as ♀ Red-head does; head dark snuffy-brown, etc., but bill colored as in ♂, and sufficiently preserves its peculiar shape; eyes reddish-brown. Size of the Red-head, or a little larger; tarsus 1.75; bill longer, as above: culmen much over 2 inches; gape about 2.67; line from upper corner to tip nearly or quite 3.00, of which distance the nostrils reach half-way. North America at large; breeds from the northwestern tier of States N. to Alaska, in the Rocky Mts. farther S. and in Nebraska, Oregon, and Nevada; winters in the U. S. and southward to Guatemala, formerly abundantly along Atlantic coast S. from the middle districts, especially in the Chesapeake; rare from the middle districts northward. I have found it breeding in North Dakota, lat. 49°. Nesting quite like that of the Red-head; eggs less buffy, greenish-drab or grayish-olive, of a darker shade than usual in eggs of the Red-head. When feeding on wild celery the flesh acquires a peculiarly fine flavor, which has gained for the bird great renown among gastronomers; but its flesh is of no special excellence under other circumstances, in fact inferior to that of most River Ducks (*Anatina*). There is little reason for squealing in barbaric joy over this over-rated and generally under-done bird; not one person in ten thousand can tell it from any other Duck on the table, and then only under the celery circumstance just said. One of the most noted old Washington restaurateurs and eaters told me that he could tell a plucked Canvas-back with the head off from a similarly dressed or rather undressed Red-head, "by the mash." I was some time in discovering that by "mash" he meant *mesh*, *i. e.*, the pattern presented on the bare skin of the breast and belly by the little points whence the feathers grew. The earliest reference to this bird in literature that I know of is in President Jefferson's celebrated Notes on Virginia, where it appears as the "Sheldraeh, or Canvas back," *e. g.* p. 77 of edition of 1786. (*Fuligula vallisneria* of 2d-4th eds. of the Key.)

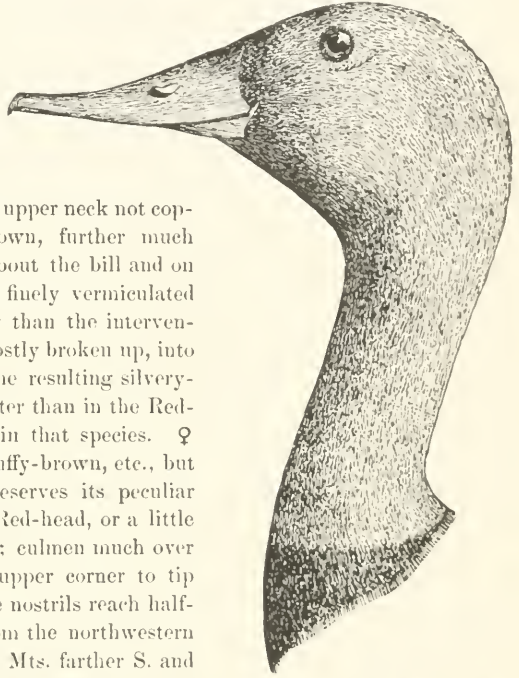


FIG. 648. — Canvas-back, $\frac{1}{2}$ nat. size. (From nature, by J. L. Ridgway.)

CLANGULA. (Lat. *clangula*, dim. of *clangor*, a noise: applied to the Garrot, the leading species of this genus, by Gesner, 1555.) **GARROTS.** Bill much shorter than head, about as long as tarsus, very high at base, tapering to end, with definite narrow nail, and acute upper corners; frontal and mental feathers little in advance of loreal. Nostrils median. Tail about half as long as wing, 16-feathered, pointed. Body plump; neck short; feet far back. ♂ with head puffy or slightly crested, dark-colored, iridescent, with great white patches; lower neck all around, under parts including sides, and most of the wing-coverts, scapulars, and secondaries, white; lining of wings dark; most of upper parts black; no waving on back or sides; crissum not black; bill dark; feet light or bright. ♀ with less puffy dark brown or gray head, and traces or not of white patches. Medium-sized and small Ducks, mostly black and white. They include two types of at least subgeneric value; one (*Clangula* proper) represented by the Garrots, the other (*Charitonetta*) by the Buffle-head. A well-marked genus, whose name *Clangula* has come down to us from the heroic age of ornithology, as that of its leading species, and was formally installed as the generic designation "ex Gesner" by W. E. Leach in Ross' Voyage, 1819, App. p. xlviii, type *Anas clangula* LINN. (*Clangula* of former editions of the Key, and of most authors; "*Glaucionetta*" (based on the identical type *A. clangula*!) STEJ. Pr. U. S. N. M. viii, 1885, p. 409; A. O. U. Lists, 1886-95; *Clangula*, A. O. U. Suppl. List. Auk, Jan. 1897, p. 125. Cf. Count Salvadori, Cat. B. Brit. Mus. xxvii, 1895, p. 376.

Analysis of Species.

Nostrils rather before middle of bill. ♂ head uniformly puffy, the gloss green; a round or oval white spot before eye, not reaching upper corner of bill; white of wings continuous; lining of wings entirely dark; eye yellow; feet orange. ♀ head dark brown, unmarked. (*Clangula* proper.) *clangula americana*
 Nostrils as before. ♂ head somewhat crested, the gloss purple and violet; an angular or crescentic white space before eye, applied against whole base of bill; white of wings divided by a dark line; lining of wings entirely dark; eye yellow; feet orange. ♀ head dark brown, unmarked *islandica*
 Nostrils rather behind middle of bill. ♂ head extremely puffy, the gloss various. No white before eye, but great white space on side of head behind, meeting its fellow on nape; white of wing continuous; lining of wing with some white; eye brown; feet flesh-color; ♀ head dark gray, with trace of white auricular patch. (*Charitonetta*.)
albica

(*Subgenus* CLANGULA.)

C. clangula americana. (Fig. 649.) **AMERICAN GARROT. AMERICAN MORILLON. AMERICAN GOLDEN-EYE. AMERICAN WHISTLER. WHISTLE DUCK. WHISTLE-WING. BRASS-EYED WHISTLER. WHIFFLER. JINGLER. MERRY-WING. GREAT-HEAD. BULL-HEAD. IRON-HEAD. COPPERHEAD. CUB-HEAD or COB-HEAD. CUR (CURRE).** Bill with nostrils rather before than behind its middle line. Head moderately uniformly puffy. Adult ♂: Gloss of head chiefly green. A large round or oval spot before eye, not touching base of bill throughout; no white behind eye. Bill black, or greenish-dusky. Iris golden-yellow. Feet orange, with dusky webs and black claws. Lower neck, under parts at large, middle and greater wing-coverts, many secondaries, and shorter scapulars in part, white, that of wings perfectly continuous. Shorter scapulars in part, long scapulars, inner and outer secondaries, edge of wing, primary coverts, primaries, and back at large, black, the latter glossy. Lining of wings dusky, as are some feathers at insertion of legs and on sides of rump. The white greater coverts have dark bases, not extensive enough, however, to divide the white wing-surface by a dark bar, as in *C. islandica*. Tail ashy. Young ♂ resembles adult ♀, but has white spot before eye more or less indicated, and gray of chest lessened. Adult ♀: Bill, eyes, and feet as in ♂, but former usually varied with yellowish at end. Head less puffy, snuffy-brown, without white loreal space. White collar on neck. Black parts of ♂ inclining to brownish; feathers of upper back with bluish-gray edgings; upper tail-coverts tipped with pale brown; white of wings less extensive and complete, often waved with gray tips of some of the coverts; white of under parts often waved with gray or brown on lower neck and along sides. Various imperfect plumages range between or combine those of adult

♂ and ♀; but in none can the bird be confounded with any but *C. islandica* (which see). Ducklings in down dark sooty-brown above; spotted with white; cheeks and throat white; lower parts dingy whitish, shaded across breast and along sides. Length 17.00–20.00; extent 27.00–32.00; wing 8.00–9.00; tail 3.00–4.00; tarsus 1.30–1.50; middle toe and claw 2.50; bill 1.30 along culmen, about 2.00 along gape, 0.90–1.05 deep and 0.75–0.85 wide at base; nail 0.25 wide. ♀ smaller than ♂—about at the minimum of the dimensions just given. North America at large, resident northerly or only forced S. from its summer home by freezing of the waters; a common winter Duck of the U. S., and somewhat farther S., breeding largely in high latitudes, N. to the limit of trees, but also from the northern borders of the U. S. Nest in hollows of trees, sometimes stumps; the down lining it very light gray, scarcely paler-centred; eggs indefinitely many, 5 or 6 to 10–12 or more, 2.20–2.40 × about 1.70, smooth, rather glossy, pale greenish, ranging from clear sea-green to dingy grayish-green, but not buffy. An expert diver, and very strong flier on its whistling wings; very handsome, too, but meat rank and fishy. *C. glaucium* of 2d–4th eds. of the Key, and hardly different from the common European Garrot; but it averages a trifle larger, with a stouter bill, and I am now willing to let it stand as a subspecies. *C. americana* Bp. 1838. *C. c. Americana* A. O. U. Suppl. List, Ank, Jan. 1897, p. 125, No. 151.



FIG 649. — American Golden-eye. (L. A. Fuertes.)

C. islandica. (Of Island or Iceland. Fig. 650.) BARROW'S GOLDEN-EYE. ROCKY MOUNTAIN GARROT. Very similar to the last. Bill with nostrils as before. Head moderately puffy, and with lengthening of coronal and occipital feathers into a slight crest. Gloss of head chiefly purple and violet (pansy-purple). A large wedge-shaped, triangular or crescentic white spot before eye, running up in a point, applied against whole side of base of bill. White area on wing more or less divided by a dark bar resulting from extension of the dark bases of the greater coverts. Averaging larger than the last: ♂ length 20.00–22.50; extent 30.00 or more; wing 9.00–10.00; tarsus 1.60; bill relatively shorter than in *C. c. americana*, and proportionally deeper at base, throwing the nostrils in a slightly different relation with measurements of length and depth; this



FIG. 650. — Barrow's Golden-eye. (L. A. Fuertes.)

may be seen on direct comparison of specimens, but is not easily expressed in figures. ♀ smaller than ♂; wing about 8.50, etc. Europe; Iceland; Greenland; North America, northerly, in winter S. to New York, Virginia, Illinois, Utah, and San Francisco Bay; breeds from the Gulf

of St. Lawrence, mountains of Oregon, and in the Rocky Mts. from Colorado, N. to high latitudes. Well distinguished from the foregoing in the full plumage of the ♂, but the ♀ and young ♂ are not easily discriminated. The ♀ may usually be recognized by division of white area on wing, or tendency thereto; some blackish spots on the ends of the greater coverts; darker and more snuffy brown of the head, running farther down the neck, especially in front, and thus making the white collar narrower; darker toned and more extensive gray of fore breast; puffy head, with more tendency to an occipital crest; different shape of bill, as above indicated, and its more extensive particoloration; and somewhat greater size, on the whole. The nest and eggs are indistinguishable. This bird belongs to North America, and is rare or only casual in Europe, even in Iceland, whence its specific name is derived. This case is curiously parallel with that of *Fuligula collaris*, above noted. The greatest ornithologist of the last century, Brisson, described it unmistakably from a specimen in the Réaumur Cabinet, though he thought it was the common Golden-eye; for he says, Orn. vi, p. 418, of the white spot before the eye, "versus synciput in acumen producta," *i. e.*, runs up in a point on the forehead, and his pl. 37, fig. 2, shows this very plainly, as well as the black bar dividing the white alar area. The best figure is Swainson's plate 70, in the Fn. Bor.-Am. ii, 1831, p. 456, when and where Dr. Richardson dedicated the handsome bird to Sir John Barrow, of Arctic fame.

(Subgenus CHARITONETTA.)

C. (C.) *albe'ola*. (Lat. *albeola* or *albula*, dim. of *albus*, white. Figs. 651, 652.) LITTLE BLACK AND WHITE ♂ or LITTLE BROWN ♀ DUCK. BUFFALO-HEADED DUCK. BUFFLE-HEAD. BUFFEL-HEAD. BUTTER DUCK. BUTTER-BALL. BUTTER-BOX. BUTTER-BACK. WOOL-HEAD. SPIRIT DUCK. CONJURING DUCK. MARIONETTE. DIPPER. Bill

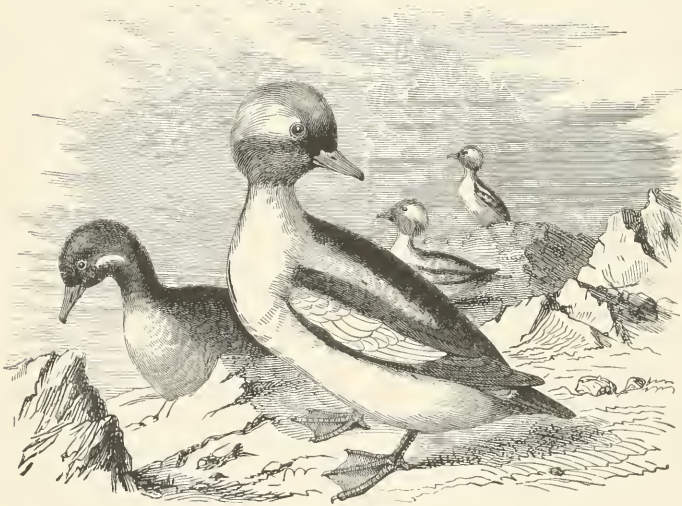


FIG. 651. — Buffle-head. (From Lewis.)

with nostrils rather behind than before its middle line. Adult ♂: Head particularly puffy with much lengthened feathers of lateral and hind parts, splendidly various with purple-violet and green iridescence; a large snowy patch on each side behind eye, blending on nape with its fellow. Bill dull bluish, with dusky nail and base. Eyes brown. Feet pale flesh-color, with blackish claws. Upper parts at large black, fading to grayish-white posteriorly. Lower neck all around, under parts at large, scapulars in part, nearly all wing-coverts, and most secondaries, white. Outer scapulars white, edged with black; inner secondaries velvet-black; sides and sometimes across lower belly shaded with dusky; lining of wings mixed dusky and white. Adult ♀: Much smaller than ♂; head scarcely puffy, but a thin compressed nuchal elongation of feathers, dusky gray, with trace at least of the white space of ♂, and commonly a white touch under eye. Bill dusky;

feet livid bluish-gray, with dusky webs. Above at large dusky-gray or blackish, with white speculum on outer webs only of 5 or 6 secondaries; below white, shaded into dark along sides and across fore breast and lower belly. Thus a very small insignificant-looking Duck, but easily recognized on that very score; notice flap of hind toe, livid feet, dark bill, white spot on dark head behind eye, etc. Length of ♂ ♀ 12.25-15.00; extent 22.00-25.00; wing 6.00-7.00; tarsus 1.10-1.24; middle toe and claw 2.00-2.25; bill 1.00, along gape 1.40; ♀ at or about the lesser of these dimensions. North America at large, and casual in Europe; U. S. in winter, one of the most abundant Ducks; also to Cuba and Mexico; breeds from Maine, Iowa, Montana to high latitudes. The drake in full feather is one of the handsomest Ducks, dressed in broad black and white in artistic contrast, to say nothing of the brilliancy of the head. Noted for its adroitness in diving to escape a shot, as smartly as a Grebe, and on that account known in some of our elegant vernacular as "hell-diver" and "devil-diver," as well as by divers other names of Grebes, as Dipper, Dapper, Doppet, Diedapper, Water-witch, etc. The flesh is little esteemed, so it is just as well there is so little of it. Nest feathery, in a tree;



FIG. 652. — Buffle-headed Duck.

eggs up to 14, ellipsoidal, about 2.00×1.50 , in tint buffy-drab (between grayish-olive and rich creamy-white). (*Bucephala albeola* BO. 1858; COUES, 1872, original edition of Key; *Clangula albeola* of later editions. *Charitonetta albeola* A. O. U. Lists. There is certainly some difference from *Clangula* proper; but not so much as there is between *Aristonetta* and *Æthya*; and as the A. O. U. declines to give *Aristonetta* full generic rank, so do I continue to allow this form to bear the name it has usually borne since 1824, and is likely to bear for an indefinite period.)

HAVELDA. (New Latin *Havelda* STEPH. 1824, by a miswriting or misprint of *Havella* RAY. 1713, Latinized from *hávella*, "the common Icelandic name for the bird, having reference to the trilling sound of its musical notes." NEWT. Dict. p. 406; *havellida* and *havellid* also found in WORMIUS, WILLUGHBY, and CHARLTON; Englished *haveld* STEPH. 1824, and corruptly *herald*. If we consider it a misprint, A. O. U. rules allow us to correct it to *Havelda*.) **HAVELDS.** SINGING DUCKS. LONG-TAIL DUCKS. Bill shorter than head, about as long as tarsus, high at base, nearly parallel-sided to the rounded end occupied by the broad nail: upper lateral angles obsolete, the feathers sweeping obliquely downward from those on culmen; those of chin reaching about opposite nostrils, which are placed high up in basal half of bill; commissure ascending near end, then decurved into the prominent nail. Tail of 14 feathers, in ♂ as long as wing by excessive elongation of the narrow middle feathers (more so than in *Dafila* or *Anatina*): ♂ scapulars also long lance-linear, produced straight over the wing. Sexual and seasonal plumages unlike. Crissum white; no white on wing nor any speculum; coloration chiefly black, white, and brown, with reddish on back in summer. One species. (*Clangula*? A. O. U. Lists, 1886-95; *Havelda* A. O. U. 8th Suppl. List, 1897; for the proper use of *Clangula* LEACH, 1819, see under that head, *antea*, p. 928.)

H. hiemalis. (Lat. of or pertaining to *hiems*, winter wintry: applied to this species by LINN. Syst. Nat. 1758, p. 126, and 1766, p. 202, in one plumage; it being called by him in another plumage *glacialis*, the name which has been most frequently used, as in former editions of the Key.) LONG-TAILED DUCK. LONG-TAILED HARELD. SWALLOW-TAILED DUCK. SOUTH-SOUTHERLY. SOUTH-SOUTHERLAND. OLD WIFE. OLD SQUAW. OLD INJEN.

OLD GRANNY. OLD MOLLY. OLD BILLY. JOHN CONNOLLY. UNCLE HULDY. MY AUNT HULDY. COWHEEN or COWEEN. CALAW or CALLOO. COCKAWEE. SCOLDE-NORE. SCOLDER. QUANDY. ♂, in breeding dress: Bill black on basal half and nail, the intervening portion of a variable and fugacious bright tint in life, as pink, salmon-pink, or pinkish-orange, which changes soon after death to reddish-purple, and in long-dried skins shows as orange or orange-red; iris yellow; feet livid bluish, with dusky webs and black claws. Head on top and behind blackish, with a great patch of silvery-gray, whitening around and behind eye. Neck all around and fore breast, very dark chocolate-brown, almost blackish; quills and lining of wings the same; under parts from breast abruptly white. Upper parts at large, and long tail-feathers blackish; long scapulars varied with bright reddish; shorter tail-feathers whitish, lateral wholly so, intermediate ones in part dark. Length very variable, according to development of tail, up to 23.00; middle tail-feathers up to 8.00-9.00 long, lateral only about 2.50; wing 8.50-9.50; extent 30.00; bill 1.25; tarsus the same; middle toe and claw twice as much. Adult ♂, in winter: No reddish on upper parts; scapulars pearly-gray. Head, neck, and fore back white or whitish, with gray cheek-patch, and dark brown or blackish patch below ear. Fore breast of the latter color, set squarely between white of neck and belly. Upper parts except as said, and 4 middle tail-feathers (less developed than in summer) blackish; rest white. Bill extensively bright-colored, with nail and broad saddle on mandible black; iris straw-yellow. Young ♂ in first winter with bill and feet dusky; iris brownish. Adult ♀ in summer: No elongation of tail or scapulars; length about 18.00; extent under 30.00; wing 8.00-9.00; tail about 3.00. Bill and feet dusky-greenish; iris yellow. Head, neck, and upper parts dark grayish-brown, paler on throat, with large grayish-white patch around eye and another on side of neck; under parts white, shaded along sides. Thus an obscure medium-sized Duck; notice generic characteristics of bill, 14 tail-feathers, no white on wing, gray head- and neck-patches in dark surroundings. Adult ♀, in winter: Head and neck mostly white; top of head and isolated auricular patch dusky, and chin similarly obscured, neck below and fore parts of body dark gray, tending to form a sort of loose collar; under parts broadly white; upper parts dusky-brown, nearly plain, but varied on scapulars with brighter brown and gray. Ducklings in down plain brown above, with light touches and a dusky stripe on sides of head; below white, with a dark band on the fore breast. Northern Hemisphere, northerly, especially maritime; also on large inland waters; U. S. in winter only, and then rare S. of the middle districts, but casually to South Carolina, Florida and Texas; not many California records; breeds chiefly in high latitudes, mostly beyond the limit of trees, as in our Barren Grounds, the Siberian tundras, Greenland, Spitzbergen, and Nova Zembla. A lively, voluble Duck, called by Sundevall melodious: "*Anas canora, ob cantum vernalem suavem et sonorum*"; among its many curious names it has acquired, those given from its loud three-syllabled notes are conspicuous. It is a swift, wayward flier, an expert diver, and at most seasons a rank animal feeder; meat bad. Nest on ground; eggs 5-9, smooth, drab-colored, more grayish or greenish as the case may be, 2.20 × 1.60, to 1.90 × 1.40; June, July. *H. glacialis* of former editions of the Key, as of most authors. *Clangula hyemalis* of A. O. U. Lists, 1886-95, No. 154 (by error). *Harelda hyemalis* A. O. U. Suppl. List, Auk, Jan. 1897, p. 124 (see remarks *antea*, under genus *Clangula*).

HISTRIONICUS. (Lat. *histrionicus*, histrionic, relating to *histrion*, a stage-player, the bird being tricked out in various colors, as if to play a part.) **HARLEQUINS.** Bill very small, shorter than head or tarsus, rapidly tapering to rounded tip which is wholly occupied by large fused nail; but higher than wide at base, with lateral upper corners as in *Fuligulina* generally, and convex sweep of feathers across its side intermediate in extent between frontal and mental projections, former reaching farthest. A membranous lobe at base of commissure, formed by production of skin of cheeks. Nostrils in basal half of bill. Wings and tail short, latter pointed and about half as long as former. Longer scapulars and inner secondaries curv-

ing outward over wing as in Eiders, with which this genus connects by means of *Heniconetta*, though in both these genera the bill is simple, as usual in *Fuligulina*, without the peculiar gibbosity and special outlines of feathers characteristic of Eiders. One species, remarkable for its fantastic markings, the ♂ being patched with different colors; a metallic speculum (here only among our *Fuligulina*, excepting *H. stelleri*).

H. histrion'icus. (For etym. see generic name. Fig. 653.) HARLEQUIN DUCK. PAINTED DUCK. MOUNTAIN DUCK. ROCK DUCK. LORD AND LADY. SQUEALER. Adult ♂: Bill olivaceous; iris reddish-brown; feet grayish-blue, with dusky webs and pale claws. Aside

from the definite markings to be given, general color deep leaden-blue or slate-color, with a purplish tinge, blackening on top of head, on lower back, rump, and tail above and below, darker on head and neck than on breast and back, changing from breast backward, including lining of wings, to sooty brown, on flanks to chestnut-brown. A white patch between bill and eye, curving upward and backward to margin the black coronal stripe, changing to chestnut from over eye to



FIG. 653. — Harlequin Duck.

nape. A round white spot on side of hind head; long white spot on side of upper neck; white collar around neck, interrupted or not before and behind; white crescent on side of breast in front of wings; these marks black-bordered. A white spot on wing-coverts; white bar across ends of greater coverts and some of the secondaries; outer webs of inner secondaries mostly white; scapulars mostly white. A white spot on each side of root of tail. Speculum metallic purplish or violet. Two or three years appear to be required to perfect this plumage; ♂ found in almost every condition between this and plumage of ♀: the final stage is completion of white ring around neck and white tips of secondaries. Adult ♀: Bill dusky; feet dull bluish-gray. Iris brown. A whitish spot before eye and behind ear. General plumage on head and upper parts dark brown, darkest on head and rump; lower parts similar, more grayish, passing through gray mottling to whitish on belly. Thus ♀ is a very small and obscure duck, widely different from ♂; observe small size, very short bill, only about 1.00 along culmen, higher than wide at base; plumage without definite markings excepting two spots on each side of head; extent of dappled gray and white on under parts very variable. Length of ♂ 16.00–17.00; extent 24.00–27.00; wing 7.00–8.00; tail 3.00–4.00; tarsus 1.30; bill along culmen 1.10, along gape 1.50. ♀ at or under these minima or averages. Europe, Asia, North America, northerly and chiefly coastwise, but also in interior; S. in winter to Middle States and California, but not common on Atlantic coast beyond northern New England; breeds in Rocky Mts. of U. S., as in Colorado; also at lat. 38° in Sierra Nevadas of California, and north, as from Newfoundland to Alaska; Greenland. Nest in hollow of a tree or stump (?), or on ground, under rocks, etc., of weeds and grasses and parents' down; eggs 6–8–10, 2.10 × 1.60 to 2.40 × 1.75, pale buff or creamy. (*H. minutus* of 2d–4th eds. of Key; but our rules call for the tautonym above given.)

CAMPTOLÆMUS. (Gr. *καμπτός*, *kamptos*, flexible; *λαιμός*, *laimos*, throat; referring to leathery expansion of bill.) **PIED DUCK.** Bill nearly as long as head, longer than tarsus, not higher than broad at base, nearly parallel-sided, but widened toward end by a leathery expansion of edge of upper mandible; nail distinct. Teeth of upper mandible slight, oblique; of under mandible very prominent, vertical. Frontal angles slight. Nostrils high up in basal third of bill. Cheek-feathers stiffish and bristly, with enlarged horny ends, extending on side of upper mandible in moderately convex outline, to about opposite those of chin. Wings short, vaulted, with eurved primaries, 1st and 2d subequal and longest; inner secondaries long and tapering. Tail short, about $\frac{2}{3}$ the wing, 14-feathered. Coloration of ♂ black and white; ♀ brown, gray, and white. One remarkable species, related in some degree to Eiders, lately become extinct. (A. O. U. has *Camptolaimus*, after the original misspelling.)

C. labrado'rius. (Of Labrador. Fig. 654.) **LABRADOR DUCK. PIED DUCK.** Adult ♂: Bill black, orange at base and along edges, grayish-blue along ridge; iris reddish-brown; feet grayish-blue, with dusky webs and claws. Head and upper neck white, with a longitudinal black stripe on crown and nape; stiff feathers of cheeks obscured. Neck below ringed with black continuous with that of upper parts, then half-collared with white continuous with that of scapulars. Below, from this white, entirely black, excepting white axillars and lining of wings. Above black, except as said; wing-coverts and secondaries white, some of the latter margined with black; some of the long scapulars pearly-gray; primaries and their coverts and tail-feathers brownish-black. Adult ♀: Bill, eyes, and feet as in ♂; several secondaries white, forming a speculum, but no white on wing-coverts or scapulars; axillars and

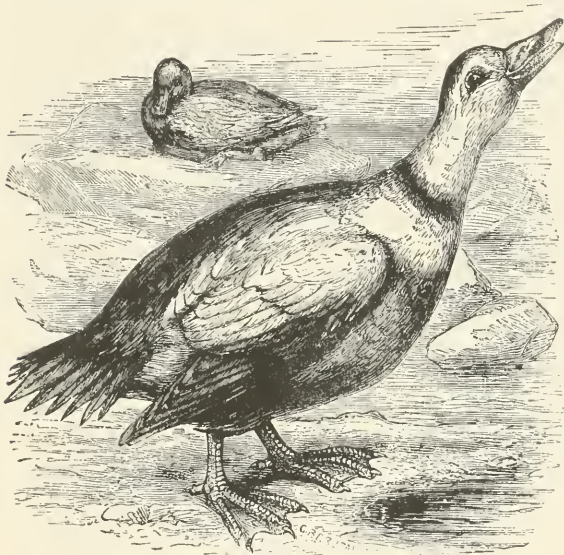


FIG. 654. — Labrador Duck. (From Ency. Brit.)

lining of wings mostly white; inner secondaries edged with black; general color dappled brownish-gray, paler and more ashy or plumbeous on wing-coverts and inner secondaries. Young ♂ most like ♀, but more white on throat, fore breast, and wing-coverts. Length 18.00–20.00; extent about 30.00; wing about 9.00; tail 3.50; tarsus 1.50; middle toe and claw 2.50; bill along culmen 1.75, along gape 2.25. Former range, as far as known, Labrador to New England, New York, New Jersey, along the coast, and inland to some parts of the Great Lake region; known to have lived to 1875, and believed to have been exterminated since that date. In 2d edition of Key, 1884, I said, “extremely rare now, and probably in a fair way to become extinct” — a prediction which now appears to have been *ex post facto*. See especially Rowley’s Orn. Misc. part vi, Jan. 1877, pp. 205–223, list of 33 known specimens; DUTCHER, Auk, April, 1891, pp. 201–216, pl. 2; 38 known specimens, 27 in North America, 11 in Europe, with historical and critical notes; DUTCHER, Auk, Jan. 1894, pp. 4–12; total known specimens 41, 29 in North America, with further historical data, criticism of statements in Newton’s Dict. pp. 221–223 (reply *ibid.* p. 736), and insistence upon date of 1875 as authentic, being

that of a young ♂ shot on Long Island, acquired in 1879 by the Smithsonian Institution from J. G. Bell. The bird became best known in the period, say, 1840-60; the authentic record dwindles notably after the fifties, and ceases in 1875. The Grand Manan record of April, 1871, is authentic, though the specimen is not extant. The Michigan record of April 17, 1872 (Forest and Stream, May 4, 1876), is not authentic, neither is the Elmira, N. Y. record of Dec. 12, 1878 (Am. Nat. Feb. 1879, p. 128). A plate of the bird forms the well-known vignette on title of Pennant's Aret. Zool. ii, 1785. A pair, adult ♂ ♀, procured by Daniel Webster, "Vineyard Island," Mass., served for Audubon's description and plate, Orn. Biogr. iv, 1838, p. 271, pl. 332; for Baird's description, B. N. A. 1858, p. 803; and for mine of 1884, substantially as above; these are now in the U. S. Nat. Mus. Nos. 1792 ♂, 2733 ♀; together with two mounted specimens, No. 61,300 ♂, and No. 77,126, the young ♂ above said to have been killed on Long Island in 1875—the last known of the species. In England \$200 was

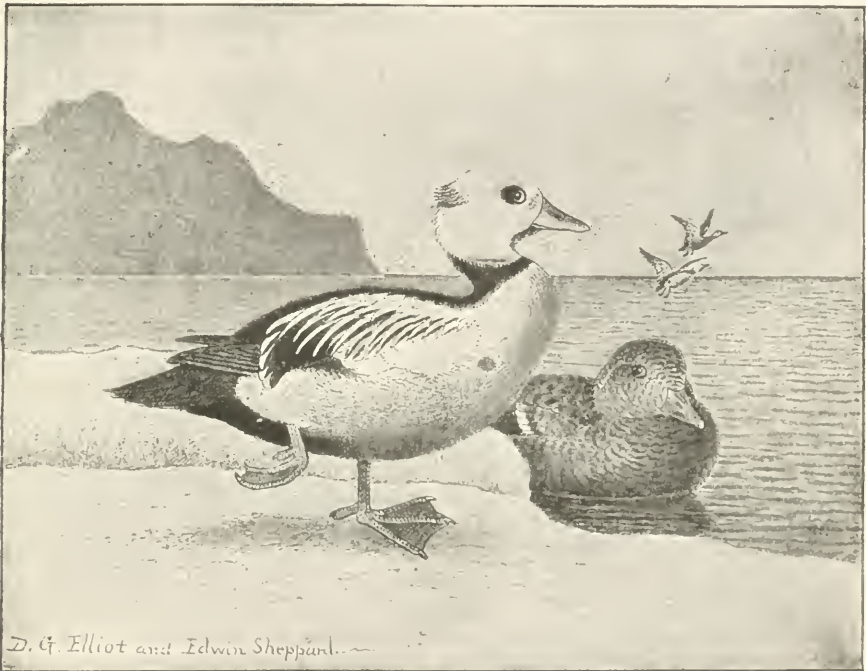


FIG. 655. — Steller's Duck. (From "Wild Fowl of North America," by D. G. Elliot.)

offered for a good pair in 1884. The extinction of the species is credibly believed to have been due to extirpation by human agency.

HENICONETTA. (Gr. *ἐνικός*, *henikos*, single, *i. e.* singular, peculiar, particular; *νήττα*, *netta*, a duck.) **STELLERIAS.** General characters those of Eiders (see *Somateria*, beyond), more nearly than those of *Camptolencus* even, and little different except in lacking special gibbosity of the bill and any unusual shape or outline of the frontal feathers. Bill not feathered to the nostrils, its tomial edges dilated and leathery, its width at base much less than half its culmen length. Wing with metallic speculum set between white bars; head of ♂ tinged with sea-green like an Eider drake's; feathers of cheeks stillish, those of occiput tufted; system of chiefly black and white coloration of ♂, and sexual differences, much as in *Somateria*. I gave this as a subgenus of *Somateria* in all former editions of the Key, there stating, how-

ever, that this was going too far (2d ed. p. 709), though no farther than such a high authority as Professor Newton goes without hesitation. I now follow the A. O. U. in according to *Heniconetta* full generic rank, but as I am not a cockney, and do not drop my *h*'s, I must crave permission to spell the word as well as I know how — not *Eniconetta*, as A. O. U. insists upon, after G. R. Gray's original cockneyism of 1840. A case like this reminds me of the English veterinary surgeon who swore that a *haitch* and a *ho* and a *har* and a *hess* and a *he* spelt 'orse!

H. stelleri. (To G. W. Steller. Fig. 655.) STELLER'S EIDER. Adult ♂: Bill and feet dull grayish-blue, the former lighter at tip; webs darker; iris brown of variable shades. Top and sides of head and collar on neck silvery-white, washed across forehead and hind head with sea-green; chin with a black patch narrowing to run down, breaking through the white collar and continuous with a broad black ring around neck; a similar patch around eye; these black areas with various lustre. Upper parts at large glossy purplish blue-black; wing-coverts white; several secondaries forming a violet speculum, tipped with white; long inner secondaries and outer scapulars silvery-white, the inner scapulars violet, striped with white edges; lining of wings, mostly, and axillars, white. Under parts dull chestnut-brown, passing to sooty black on belly and crissum, with an isolated black spot on each side of breast. Young ♂ closely resembles ♀. In both sexes bill and feet of an undefinable dark color in dried specimens. Adult ♀: Differs as Eiders do; dark reddish-brown, blackening on belly and crissum, much mottled and barred with black; head and neck lighter brownish, speckled with dusky; wing-coverts dusky, with paler gray tips; no white except on lining of wings and tips of greater coverts and of secondaries, these forming two white bars enclosing an imperfect speculum. Length 16.00–18.00, extent 27.00–30.00; wing 8.00–8.50; tail 3.50; bill 1.50 along culmen, 1.75 along gape; tarsus 1.25; middle toe and claw 2.20. Northern regions of Europe, Asia, and western North America; accidental on east side of continent; abounding and sometimes gathering in enormous flocks on the islands and both shores of Bering's Sea and the Arctic coast of N. E. Siberia; wintering mainly on the Aleutian Islands; usually found in company with Pacific, Spectacled, and King Eiders. Like other Eiders the Drake moults during the breeding season into a temporary, dull, protective plumage of the body, preliminary to the annual moult. The most beautiful of many specimens I have handled have been winter birds. Eggs 7–9, 2.25 × 1.60, or a little more, ranging through drab to clearer greenish, and thus exactly like those of the common Eider in shape, color, and texture of shell; nest the same, on the ground, generally sunken in moss or sphagnum, and furnished copiously with down; May–July.

ARCTONETTA. (Gr. *ἄρκτος*, *arktos*, a bear, esp. the brown bear of Europe, *Ursus arctos*, also the constellation Ursa Major, hence the North; *νήττα*, *netta*, a duck. FISCHERIAS. Characters of *Somateria* strictly, except the formation of the base of the bill and outline of the frontal feathers, as described under head of the only species; and with further exception of peculiar circumorbital plumage. (As subgenus of *Somateria* in former eds. of the Key.)

A. fischeri. (To Gotth. Fischer, a Russian naturalist. Fig. 656.) SPECTACLED EIDER. Bill (in both sexes) peculiar in extension upon it of dense velvety feathers which reach to a point on culmen beyond nostrils, thence sweeping past nostrils obliquely downward and backward to commissure; nostrils opening just beneath line of feathers. Feathers of chin extending in a point nearly as far as those on culmen. A dense, puffy patch of velvety feathers about eye, suggesting spectacles; frontal feathers erect, pilous, like a pad, in ♂ somewhat stiffened; occipital feathers lengthened into a hanging hood; these characters of head-feathering best marked in ♂, but indicated also in ♀. Nail of bill distinct. Adult ♂: Bill orange; feet brownish-olive with yellowish scales on front of tarsus; iris white, ringed with light blue. General color grayish-black; neck and most of back white; lesser and median wing-coverts, long curved inner secondaries, lining of wings, axillars, and patch on side of rump, white. On head, white of neck gives way to rich sea-green, especially on occipital crest; frontal feathers

also tinged with greenish; but the "spectacles" are pure silvery white, framed in black. Bill, in dried state, dingy yellowish; feet the same, with dusky webs. Smaller than the common Eider: Length 20.00-22.50; extent 34.00-36.50; wing 11.00; tail 4.00; tarsus 1.75; middle toe and claw 2.75; bill with only about an inch of bare culmen, but about 2.25 along gape. ♀: Greatly different in color, as all Eiders, but little smaller than ♂. Bill black in dried state with whitish nail of under mandible, in life dull bluish; feet dingy yellowish-brown, drying dark. General plumage like that of the common Eider, barred almost throughout with black, chestnut-brown, and yellowish-brown, giving way on belly to dull brownish nebulated with dusky; on head to pale brown streaked or otherwise obscured with dusky; axillars white. Coast of Alaska from Uualashka and some other islands of the Aleutian chain N. to Point Barrow on the Arctic coast; confined to the salt marshes, and very locally distributed; common in some localities, nearly coincident with those occupied by the Emperor

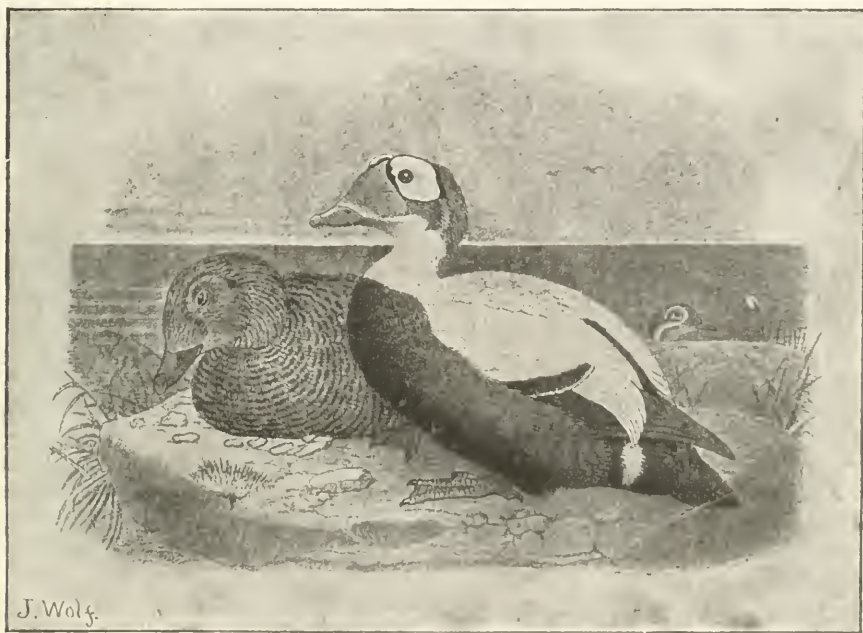


FIG. 656. — Spectacled Eider. (From "Wild Fowl of North America," by D. G. Elliot.)

Goose: breeds from the Kuskokwim mouth to Point Barrow, but especially about St. Michael's and the Yukon delta, where it arrives about the middle of May; eggs in June and July, 5 to 8 or 9, 2.60-2.80 × 1.80-1.90, light olive drab; nest on ground in the grass; young fly in August, and during that month the drakes moult into a plumage somewhat resembling that of the ducks. See Nelson's Alaska, 1887, pp. 76-78 for biography and colored pl. 5, fig. 1.

SOMATERIA. (Gr. *σῶμα, σώματος, soma, somatos*, the body; *ζῆλον, erion*, wool, down.)

EIDERS. Bill variously tumid or gibbous, with different dispositions of frontal processes and outlines of feathers, in the several species (as in Scoters (*Edemia*); in both of these genera the particulars of the bill being specific and in a measure sexual characters, to found genera upon them would be to make one for almost every species). Nostrils averaging median, variable in position; feathers reaching under or not to them. Frontal angles of bill variously exaggerated. Nail of bill large, fused, forming whole tip. Inner secondaries and scapulars sickle-shaped, curved outward and falling obliquely over wing. Sexes very unlike. ♂ chiefly

black and white, with sea-green on head; feathers of head in part short, close-set, and erect, like pile of velvet, in part usually stiffish and bristly. Several remarkable species, of the Northern Hemisphere.

Analysis of Subgenera, Species, and Subspecies.

- ♂ Bill gibbous at base of upper mandible; outline of culmen variously curved; with long, acute or clubbed, tumid process extending in line with culmen on each side of forehead, divided by extension of feathers on culmen; feathers of side of bill advancing to about under nostrils, far beyond those on culmen. (SOMATERIA proper.)
 - ♂ No black V-mark on chin.
 - Frontal processes short, narrow, acute, parallel. Smaller *mollissima borealis*
 - Frontal processes long, broad, clubbed, divergent. Larger *dresseri*
 - ♂ A black V-mark on chin *v-nigrum*
- ♂ Bill extremely gibbous at base of upper mandible, with broad squarish nearly vertical frontal processes bulging angularly out of line of culmen, on each side of forehead, divided by extreme projection of feathers on culmen far beyond those on sides of mandible, which do not nearly reach nostrils. (ERIONETTA)
 - ♂ A black V-mark on chin *spectabilis*

S. mollis'sima borea'lis. (Lat. *mollissima*, very soft, superlative of *mollis*, soft; referring to the down of the Eider; and *borealis*, *boreal*, northern. Figs. 657, 658.) NORTHERN EIDER DUCK. GREENLAND EIDER. Bill (in both sexes) with lateral frontal process extending on

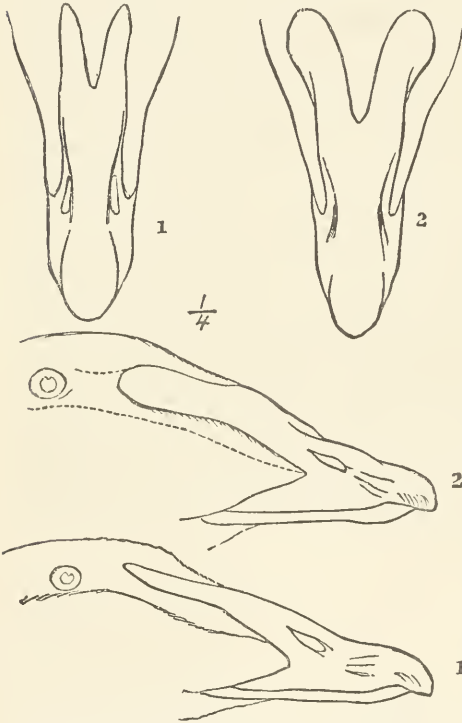


FIG. 657.—Bills of Eiders, $\frac{1}{4}$ nat. size, viewed from above and in profile. 1, *S. mollissima*; 2, *S. dresseri*. (From Sharpe.)

each side of forehead, between the short pointed extension of feathers on culmen and the much greater extension of those on sides of bill, which reach to below nostrils, about opposite those on chin. General upper outline of bill nearly straight, and frontal processes narrow, acute, and nearly parallel (see figs. and compare description of next species). Adult ♂: Plumage almost entirely black and white. Top of head glossy blue-black, including eyes, and forking behind to receive the white of the hind head. Occiput more or less washed with sea-green, which does *not* encroach on the white of sides of head. Neck all around, fore breast, most of the back, most of the wing-coverts above and below, curly inner secondaries, and sides of rump, white, on breast tinged with pale creamy-brown. Middle line of rump, upper tail-coverts, and under parts from breast,

black or blackish. Bill yellowish. Length about 24.00; extent 40.00; wing 11.00; tail 4.00; tarsus 1.75; middle toe and claw 3.75; culmen of bill 2.00 or less, from apex of frontal processes to tip 2.60; along gape 2.40. Adult ♀: Sufficiently similar to ♂ in character of bill, and feathering of its base; plumage entirely different, being nearly everywhere varied, chiefly in bars, with black, chestnut-brown, and yellowish-brown, giving way on under parts to grayish-brown with dusky nebulation. Size less than that of ♂. Eggs nearly or about 3.00 × 2.00, from pale buff through drab shades to greenish. Greenland and eastern parts of arctic and sub-arctic America, S. in winter to Massachusetts. This is a boreal American race of the common

Eider of Europe (*S. mollissima*), semidomesticated in some places, so famous for yielding the prized down of commerce, which the parent plucks from her breast to cover the eggs; but the common American Eider is of the following species (*S. dresseri*). I have not hitherto discriminated this subspecies from *mollissima* proper in any edition of the Key; the latest monographer of the *Anatidæ* finds no tangible distinction, and none was indicated in the A. O. U. List of 1886.

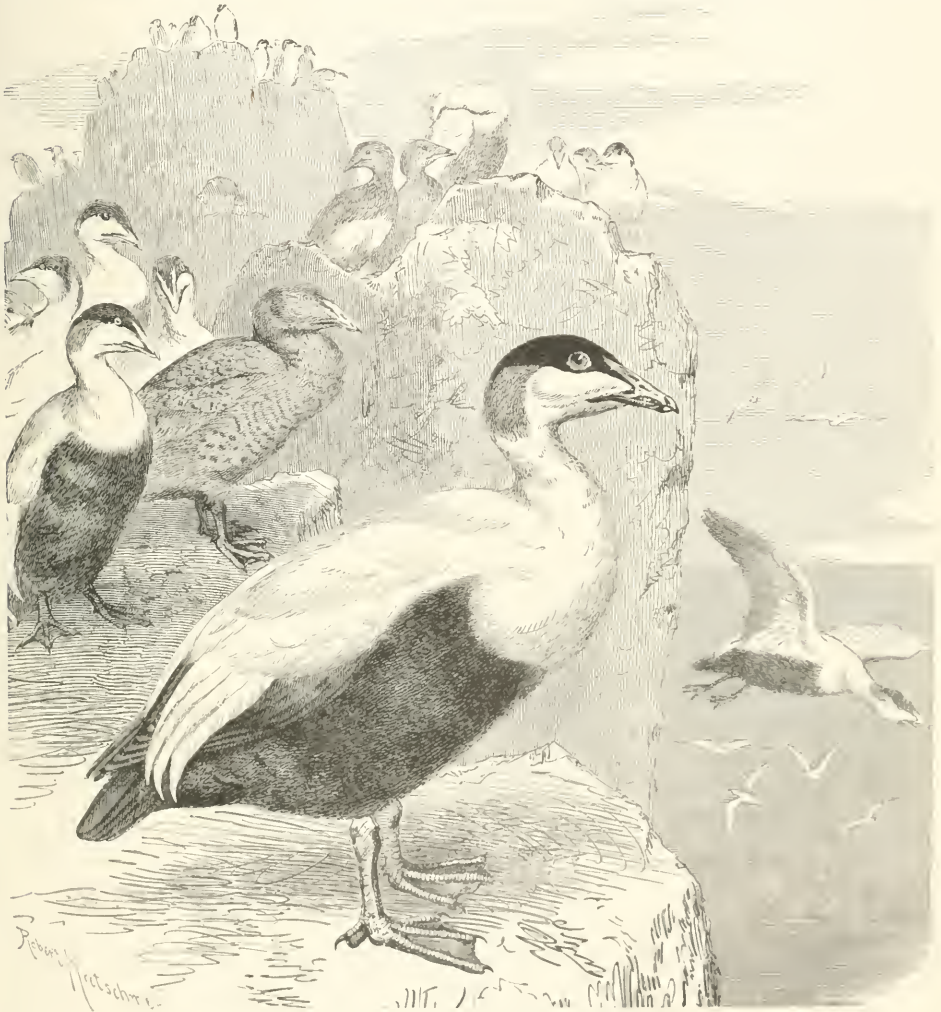


FIG. 658. — Eider Ducks, ♂, nat. size. (From Brehm.)

The present bird is *Platypus borealis* C. L. BREHM, 1824; *Somateria borealis* C. L. BREHM, Isis, 1830, p. 998, and ALLEN, Auk, Apr. 1893, p. 123; see SALVADORI, Cat. B. Brit. Mus. xxvii, 1895, p. 428. *S. mollissima borealis* A. E. BREHM, 1866; RIDGW. MAN. 1887, p. 109; A. O. U. List, 2d ed. 1895, No. 159; Suppl. List, Auk, Jan. 1899, p. 104.

S. dresseri. (To H. E. Dresser of England. Fig. 657.) AMERICAN EIDER DUCK. DRESSER'S EIDER. SEA DUCK ♀ AND DRAKE ♂. BLACK-AND-WHITE COOT ♂. ISLES OF SHOALS DUCK. SQUAM DUCK. WAMP ♂. Like the last; plumage the same, more

extensively greenish on sides of head, along border of the black cap, and sometimes a trace of black on chin indicating an approach to *v-nigrum*; form of bill different, exhibiting an approach to that of *spectabilis*. General profile of culmen concavo-convex, the frontal processes being wider, higher, more obtuse, and more divaricating than in *mollissima* (compare figs. and foregoing description). The difference is obvious on comparison of specimens, and may now be held of specific value, as no intermediate specimens are forthcoming. Culmen 2.00 or more; from apex of frontal process to tip of bill about 3.00; along gape 2.50. ♀ differs as in case of *mollissima*. Ducklings in down plain grayish-brown, paler grayish below, grayish-white on belly, these tones all shading insensibly; but has a dusky stripe on each side of the head, contrasting with light color over the eyes and on the chin. North America, northerly, especially on the Atlantic Coast; also on large inland waters; not noted from the N. Pacific; S. regularly in winter to New England, more rarely to the Middle States; breeding from the Maine

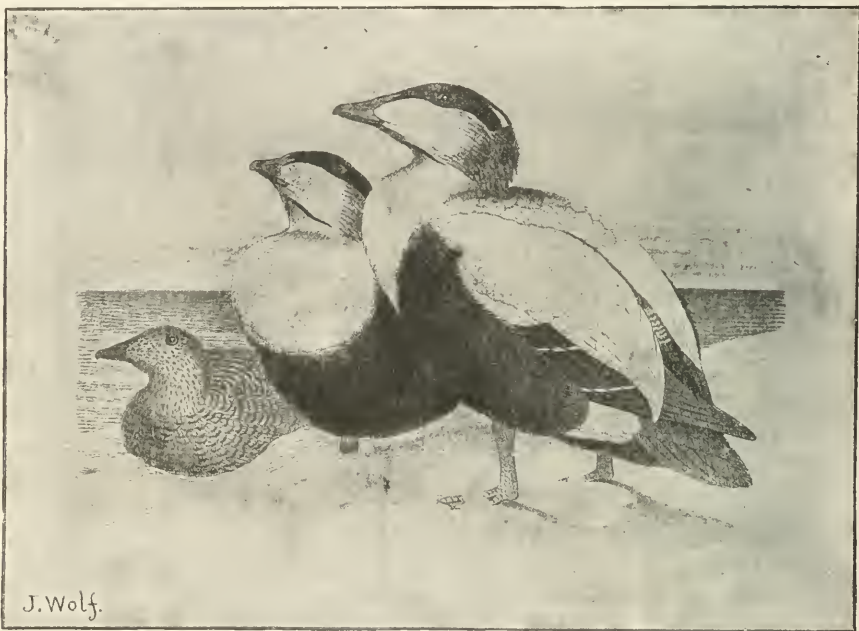


FIG. 659. — Pacific Eider. (From "Wild Fowl of North America," by D. G. Elliot.)

coast northward, abundantly in Newfoundland and Labrador, where it is one of the characteristic birds. Nest on the ground, of mosses, lichens, hay, sea-weed, and down-feathers; eggs 6-10, usually fewer, plain dull greenish-drab, about 3.00×2.00 , laid in June and July. *S. mollissima* (var. ?) of orig. ed. of the Key, 1872, p. 293; *S. m. dresseri* of 2d-4th eds. 1884-90, p. 712 (on p. 905 of 4th ed. given inadvertently, as *S. m. borealis*). *S. dresseri* SHARPE, 1871; A. O. U. Lists, 1886 and 1895, No. 160.

S. v-nigrum. (Quasi-Lat. *v-nigrum*, noting the black V-shaped mark or chevron on the throat. Fig. 659.) PACIFIC EIDER. Like the two preceding, but with a large black V-shaped mark on throat, pointing forward and forking behind, as in *spectabilis*. While the plumage is otherwise as in the common Eider, the shape of bill and character of its feathering are appreciably different, furnishing useful characters, especially in the case of ♀. The frontal processes are acute and parallel, as in *mollissima*, but the gibbosity of bill is greater than in *dresseri*; while the feathers upon its sides do not extend so far (scarcely or not reaching oppo-

site hind end of nostrils), and have rounded instead of acute termination; their lower border is also more nearly parallel with edge of commissure. The extension of feathers on chin equals or even surpasses that on side of bill, rather the reverse being the case with *mollissima* and *dresseri*. The bill of the adult ♂ is bright orange, that of the ♀ dull greenish-yellow, in both cases with paler nail. N. Pacific coast to the Arctic Ocean, common in suitable localities on both coasts and islands of Bering's Sea, and the polar coasts of Siberia; replacing the common Eider, and associated with the King, Spectacled, and Steller's Eiders. Recorded from Great Slave Lake. Nesting like that of other true Eiders, and eggs probably not distinguishable; they measure 2.87-3.12 × 2.00 or a trifle more, and are light olive drab in color; laid mostly in June, during which month the drakes go off to flock by themselves; the moult progresses in July and August, and the flappers hardly fly before September.

(Subgenus ERIONETTA.)

S. (E.) spectabilis. (Lat. *spectabilis*, conspicuous, spectacular. Fig. 660.) KING EIDER. Characters of bill and its feathering quite different from those of other Eiders, and moreover varying much, not only in the two sexes, but in ♂ at different seasons. In adult ♂, in breeding season, the bill develops immense rounded or squarish lateral frontal processes, bulging high out of line with rest of bill; these

processes are soft, and moreover depend for their prominence upon development of a mass of fatty substance upon which they are supported; they shrink and become more depressed in winter, when the general formation of the parts is not very different from that of other Eiders. The frontal feathers extend in a definite line along the elevated culmen to about opposite hind end of nostrils; those of side of bill, on the contrary, fall far short of nostrils; those of chin reach about opposite those of culmen; the whole feathered out-



FIG. 660. — King Eider, Post-nuptial Dress. (L. A. Fuertes.)

line of bill being thus very different from that of any other Eider. In ♀, though all the parts concerned are less developed, the same relative extension of feathers obtains, so that the bird is distinguished easily from ♀ of any other Eider; culminal and mental feathers both reach about opposite nostrils, those on side of bill not extending nearly so far. Such conformation is discernible even in downy ducklings. Adult ♂: Black; neck and fore part of body, most of the wing-coverts and lining of wings, and spot on each side of rump, white; white of breast tinged with creamy-brown; curly inner secondaries black (white in other Eiders). A black V-shaped chevron on chin, as in *r-nigrum*. Top of head and nape beautiful pearl-gray; sides of head washed with sea-green; eyelids and spot below eye black; processes of bill framed about with glossy black. Bill reddish-orange; feet reddened, with dusky webs, iris yellow. Length about 22.00; wing 11.00; tail 4.00; bill along culmen 1.25; along gape 2.25; from apex of processes to tip about the same; from feathers on side of upper mandible to tip about 1.60. Adult ♀: Hardly distinguishable from other ♀ Eiders in plumage, but readily recognized by the bill, as above said. Bill olive-brown, drying blackish; feet dingy ochraceous, drying darker; iris dull yellow; dimensions of bill, aside from the frontal processes, nearly as in ♂. As usual, the drake moults to an "eclipse" plumage which in a general way is like that of the duck. This beautiful Eider is circumpolar, abounding at various points along the shores of the

Arctic Ocean, thence S. in winter on the Pacific side in great numbers to the Aleutian Islands and beyond, though rare on the Alaskan coast of Bering's Sea; on the Atlantic side S. rarely but regularly to New York, exceptionally to Georgia, and in the interior to the Great Lakes, though it is a thoroughly maritime bird, sometimes found far at sea, and much attached to its Arctic waters: individuals found far south are mostly stray young ones. Breeds north from Labrador; eggs about 6, their variation in number not well ascertained; smaller than those of other Eiders, commonly 2.75×1.80 or less, down to 2.45×1.70 ; color dull greenish-gray; laid mostly in July.

ŒDE'MIA. (Gr. οἰδημα, *oidema*, Lat. *œdema*, a swelling. Fig. 661.) SCOTERS. SEA COOTS. SURF DUCKS. Bill tumid or gibbous in various character according to the species,

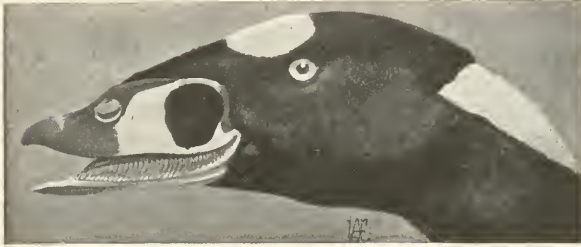


Fig. 661. — Surf Scoter. (L. A. Fuertes.)

and sexes of same species; outline of feathers equally variable, but always extending farther on ridge than on sides of upper mandible, and without angular re-entrance; terminally expansive, with large, elevated, and decurved nail, fused with and occupying whole tip. Nostrils in middle of bill or beyond. Feathers of chin running far forward, more or less nearly opposite

nostrils. Color of ♂ black, relieved or not with white patches on head or wings, or both; bill singularly gibbous at base, particolored. ♀ sooty-brown, bill simply turgid, much widened at end. Young ♂ like ♀. Embracing the black Sea Ducks, Surf Ducks, Sea Coots, or Scoters, as they are variously called; maritime mollusk-eating species, scarcely fit for food. Our three regular species inhabit both coasts, sometimes large inland waters, breeding northward, occurring abundantly in winter along the whole U. S. coasts; a fourth is only North American as occurring in Greenland.

Analysis of Subgenera and Species.

Gape shorter than inner toe without claw.

♂ Bill scarcely encroached upon by frontal feathers, which sweep directly across base; gibbosity superior, circumscribed, orange. Nostrils median. Nail narrowed anteriorly. Plumage entirely black. Feet dark. Tail normally 16-feathered. (**ŒDE'MIA.**)

♀ Sooty-brown, paler below, whitish on throat and sides of head; bill not gibbous, black . . . *americana*

Gape longer than inner toe without claw.

♂ Bill broadly encroached upon by frontal feathers, on culmen nearly or quite to nostrils, on sides to less extent, shorter than head, the gibbosity superior, circumscribed. Nostrils beyond middle. Nail broad and obtuse. Bill black, orange-tipped; feet orange. Plumage black, with white wing-patch and eye-spot. Tail normally 14-feathered. (**MELANETTA.**)

♀ Sooty-brown, with white wing-patch; bill all black, less tumid *fusca* and *deglandi*

♂ Bill narrowly encroached upon by frontal feathers; on culmen nearly or quite to nostrils, on sides not at all; about as long as head, the gibbosity lateral as well as superior. Nostrils beyond middle. Bill orange and white, with black lateral spot. Plumage black, with white frontal and nuchal patch, but none on wing; feet orange. Tail normally 14-feathered. (**PELIONETTA.**)

♀ Sooty-brown, paler below, whitish on head, chiefly in loreal and auricular patches; bill black; feet dark *perspicillata*

(*Subgenus ŒDE'MIA.*)

Œ. americana. (Fig. 662.) AMERICAN BLACK SCOTER. BLACK SEA COOT. BROWN COOT ♀. GRAY COOT ♀. SMUTTY COOT ♀. BROAD-BILLED COOT. HOLLOW-BILLED COOT. PUMPKIN-BLOSSOM COOT. BUTTER-BILL. BUTTER-NOSE. COPPER-BILL. COPPER-NOSE. YELLOW-BILL. FIZZY. Bill shaped as above said. Adult ♂: Plumage entirely black, less glossy and jetty below than above, grayish on inner webs of quills. Bill black or blackish, the knob orange or yellow, or partly both. Iris brown. Feet blackish.

Young ♂ resembling ♀. ♀: Sooty-brown, paler below, becoming grayish-white on belly, there dusky-speckled, on sides and flanks dusky-waved; throat and sides of head mostly continuous pale gray or whitish, not in special spots; bill blackish, not bulging; feet livid olivaceous with black webs. Ducklings covered with dusky brown down, lighter grayish-brown

on belly, and whitish on throat. Length 17.00–21.00; extent 30.00–36.00; wing 8.00–10.00; tail 4.00; tarsus 1.75; middle toe and claw 3.25; bill 1.75–2.00.

♀ much smaller than ♂; near the lesser figures given. Differs from European *Æ. nigra* in shape and color of the protuberance on bill of ♂, and more hooked nail. North America, chiefly coastwise, but

also on large inland waters; U. S. in winter, generally in large flocks or rafts, not very southerly, chiefly the northern half of the States, though I have shot it in North Carolina; common on N. Atlantic coast; on Pacific to S. California; breeds in Labrador and from Hudson Bay to the Arctic, and on Aleutians and islands and Alaskan coast of Bering Sea. Eggs 6–10, 2.50 × 1.60, pale buff, June and July, in a nest with neutral-gray, light-centred down. The bulky eggs of Scoters are quite unlike the grayish-green eggs of their relatives the Eiders. (N. B. The upper fig. 662 shows extent of feathers under bill — to first acute angle from the left — and shape of mandibular rami, reaching to next obtuse re-entrance.)

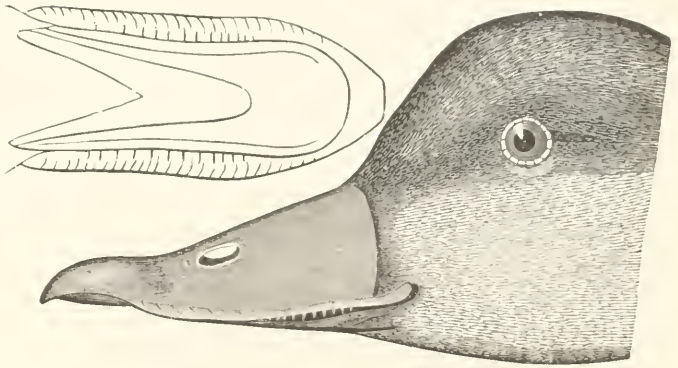


FIG. 662. — Female Black Scoter. (Ad. nat. del. E. C.)

(Subgenus MELANETTA.)

Æ. fusca. (Lat. *fusca*, dusky; but the adult ♂ is black.) EUROPEAN VELVET SCOTER. The true Scoter of Europe and Asia has occurred in Greenland, and therefore enters our fauna as an extralimital species. It is distinguished from the American Velvet Scoter, *Æ. deglandi*, by a somewhat different outline of the feathers upon the base of the upper mandible, as the loreal feathers do not advance so far toward the nostrils. In other respects like the next species. This is the "velvet" Scoter of the A. O. U. Lists, 1886 and 1895, No. [164].

Æ. deglandi. (To C. D. Degland, author of a work on European birds published in 1849.) AMERICAN VELVET SCOTER. VELVET DUCK. WHITE-WINGED SURF DUCK or SEA COOT or SCOTER. BLACK ♂ or GRAY ♀ WHITE-WING. PIED-WINGED COOT. UNCLE SAM COOT. BELL-TONGUE COOT. BULL COOT. BRANT COOT. SEA BRANT. MAY WHITE-WING. ASSEMBLYMAN. Bill shaped as above said. Adult ♂: Plumage black, paler below; a white speculum, formed by most of the secondaries and tips of greater coverts; a small white spot under and behind eye. Iris pearly or dead white. Feet orange or carmine-red, with black webs and joints: the outer aspect inclining to purplish-pink, the other side to the carmine hue with the orange tint. Bill black at base, this color extending on the knob and along the edges to the nail; sides of upper mandible reddish passing to orange on the knob and nail, with a white space between; under mandible black with orange nail. Young ♂ resembles ♀. Adult ♀: Bill less bulging, entirely dark or blackish; eyes dark brown; feet much paler than in the ♂, rather flesh color, somewhat obscured, the webs black as before. Plumage sooty-brown

above, pale grayish below, but retaining the *white speculum*; some whitish on head, tending to form loreal and auricular spots, as in the Surf Scoter, but variable and unreliable; disregard this, and look to the white wing-mark, which always shows in this species, never in either of the other American Scoters. Largest: Length 19.50–22.50; extent about 36.00 (33.50–40.00); wing 11.00–12.00; bill along gape 2.50 or more; tarsus about 2.00; middle toe and claw 3.50. ♀ < ♂. North America at large, chiefly coastwise, but also on large inland waters; abundant. Winters in the U. S. as far south as Virginia, Illinois, Colorado, and S. California, in some cases farther; breeds from Labrador, N. Dakota, and British Columbia to Alaska. Nest on the ground, generally hidden under bushes or other low growth, lined with grayish-brown down having indistinctly paler centres; eggs about 8 or 9 to 11 or more, 2.70–2.90 × 1.85–1.95, pale buff or flesh color, laid late in June and in July. This is the *Anas, Fuligula*, or *Oidemia fusca* of early American authors who did not separate it from the European species; the *double macreuse d'Amérique* of Degland, Orn. Eur. ii, 1849, p. 474, whence *Oidemia deglandi* of Bonaparte, Rev. Crit. 1850, p. 108, actually antedating *O. velvetina* of Cassin, Proc. Acad. Nat. Sci. Phila. for Oct. 1850, p. 126; *Æ. fusca velvetina* of the Key, 3d and 4th eds. 1887 and 1890, p. 890.

NOTE. — It is possible that a third species of Velvet or White-winged Scoter occurs in Alaska. This is the form of N. E. Asia. (*Anas carbo* PALL. *Oidemia stejnegeri* RIDGW. *Edemia carbo* SALVAD. Brit. Mus. Cat. xxvii, 1895, p. 411, which see.)

(Subgenus PELIONETTA.)

Æ. perspicilla'ta. (Lat. *perspicillata*, conspicuous, spectacular. Figs. 661, 663, 664.) SURF SCOTER. SURF DUCK. SURFER. SEA COOT. BROWN COOT ♀. GRAY COOT ♀. BAY COOT. BOX COOT. SPECTACLE COOT. BUTTERBOAT-BILLED COOT. HOLLOW-BILLED COOT. SPECKLE-BILLED COOT. BLOSSOM-BILLED COOT. PATCH-POLLED COOT. HORSE-HEAD COOT. PATCH-HEAD. WHITE-HEAD. WHITE-SCOP. BALD-PATE. SKUNK-HEAD. SKUNK-TOP. PLASTER-BILL. MOROCCO-JAW. GOGGLE-NOSE. SNUFF-TAKER. Adult ♂: Bill shaped as above said, and singularly variegated in color; mostly white or pinkish,

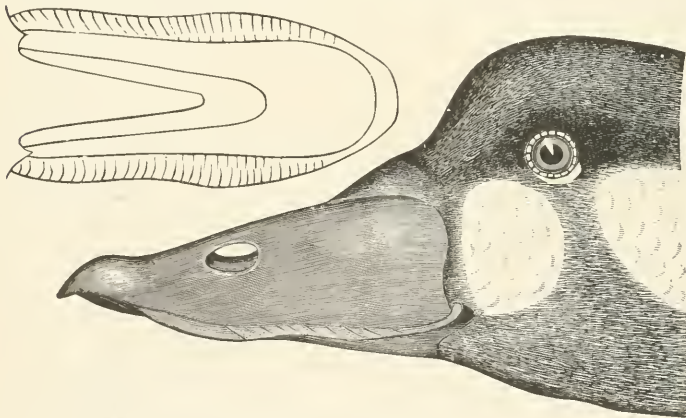


FIG. 663. — Bill of young ♂ Surf Duck, nat. size. (Ad. nat. del. E. C.)

and orange, with a great round or squarish black spot on side of upper mandible near its base, like a piece of court-plaster, bounded behind by a line of carmine-red; culmen to nostrils deep red; lower mandible white and orange; both nails yellow; iris pearly white; feet orange-red, with dusky webs and joints, and the differences in tints noted for the Velvet

Scoter. Plumage glossy black, duller below; no white on wings, but a triangular white patch on forehead, pointing forward, reaching to or beyond opposite eye, and another on nape, pointing downward. Young ♂ resembles the ♀, before the bill acquires distinctive shape and color. Adult ♀: Bill blackish, not particularly tumid; feathers of culmen restricted, not reaching opposite nostrils; feet dark, tinged with reddish or yellowish; webs blackish. Plumage sooty-brown, below silvery-gray; side of head with much whitish, chiefly in two

patches, loreal and auricular; no frontal or nuchal white. A bird in this non-committal plumage, but with the whitish on side of head gathered into two definite patches, is most likely a young ♂, as shown in the figure. Length 18.00–21.00; extent 31.00–36.00; wing 9.00–10.00; tarsus 1.67; middle toe and claw 3.25; bill 2.25–2.50 along gape. ♀ fairly smaller than ♂, at or below minima and averages here given. North America at large, chiefly coast-wise, but also on large interior waters; U. S. in winter, abundant in more northerly portions, not rare even to Florida and Lower California; Jamaica; casual in Europe (for numerous British cases, see Seebohm, Hist. vi, 1885, p. 607; a late case is Hjeltefjord, Norway, Sept. 23, 1893).



FIG. 664. — Surf Duck, reduced. (From Elliot.)

Breeds from Labrador, British Columbia and Sitka to Arctic coast, Alaskan coast of Bering Sea and Aleutian islands. Eggs 5–8 or 9, 2.25–2.50 × 1.60–1.75, pale buff, more grayish or creamy in different instances, laid in June and July. (N. B. In upper fig. 663 the first re-entrance indicates extent of feathering under the bill, the next the mandibular rami.)

Obs.—*E. p. troubridgii*, queried as “scarcely tenable” in former editions of the Key, has been abandoned by common consent.

ERISMATURA. (Gr. *ἔρεισμα*, *eveisma*, a stay, prop, pier, and *οὐρά*, *oura*, tail, as the stiffened member might seem to be.) **RUDDER DUCKS.** Remarkably distinguished from our other *Fuligulinae* excepting *Nomonyx* by the stiffened, linear-lanceolate tail-feathers, normally 18 in number, exposed to base by reason of extreme shortness of coverts, their shafts enlarged, channelled underneath; appearance of tail strikingly like that of a Cormorant. Bill about as

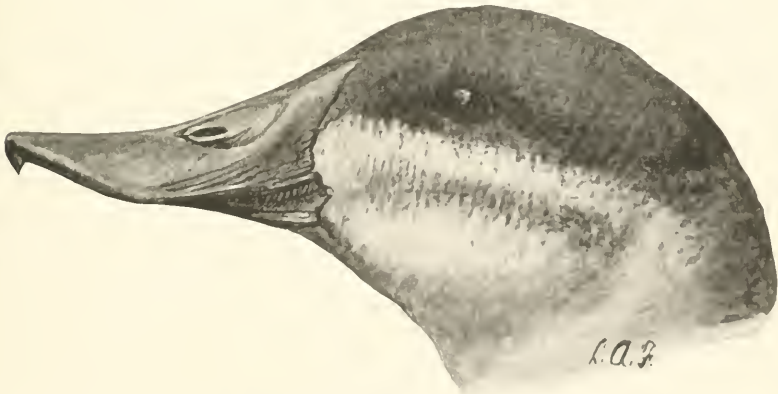


FIG. 665. — Ruddy Duck. (L. A. Fuertes.)

long as head, scarcely higher than broad at base, widened and depressed at end, which is almost turned up; its spoon-shape suggesting that of the Shoveller, though the widening is not so great. Nail as viewed from above very small, narrow, and linear, greatly expanding on a decurved part bent under end of bill (unique). Head small, and neck thick: you can easily draw the skin of the Ruddy Duck over the head, which is impracticable with most Ducks. Tarsus short; toes very long, the outer longer than middle, the latter with claw twice as long as tarsus.

One North American species, of 7 which compose the almost cosmopolitan genus. It is quite different from the foregoing Scoters and Eiders, in fact from all ordinary Sea Ducks; the peculiarities of the tail are shared by *Nomonyx*, *Thalassornis*, and *Biziura*, and these four genera constitute a group sometimes recognized as the subfamily *Erismatirinae* (p. 921).

E. jamaicensis. (Lat. of or pertaining to Jamaica, whence the bird was originally described by Latham as the Jamaica Shoveller, 1785; *Anas jamaicensis* GM. 1788; *Anas rubida* WILS. 1814. *E. rubida* of most authors, as of all former editions of the Key. Fig. 665.) **RUDDY DUCK:** called also by more fanciful and absurd names than any other, the Scoters not excepted. The following is Trumbull's list, for the most part: **DUMPLING DUCK. DAUB DUCK. DEAF DUCK. FOOL DUCK. SLEEPY DUCK. BUTTER DUCK. BUTTER-BALL. BUTTER-BOWL. BATTER-SCOOT. BLATHER-SCOOT. BLADDER-SCOOT or BLATHERSKITE. SALT-WATER TEAL. BROWN DIVING TEAL. WIDGEON COOT. CREEK COOT. SLEEPY COOT. BOOBY COOT. BUMBLE-BEE COOT. QUILL-TAILED COOT. HEAVY-TAILED DUCK. QUILL-TAIL. STIFF-TAIL. PIN-TAIL. BRISTLE-TAIL. STICK-TAIL. SPINE-TAIL. DIP-TAIL. DIVER. RUDDY DIVER. DUN DIVER. DUN-BIRD. MUD-DIPPER, DOPPER, or DAPPER. SPOON-BILLED BUTTER-BALL. SPOONBILL. BROAD-BILLED DIPPER. BROAD-BILL. HARD-HEADED BROAD-BILL. BLUE-BILL. SLEEPY BROTHER. SLEEPY-HEAD. TOUGH-HEAD. HICKORY-HEAD. STEEL-HEAD. BULL-NECK. LEATHER-BACK. PADDY-WHACK. STUB-AND-TWIST. LIGHTWOOD-KNOT. SHOT-POUCH. WATER-PARTRIDGE. DINKEY. DICKEY. PADDY. NODDY. BOOBY. ROOK. ♂ in perfect plumage: Neck all around and upper parts and sides of body rich brownish-red, or bright glossy chestnut. Lower parts silky silvery white "watered" with dusky, yielding gray undulations; this tone due to gray bases of the feathers, showing more or less, and often overlaid with a rusty tinge. Chin and sides of head dead white; crown and nape glossy black. Wing-coverts, quills, and tail blackish-brown; under wing-coverts and axillaries gray, with some white edgings; crissal feathers white to the roots. Bill and edges of eyelids grayish-blue; iris reddish-brown; feet bluish-gray, with dusky webs. Not often seen in this faultless dress in the U. S. As generally observed, and ♀: Brown above, finely dotted and waved with dusky; below paler and duller, more grayish, with dark undulations, and often a tawny wash, as also occurs on the white of head; crown and nape dark brown; crissum white; bill dusky. In this state it looks obscure and sordid, but is unmistakable; ♀ may be known from young by a dusky streak from bill backward in the whitish of side of head. Length 15.00-17.00; extent 20.00-24.00; wing 5.50-6.00; tail 3.50; tarsus 1.25; middle toe and claw 2.60; bill 1.50 along culmen, 0.90-0.95 wide. A curious and interesting Duck, abundant in North America at large, wintering in the U. S. and beyond to the West Indies and South America; breeding over much of its range, as in parts of western U. S. and from N. border of the U. S. northward, and in West Indies and Guatemala. It is an expert diver, and swims well under water, when its rudder comes into use, like a Cormorant's; it is held cocked up when not in use, so that this Duck does not slope down behind as most do on the water. When alarmed, it sometimes sinks quietly backward into the water, like a Grebe; but some other Sea Ducks, as the Harlequin, will do the same. The tail well illustrates a method in which early down-feathers are supplanted by true quills. Up to the time the "flappers" are 8 or 10 inches long, the true tail-feather (teleoptile) bears at its end the simple stem of the down-feather (neossoptile), terminating in a bushy tuft of loose barbs; the whole affair then breaks off and falls. (See Am. Nat. xii, 1878, p. 123, fig.) Ducklings in down are smoky-brown above and on the fore breast, grayish-white on the belly, with a whitish spot on each side of the back, and a light and a dark stripe on each side of the head. Nest bulky, usually among reeds, etc., in a slough; eggs 9-14, very large for the bird, about 2.40 × 1.80, less elliptical than usual, finely granular, buffy white. (*E. rubida*, A. O. U. Lists, 1886-95, No. 167. *E. jamaicensis* SALVAD. Cat. B. Brit. Mus. xxvii, 1896, p. 445; A. O. U. Suppl. List, Auk, Jan. 1897, p. 125.)**

NOMO'NYX. (Gr. νόμος. *nomos*, law, order; ὄνυξ. *onux*, nail: nail of bill ordinary.) **RUBBER DUCKS.** Character of *Erismatura*, but nail of bill not peculiar, and outer toe shorter than middle one. Inner secondaries so lengthened as to fold over primaries in closed wing. One species.

N. domí'nicæ. (Of St. Domingo.) **ST. DOMINGO DUCK.** Adult ♂: General color ferruginous, or chestnut-red, more or less extensive and continuous on under parts and around neck, lightening on belly to rusty-yellowish, varied with black centres of the feathers on the back, scapulars, and flanks; most of head black; large white area on wing formed by ends of many of the coverts and bases of corresponding secondaries; axillars also white; tail black. Bill blue, black-tipped; feet dark; eyes brown, with a bluish ring. Adult ♀ or young ♂: Back blackish, spotted with yellowish-brown; general rusty color dappled with dusky; two blackish stripes on each side of head, one through eye, the other lower down, each bordered above with buff; speculum white, as before; bill obscured. Length 13.00-14.50; wing 5.50; tail 4.00; tarsus 1.00; culmen 1.40. A small, curious Duck of Central and South America and the West Indies, N. to the Lower Rio Grande, accidental in the U. S. Lake Champlain, N. Y. and Lake Koshkonong, Wisconsin (see Proc. Bost. Soc. Nat. Hist. vi, 375; xiv, 154; Amer. Nat. v, 441; BAIRD, B. N. A. 1858, 925) and in Massachusetts near Malden (Auk, 1889, p. 336).

Subfamily MERGINÆ: Mergansers.

Bill narrow, more or less nearly cylindrical, nail hooked and overhanging, lamellæ highly developed into prominent serrations, nasal fosse lengthened and narrowed. Nostrils median or sub-basal. Tarsi compressed, anteriorly scutellate, with smaller plates on sides and behind, $\frac{1}{2}$ - $\frac{2}{3}$ as long as middle toe and claw. Hind toe lobate. Tail rounded, usually $\frac{1}{2}$ or more the length of the pointed wings, 16-18-feathered. Head usually crested. Excepting character of bill, Saw-bills or Fishing Ducks are simply *Fuligulina*, somewhat modified in adaptation to a more exclusively animal regimen; the lamellæ of the bill become detainers of large objects, not sifters or strainers of minute things. The principal point in their economy is ability to pursue fish under water, like Cormorants, Loons, and other birds of lower orders. The nature of their food renders their flesh rank and unpalatable; in buying a "Duck," notice the bill that it be not cylindric, hooked, and saw-toothed. The flap of the hind toe is as in any Sea Duck; the tarsi are much compressed. The gizzard is rather less muscular than in most Ducks; intestines and their cœca shorter; syringeal capsule of ♂ very large, irregular, partly membranous: the trachea has other dilatations (fig. 3). Birds of this group inhabit fresh as well as salt water, and are abundant in individuals if not in species. There are about 8 species, chiefly of the Northern Hemisphere, but several occur in South America: we have 3, commonly and properly referred to 2 genera, *Merganser* and *Lophodytes*; besides a fourth, which is only a rare straggler.

Analysis of Genera and Species.

Tarsus shorter than culmen. Tail of 18 feathers.

Bill not shorter than head, mostly red. Serrations of bill acute, recurved, claw-like. Tarsus about two-thirds as long as middle toe. Tail about half as long as wings. Crest low, blmsy, occipital, if any. Head green or brown. (MERGANSER.)

Nostrils near middle of bill. Frontal feathers beyond those on side of bill. Crest scarcely developed. ♂ with breast uncolored. *m. americanus*

Nostrils near base of bill. Frontal feathers not beyond those on side of bill. Crest better developed. ♂ with breast and sides colored. *m. serrator*

Bill shorter than head, mostly black. Serrations of bill low, oblique, not hooked. Tarsus about half as long as middle toe. Tail more than half as long as wing. Crest of ♂ highly developed, erect, compressed, semicircular, coronal as well as occipital. (LOPHODYTES.)

Nostrils near base of bill. Frontal feathers produced beyond those on sides of bill. *l. cucullatus*

Tarsus longer than culmen. Tail of 16 feathers. (MERGANSER.)

A straggler from Europe. *m. albellus*

MERGAN'SER. (Lat. *mergus*, a diver, and *anser*, a goose.) **MERGAN'SERS.** **FISHING DUCKS.** **SAW-BILLS.** Characters as given in the above analysis. We have two perfectly distinct species, one of them closely related to, the other identical with, the corresponding birds of Europe. (*Mergus* of former editions of the Key; but *Merganser* BRISS. 1760, antedates *Mergus* as restricted to *M. ulbellus* by Leach in 1816.)

M. americana'sus. **AMERICAN MERGAN'SER.** **AMERICAN GOOSANDER.** **AMERICAN SHELDRAKE.** **BUFF-BREASTED MERGAN'SER** or **SHELDRAKE** (with many other qualifying terms of "Sheldrake," mostly shared by the next species). **FISHING DUCK.** **SAW-BILL.** **SPARKLING FOWL.** **DUN DIVER** (♀). **MOROCCO-HEAD** (♀). **VELVET-BREAST.** **BREAKHORN** or **BRACKET.** **WEASER** or **TWEEZER** (*Trumbull*). Nostrils near middle of bill. Frontal feathers extending acutely on culmen about half-way from those on side of bill to nostrils; loreal

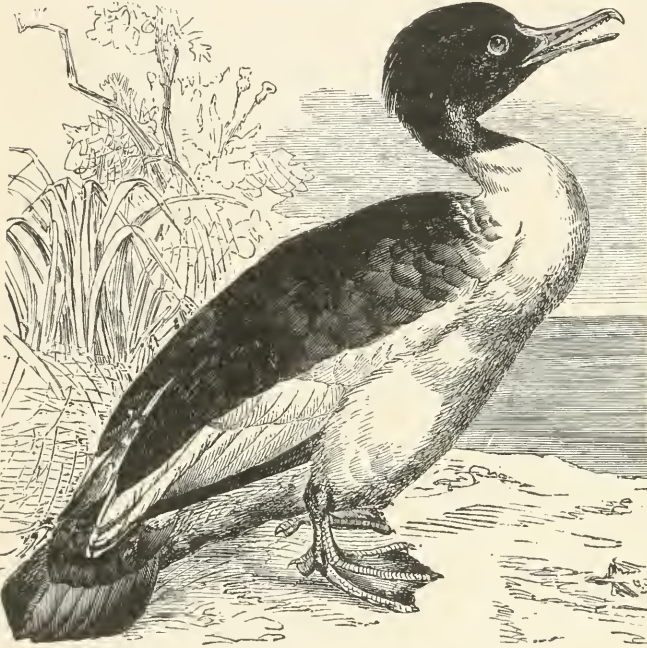


FIG. 666. — European Merganser, ♂, $\frac{1}{2}$ nat. size. (From Brehm.)

feathers sweeping in nearly vertical line across side of base of upper mandible, about opposite those on side of lower mandible. Head scarcely crested — merely a line of little lengthened feathers along occiput and nape — better developed in ♀ than in ♂. Tail 18-feathered. Adult ♂: Bill and feet vermilion-red in breeding season, with black hook of the bill, and the culmen more or less blackened; iris carmine. Head and upper part of neck splendid dark green like a Mallard's. Under parts white, more or less salmon-colored, the flanks and lower belly marbled or watered with dusky, the white extending all around the lower neck. Upper

parts glossy black, fading to ashy-gray on rump and tail; surface of wing mostly pure white, crossed by a black bar formed by bases of greater coverts. Primaries and outer secondaries black, intermediate secondaries white, inner secondaries and scapulars black and white. ♀: Bill red with dusky culmen; iris yellowish; feet chrome or orange with dusky webs; crest better developed than in ♂ — still flimsy, however long. Head and neck reddish-brown; throat white; under parts white, less salmon-tinted than in ♂. Black parts of ♂ ashy-gray; scapulars without white; white of wing restricted to some of the secondaries and greater coverts, which are black at base; smaller coverts ashy. Length 23.50–27.00; extent 34.00 or more; wing 10.00–11.00; tail 5.00; bill 2.00 along culmen, 3.00 along gape; tarsus 1.75–1.95; middle toe and claw 2.75; ♀ much smaller than ♂, at the lesser or below the single dimensions here given. Downy young: Brown above, with four white spots; the head more rusty-brown, with a white loreal stripe between two dark brown ones; under parts white. North America at large, common on inland fresh waters as well as coastwise; U. S. in winter, and breeding from northern borders northward, and in mountains of Middle States, Colorado, California, etc.

Nest in a hole in a tree or cliff, or on the ground, down-lined; eggs 6-10, elliptical, creamy buff, 2.75×2.00 . (*Mergus merganser* of 2d-4th eds. of the Key; *M. americanus* CASS. 1853; *Merganser americanus*, A. O. U. Lists, No. 129. As stated in the Key, the American differs from the European Merganser in the evident black bar across the white area of the wing, and in some other particulars.)

M. serra'tor. (Lat. *serrator*, a sawyer. Fig. 667.) RED-BREASTED MERGANSER. RED-BREASTED GOOSANDER or SHELDRAKE. SALT-WATER SHELDRAKE. FISHING DUCK. SAW-BILL (with various other names, more or less shared with the foregoing species). Nostrils near base of bill. Frontal feathers extending obtusely on culmen, and not beyond those on sides of upper mandible; the loreal sweeping forward convex beyond those on side of lower mandible. A long, thin, pointed occipital and nuchal crest in both sexes. Adult ♂: Head and upper neck all around splendid dark green as in the foregoing. A white ring almost round lower neck, but interrupted behind by a dark line. Under parts white, more or less salmon-tinted, fore breast brownish-red streaked with dusky, sides finely waved with dusky. A white black-bordered patch of broad feathers in front of wing. Fore back, interscapulars, and long inner scapulars,

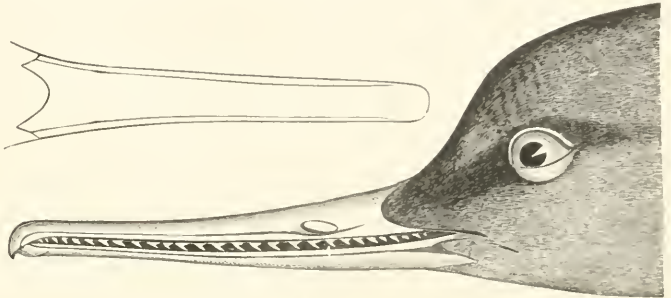


FIG. 667. — Bill of Red-breasted Merganser, nat. size. (Ad. nat. del. E. C.)

black; middle and lower back gray, waved with whitish and dusky. Surface of wing mostly white, including outer scapulars; inner secondaries edged on outer web with black; wing crossed by two black bars at bases and just beyond ends of greater coverts. Bill carmine-red, dusky on top; eyes carmine; feet bright red. Adult ♀: Bill and feet duller colored; head grayish-chestnut; under parts white, shaded with ashy-gray along sides. Upper parts plumbeous-gray, the feathers with paler edges; white of wing restricted to a patch formed by ends of greater coverts, and much of the outer secondaries; like the last, smaller than ♂. No peculiar feathers in front of wing. Length about 24.00; extent 34.00; wing 8.50-9.50; tail 4.00; tarsus 1.60; middle toe and claw 2.60; bill 2.20 on culmen, 2.60 on gape. Young ♂ resembles ♀; both closely resemble *M. americanus* in plumage, but are smaller, and easily distinguished by the position of the nostrils and outline of the feathers on the bill. Nestlings in down curiously patched; hair brown above with a yellowish white mark on each side of rump and along hind border of wing; lower parts dingy whitish; sides of head and neck rusty, with pale lores between two dusky stripes, and whitish eyelid. N. Am. at large, more numerous than Goosander. U. S. abundantly in winter, and breeding northerly in many places as well as N. to Arctic regions; N. parts of Northern Hemisphere. Nest on ground, down-lined, often well concealed; eggs 6-12, oftener 8-10, elliptical, dull buff, 2.50×1.65 .

LOPHODYTES. (Gr. *λόφος*, *lophos*, a crest; *δύτης*, *dutes*, a diver.) Characters as given in the foregoing analysis. One species, the ♂ of which is known at a glance by the elegant crest. (As subgenus of *Mergus* in all former eds. of the Key.)

L. cucullatus. (Lat. *cucullatus*, wearing a hood. Fig. 668.) HOODED MERGANSER. HOODED SHELDRAKE. LITTLE WOOD, SWAMP, POND, PICKAX, and SUMMER SHELDRAKE. LITTLE FISHING DUCK or SAW-BILL. ROUND-CRESTED DUCK. FAN-CRESTED DUCK. WOOD DUCK (a name shared with *A. sponsa*). TREE DUCK. SPIKE-BILL. Hairy-head. MOSS-HEAD. TOW-HEAD. TADPOLE. SNOWL. SMEW (a name properly belonging to

Mergus albellus). Bill shorter than head. Nostrils in its basal half. Frontal feathers extending far beyond those on side of bill, the latter beyond those on lower mandible. A magnificent crest, compressed, semi-circular in outline when erected, in both sexes, but in ♀ smaller,

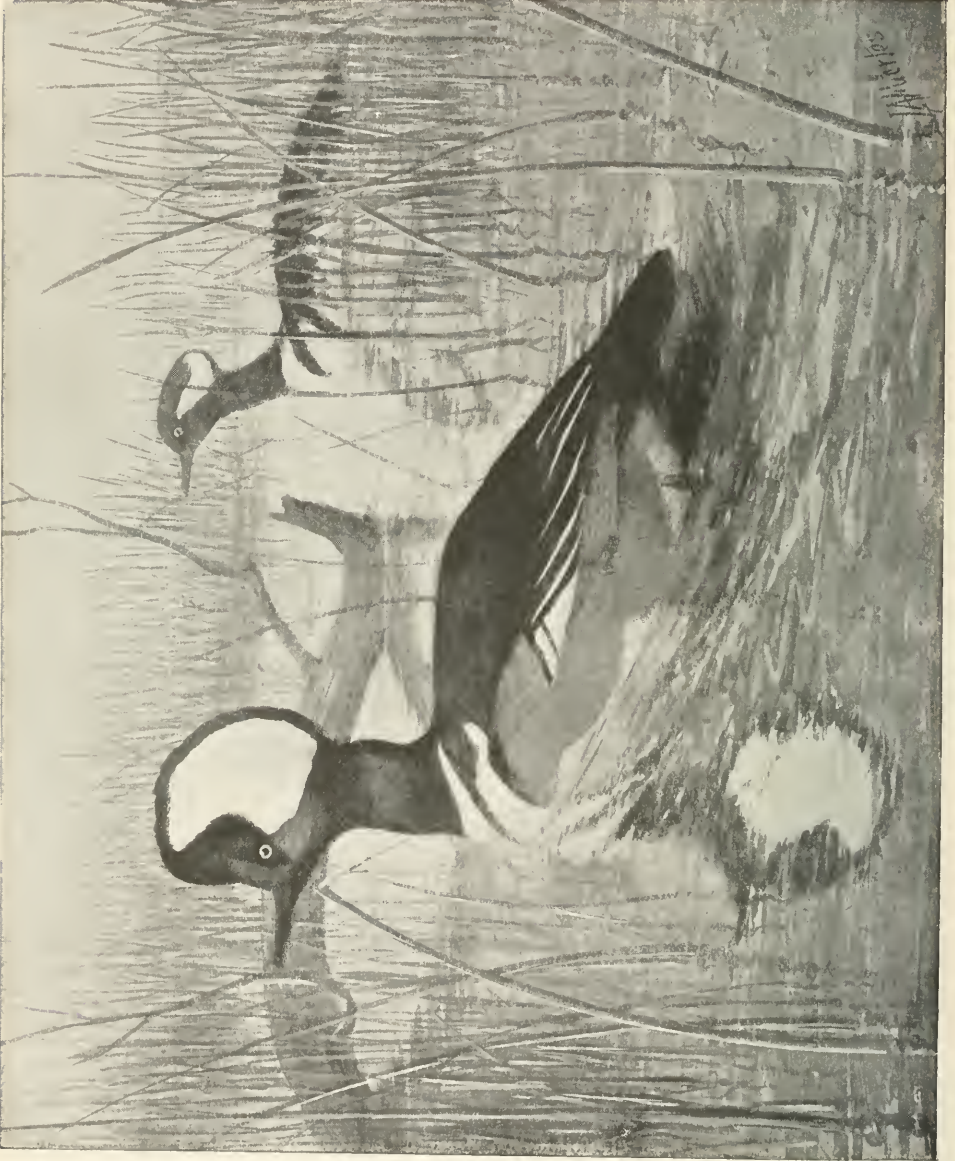


FIG. 638. — Hooded Merganser.

and less strict; the ♂ can open and shut it like a fan, by lifting or lowering it. Adult ♂: Bill black; eyes yellow; feet light brown, with dusky claws. Head, neck, and upper parts black, changing to brown on lower back; crest elegantly centred with snowy white; lower fore-neck and under parts white; sides regularly and finely waved with brownish-red and black; crissum

waved with dusky. Lining of wings and axillars white. Enlarged white doubly black-barred feathers in front of wing. A white speculum, with two black bars, the white being on outer webs of secondaries and ends of these and greater coverts; inner secondaries black, with white median stripe. Young ♂ similar to ♀. Adult ♀: Bill dusky, with orange base below. Head and neck grayish-chestnut, darker brown on crown; throat and under parts whitish; back and sides dusky-brown, the latter not undulated, the feathers generally with paler edges. No black and white bars before wing; white of wing restricted or impure; speculum crossed with only one dark bar. Young in down dark brown above, with a pair of whitish spots on back, another pair on rump, and hind edge of wing whitish: sides of head buff, paler on throat; fore breast and sides of body dingy, belly white. Length 16.50-18.00; extent about 25.00; wing 7.00-8.00; tail 4.00; tarsus 1.20; middle toe and claw 2.35; bill 1.50 along culmen, 2.00 along gape. North America at large, common; breeds at large in the U. S., as well as farther north; winters in the U. S., Mexico, and Cuba; casual in Europe. This beautiful species usually if not always nests in holes in trees or stumps like the Wood Duck and some others, the young, it is said, being transported to the water in the bill of the mother. Eggs 6-10 or more. 2.05 × 1.70, white or faintly buffy, and more rounded than those of the foregoing.

MERGUS. (Lat. *mergus*, a diver; *mergo*, I immerse). SMEWS. General characters of the foregoing Mergansers, but bill very short, less along culmen than length of tarsus. Tail of 16 feathers. Size small. A slight crest. Colors white and black in ♂. One species, of the Old World, only a straggler in America. (Not in former eds. of the Key. *Mergellus* KAUP; SELBY, 1840.)

M. albellus. (Lat. dim. of *albus*, white.) WHITE MERGANSER. WHITE NUN. SMEW. Adult ♂: Pure white; glossy greenish-black patch about eye, and V-shaped mark of the same on back of head; back, rump, two crescents on each side of fore breast, secondaries, and wing-coverts in part, black; tail and its coverts ashy-gray. Bill and feet slate-gray. Length 16.50; extent about 23.00; wing 7.75; bill little over 1.00. Adult ♀: Smaller than ♂, with less crest; upper parts and sides of body ashy-gray, darkest on lower back; head reddish-brown, shading on sides into the white of under parts, which are shaded with gray across fore breast; markings of wings nearly as in ♂. A well known bird of Europe and Asia, of casual occurrence only in North America, though given as North American by most of the early writers. Audubon records and figures a ♀ taken by himself near New Orleans, winter of 1819; another is in the British Museum, received from the Hudson's Bay Co. (Not hitherto admitted to the Key. A. O. U. List, Eighth Suppl. Jan. 1897, p. 118, No. [131.1].)

Order STEGANOPODES: Totipalmate Birds.

Feet totipalmate, with 3 full webs (as in fig. 52, for example); hind toe semi-lateral, larger and lower down than in other water birds, *connected with inner toe by a complete web reaching from tip to tip*. Nostrils minute, rudimentary, or entirely abortive. A gular pouch. Bill not membranous nor lamellate; tomia sometimes serrate; usually, a long sulcus on upper mandible reaching alongside culmen nearly to tip of bill, which is commonly hooked with a more or less distinct nail; mouth much cleft.

This is a definite and perfectly natural group, which will be immediately recognized by the foregoing characters, one of which, complete webbing of hallux, is not elsewhere observed among birds. It is represented by 6 genera, all in North America, each type of a family. The name *Steganopodes* was given to the order by Illiger in 1811; it is also called *Totipalmata*, and was named *Dysporomorpha* by Huxley in 1867.

The nature is altricial (nidicolous). The eggs are few, frequently only one, usually if not always plain-colored, and encrusted with a peculiar white chalky substance; they are

deposited in a rude nest on the ground, on rocky ledges, or on low trees and bushes in the vicinity of water. The dietetic regimen is exclusively carnivorous, the food being chiefly fish, sometimes pursued under water, sometimes plunged after, sometimes scooped up. In accordance with this, we find the alimentary canal to consist of a capacious distensible œsophagus not developing a special crop, a large proventriculus with numerous solvent glands, a small and very moderately muscular gizzard, rather long and slender intestines, and an ample globular cloaca. The cæca are small, in some cases functionless, or only one cæcum exists. The tongue is extremely small, a mere knob-like rudiment (as in piscivorous Kingfishers). The characteristic gular pouch varies greatly in development, being enormous in Pelicans, but inconspicuous in Tropic-birds. The condition of the external nostrils is a curious feature; they are generally obliterated in the adult state, but in some species, like the Tropic-bird, they remain open. Intrinsic syringeal muscles may be present or absent in birds of this order. But the most notable fact in connection with the respiratory system is the extraordinary pneumaticity of the body in some of the families, this reaching its height in Pelicans and Gannets. The interior air receptacles are of an ordinary character, but the anterior of these cells are more subdivided than usual; from them, air gets under the skin through the axillary cavities, and diffuses over the entire pectoral and ventral regions, in two large parallel intercommunicating cells on each side, over which the skin does not fit close to the body, but hangs loosely. It is further remarkable that the skin itself does not form a wall of these cavities, a very delicate membrane being stretched from the inwardly projecting bases of the contour-feathers. Thus there is yet another, although a very shallow, interval between this membrane and the skin, this also containing air, admitted from the larger spaces by numerous minute orifices close to the roots of the feathers. This subcutaneous areolar tissue is that which, in ordinary birds and mammals, holds the deposit of fat, no trace of which substance is found in these birds.

The pterylosis adheres throughout to one marked type, there being little variation except in density of plumage, which would seem to accord with temperature, tropical forms being the more sparsely feathered; however, it is peculiar to some extent in *Anhinga*. Excepting *Phaethon*, the gular sac is wholly or in part bare; aftershafts wanting or minute (*Fregata*). The remiges are from 26 to 40 in number, of which 10 are always long, strong, pointed primaries. There are usually 22-24 tail-feathers in Pelicans, but 12, 14, or 16 in other genera. All have the oil-gland large, with circle of feathers and more than one orifice; sometimes, as in Pelicans, it is protuberant, heart-shaped, as large as a Pigeon's egg, with 2 sets of 6 orifices; in Gannets it is flat and disc-like. The carotids are double as a rule, but single in Darters, some Pelicans, and a Gannet; the great pectoral muscle is likewise double, with a different mode of insertion of its two divisions into the humerus. The ambiens is normally present; other muscles of the thigh vary to a degree.

The palatal structure is extremely desmognathous; no basipterygoids; maxillo-palatines large and spongy; mandibular angle is truncate; other cranial characters appear under two aspects, one peculiar to Pelicans, the other common to the rest of the order. The cervical and cervicodorsal vertebræ are from 15 in *Phaethontidae* and *Fregatidae* to 17-20 in the other four families; and the 8th or 9th one has a peculiarity of its articulation which causes the kink or bend of the neck at that place so characteristic of these birds, but best marked in Cormorants and Darters. The sternum is short and broad, with transverse, entire or emarginate, posterior border. The upper arm bones are very long; the tibia does not develop the very long enomial apophysis or so-called "rotular process" seen in many *Pygopodes*. (See fig. 675.)

The species of this order are few — apparently not over 70, of which Cormorants represent one half — very generally distributed over the world. Of the 6 families, *Phaethontidae* and *Fregatidae* differ as much from each other as both do from the other 4 — *Phalacrocoracidae*,

Anhinga, *Sulida*, and *Pelecanida* being more closely related to one another. Such inter-relationships might serve for formal division of the order into 3 suborders, one containing Tropic-birds alone, another the Man-of-war birds, and a third the Cormorants, Darters, Gannets, and Pelicans. But as it is hardly necessary to insist upon this refinement, I proceed at once to consider the 6 families.

Family SULIDÆ: Gannets; Boobies.

Bill rather longer than head, cleft to beyond eyes, very stout at base, tapering and a little decurved toward tip, which however is not hooked, the tomia irregularly serrate, or rather lacerate. An evident nasal groove. Nostrils abortive. Gular sac little developed, but naked and thus obvious. Wings rather long, pointed; 1st primary longest. Tail long, stiff, wedge-shaped, 12-18-feathered. Feet stout and serviceable, more nearly beneath centre of equilibrium than in some other families of this order; tarsus rather short; 3d and 4th toes of about equal lengths. General configuration somewhat that of a Goose; body stout; neck rather long; head large, uncrested; plumage compact. Marine.

Two carotids; oil-gland disc-like; œca very small; gall-bladder large. Pneumaticity extreme, even to intermuscular air-cells. Ambiens, femoro-caudal, and semitendinosus present; accessories absent; former with a peculiarity of insertion. Sternum very long for its breadth; coracoids nearly parallel with its axis. The relationships of the family are decidedly with Cormorants.

Gannets are large heavy sea-birds of various parts of the world. There are numerous well-established species, of which the six following are the principal ones. They are piscivorous, and feed by plunging on their prey from on high, when they are completely submerged for a few moments; but they do not appear to dive from the surface of the water like Cormorants. The gait is firm; the flight vigorous and protracted, performed with alternate sailing and flapping. In flight the neck is held straight, at full length, after the manner of Cormorants, Geese, Storks, Ibises, etc. Although so heavy, they swim lightly, owing to the remarkable pneumaticity of the body, already noticed. They are highly gregarious: the common Gannet congregates to breed in almost incredible numbers on rocky coasts and islands of high latitudes, while the Booby similarly assembles on low shores of warmer seas. The nest is none, or a rude bulky structure of sticks and seaweed, placed on rocks or in low thick bushes; egg, generally single, elliptical or long-ovate, plain greenish in ground color, but encrusted with white calcareous matter; two are sometimes laid. Both sexes incubate; they are alike in color, the young being different.

SULA. (Norse *sula* or *sule*. *Havsula*, meaning "sea-swallow," is a Scandinavian name of the common Gannet.) **GANNETS.** Character of the family, as above. The white Gannet, type of *Dysporus* ILLIGER, 1811, differs subgenerically from the brown Boobies which have generally been referred to *Dysporus*, but one of which becomes by elimination the type of *Sula* BRISSON, 1760, as now restricted.

Analysis of Species (adults).

- GANNETS.** Lower jaw, chin, and throat not extensively naked. (Subgenus *Dysporus*.)
 White, with black primaries, head washed with amber. Naked parts of head, and feet, blackish. Tail 12-feathered. Young spotted. Atlantic coast *bassana*
- BOOBIES.** Lower jaw, chin, and throat extensively naked. (Subgenus *Sula*.)
 Plumage extensively white on head, neck, and back.
 Feet red or reddish; face and sac blue. Tail of 16-18 feathers. Florida *exonops*
 Feet red; face blue; sac blackish. Tail of 14-16 feathers. Florida *pisator*
 Feet blue. Tail of 16 feathers. Lower California *na borei*
 Plumage extensively or entirely brown on head, neck and back; belly white.
 Feet greenish; face blue. Tail of 14 feathers. Lower California *breusteri*
 Feet yellowish; face light-colored. Tail of 12-14 feathers. S. Atlantic coast *sula*

(Subgenus *DYSPORUS*.)

S. (D.) bassa'na. (Of Bass Rock, Firth of Forth.) COMMON GANNET. WHITE GANNET. SOLAN or SOLAND GOOSE. JAN VAN GENT. GRAND FOU. Adult ♂ ♀: Bill pale grayish, tinged with greenish or bluish; nasal groove, lores, and gular sac blackish; feet black, with greenish or bluish scutella; claws pale gray; iris white or pale yellowish. Plumage white; primaries and their coverts black; head washed with amber-yellow. Length 3 feet or more; extent 6 feet, more or less; wing 17.00–21.00 inches; tail 9.00–10.00, pointed, 12-feathered; culmen 4.00, gape 6.00; tarsus 2.00; middle toe and claw 4.00. Young: Bill brownish; lores livid bluish; feet dusky; iris green. Plumage dark brown, spotted with white, below from neck grayish-white, each feather darker-edged (character much as in a young Night-heron); wing-quills and tail-feathers blackish. This dusky, sharply-spotted plumage gradually clears up white, the changes beginning on the head, neck, and under parts, which become white while the back is still brown and more or less spotted; the change is completed at the end of the 3d year. North Atlantic coasts, swarming in summer at certain northern breeding-places, as Bass Rock in the Firth of Forth, and Bonaventure Island and Gannet Rock in the Gulf of St. Lawrence; S. to Africa and the Gulf of Mexico in winter. Nest of seaweed; egg single, 3.00 × 2.00, pale greenish-blue flaked over with white chalky substance. Young hatch naked, blackish, pot-bellied; later covered with thick white or pale yellowish down.

(Subgenus *SULA*.)

S. (S.) cyanops. (Gr. *κύανος*, *kuanos*, Lat. *cyaneus*, blue; *ὤψ*, *ops*, face.) BLUE-FACED BOOBY. SUNDEVALL'S BOOBY. Gular sac ending squarely across throat. Adult ♂ ♀: Naked face and sac livid blue, drying slaty or blackish; bill grayish, greenish, or yellowish, drying undefinable horn color; iris yellow; feet reddish, drying dingy. Plumage white; primaries, secondaries, and their coverts, and tail-feathers, blackish, latter more or less extensively white from the base. Young: Only white below from the neck; head, neck, and upper parts dark grayish-brown, with white feathers here and there, especially on hind neck and rump. This plumage gradually clears up. The color of the soft parts varies much in life, and always changes in drying. Length about 30.00; wing 15.50–17.50; tail 7.75–8.75, composed of 16, rarely 18 feathers; culmen 3.50–4.00; depth of bill at base 1.25–1.60; tarsus 1.75–2.25; middle toe 2.25 or more. A Booby of wide distribution in warm seas of the globe, inhabiting the West Indies and occasionally occurring in Florida. It should have been admitted to 2d edition of the Key, 1884, having been then ascertained to occur within our limits (LAWR. Proc. Bost. Soc. Nat. Hist. xiv, p. 302. *Dysporus cyanops* SUND. 1837; *Sula cyanops* SUND. 1842; COUES, Key, 3d ed. 1887, p. 890; RIDGW. Man. 1887, p. 75; A. O. U. Lists, 1st and 2d eds. No [114].

S. (S.) piscator. (Lat. *piscator*, a fisherman.) RED-FOOTED BOOBY. GOULD'S BOOBY. Gular sac ending squarely across throat. Adult ♂ ♀: Sac blackish; bare face violet-blue; bill bluish, becoming reddish toward base, there contrasting in color with lores and sac; iris gray; feet rich red, varying from pink or coral to purplish, drying dingy. Plumage white, tinged with buff on head and neck; primaries and their coverts, secondaries and coverts in part, slate-gray, or wearing to blackish, this color chiefly on outer webs and tips of secondaries and their coverts; shafts of tail-feathers yellowish. Young: Brown, nearly uniform, but paler on breast and belly; wings as in adult, but more extensively blackish. This plumage clears up by degrees, with great variability, but the species is easy to recognize at any age by the characters here given. Length about 29.00; wing 15.00–15.50; tail 8.50–9.00, composed of 14–16 feathers; culmen 3.25; depth of bill at base 1.10 or less; tarsus 1.35; middle toe 2.25. Eggs 2, 2.60 × 1.80. Tropical and subtropical coasts and islands of most

parts of the world; casual in Florida; perhaps N. on Mexican coast to Lower California? The species should have been taken into the Key with *S. cyanops* in 1884 (LAWR. Pr. Bost. Soc. Nat. Hist. xiv, p. 303). *Pelecanus piscator* L. 1758; *Sula piscator* GRAY, 1845; COUES, Key, 3d ed. 1887, p. 890; RIDGW. Man. 1887, p. 76; A. O. U. Lists, 1886-95, No. [116].

S. (S.) nebourg'i. (To — Nebourg.) BLUE-FOOTED BOOBY. NEBOUX'S BOOBY. GOSS' BOOBY. Adult ♂ ♀: Bill dull olivaceous blue; sac and face slaty-blue; iris yellow; feet bright blue. Plumage white, plain below, but head and neck streaked with brown or dark gray, and back and scapulars dusky with only whitish tips. Primaries brownish-black; secondaries like wing-coverts; tail-feathers white and brown to varying extent. Downy young pure white. Length 34.00; extent 62.00-66.00; wing 15.75-16.75; tail 8.75-9.75, composed of 16 feathers; bill 4.20-4.70; tarsus about 2.00. A large Booby resembling *cyanops* in some respects and *piscator* in others, but easily distinguished by the blue feet, etc. Gulf of California and S. to the Galapagos and Chili. It breeds in profusion on San Pedro Martir Island in the Gulf near lat. 28°, and on Tres Marias Islands. Egg single, 2.40 × 1.60, long ovate, color as usual, but generally stained with guano; laid on bare rock, April, May. *S. nebourgii* MILNE-EDW. Ann. Sc. Nat. 6th Ser. Zoöl. xiii, 1882, p. 37, pl. 14; RIDGW. Man. 2d ed. 1896, p. 524; A. O. U. Suppl. List, Auk, Jan. 1897, p. 124. *S. gossi* RIDGW. MS. GOSS, Auk, v, July, 1888, p. 241; COUES, Key, 4th ed. 1890, p. 906; A. O. U. List, 2d ed. 1895, No. 114.1.

S. (S.) brewsteri. (To William Brewster, the eminent ornithologist of Cambridge, Mass.) GREEN-FOOTED BOOBY. BREWSTER'S BOOBY. Adult ♂: Bill dull olivaceous-blue; sac bluish; face indigo-blue; feet pea-green. Adult ♀: Bill bluish-horn color, fading to dirty buff after death; face slate-blue; sac pale greenish; feet greenish-yellow. In ♂ ♀, iris dark brown with a whitish ring. Adult ♂ ♀: Plumage not so extensively white as that of any of the foregoing, this being a "brown" Booby, more like the next species (*S. sula*). Upper parts brown, lightening through gray to white on head and throat of ♂, darkening on quills and tail; under parts white from the breast. Nestlings covered with white down. Length 29.50-31.50; extent 55.50-59.50; wing 14.50-15.50; tail 8.00; tarsus 1.75-2.00; culmen 3.50-4.00; ♀ averaging larger than ♂. Gulf of California and southward, breeding numerously on San Pedro Martir Island and the Tres Marias Islands with *S. nebourgii*, and on other islands to the head of the Gulf. Eggs 2, 2.44 × 1.60, laid in a sort of nest on the ground, otherwise indistinguishable from those of *nebourgii*, laid in May and June. The species was formerly identified with the common Brown Booby. *S. brewsteri* GOSS, Auk, July, 1888, p. 242; COUES, Key, 4th ed. 1890, p. 905; A. O. U. List, 2d ed. 1895, No. 115.1.

S. (S.) sula. (Etym. that of the generic name.) COMMON BOOBY. BROWN BOOBY. YELLOW-FOOTED BOOBY. CATESBY'S BOOBY. Adult ♂ ♀: Bill and bare parts of head light-colored, very variable, inclining to greenish or yellowish; feet similar; all drying indefinably light; iris white. Plumage dark brown, abruptly white below from the neck, including lining of wings. Young: Plumage grayish-brown, paler below, more or less mixed with white on the parts which are to become pure white: bill and feet obscured. The full plumage is probably assumed after the third year. Length 28.00-30.00; extent 50.00 or more; wing 11.50-16.50, averaging nearly 16.00; tail 6.50-9.50, averaging about 8.00, composed of 12-14 feathers; tarsus 1.50-1.90; middle toe and claw 3.50; culmen 3.25-4.00, averaging 3.75; gape 5.00; depth of bill at base 1.25. A long and well known species, widely dispersed over warm seas of most parts of the world, and the only Booby which inhabits the U. S. to any great extent; it is abundant on our South Atlantic and Gulf coasts, N. to Georgia, but apparently is not found on the Pacific side, where it is replaced by *brewsteri*. It swarms at its breeding places on low shores and keys, where it builds a nest of sticks and weeds on bushes; one egg or two, 2.25-2.50 × 1.50-1.75, of the same chalky character as that of the whole

genus. This is the original Booby of Catesby, 1731, pl. 87; *Pelecanus sula* L. 1766, which most authors have called *Sula fiber*, as I did in Key, 1st ed. 1872, p. 298; *S. sula* VERR. and DES MURS, Rev. Mag. Zoöl. 1860, p. 442; A. O. U. Lists, 1886-95, No. 115; RIDGW. Man. 1887, p. 75. It is also *Pelecanus leucogaster* BODD. 1783; *Sula leucogastra* of many authors, as of Key, 2d-4th eds. 1884-90, p. 720.

NOTE. — *S. websteri* ROTHSCHILD, Bull. Brit. Orn. Club, vii, No. liv, 1898, of the Revillagigedo Islands, will probably be found within our limits.

Family PELECANIDÆ: Pelicans.

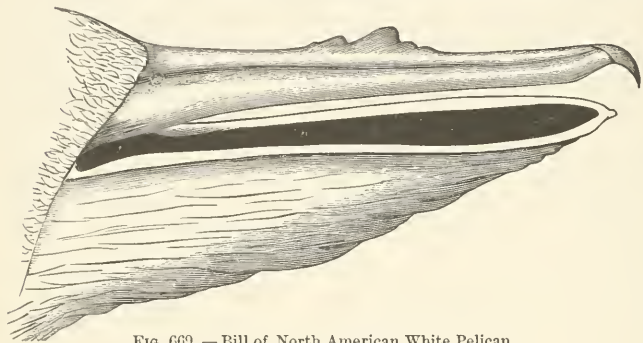


FIG. 669. — Bill of North American White Pelican.

Bill several times as long as head, comparatively slender, but strong, straight, broad, flattened, grooved throughout, ending with a distinct claw-like hook. Mandibular rami joining only at their apex; long broad interramal space, and throat, occupied by an enormous membranous sac. Nostrils abortive. Wings extremely long, in upper-

and fore-arm portions, as well as pinion, with very numerous remiges. Tail very short, up to 22-24 feathers. Feet short, very stout; tarsi compressed, reticulate. Size large. Marine and lacustrine or fluviatile.

The remarkable pneumaticity of the body (shared however by Gannets) has been already described. A principal osteological character is, that "the inferior edge of the ossified inter-orbital septum rises rapidly forward, so as to leave a space at the base of the skull, which is filled by a triangular crest formed by the union of the greatly developed ascending processes of the palatines." The sternum is short and broad, with shallow emargination on each side behind; furculum is firmly ankylosed with it. Cæca an inch long. Tongue a mere rudiment. But the most obvious peculiarity of these birds is the immense skinny bag hung to the bill, capable of holding several quarts when distended. The covering is ordinary skin, but very thin; the lining is skin modified somewhat like mucous membrane; between these "is interposed an equally thin layer, composed of two sets of very slender muscular fibres, separated from each other, and running in opposite directions. The outer fibres run in fascicles from the lower and inner edge of the mandible, those from its base passing downward, those arising more anteriorly passing gradually more forward, and reach the middle line of the pouch. The inner fibres have the same origin, and pass in a contrary direction, backwards and downwards. From the hyoid bone to the junction of the two crura of the mandible, there extends a thin band of longitudinal muscular fibres, in the centre of which is a cord of elastic tissue. By means of this apparatus, the sac is contracted, so as to occupy but little space. When the bill is opened, the crura of the lower mandible separate from each other to a considerable extent [in their continuity — not at the symphysis], by the action of muscles inserted into their base, and the sac is expanded." This organ is used like a dip-net, to catch fish with; when it is filled, the bird closes and throws up the bill, contracts the pouch, letting the water run out of the corners of its mouth, and swallows its prey. Pelicans feed in two ways; most of them, like our white one, scoop up fish as they swim along on the water; but the brown species plunges

headlong into the water from on wing, like a Gannet, and makes a grab, often remaining submerged for a few seconds. Neither species often catches large fish; they prefer small fry of which several hundred may be required for a full meal. The prevalent impression that the pouch serves to convey live fish, swimming in water, to the little Pelicans in the nest, is untrue: the young are fed with partially macerated fish disgorged by the parents from the crop. As Audubon remarks, it is doubtful whether a Pelican could fly at all with its burden so out of trim.

The gular pouch varies in size with the different species, reaching its greatest development in the Brown Pelican, where it extends half-way down the neck in front, is a foot deep when distended, and will hold a gallon. Besides this singular adjunct, the bill of our White Pelican has another curious structure, not found in other species. The culmen is surmounted near the middle by a high thin upright comb or crest, the use of which is not known. It is found only during the breeding season, being shed and renewed in a manner analogous to the casting of deer's antlers. Its structure explains how this can be: "The crest-like excrescence on the ridge of the upper mandible is not formed of bone, nor otherwise connected with the osseous surface, which is smooth and continuous beneath it, than by being placed upon it, like any other part of the skin; and when softened by immersion in a liquid may be bent a little to either side. It is composed internally of erect slender plates of a fibrous texture, externally of horny fibres, which are erect on the sides, and longitudinal on the broadened ridge; these fibres being continuous with the cutis and cuticle."

Pelicans are found in most temperate and tropical countries, both coastwise and inland; they are gregarious birds at all times, and gather in immense troops to breed. A large rude nest is prepared on the ground, or built of sticks in a bush or tree near water: the eggs are one to three or four, plain dull whitish, with a thick roughened shell. The gait of these cumbersome birds is awkward and constrained; but their flight is easy, firm, and protracted, and they swim lightly and gracefully, buoyed up by the interior air-sacs. The sexes are alike; the young different; most species are white, with yellow or rosy hue at times, and a crest or lengthened feathers, at the breeding season; while nearly every one of them has a peculiar contour of the feathering at the base of the bill, by which it may be known. There are only 9 unquestionable species, although some authors admit more. The exotic ones are: *P. onocrotalus* of Europe, Asia, and Africa; *P. roseus* of Asia, etc. (including *minor* and *javanicus* of authors); both of these with frontal feathers extending in a point on culmen; *P. crispus* of Europe, Asia, and Africa, largest of the genus; *P. rufescens* of Africa; *P. philippensis* of India and eastward; in all three of these the frontal outline concave on base of culmen; the Australian *P. conspicillatus*, in which a strip of feathers cuts off a naked circumocular region from base of bill. This is an entirely peculiar feature; and our White Pelican shows another, having the sides of the under mandible feathered at base for a short distance. Finally, the South American Brown Pelican, *P. thagus*, is believed to be distinct from ours.

PELECANUS. (Gr. πελεκάν, *pelekan*, or πελεκίνος, *pelekinos*, Lat. *pelecanus*, a pelican.)
PELICANS. Character as above.

Analysis of Subgenera and Species.

CYRTOPELECANUS. White, with black wing-tips. Tail of 24 feathers. Plumage extending on side of lower mandible.
erythrorhynchus

LETOPELECANUS. Not white, but of varied dark colors. Tail 22-feathered. Plumage restricted from side of lower mandible.

Length 48.00-56.00; wing 18.50-21.00; bill 9.50-12.00; pouch always dusky *fuscus*
 Length 54.00-60.00; wing 20.50-23.00; bill 12.00-15.00; pouch sometimes reddening *californicus*

(*Subgenus* CYRTOPELECANUS.)

P. erythrorhynchus. (Gr. ἐρυθρός, *eruthros*, red; ῥύγχος, *hrugchos*, beak. Fig. 639.)
AMERICAN WHITE PELICAN. Adult ♂ ♀: Plumage white, with black primaries, their

coverts, alula, and many secondaries; shafts of quills white. Lengthened feathers of occiput and breast, and some of the lesser wing-coverts, pale straw-yellow. Tail-feathers said to be rosy at times; a dark spot on occiput after the breeding season, when the crest and the ridge of the bill have been shed. Iris pearly white, brown or dusky at times or in young. Bill and feet ordinarily yellow, much reddened in breeding season, when the general tone of bill is reddish-salmon; under mandible brighter than upper, which has the ridge whitish; pouch passing from livid whitish anteriorly through yellow and orange to red at base; bare skin about eye orange; eyelids red; feet intense orange-red. Length 5 feet; extent 8-9 feet; wing 2 feet or more; bill a foot or more; fore arm about 15 inches; tail 6.00, 24-feathered; tibia bare 1.00; tarsus 4.50; middle toe about 5.00. The size varies much, some individuals being over and others under the usual dimensions here given. The average weight may be about 17 pounds. Young birds differ from adults mainly in having lesser wing-coverts and some feathers on head marked with gray; bill and feet pale yellowish. This magnificent bird ranges over temperate North America at large, but irregularly; rare on Atlantic coast, casual, or wanting in Middle and Eastern States and beyond; Florida and Gulf coasts, common in winter when also S. to Guatemala; in the West abundant in suitable places, inland as well as coastwise, up to 61° N. at least. Breeds in colonies, sometimes of vast extent; nest on ground or rocks, simple, of sticks, weeds, etc.; egg single or multiple, long, oval, or somewhat elliptical, chalky white, but usually found stained or soiled, 3.30 × 2.20. (*P. trachyrhynchus* of former eds. of Key. *P. erythrorhynchos*, A. O. U. Lists, No. 125.)

(Subgenus LEPTOPELECANUS.)

P. fuscus. (Lat. *fuscus*, brown. Figs. 670, 671.) AMERICAN BROWN PELICAN. Adult ♂ ♀ in breeding plumage: Bill mottled with light and dark colors, much tinged in places



FIG. 670. — Brown Pelican Nesting.

with carmine; eyes white; bare space around them blue; eyelids red; pouch blackish; feet black. Plumage dark and much variegated. Head mostly white, tinged with yellow on top, the white extending down neck as a bordering of pouch and somewhat beyond; rest of neck dark chestnut. Upper parts dusky, each feather pale or whitish-centred, the paler gray color prevailing on wing-coverts. Primaries blackish, their shafts

basally white; secondaries dark, pale-edged; tail-feathers gray. Lower parts grayish-brown, striped with white on sides; lower fore-neck varied with yellow, chestnut, and blackish. ♂ ♀, in winter: Most of the neck white. Length about 4.50 feet; extent 6.50 feet; wing 18.50-21.00 inches; bill a foot or less; gular pouch extending about the same distance along neck. Tail 7.00, 22-feathered; tarsus 2.50; middle toe and claw 4.50. Bill and soft parts variable in color with age or other circumstance, but pouch never reddish. Young lack special coloration of neck, which is simply brownish; at first, covered with whitish down. Feathers of neck of adult peculiarly soft and downy; a slight nuchal crest, with stiff bristly feathers on forehead, and lengthened acute feathers on lower fore-neck and breast. The Brown Pelican is exclusively maritime, inhabiting the Atlantic coast of America from tropical regions to North Carolina, and only casually occurring inland, as in Wyoming. It plunges for its prey like a Gannet, not scooping it up swimming like the White Pelican. Breeds in colonies, indiffer-

ently on the ground or on bushes and low trees. Eggs 2-3 commonly, white, chalky, elliptical, 3.00×2.00 . (*P. onocrotalus*, β *occidentalis* LINN. 1766, in part; *P. fuscus* GM. 1788.)

P. californicus. (Lat. of California.) CALIFORNIAN BROWN PELICAN. Similar to the last; larger; length 4.50 feet or more; wing 21.00-23.00 inches; bill 12.00-15.00. In full breeding plumage the pouch more or less reddish, the bare skin about the eyes brownish, the

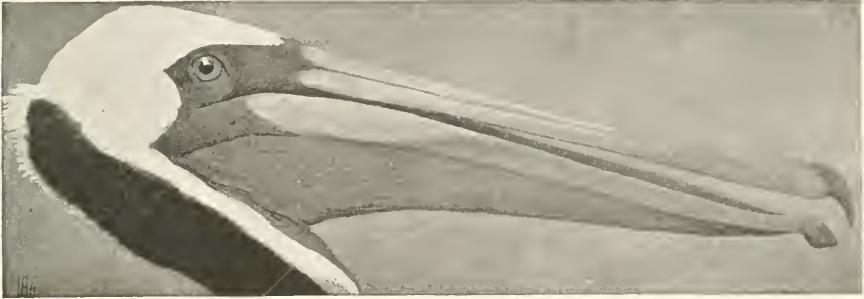


FIG. 671. — American Brown Pelican. (L. A. Fuertes.)

chestnut of the neck very dark or brownish-black. Pacific coast of America, from southern British Columbia southward to the Galapagos: an abundant and conspicuous bird on the coast of California. The difference from *P. fuscus* is not great, but as the habitats of the two forms are apart, in North America at least, intergradation does not occur, and the peculiarities of the West coast bird may therefore be regarded as specific. Hist. N. A. Water Birds, ii, 1884, p. 143; A. O. U. List, 1886, p. 112, No. 127; Key, 3d ed. 1887, p. 891.

Family PHALACROCORACIDÆ: Cormorants.

Bill about as long as head, stout or slender, more or less nearly terete, strongly epignathous or hooked at end: tomia generally irregularly jagged, but not truly serrate; a long,

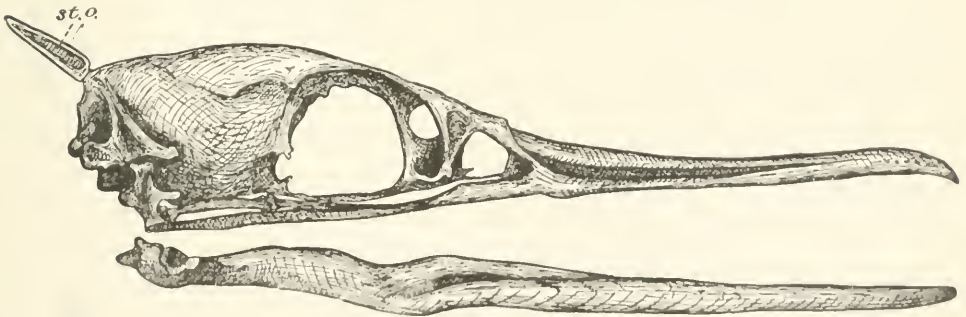


FIG. 672. — Skull of *Phalacrocorax bicristatus*, showing *st. o.* occipital style or michal bone: nat. size. (From nature by Dr. R. W. Shufeldt. The style is somewhat tilted upward from its natural position.)

narrow, nasal groove, but nostrils obliterated in adult state; gape reaching below eyes, which are set in naked skin. Gular pouch small, but forming an evident naked space under bill and on throat, variously encroached upon by feathers. Wings short for the order, stiff and strong; 2d primary usually longer than 3d; both these exceeding 1st. Tail rather long, large, more

or less fan-shaped, of 12-14 very stiff, strong feathers, denuded to base by extreme shortness of coverts; thus almost "scansorial" in structure, recalling that of a Woodpecker or Creeper, and used in a similar way, as a support in standing, or an aid in scrambling over rocks and bushes. Body compact and heavy, with a long sinuous neck; general configura-



FIG. 673. — The nest of the Cormorant (*P. bicristatus*). (Designed by H. W. Elliott.)

tion, and especially the far backward set of the legs, much like that of *Pygopodous* birds. While other *Steganopodes* can stand with the body more or less nearly approaching a horizontal position, Cormorants are forced into a nearly upright posture, when the tail affords with the feet a tripod of support. They also, like the birds just mentioned, dive and swim under water in pursuit of their prey, using their wings for submarine progression, which is not the case with the other families, except *Anhingidae*. In both these families the body is not in the least pneumatic under the skin — quite the reverse of Pelicans and Gannets.

Among osteological characters, aside from the general figure of the skeleton, a long bony style in the nape, in position of the *ligamentum nuchæ* of many animals, but in relation with extensive temporal muscles, and articulated with occiput,

is the most remarkable (fig. 672). It occurs in the *Anhinga* also, but is there much smaller. The desmognathous structure is seen in its highest development; palatines not only soldered, but sending down a keel along their line of union; interorbital septum very defective, with horizontal inferior border (a general character of the order except in Pelicans). There are 20

vertebræ in the neck, where the kink already mentioned (p. 952) begins at the 9th: the 20th-24th are opisthocœlous. The sternum has a short deep keel, with which the furculum is not ankylosed. There is a bulky free patella, coexistent with a short cnemial apophysis or rotular process of tibia, but perfectly distinct therefrom, as in *Grebes*. The muscles of the legs are as in *Sulide*: there are two carotids; the subcutaneous cellular tissue is not

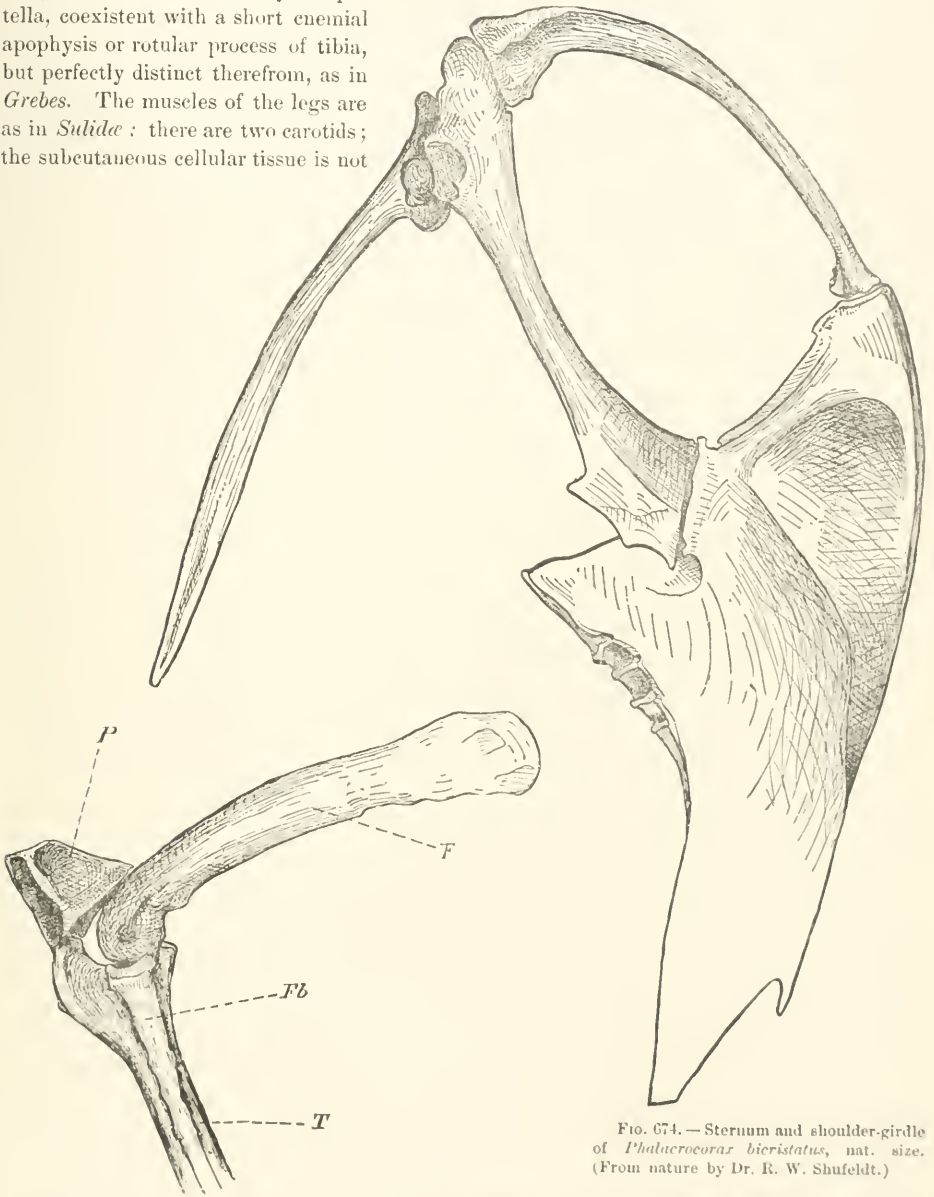


FIG. 673.—Knee-joint of *Phalacrocorax bicristatus*, nat. size, from nature by Dr. R. W. Shufeldt. F, femur; P, patella; T, tibia; Fb, fibula.

FIG. 674.—Sternum and shoulder-girdle of *Phalacrocorax bicristatus*, nat. size. (From nature by Dr. R. W. Shufeldt.)

emphysematous. The pterylosis agrees essentially with ordinary pterylographic characters, but the apteria are very narrow, and the plumage is peculiar in certain details. Excepting a few speckled species, and some others that are largely white below, the plumage is glossy or lustrous black, often highly

iridescent with green, purple, and violet tints, commonly uniform on head, neck, and under parts, but on back and wing-coverts, where the feathers are sharp-edged and distinct, the shade is more apt to be coppery or bronzy, each feather with well-defined darker border. This concerns, however, only the adult plumage, which is the same in both sexes; the young are plain brownish or blackish. Cormorants have other special featherings, generally of a temporary character, assumed at the breeding season and lost soon after; these are curious long filamentous feathers (considered by Nitzsch filoplumaceous), on head and neck, and even, in some cases, on upper and under parts too. These feathers are commonly white, as is also a large silky flank-patch acquired by several species. Some Cormorants are also crested with ordinary long slender feathers; the crest is often double, and when so, the two crests may be either one on each side of head, or they may follow each other on middle line of hind head and nape. Our species illustrate all these various featherings. The naked parts about the head vary with the species and afford good characters, especially considering shape of the pouch; the skin is usually brightly colored, sometimes carunculate. Eyes, as a rule, green—a color not common among birds. These birds are highly psilopædic as well as altricial; the young are for some time blind, naked, and perfectly helpless.

Thirty-five species of Cormorants may be considered established. Their study is difficult, owing to great changes in plumage, high normal variability in size, and close inter-relation, which is such that the single genus *Phalacrocorax* does not appear capable of well-founded division. Species are found all over the world, excepting the uttermost polar regions, and are usually very abundant in individuals; they are all very much alike in their habits. Many are maritime, but others range over fresh waters as well. They are eminently gregarious, especially in the breeding season, when they congregate by thousands—the boreal kinds generally on rock-begirt coasts and islands, those of warm countries in the dense fringes of shrubbery. They often migrate in large serried ranks. The nest is rude and bulky; the eggs are commonly 2-3, but may be 4-5 or more, elliptical, pale greenish, overlaid with white chalky substance. Cormorants feed principally upon fish, and their voracity is proverbial, though probably no greater than that of allied birds. Under some circumstances they show an intelligent docility; witness their semi-domestication by the Chinese, who train them to fish for their masters, a close collar being slipped around the neck to prevent them from swallowing the booty. Inquisitiveness is another trait of Cormorants. These ugly, ungainly, and untidy birds have provoked various poets to uncomplimentary remarks, since Milton's comparison of Satan thereto in *Paradise Lost*, iv, 192; but Newton makes the more sensible suggestion that a lot of Cormorants sunning themselves look like a row of black bottles. Longfellow notes the flight in these fine lines:

“ As with his wings aslant,
Sails the fierce Cormorant,
Seeking some rocky haunt
With his prey laden.”

PHALACROCORAX. (Gr. φαλακροκόραξ, *phalakrokorax*; Lat. *phalacrocorax*, a cormorant, sea-crow, *corvus marinus*: φαλακρός, *phalakros*, bald, and κόραξ, *korax*, a raven.)
CORMORANTS. SHAGS. Character as above said. There appears to be but one genus in the family, but several groups of species may be cited subgenerically. There are five such groups among our species, respectively exemplified by *P. carbo*, *P. dilophus*, *P. mexicanus*, *P. penicillatus*, and *P. pelagicus*; a sixth is represented by the extinct *P. perspicillatus*.

Analysis of Subgenera, Species, and Subspecies. (Adults in breeding plumage.)

Tail of 14 feathers. Crested. (Subgenus *Phalacrocorax*.)

Gular sac heart-shaped, bordered with white feathers. Atlantic coast *carbo*

Tail of 12 feathers. Crested or crestless.

Gular sac convex or nearly straight-edged behind. Lateral crests of curly plumes on each side of head. (Subgenus *Dilophalius*.)

No border of white feathers behind gular sac.

- Large: length about 36.00. Crests chiefly white. Northwest coast *d. cincinnatus*
- Medium: length 30.00-33.00. Crests chiefly black. N. Am. at large *dilophus*
- Small: length about 30.00. Crests black. S. Atlantic coast *d. floridanus*
- Small: length about 30.00. Crests partly white. California coast *d. albociliatus*

A border of white feathers behind gular sac. (Subgenus *Viguacarro*.)

- Very small: length under 30.00. Gulf coast and lower Mississippi Valley *mexicanus*

Gular sac heart-shaped behind.

No crests nor white flank-patches. Tail very short. (Subgenus *Compsohalieus*.)

- Sac dark blue, bordered by a fawn-colored gorget. Pacific coast *penicillatus*

Two black crests in median line, and white flank-patches. No colored gorget.

Very large, with short wings and tail. (Subgenus *Pallasicarro*.)

- Shafts of tail-feathers white. Bering's Island (extinct) *perspicillatus*

Medium or small; tail more than $\frac{1}{2}$ as long as wing. (Subgenus *Urile*.)

- Frontal feathers not reaching bill, which is surrounded with red skin; base of bill blue. Alaska *bicristatus*

Frontal feathers reaching bill.

- Larger: wing 10.00 or more. Pacific coast, northerly *pelagicus*
- Smaller: wing under 10.00. Pacific coast, southerly *p. resplendens*

NOTE. — The above analysis is available for winter plumages and young of most of the forms, if attention is paid to number of tail-feathers, shape of gular sac, relative lengths of wing and tail, feathering or nakedness of face, size of bird as a whole, and geographical distribution. In case the genus *Phalacrocorax* should be restricted to its type, with 14 rectrices, the next name in order for the other species would be *Carbo* LACÉP, 1801. There is no foundation in fact for the reiterated statements that any of our species except *P. carbo* has normally more than 12 rectrices.

(Subgenus PHALACROCORAX.)

P. car'bo. (Lat. *carbo*, carbon: from the black color.) COMMON CORMORANT. SHAG. Tail of 14 feathers (here only among our species). Adult ♂ ♀: Gular sac heart-shaped behind. Bill blackish, whitish along edges and at base below. Iris green. Skin about eyes livid greenish, orange under eye; sac yellow, bordered behind by a gorget of white feathers. Feet blackish. General plumage glossy greenish-black; feathers of back and wing-coverts distinct bronzy-gray, black-edged; quills and tail grayish-black; feet black. In breeding plumage, a white flank-patch, numerous long thready white plumes scattered on head and neck, and a black occipital and nuchal crest of plumes 1.00-1.50 long. Length 36.00; extent 60.00; wing 12.00-14.00; tail 6.00-7.00; tarsus about 2.50; bill 3.40 along ridge, 4.00 along gape, with appreciably concave culmen, and large strong hook, the latter about one-third the length of the whole culmen. In winter no crests or white feathers on neck or flanks. Young: Bill grayish-brown, black on top and at tip; bare skin and sac yellow. Top of head and hind neck brownish-black; back and wing-coverts brownish-gray, the feathers with dark margins, some of them finally edged with whitish. Throat brownish-white, and under parts generally whitish, blackish along sides, dusky under wings and across lower belly. The naked young in the nest are unpleasant livid purplish objects, with protuberant bellies, and large feet; the first down is blackish. Eggs 3-4, sometimes 5, bluish-green, coated with white chalky substance, 2.60 × 1.75; nests of sticks, moss, and seaweeds, very filthy and offensive. Atlantic coast of Europe and North America; breeds on rocky shores of Labrador and Newfoundland; S. to Middle States in winter. The American bird has been thought by some authors to be sub-specifically distinct from that of Europe (*P. c. macrorhynchus*).

(Subgenus DILOPHALIEUS.)

P. dilo'phus. (Gr. *δῖς*, *dis*, twice; *λόφος*, *lophos*, crest. Fig. 676.) DOUBLE-CRESTED CORMORANT. Tail of 12 feathers. Gular sac convex behind. No colored gorget of feathers bordering the sac. Adult ♂ ♀: Glossy greenish-black; feathers of back and wings coppery-gray, black-shafted, black-edged; two curly black lateral crests in breeding season, but few if any white filaments over eyes and none along sides of neck; no white flank-patches; iris green; gular sac and lores orange; eyelids and inside of mouth blue; feet black. Adults in winter

similar, but no crests, and eyelids not blue; bill bright yellow, blackening along culmen, gular sac red anteriorly, ochrey-yellow posteriorly; feet dull black. Length 30.00–33.00; extent 50.00; wing 12.00–13.00; tail 6.00–7.00; tarsus a little over 2.00; bill along gape 3.50; along culmen 2.30; the shape of bill and size of hook much as in *carbo*. ♀ rather smaller than ♂. Young: Plain dark brown, paler or grayish (even white on breast) below. North

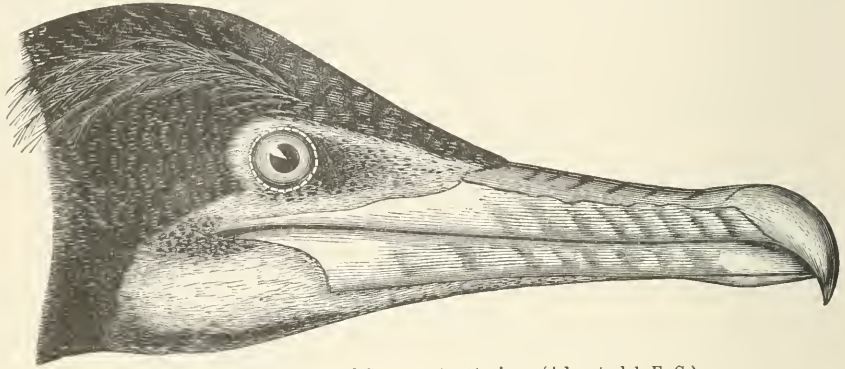


FIG. 676. — Double-crested Cormorant, nat. size. (Ad. nat. del. E. C.)

America, the commonest species, and the only one generally diffused over the interior; S. in winter to the Gulf coast, breeding in summer from the northern U. S. northward. Eggs 3–4 or more; 2.50×1.55 . This is the stock form, replaced southwardly in eastern North America by *floridanus* in summer, and on the Pacific coast by *cinnimatus* northerly, by *albociliatus* southerly.

P. d. cinnimatus. (Lat. *cinnimatus*, having curly hair. Fig. 677.) WHITE-CRESTED CORMORANT. General character of the preceding, of which it appears to be a large northern variety. White lateral crests, of a superciliary bundle of long curly filamentous feathers. Larger: size of *carbo*; length up to 36.00; wing 13.00–14.00, etc. Northwest coast; breeds in Alaska, S. in winter along the California coast.

P. d. floridanus. FLORIDA CORMORANT. "NIGGER GOOSE." Similar to but smaller than *P. dilophus*. Length 30.00 or less, sometimes only 22.00; extent about 45.00; wing 12.50 or less; tail 6.00 or less; tarsus a little under 2.00; but bill as large as if not larger than that of *dilophus*; gape nearly 4.00; culmen up to 2.40. The plumage is exactly the same as in *dilophus*. There are said to be certain differences in the life-colors of the bills (blue instead of yellow on under mandible and edges

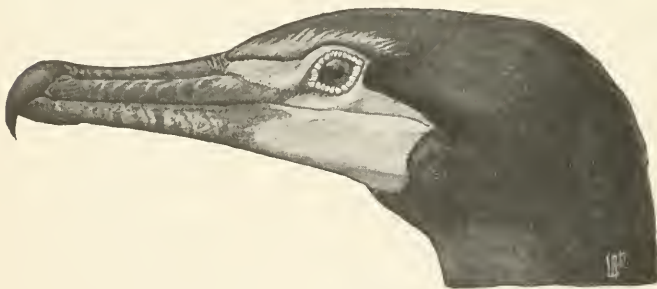


FIG. 677. — White-crested Cormorant. (L. A. Fuertes.)

of upper — Audubon), but none show in my specimens. As originally stated in Key, 1872, this is simply a localized southern race of *dilophus*, smaller in general dimensions, with relatively larger bill, as usual in such cases; sac apparently more extensively denuded. Florida and Gulf coast, resident, breeding by thousands on mangrove bushes; ranging up the coast to North Carolina, and up the Mississippi Valley to Ohio. Eggs about 2.40×1.50 .

P. d. albocilia'tus. (Lat. *albus*, white; *ciliatus*, having *cilia*, i. e., the early plumes of the lateral crests.) FARALLONE CORMORANT. Small; length 30.00 or less; wing about 12.00; bill 2.15. Plumage as in *floridanus*; but nuptial crests chiefly white, as in *cincinatus*, of which it is the southerly representative. Coast and inland waters of southern Oregon and California to Cape San Lucas, and thence in winter extending along the Mexican coast. Breeds in abundance on Farallone and other islands; nests in trees inland. Eggs 2.40 × 1.50.

(*Subgenus* VIGUACARBO.)

P. mexica'nus. (Lat. *mexicanus*, Mexican.) MEXICAN CORMORANT. Resembling the last, but perfectly distinct from this or any other species of North America; closely related to the Brazilian Cormorant, *P. vigua*, of which perhaps only a subspecies. Adult ♂ ♀. in breeding dress: Black, intensely lustrous, rather purplish-violet than green; feathers of back and scapulars dark slate, with black edges, making more sharply lanceolate figures than usual. A sharp white gorget bordering gular sac behind and reaching nearly to eyes; sac not strongly convex in posterior outline, where the feathers pass across throat with a straight or slightly convex outline. Nuptial plumes white, in a packet on each side of head, and other long white filaments scattered over the neck and some other parts. Thus there are lateral crests resembling those of *albociliatus*, but the other filaments are different. Gular sac orange. Adults in winter lack the white plumes and gorget, and the plumage is not so lustrous as in summer. Young: grayish-brown, paler or even whitish on most of the under parts; the white gorget thus undefined. Immature birds are thus of ambiguous aspect, but the very small size, and shape of gular pouch, are distinctive. Length always under 30.00, usually 24.00-28.00; extent about 40.00; wing 10.00; tail 6.00-6.50, thus relatively long, 12-feathered; tarsus under 2.00; culmen 2.00 or less. Central America, Mexico, West Indies; Texas, New Mexico, and Kansas, and up the Mississippi Valley to Illinois. Eggs 2.20 × 1.40.

(*Subgenus* COMPSOHALIEUS.)

P. penicilla'tus. (Lat. *penicillatus*, pencilled, brushy; *penicillum*, a painter's brush or pencil.) PENCILLED CORMORANT. TUFTED CORMORANT. BRANDT'S CORMORANT. TOWNSEND'S CORMORANT. Tail short, of 12 (*not* 14) feathers. Gular sac heart-shaped behind, owing to a narrow pointed forward extension of feathers on median line, as in *carbo*, but largely naked, the feathers reaching on it little if any in advance of those on lower mandible. No definite crests; no white flank-patch. Adult ♂ ♀, in breeding plumage: Deep lustrous greenish-black, changing to violet or steel blue-black on neck and head; middle of back plain, like under parts, but scapulars and wing-coverts showing narrow black edgings of individual feathers, less conspicuous than in any of the foregoing species. White or pale yellowish filamentous plumes, 2.00 or more in length, straight and stiffish, spring in a series along each side of neck; a few others are irregularly scattered over back of neck; many others, still longer, and somewhat webbed, grow on interseapulars and scapulars. A gorget of mouse-brown or fawn-colored plumage surrounding gular sac; this is conspicuous, especially when palest. Sac dark blue; bill dusky; iris green, as usual in the genus. Adults out of season lack the straw-colored filaments. Young: Blackish-brown, more rusty below, the belly grayish; scapulars and wing-coverts with edges paler than centres; gorget fawn-colored, as in the adult (*P. townsendi* AUD.). Length about 33.00; wing 10.75-11.75; tail hardly 6.00, little rounded; tarsus 2.50; culmen 2.75 on an average, nearly straight to the small hook. The species does not closely resemble any other here described. Pacific coast of the U. S., Vancouver Island to Cape San Lucas, abundant, breeding in large rookeries on rocky islands, sometimes in company with Baird's Cormorants (Loomis, Proc. Cal. Acad. 2d ser. v, June, 1895, pp. 217-221). Nest of eel-grass or other seaweeds, about 20.00 × 6.00 outside, 10.00 × 4.00

inside; eggs ordinarily 3-4, 2.55×1.55 , laid in June. Food largely consisting of a species of rock-cod (*Sebastes paucispinis*).

(*Subgenus* PALLASICARBO.)

P. perspicilla'tus. (Quasi-Lat. *perspicillatus*, wearing spectacles.) SPECTACLED CORMORANT. PALLAS' CORMORANT. Tail of 12 (not 14) feathers. Adult in breeding plumage: Deep lustrous green above and below, with blue gloss on neck and rich purplish on scapulars and wing-coverts, where the individual feathers are black-edged. Shafts of tail-feathers mostly white on upper side — a unique character among our species. Large median coronal and occipital crests (not lateral paired crests), glossy black. Head and neck with long sparse straw-yellow plumes. A white flank-patch. Feet black; bill blackish; sac orange, heart-shaped; bare parts of face mixed red, blue, and white, the latter color surrounding the eyes like a pair of spectacles. Changes of plumage unknown. Very large; weight 12-14 lbs.; length 36.00-39.00; wing 13.25; tail 7.50; tarsus 2.50; gape 4.00; bill very stout, and distance from feathers of forehead to tip 3.50. This was a very bulky, heavy Cormorant, with comparatively short wings, tail, and feet, discovered on Bering's Island by Steller in 1741. Known living for little more than a century, then becoming extinct, soon after the Great Auk did, probably about 1852. Four or five specimens are known to exist — two in St. Petersburg, one in Leyden, two in the British Museum; a few bones are in the U. S. National Museum at Washington. PALL. Zoog. R. A. ii, 1811, p. 305, from Steller; GOULD, Voy. Sulphur, 1844, p. 49, pl. 32; ELLIOT, B. N. Am. ii, 1869, pl. 50. For history, etc., see especially Pr. U. S. Nat. Mus. vi, 1883, p. 65; x, 1887, p. 138; xii, 1889, pp. 83-94, pll. 2-4; xviii, 1895, p. 717, pll. 34, 35. The bird is questionably the Red-faced Shag of LATHAM, *Pelecanus urile* GM., at least in part. It has been given as North American in all our systematic works since LAWR. in BD. B. N. A. 1858, p. 877; COUES, Key, 1872, p. 304; 2d-4th eds. 1884-90, p. 728; RIDGW. Man. 1887, p. 81; but is relegated to A. O. U. Hypothetical List, 1886-95, No. 7.

(*Subgenus* URILE.)

P. bicrista'tus. (Lat. *bicristatus*, twice crested; *bis*, twice; *crista*, crest.) RED-FACED CORMORANT. VIOLET SHAG. URILE (Russian name). Tail of 12 feathers, as usual in the genus. Face bare. Two median crests. Adult ♂ ♀, in breeding plumage: Frontal feathers not reaching base of culmen; bill entirely surrounded by naked red or orange skin which also surrounds the eyes, and is somewhat carunculate, forming a kind of wattle on each side of chin; feathering of side of under mandible also restricted; base of under mandible blue; sac blue, becoming livid reddish behind. Crown with a median bronze-black crest, and nape with another, in same line; few if any white plumes on neck; a large white flank-patch. Plumage richly iridescent, mostly shining green, but violet and steel-blue on neck, purplish, violet, and bronzy on back, and wings, the individual feathers there without definite dark edgings. Adults out of season lack the white plumes and flank-patches, but are usually if not always crested. Length 33.00; extent 48.00; wing 11.00-12.00; tail 7.00-8.00; culmen 2.25; gape 3.00; tarsus 2.97. Young: Rather smaller than old birds. Face less bare. Plumage dark brown, darker and more glossy above than below. Nestlings are covered with dark gray down. North Pacific; Kamtschatka, S. in winter to the Kuriles and Japan; Alaska, resident, both on the coast and islands. It swarms on the Seal Islands of Bering Sea, nests on rocky cliffs, and has habits in all respects like those of most other species. Eggs 3-4, 2.50×1.50 . This is the Red-faced Cormorant of Pennant, but *Pelecanus urile* GM. is not exclusively pertinent, and the name had better be avoided. I therefore make no change from former editions of the Key. *P. bicristatus* PALL. Zoog. R. A. ii, 1811, p. 183; COUES, Key,

2d-4th eds. 1884-90, p. 728, No. 757. *Graculus bicristatus* BD. Trans. Chicago Acad. i, 1869, p. 321, pl. 33, Kadiak, original entry into our fauna; COUES, Key, orig. ed. 1872, p. 304. *Phalacrocorax urile*, B. B. & R. Water B. N. A. ii, 1884, p. 162; RIDGW. Man. 1887, p. 80; A. O. U. Lists, 1886-95, No. 124.

P. pelagicus. (Gr. *πελάγιος*, *pelagios*, Lat. *pelagicus*, of the sea, marine, pelagic. Fig. 678.) PELAGIC CORMORANT. VIOLET-GREEN CORMORANT. Very closely related to the preceding; but face not bare, the frontal feathers reaching culmen; gular sac inconspicuous, very extensively feathered, the feathers reaching on sides of under mandible to below eyes, and running in a point on sac far in advance of this. Adult ♂ ♀, in breeding plumage: Deep lustrous green, including back, the feathers of which are not margined; scapulars, wing-coverts, and sides of body iridescent with purplish or coppery, neck with rich violet and blue. Two median black crests, a few scattered white plumes on neck and rump, and white flank-patch, as in *bicristatus*. Adults out of season lack crests, plumes, and patches. Young: Not easy to distinguish from young *bicristatus*; notice feathered face, and green rather than purplish gloss, if any, on back and scapulars; plumage mostly plain dusky, darkest and most glossy above, grayer and duller below. Downy young sooty gray. Small: Length 25.00-29.00; extent about 40.00; wing 10.00-11.00; tail 6.00-7.00; tarsus 2.00; culmen 2.00; gape



FIG. 678. — Pelagic Cormorant. (L. A. Fuertes.)

3.00; bill smooth and slender, its depth at base about 0.33. North Pacific, on the Asiatic side S. to the Kuriles and Japan, on the American side to Washington and the Aleutians; abundant in suitable places on the Alaska coast, breeding on cliffs. Eggs 2.35×1.45 . It is an error to attempt to separate Alaskan birds from *pelagicus*; they are absolutely identical, as I have long been assured: see also GRANT, Cat. B. Brit. Mus. xxvi, 1898, p. 361, confirming this view. *P. pelagicus* PALL. Zoog. R.-A. ii, 1811, p. 303, pl. 76; B. B. & R. Water B. N. A. ii, 1884, p. 160; RIDGW. Man. 1887, p. 80; A. O. U. Lists, 1886-95, No. 123. *Graculus violaceus* LAW. in BD. B. N. A. 1858, p. 881; COUES, Key, 1872, p. 304. *Phalacrocorax violaceus* COUES, Key, 2d-4th eds. 1884-90, p. 729, No. 758; but I have abandoned the name, in the uncertainty attaching to *Pelecanus violaceus* of the early authors; and *P. resplendens* AUD. which I cited here, perhaps is better referable to the following subspecies. *P. pelagicus robustus*, B. B. & R. Water B. N. A. ii, 1884, p. 160; RIDGW. Man. 1887, p. 80; A. O. U. Lists, 1886-95, No. 123a.

P. p. resplendens. (Lat. *resplendens*, resplendent, splendid.) RESPLENDENT CORMORANT. BAIRD'S CORMORANT. Like the last, but very small, with extremely slender bill; wing averaging under 10.00; tarsus 1.67; culmen 1.75; gape 2.67. This is a small southern race, bearing somewhat the relation to *pelagicus* that *albicollis* does to *cinnamomus*, or *floridamus* to *dilophus* proper, as noted in the original edition of the Key, 1872, p. 301. Eggs indistinguishable. Pacific coast of the U. S., Washington to Lower California and southward, breeding on various rocky islands, especially on the California coast; type of *resplendens* from the mouth of the Columbia, type of *bairdi* from the Farallones. *P. resplendens* AUD. v, 1839, p. 148, folio, pl. 412, fig. 1; 8vo, 1843, vi, p. 440, pl. 419. *P. pelagicus resplendens*, B. B. & R. Water B. N. A. ii, 1884, p. 160; RIDGW. Man. 1887, p. 80; A. O. U. Lists, 1886-95, No. 123b. *Graculus bairdi* GRAYB. MS., COOPER, Pr. Phila. Acad. 1865, p. 5; ELLIOT, B. N. A. ii, 1869, pl. 49. *P. violaceus bairdi* COUES, Key, 2d-4th eds. 1884-90, p. 729, No. 759.

Family ANHINGIDÆ: Anhingas; Darters; Snake-birds.

(Formerly PLOTIDÆ.)

Bill about twice as long as head, straight, slender, very acute, paragnathous; tomia with fine serratures. Gular sac moderate, naked. Nostrils minute, entirely obliterated in adult. Wings moderate; 3d quill longest. Tail rather long, stiff, broad, and fan-shaped, of 12 feathers widening toward end; outer web of middle pair curiously crimped.

There is an occipital style, as in Cormorants, but it is very small, and not always ossified. There are remarkable peculiarities of the cervical vertebræ, in their conformation and articulation, the passage of tendons through bony eyelets, etc. — a mechanism producing the strong kink observable near middle of neck, and ability of the bird to thrust forward and retract the head. Cervical vertebræ 20; the kink begins at the 8th; the 22d–25th vertebræ are opisthocœlous. The digestive system shows a remarkable feature; instead of the lower part of the œsophagus being occupied by proventricular glands, these are placed in a small distinct sac on right side of gizzard, which, as in other *Steganopodes*, develops a special pyloric cavity, the orifice of which “is protected by a mat of lengthy hair-like processes, much like cocoa-nut fibre, which nearly half fills the second stomach.” There is a single small cœcum, as in Herons, in our species, but a small pair in another. The tongue is very rudimentary and almost obsolete. Carotid single. Pterylosis peculiar in reduction of apteria to a lateral pair on the trunk and one narrow inferior space. Subcutaneous tissue not emphysematous. Sternum as in Cormorants.

Darters are birds of singular appearance, somewhat like Cormorants, but much more slightly built, and with exceedingly long slender neck and small constricted head that seems to taper directly into the bill, the head, neck, and bill resembling those of a Heron. As in Cormorants, there are long slender feathers on neck; sexes commonly distinguishable, but ♀



FIG. 679. — American Darter. (L. A. Fuertes.)

sometimes resembles ♂. Other changes of plumage appear to be considerable, but not well made out. The feet are short, and placed rather far back, but the birds perch with ease. Unlike most of the order, they

are not maritime, shunning the seacoast, dwelling in the most impenetrable swamps of warm countries. They fly swiftly, and dive with amazing ease and celerity. They are timid and vigilant; when alarmed they drop from their perch into the water below, noiselessly and with scarcely a ripple of the surface, and swim beneath the surface to a safe distance before reappearing. When surprised on the water, they have the curious habit of sinking quietly backward, like Grebes; and they often swim with the body submerged, only the head and neck in sight, looking like some strange kind of water-serpent; whence the names Snake-bird and Anbinga. They feed on fish, which they do not dive down upon, but dive for and pursue under water like Cormorants and Loons. Eggs 2–5, pale bluish, with white chalky incrustation. There are only 4 species: the African *P. rufus*, *congensis* or *levaillanti*; the Indian *P. melanogaster*; the Australian *P. nova-hollandiæ*; with the following:

ANHIN'GA. (South American name, meaning snake-bird. Compare Portuguese *anhina*, Lat. *anguina*, snaky, serpentine.) **DARTERS.** Character as above. *Plotus* of most authors, as of all former editions of the Key.

A. anhin'ga. (Fig. 679.) **ANHINGA.** **AMERICAN DARTER.** **BLACK DARTER.** **BLACK-BELLIED DARTER.** **WHITE-BELLIED DARTER (young).** **SNAKE-BIRD.** **WATER-TURKEY.** Adult ♂: Glossy greenish-black on head, neck, and body; wings and tail plain black, latter tipped with whitish, former with a broad silver-gray band formed by greater and median coverts; lesser wing-coverts spotted, and scapulars striped with silver-gray. These silvery markings variable; greater coverts mostly of this color, with only a part of their inner webs black; on the other coverts, inner secondaries, and long lanceolate scapulars the silvery is a sharp median spot or stripe. In breeding plumage, back of neck with a sort of mane of long black feathers, and along this a lateral series of filamentous plumes of a purplish-ash or brownish-white color. Adult ♀: Differs decidedly; jugulum and breast fawn color, sharply bordered behind with rich chestnut-brown; feathers of upper back with brown edges and white centres; head and neck grayish-brown varied with rufous, buff, and whitish, and with scattered series of pale filaments. In both sexes iris red, ranging from carmine to pink; bill yellow, with dusky greenish ridge and tip; bare skin about eyes livid green: sac orange; feet dusky olive and yellow; webs yellow; claws blackish. Some of the inner secondaries are crimped cross-wise on outer webs, like the middle tail-feathers. Young: Like ♀, but duller black; silvery markings unformed; no chestnut breast-band; under parts simply dull gray; primaries and secondaries with whitish margins toward ends; no crimps. Nestlings covered with buff down. In full dress this is a very stylish bird, as picturesque in plumage as it is peculiar in form, attitude, and action. Length of ♂ ♀ nearly or about 36.00; extent nearly 48.00; wing 13.00-14.00; tail 10.00-11.00; tarsus 1.25-1.50; culmen 3.25-3.50. Tropical and sub-tropical America; in North America, S. Atlantic and Gulf States, common; N. along coast to North Carolina, and up the Mississippi valley to Illinois and Kansas; New Mexico; accidental in England near Poole, June, 1851 (Zool. pp. 3601, 3654; Newton's Dict. p. 882). Nest bulky, placed on trees and bushes over water of secluded swamps or bayous, where Herons also congregate to breed, built of sticks, leaves, roots, moss, etc.: eggs 2-5, oftenest 3-4, 2.60×1.25 , like Cormorant eggs in color and texture, but narrower and more elongate; laid April-June. Young fed in the nest by regurgitation like Cormorants; and in many other habits, such as that of sunning themselves with drooping wings, the affinity of these birds is shown as plainly as it is by physical characters. (*Plotus anhin'ga* of all former editions of the Key.)

Family FREGATIDÆ: Frigates; Men-o'-War.

(Formerly TACHYPETIDÆ.)

Bill most like that of a Cormorant, longer than head, epignathous, stout, straight, wider than high at base, thence gradually compressed to the strongly hooked extremity, where the under as well as upper mandible is decurved. Culmen rounded, with lengthwise outline concave to the hook; culmicorn divided from latericorn by a deep groove, which forks at the unguicorn. Nostrils basal, very small, linear, almost entirely closed, in a long narrow groove. Gular sac small, but capable of considerable distension. Wings exceedingly long and pointed, of about 34 remiges, of which the 10 primaries are very powerful, with stout quadrangular shafts; 1st primary much the longest: upper and middle portion of wings greatly lengthened, and the fore arm about a third longer than the humerus. Tail very long, deeply forked, of 12 strong feathers. Feet exceedingly small; tarsus extraordinarily short, feathered; tarso-metatarsal bone shorter than some of the digital phalanges, which latter have an unusual ratio of lengths; webbing restricted, that between inner and next toe very slight; middle toe much

longer than outer, its claw pectinate. The feet are thus unique among water-birds in externals; the tarso-metatarsus recalls that of Penguins to some extent.



FIG. 680. — Frigate, with Tropic Bird in the distance. (From Michelet.)

water-birds, in the immense length and sweep of wing, length of forked tail, and extreme smallness of feet. In command of wing they are unsurpassed; few birds approach them in this respect. They are more nearly independent of land than any other birds excepting Albatrosses and Petrels, being often seen hundreds of miles at sea, and delight to soar at an astonishing elevation. They cannot dive, and scarcely swim or walk; food is procured by dashing down on wing with unerring aim, and by harassing Gulls, Terns, and other less active or weaker birds until these are forced to disgorge or drop their prey. Their habit is gregarious, especially during the breeding season, when thousands congregate to nest in trees or bushes by the water's edge, or on bare rocks. The nest is a very slight, shallow structure of sticks: eggs 1-3 in number, white, with thick smooth shell. The young are covered with fluffy white down, like puff-balls, and look at first as if they had no feet. "They are fed by regurgitation, but grow tardily, and do not leave the nest until they are able to follow their parents on wing." The following is the only genus:

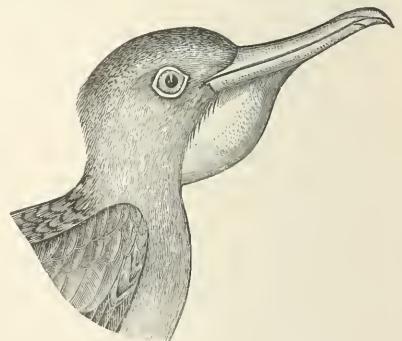


FIG. 681. — Gular pouch of Frigate.

Bulk of body slight compared with the great length of wings and tail. Here only in this order is found the *os uncinatum*, a peculiar skull-bone occurring in nearly all Petrels, the Tropicbird (*Musophagidæ*), and many Cuckoos; and here only the stomach develops no pyloric cavity. Cæca 2, very small. Sternum very broad for its length, with posterior border entire; furculum firmly ankylosed both with sternal keel and with coracoids, which latter are also soldered with scapulæ. The sacrocoxygeal vertebrae develop continuous transprocesses; the ilia are discrete in their preacetabular extent. Femorocaudal and ambiens present; accessory femorocaudal, semitendinosus, and its accessory absent. The pterylosis is of the Cormorant type, but the pterygæ are much less densely feathered.

Frigates are maritime and pelagic birds of most warm parts of the globe. Their general contour is unique among

FREGATA. (Ital. *fregata*, Span. and Port. *fragata*, in some other languages *fregat*, *fregatt*, *fregatte*, French *frégate*, a frigate; a word supposed to be formed from Lat. *fabricata*, fabricated, constructed, built.) FRIGATE BIRDS. MAN-O'-WAR BIRDS. HURRICANE BIRDS. RABHORCADOS. Characters as above given for the family. The following is the leading species; a subspecies of this is *F. a. minor*; a probable second species is *F. ariel*. (*Tachypterus* of most authors, as of all former editions of the Key.)

F. a'quila. (In form Lat. *aquila*, an eagle, prob. = adj. *aquilus*, dark, swarthy.) FRIGATE. PALMERSTON FRIGATE. MAN-O'-WAR BIRD. HURRICANE BIRD. RABHORCADO. Adult ♂: Brownish-black, glossed with green bronze or purple on head, scapulars and interseapulars, where the feathers are long and lanceolate, duller on belly; wings usually showing some brown or gray from wear. Adult ♀: Less glossy than ♂; less elongate feathers of head and scapulars. Back of neck brown; wing-coverts mostly brown, with darker centres and paler edges; fore neck, breast, and sides pure white. In ♂ ♀, iris brown; bill running through various whitish or flesh-tints to livid bluish and blackish in old ♂; bare space about eye livid; sac scarlet to orange; mouth carmine inside. Young: Most like adult ♀; more extensively white on head, neck, and under parts; eyes, bill, feet, and soft parts livid bluish, or undefinable dark color. Length about 40.00, variable with development of tail; extent 84.00-96.00; wing 23.00-27.00; tail 15.00-19.00, forked more than half its length; culmen 5.00-6.00; tarsus 1.00 or less! Tropical and subtropical seas; in North America, South Atlantic and Gulf coasts, regularly; N. casually to Nova Scotia, and in the interior to Ohio, Indiana, Wisconsin, and Kansas; on Pacific coast N. to Humboldt Bay, California: accidental in Germany in 1792 (BECHSTEIN). Nests on trees and bushes, chiefly mangroves, or on rocks; eggs 1-3, usually 1, 2.70-2.90 × 1.80-2.00, white, unmarked.

Family PHAETHONTIDÆ: Tropic Birds.

Bill about as long as head, stout, straight, compressed, tapering, acute, paragnathous, with continuous horny sheath (lacking the sutures seen in other birds of this order). Head rather large; neck short and thick, with comparatively few vertebrae, which lack those peculiarities of the articulating surfaces so marked in the kinky necks of Darters and Cormorants. Gular sac rudimentary, almost completely feathered. Nostrils small, linear, but remaining patulous. Tonia somewhat serrate. Tail of 12-14-16 feathers with the 2 middle ones in adult filamentous and extraordinarily prolonged, the rest short and broad. Wings moderately long, pointed. Feet small; toes fully webbed; hind toe more elevated than in other families of this order; middle claw not pectinated. Among anatomical characters it is to be noted that the muscles of the leg are as in *Laridae*, as might be expected from the outward resemblance of these birds to Terns; they having the accessory semitendinosus, lacking in other families of the order. The biceps cruris does not pass through a loop. The skull is holobrainal, as it is not in Gulls and Terns; the sternum is doubly notched behind. There is considerable pneumaticity of the subcutaneous tissue, as in various other birds of the present order. The plumage is close and smooth. The single egg is marked, contrary to the rule in this order; the nesting place is indifferently on the ground, rocks, trees, or bushes. The young is covered with white fluff.

The Tropic Bird resembles a large stout Tern in general figure; the bill, especially, being almost exactly like that of a Tern, and the system of coloration being similar. The principal external peculiarity is the development of the middle tail feathers: the feathering of the gular sac and the permanent patulness of the nostrils are other features. They are strong and swift birds on the wing, fly with quick regular strokes, and are capable of protracted flight, venturing far from land. They are gregarious at all times, and nest in communities along coasts and

on islands, in rocky places or among low trees and bushes. As implied in their name, they are birds of the torrid zone, though in their extensive wanderings they visit Southern seas, and have even been reported from beyond latitude 49° N. There were only 3 well-determined species (*P. flavirostris*, *P. athereus*, and *P. rubricauda*) for many years, but the latest monographer of the family recognizes 6; 3 of these are now known to occur in the U. S., and I can consequently add one to the two formerly given in the Key. The additional species is *P. rubricauda*; besides which, the one formerly given as *P. flavirostris* is now named *P. americanus*. The extralimital species are *P. lepturus*, *P. fulvus*, and *P. indicus*.

PHAËTHON. (Gr. φαῖθων, *Phaëthon*, son of Helios, the Sun; from φαῖθην, *phaëthin*, to shine, beam.) TROPIC BIRDS. BOATSWAIN BIRDS. STRAW-TAILS. Character as above.

Analysis of Species (Adults).

Tail of 12 feathers, middle pair not red.	Bill yellow	<i>americanus</i>
Tail of 14 feathers, middle pair not red.	Bill coral-red	<i>athereus</i>
Tail of 16 feathers, middle pair red with black shafts.	Bill orange-red	<i>rubricauda</i>

P. aethe'reus. (Lat. *athereus*, from Gr. αἰθέραος, *aitheraios*, pertaining to the upper air or æther; ethereal.) RED-BILLED TROPIC BIRD. CATESBY'S TROPIC BIRD. Tail of 14 feathers. Adult ♂ ♀: Bill coral-red. Iris black. Tarsi and tops of toes yellow; feet otherwise black, including claws. Plumage pure white, finely barred with black on nearly all the upper parts; black markings on flanks; a black transocular fascia, ending in a crescent on side of nape; several outer primaries with their outer webs and part of inner webs next the shaft, black; other primaries with a long black stripe; several inner secondaries mostly black; most of the tail-feathers with black shafts, and some outer ones with black marks; the long middle pair, however, with the shafts white in most of their extent. Length 30.00–36.00, including the long “pailles en queue;” without these, about 18.00; wing 12.00 (more or less); long middle tail-feathers up to 18.00 or more; tarsus 1.00; middle toe and claw 1.75; culmen 2.50; bill nearly 1.00 deep at base. Young birds do not differ much from adults; middle tail-feathers ungrown; more black in the white plumage, especially on tail and flanks; bill passing from yellow through orange to red. Tropical and subtropical America on both coasts; known to breed on San Pedro Martir Island in Gulf of California; accidental N. to Newfoundland Banks, Aug. 1876 (FREKE, Pr. Roy. Soc. Dublin, 1879); said to have been seen in Norway. Egg 2.25 × 1.60, heavily colored with dark reddish-brown.

P. america'nus. (Lat. American.) YELLOW-BILLED TROPIC BIRD. GRANT'S TROPIC BIRD. Tail of 12 feathers. Adult ♂ ♀: Bill yellow; tarsi yellow; most of toes black; claws black. Plumage pure white, in high feather tinted with rosy on under parts and long tail-feathers; not finely barred with black, but with definite black areas: a black transocular fascia as in *athereus*; an oblique black band on wing from lesser coverts to inner secondaries and scapulars; 1st primary with the black reaching within 0.50 of end; 2d–4th with black nearly reaching tips; 5th with black outer web to within about 1.00 of the end. Flank feathers with blackish shaft-stripes toward their ends; most of the shafts of tail-feathers, including middle pair, black. Young: Similar, but extensively marked with black bars or crescents on most of the upper parts, and spots on tail. Smaller than the last; bill notably smaller, hardly 2.00 along culmen and 0.75 deep at base; wing 11.00; development of middle tail-feathers about the same as in *athereus*, 16.00–21.00. Egg 2.20 × 1.55, indistinguishable from those of the foregoing. Tropical and subtropical America on the Atlantic side, rare or casual in the U. S., as on the Gulf coast; Florida; Cuba; the Bermudas; has strayed to western New York in one instance (COUES, Bull. Nutt. Club, v, 1880, p. 63). This is the original Tropic Bird of CATESBY, 1743, pl. 14; and the species figured by AUDUBON, folio pl. 262, 8vo pl. 427, from the Tortugas, under wrong name of *P. athereus*, which belongs to the foregoing. It is also *P. flavirostris* of all former editions of the Key, and of A. O. U. Lists,

but not of BRANDT, 1837, from which distinguished as *P. americanus* by GRANT, Bull. B. O. C. No. xlix, Dec. 29, 1897, p. xxiii; Cat. B. Brit. Mus. xxvi, 1898, p. 456; A. O. U. Suppl. List, Auk, Jan. 1899, p. 102, No. 112.

P. rubricauda. (Lat. *rubricauda*, red-tail; *ruber*, red; *cauda*, tail.) RED-TAILED TROPIC BIRD. Tail of 16 feathers. Adult ♂ ♀: Bill orange; iris black; tarsi and bases of toes bluish, rest of toes black. Plumage pure white, with a delicate roseate hue in high feather. A black transocular fascia, as in other species. Outer primaries with outer webs white. Inner secondaries with an irregular black band; remiges and lateral rectrices with most of the shafts black on upper side to near end; long middle tail-feathers carmine or scarlet, fading to white toward the base, with stiff black shafts, and a narrow black edging next them on the very slender webs; flank-feathers with blackish stripes. Young: Bill black or blackish, gradually changing to orange; upper parts with more black than in the adults, in bars on most of the upper parts, in spots and lengthwise stripes on the remiges and rectrices. Large: Length about 36.00; wing 12.25-13.25; long tail-feathers about 18.00; tarsus 1.25; bill 2.50-2.60. Tropical and subtropical Pacific and Indian Oceans: a recent addition to our Fauna, new to the Key: one specimen taken near Guadalupe Island, California, July 23, 1898 (ANTHONY, Auk, Jan. 1898, p. 39). *P. rubricauda* BODD. 1783; A. O. U. Suppl. List, Auk, Jan. 1899, p. 102, No. [113.1]. *P. phœnicurus* GM. 1788. *P. melanorhynchus* GM. 1788 (young).

Order LONGIPENNES: Long-winged Swimmers — Jaegers, Gulls, Terns, Skimmers.

Long-winged Natatores with open lateral nostrils and small-free hind toe. Wings long, pointed, reaching when closed beyond base, in many cases beyond end, of tail, which is usually lengthened and always of 12 rectrices. Tail square, or square with long-exserted middle feathers, or forked, or forficate, exceptionally cuneate. Developed primaries 10; no 5th secondary (wings aquintocubital). Legs more or less perfectly beneath centre of equilibrium when the body is in the horizontal position; crura more nearly free from the body than in other *Natatores*, if not completely external; tibiæ naked below; tarsus scutellate in part, elsewhere reticulate. Anterior toes palmate; hallux never united with the inner toe, highly elevated, directly posterior, very small (rudimentary in *Rissa*). Bill of variable form, but never extensively membranous nor lamellate, the covering horny throughout, sometimes discontinuous. Nostrils pervious, lateral, slit-like, but never abortive. No gular pouch. Altricial and nidicolous, but young covered with down when hatched. Eggs oftenest 3, always colored; nest ordinarily on the ground or rocks. Chiefly piscivorous.

Palate schizognathous; maxillo-palatines lamellar and concavo-convex; basipterygoid processes wanting; nasal bones schizorhinal. Cervical vertebræ 15. Sternum singly or doubly notched on each side of the posterior border; furculum with a hypoleididium; coraco-humeral groove well marked; hypotarsus with two grooves. There is apparently one pair of syringeal muscles throughout the order; cesophagus capacious and distensible; no special crop; proventriculus is a bulging of the gullet; gizzard small and little muscular; cœca variable; cloaca large. Contour-feathers aftershafted: oil-gland tufted: spinal pterygia defined in neck by lateral apertures, forked on back. According to Nitzsch, the pterylosis of Gulls "approaches very closely that of the *Scolopacidae*, and can hardly be distinguished therefrom with certainty by any character." In Terns, "in consequence of the slender and elegant form of the body, the tracts are very narrow, and perfectly scolopacine." Jaegers differ "in having the outer branch of the inferior tract united with the main stem in the first part of its course, and all the tracts still broader and stronger than in" Gulls. With all due regard to the

Limicoline affinities of *Longipennes*, as thus indicated by pterylosis, and further borne out by various osteological characters, I see no necessity for removing the present order from its long-wonted position next to Petrels, and not far from Auks. In former editions of the Key, I made the *Longipennes* include two suborders, *Gaviæ* for Jaegers, Gulls, Terns, and Skimmers, or "Slit-nosed Longwings," and *Tubinæres* for the Petrel group, or "Tube-nosed Longwings." But I remarked (p. 732) that *Longipennes*, as an order thus constituted, was "less substantially put together than either of the two preceding" (*Anseres* and *Steganopodes*), and that "it is not certain that the order must not be broken up." I now find it much better to raise my former suborders *Gaviæ* and *Tubinæres* to ordinal rank, as has been already done in the British Museum Catalogue of these birds, as well as by the A. O. U. I make no change in the composition or sequence of the two groups.

Fuller external characters of the *Longipennes* or *Gaviæ* are: Bill of moderate length, entire, or furnished with a cere; upper mandible longer than, as long as, or shorter than the under; culmen convex; commissure very large, cutting edges without lamellæ, symphysis of inferior mandibular rami complete for a considerable distance, an eminence being formed at their junction. No gular sac. Feathers usually extending farther on sides of upper mandible than on culmen, and farther between rami than on sides of under mandible. Nostrils never tubular, but linear or oval; direct, pervious, lateral, opening on basal half of bill. Eyes of moderate size, placed about over angle of mouth. Wings long, broad, strong, pointed, with little or no concavity. Primaries very long, more or less acute, the 1st developed one the longest, the rest rapidly graduated. Secondaries numerous, short, broad, with rounded or excised tips. Legs placed well forward, more or less perfectly ambulatorial. Thighs entirely covered and concealed. Tibiæ projecting; feathered above; a considerable portion below naked, covered with more or less dense, sometimes reticulated, skin. Tarsi of moderate length or rather short; compressed; rather slender; anteriorly transversely scutellate, posteriorly and laterally reticulate. Anterior toes of moderate length; middle one usually about equal to tarsus; outer shorter than middle, intermediate between it and inner; scutellate superiorly; all of normal number of segments (3, 4, 5). Hallux present; very small, short, elevated above plane of other toes; entirely free and disconnected; of the normal number of segments (2) — except in *Rissa*. Webs extending to claws; their surfaces finely reticulated, their edges usually more or less incised, sometimes rounded. Claws fully developed, compressed, curved, more or less acute; edge of middle dilated, but not serrated. Tail very variable. Body generally rather full, and sometimes slender. Neck rather long. Head of moderate size. Plumage soft, close, thick; its colors simple — white, black, brown, or pearl-blue predominating; bright tints hardly found, except on bill or feet, or as a temporary condition; sexes alike in color, but plumage varying greatly with age and season. Eggs generally 3, light-colored, with numerous heavy black blotches. Nidification normally terrestrial; reproduction altricial; young ptilopædic and nidicolous. Regimen chiefly piscivorous. Habitat fluvialite, lacustrine, and maritime rather than pelagic.

The birds thus characterized may be regarded as forming one family with four subfamilies, as in former editions of the Key; or divided into two, three, or four families. The A. O. U. has *Stercorariidæ*, *Laridæ* (with subfamilies *Larinæ* and *Sterninæ*), and *Rhynchopidæ*. In view of the anatomical characters which I first pointed out in 1863, I am now inclined to recognize two families, *Stercorariidæ* and *Laridæ*, the latter with three subfamilies, *Larinæ*, *Sterninæ*, and *Rhynchopinæ*; and such is the course adopted by Howard Saunders, the latest monographer of the *Longipennes* or *Gaviæ* (Cat. B. Brit. Mus. xxv, 1896, p. 3).

Analysis of Families and Subfamilies.

Cæca very long; steruum single-notched.

Bill cered, epignathous. Tail square, with long-exserted middle feathers. Webs full; claws raptorial. (Skuas.)
Family STERCORARIIDÆ

Cœca moderate; sternum double-notched. Bill not cered	Family LARIDÆ
Bill epignathous. Tail usually square (Gulls)	Subfamily Larinæ
Bill paragnathous. Tail usually forked. (Terns)	Subfamily Sterninæ
Bill hypognathous. Tail forked, (Skimmers)	Subfamily Rhynchopinæ

Family STERCORARIIDÆ: Jaegers, or Skuas.

Long-winged Swimmers with the horny covering of the epignathous bill discontinuous, the upper mandible being saddled with a large "cere," perhaps deciduous, beneath the edges of which the nostrils open (unique, among water-birds), and the dertrum or hook at the end being also marked off from the rest. Tail nearly square, but middle pair of feathers abruptly long-exserted in *Stercorarius*. Feet strong; tibiae naked below; podotheca granular or otherwise roughened behind, scutellate in front; webs very full; claws large, curved, acute. Certain pterylographic characters have been already noted. A leading anatomical peculiarity is the large size of the cœca, as compared with *Laridæ*. Another is that the sternum is single-notched behind, there being two notches on each side in the three subfamilies of *Laridæ*. There are two genera and six or seven species of the family. Only four species are well determined. They belong more particularly to the Northern Hemisphere, although some also inhabit southern seas; they mostly breed in boreal regions, but wander extensively at other seasons. They inhabit sea-coasts, and also large inland waters; the nidification resembles that of Gulls; eggs 2-3, dark-colored, variegated. The sexes are alike; the young more or less different; there is also a particular melanotic plumage, apparently a normal special condition. At first the central tail-feathers do not project, and they grow tardily. Skuas are eminently rapacious, whence their name of "jaeger" (hunter); they habitually attack and harass Terns and small Gulls, until these weaker and less spirited birds are forced to drop or disgorge their prey. Their flight is vigorous; lashing the air with the long tail, they are able to accomplish the rapid and varied evolutions required for the successful practice of piracy. Thus in their leading traits they are marine Raptores; whilst the cered bill and strong hooked claws furnish a curious analogy to true birds of prey. (*Lestridinæ* of former editions of the Key, as a subfamily of *Laridæ*.)

Analysis of Genera and Species.

- Bill shorter than middle toe without claw; tarsus shorter than middle toe and claw; central rectrices little projecting, broad to the tip. MEGALESTRIS.
- Of great size, and robust form. Bill 2 inches long *m. skua*
- Smaller: bill and tarsi relatively longer than in the foregoing; latter not shorter than middle toe and claw; central rectrices finally projecting far beyond the rest. STERCORARIUS.
- Central rectrices projecting about 4 inches, broad to the end, and twisted *s. pomatorhinus*
- Central rectrices projecting about 4 inches, acuminate, not twisted *s. parasiticus*
- Central rectrices projecting 8-10 inches, acuminate, not twisted *s. longicauda*

MEGALES'TRIS. (Gr. μέγας, *megas*, great, large, and ληστρίς, *lestris*, piratical, from ληστής, *lestes*, a robber, thief.) **SKUAS.** Bill shorter than middle toe without claw; exceedingly robust; width at base about equal to height, which is a third of the length of culmen. Striæ and sulci numerous and well marked. Encroachment of feathers on bill moderate, and nearly the same on both mandibles. Occiput scarcely crested. Wings only moderately long for this subfamily; primaries very broad, and rounded at their tips. Tail very short, broad, nearly even, the feathers truncated; central pair projecting about ½ an inch in adults, broad to their very tips, which are also truncated. Feet large and stout; tarsi shorter than middle toe and claw. Size large; form robust and heavy; general organization very powerful. Colors much the same over the whole body; not subject to any very remarkable changes with age, sex, or season. One northern species, *M. skua*, occurring in North America, and two or three others of southern seas, the best known of which is *M. antarctica*. (As subgenus of *Stercorarius* in 2d-4th eds. of Key. *Buphagus* COUES, 1863, after Moehring, 1752, of 1st ed. of Key.)

M. sku'a. (Færoese name, as given by Hoier about 1604, now spelled *skuir*; Shetland name *skooi*, Icelandic *skumr* or *skufr*, Norwegian *skua*.) GREAT or COMMON SKUA. SEA-HAWK. SEA-HEN. BONXIE. Adult ♂ ♀: Lateronuchal feathers elongated, rigid, with long disconnected fibrillæ. Above, blackish-brown, more or less variegated with chestnut and whitish; each feather being dark-colored, with a spot of chestnut toward its end, fading into whitish along the shaft. On the lateronuchal region and across throat the chestnut lightens into reddish-yellow, with a well-defined, narrow, longitudinal white streak on each feather. Crown, postocular, and mental regions have but little whitish. Inferiorly the plumage is blended fusco-rufous, lighter than back, and with a plumbeous shade. Wings and tail blackish; their shafts white, except toward tips; remiges and rectrices white for some distance from base; this white on tail is concealed by the long coverts, but appears on outer primaries as a conspicuous spot. Bill and claws blackish; the cere grayer; feet black; iris brown. In another plumage, not known to be regularly characteristic of age or season, the bird is nearly uniformly sooty-blackish, with the white wing-spot very conspicuous. Very old birds may become lighter colored. Length 20.00–22.00; wing 16.00; tail 6.00; tarsus 2.70; middle toe and claw 3.10; bill from base to tip 2.10; to end of cere 1.20; gape 3.00; height at base 0.75; width a little less; gonys 0.50. Young-of-the-year: Size much less; bill weaker and slenderer; cere ill developed; striæ not apparent, and its ridges and angles all want sharpness of definition. Wings short and rounded, the quills having very different proportional length from those of adults; 2d longest, 3d but little shorter, 1st about equal to 4th. The inner or longest secondaries reach, when the wing is folded, to within an inch or so of tip of longest primary. Central rectrices a little shorter than the next. Colors generally as in adult, but duller and more blended, having few or no white spots; reddish spots dull, numerous, and large, especially along edge of forearm and on least and lesser coverts. On under parts the colors lighter, duller, and more blended than above; prevailing tint light dull rufous, most marked on abdomen, but there and elsewhere more or less obscured with ashy or plumbeous. Remiges and rectrices dull brownish-black; their shafts yellowish-white, darker terminally. At bases of primaries there exists the ordinary large white space, but it is more restricted than in adults, and so much hidden by the bastard quills that it is hardly apparent on outside of wing, though conspicuous underneath. Feet brownish-black, variegated with yellowish. Bill along culmen 1.75; along gape 2.75; height at base 0.50; gonys 0.35; tarsus 2.60; middle toe and claw the same; wing 12.25; tail 5.75. Nestlings: Buffy-gray, ruddier above than below. Eggs 2–3, 2.75 × 1.95, ovate, pale olivaceous or brownish, spotted and blotched with dark brown. This powerful predatory sea-fowl inhabits the coasts and islands of the N. Atlantic, only casually occurring on inland waters; it is known to breed in Iceland, the Shetland and Færoe islands, etc.; S. in winter to the Straits of Gibraltar. On the American side it is rare; known to occur from S. Greenland and Hudson's Straits, where possibly it breeds, to Quebec (Auk, Oct. 1890, p. 387), Massachusetts (Bull. Nutt. Club, iii, 1878, p. 188; Auk, i, 1884, p. 395), New York (Niagara, Auk, Oct. 1889, p. 331), Long Island (Auk, iii, 1886, p. 432), and casually to North Carolina. Not known to have occurred on the Pacific Coast; the "California" record of our books since 1858 not authenticated. (*Stercorarius skua* of former editions of Key.)

STERCORARIUS. Lat. *stercorarius*, having to do with *stercus*, dung, ordure, excrement, as a scavenger.) JAEGER. TEASERS. BOATSWAINS. MARLINGSPIKES. DUNGHUNTERS. Size smaller, and form less robust than in *Megalestris*; bill weaker, its depth at base less than length of the cere. Tarsus not shorter than middle toe and claw. Central rectrices of adults long-exserted, projecting from 3–4 to 8–10 inches beyond the others. Three species, of wide distribution, all American. (For analysis, see p. 975.) Each of the three is well marked by the characters of the central rectrices of the adults, which in *S. pomatorhinus* are broad throughout and peculiarly twisted at their ends, so that a vertical spatulate figure results. This species and *S. parasiticus* are often dichromatic, having a melanotic phase of plumage rarely known to occur in *S. longicauda*.

S. pomatorhi'nus. (Gr. *πῶμα*, *πῶματος*, *poma*, *pomatos*, a flap, lid; *ρίς*, *ρίνος*, *hris*, *hrinos*, nose: in allusion to the cere. Fig. 682.) POMATORHINE JÄGER. Bill shorter than head, or $\frac{3}{4}$ the tarsus, about $2\frac{1}{2}$ times its height at base; width about the same as height. Tail (without middle feathers) less than half the wing; 1st primary little longer than 2d. Occiput subersted. Feathers of neck rigid and acuminate, their fibrillæ disconnected. Tail-feathers, including middle pair, broad to tips, which are truncated, the rachis projecting as a small micro; middle pair projecting 3.00–4.00, and not flat near tip, where they are twisted on the shafts at an angle of 45° or more, so that the vanes together form a nearly vertical disc visible in flight; the webs near the tip also lengthened to about 2.75, those of other rectrices being only about 1.75; exclusive of these projecting feathers, the tail is slightly graduated. Tibiæ bare for 0.75, scutellate 0.50. Tarsi very rough, anteriorly covered with a single row of scutella, except toward the tibiotarsal articulation, where these scutella gradually degenerate into small, irregular polygonal plates, with which all the rest of the tarsus is reticulated. These plates largest on outer side of tarsus; on heel-joint, and posterior aspect of tarsus generally, they rise into small cones acutely pointed. Tarsal scutella continuous in front with those on toes; polygonal reticulation on both surfaces of webs, and under side of toes. Hallux extremely short, its nail stout, conical at base, acute, little curved. Anterior claws very strong and sharp; inner most so; middle expanded, but not serrated. Webs broad and full, their free margins a little convex. Cere straight, smooth, with transversely convex culmen; its lower border curves gently upward to give passage to the nostrils. Adult ♂ ♀, in breeding plumage: Bill horn-color, deepening into black: feet black. Pileum and occipital crest brownish-black, this color extending much below eyes, and occupying feathers on sides of lower mandible. Acuminate feathers of neck light yellow. Back, wings, tail, upper wing-coverts, under tail-coverts as far as flanks, deep blackish-brown. Under parts, from chin to abdomen, and neck all round (except the acuminate feathers), pure white. Length 20.00 or more; extent 48.00; wing 14.00; tail 5.00 or more, with middle feathers projecting 3.00–4.00 farther; bill 1.75; tarsus 2.00–2.10; middle toe and claw rather less. Nearly adult: Generally the same, but with a row of brown spots across breast; sides under wings barred with white and brown; dark color of abdomen interrupted by touches of white. Feet wholly black; middle tail-feathers projecting about 3.00. Intermediate stage: The band of dark spots across breast so enlarged that the whole breast appears brown, mottled with white; sides under wings conspicuously barred with white and brown; white of under parts continued over abdomen to under tail-coverts, the pure brown of these parts which obtains in the adult only appearing as transverse bars. Upper tail-coverts and some of the wing-coverts barred with white. Bases of primaries inferiorly white. Central tail-feathers only projecting 1.00 and not twisted. Feet irregularly blotched with chrome-yellow. Young-of-the-year: Bill much smaller and weaker than in the adult, light-colored to beyond nostrils, where it becomes brownish-black. Feet mostly



FIG. 682. — Pomatorhine Jäger.

bright-yellow; ends of toes black. Whole body transversely waved with dull rufous. On head, neck, and under parts, this rufous predominates, and the bands are very numerous, of about the same width as the intervening dark color. On flanks and under tail-coverts the bars become wider, and paler or almost white. On back and wing-coverts brownish-black prevails, and if any rufous is present, it is merely as narrow edging of the feathers. Quills and tail-feathers brownish-black, darker at tips, whitish toward bases of primaries on inner webs. Light rufous predominating on head and neck; a dusky spot before eye. All the above stages traceable from one to another, and evidently progressive with age, though the several plumages described do not always succeed one another regularly; all are independent of sex and season, and different from the following *melanotic* state, in which the bird is nearly unicolor; blackish-brown, deepening into black on pileum, lightening into fuliginous-brown on abdomen, with a slight gilding of the black on sides of neck; bases of primaries whitish. The feet are chromo-variegated and the middle tail-feathers scarcely project 0.50 in all the melanotic individuals I have examined, indicating immaturity; but it is probable that breeding adults may be found in this condition, and certain that the melanism is not permanent in all individuals that display it at some period of their lives. This species is very wide ranging; it chiefly inhabits the Northern Hemisphere, breeding within the Arctic circle, but in winter reaches South Africa, North Australia, and portions of South America. Not common in North America, but observed along the coasts and over some of the larger inland waters of the U. S. during migrations and in winter. Nest on the ground; eggs 2-3, 2.35×1.65 , of variable olivaceous, greenish, or brownish ground color, more or less heavily spotted with dark brown. (A. O. U. misspells "*pomarinus*" after TEMM. 1815.)

S. parasiticus. (Lat. *parasiticus*, parasitic.) PARASITIC and RICHARDSON'S JAEGER of the books. ARCTIC BIRD (♀) of Edwards, 1751, pl. 149. ARCTIC GULL and BLACK-TOED GULL of Pennant, 1768. FASCEDDAR or FASGADAIR of the Hebrides. SHOOI of the Shetlands. SCOUTY-ALLEN of the Orkneys (also SCOUTY-AULIN, SCOUTI-AULIN, SCOUTI-ALLIN, etc.). SKAIT-BIRD. BOATSWAIN, MARLINGSPIKE, TEASER, and DUNGHUNTER of U. S. fishermen.) Bill much shorter than head or tarsus, as high as broad at base. Culmen broad, flattened, scarcely appreciably convex to unguis, which is moderately convex. Rami very long; gonys very short; both somewhat concave in outline. Eminentia symphysis small but well-marked. Tomia of upper mandible at first ascending and a little concave, then descending and a little convex, very concave toward tip. Cere without oblique striæ, but a straight longitudinal sulcus on each side of culmen; length of cere greater than that of unguis. Feathers extending far on upper mandible, with a curved free outline, so broad that the feathers of its sides meet over culmen. Feathers on lower mandible also projecting considerably, almost filling the triangular sulcus on the side, as well as the angular space between rami. Wings moderately long, strong, pointed; 1st primary much the longest; rest regularly and rapidly graduated. Tail contained not quite $2\frac{1}{2}$ times in the wing, the lateral feathers graduated only 0.50, the acuminate middle pair projecting 3.00-4.00 only, and beginning to taper about 4.00 from their very acute tips. Feet rather short and quite slender; tarsus as long as middle toe and claw; tibia naked 0.50 above the joint; scutellation and reticulation the same as already described under *S. pomatorhinus*. Adult ♂♀, in breeding plumage: A decided occipital crest and a calotte. Nuchal region with the feathers acuminate and rigid, with loosened webs. Pileum, occipital crest, and whole upper parts brownish-black, with somewhat slaty tinge and slight metallic gloss, deepening into black on wings and tail. Shafts of primaries and rectrices whitish, except at tips; their inner vanes whitening toward their bases. Chin, throat, sides of head, neck all round, and under parts to vent, pure white; the rigid, acuminate feathers of lateronuchal region light yellow. Under tail-coverts like upper parts, but somewhat fuliginous, with sharp line of demarcation from white of abdomen. Bill horn-colored, the hook darker than the cere; tarsi and toes black. Smaller than the Pomatorhine

Jaeger: Length 17.00–20.00; wing 12.00–13.00; tarsus 1.75–1.87; bill 1.35–1.50; tail 5.00–6.00, the long feathers up to 9.00. Nearly mature: Pileum, lateronuchal region, and whole upper parts, as in adult. Under parts white (as in adult), but clouded everywhere with dusky patches, most marked across breast, on sides, flanks, and under tail-coverts, leaving middle of belly and throat nearly pure. Varying degrees of this dusky nubilation approach in some specimens nearly to the uniform dusky plumage below characterized; in others fade almost into the pure white of the normal adult, connecting the two states perfectly. The tarsi of the darkest specimens have small yellow blotches; others not. Melanotic state (adult): Wholly deep dusky; darker and more plumbeous above; lighter and with a fuliginous tinge below; pileum black; lateronuchal region yellow; remiges and rectrices black; feet black. Immature (size and general proportions nearly of adult; bill and cere perfectly formed): Feet mostly black, but with some yellow blotches. Upper parts unadulterated with any rufous bars; the deep brownish-black pileum has appeared, and sides of neck have obtained their yellow shade, which contrasts conspicuously with the fuliginous background. Evidences of immaturity, however, are found on under parts, where the dark color is mixed with illy-defined transverse bars of ochraceous; rufous is also found at bend of wing and on under wing- and tail-coverts. Primaries still whitish outside, as are also the rectrices. The middle tail-feathers project 2.50, and have the tapering form of those of adults. Younger (small size, delicate bill and feet, little projection of the central rectrices, general mollipilose condition of plumage, etc.): The rufous of the very young bird, instead of giving way everywhere to dusky, yields to this color only on upper parts and crown; on sides of head, neck, and whole under parts, whitish prevailing, only interrupted by indistinct dusky bars. The yellow of sides of neck has not yet appeared. There are the same white spaces on bases of wings and tail that exist in very young birds. The middle tail-feathers project about 2.50. Young-of-the-year in August (size considerably less than that of adult; form every way more delicate; wings more than 1.00 shorter; bill and feet much slenderer and weaker): Bill in some specimens light bluish-horn; in others greenish-olive, the terminal portion brownish-black. Tarsi and greater part of toes yellow. Plumage everywhere rayed and barred with rufous and brownish-black. On head and neck the light ochraceous rufous predominates, the dark color only appearing as a narrow line along shaft of each feather. Proceeding down neck to back, the longitudinal lines gradually spread until between shoulders they occupy the whole of each feather, except a narrow border of rufous, which latter is of a deeper tint than on head. Passing down throat to breast, the rufous becomes decidedly lighter — almost whitish; while the dark brown, which on the throat exists only in longitudinal lines, changes to transverse bars of about equal width with the light rufous bars with which it alternates. This pattern prevails over the whole under parts, the transverse bars being broadest on flanks and under tail- and wing-coverts, narrowest in middle of belly. Primaries brownish-black, narrowly tipped with rufous, their shafts yellowish, their inner webs fading basally into white. Tail like wings; middle feathers projecting about 0.75. Such are the plumages of the normally colored birds, from the first feathering to the fully adult dress, irrespective of the melanotic state; but some individuals show the dark phase at all ages, and when adult pair with birds of the normal plumage, giving rise to intermediate specimens in every degree between the extremes. Eggs 2–3, resembling those of *Numenius borealis*, and quite as variable in ground-color and markings but not so pear-shaped; size 2.00–2.40 × 1.50–1.70, averaging about 2.30 × 1.65; the nest is placed on the ground in open places, in the grass, moss, or heather. This Jaeger is found at times in most parts of the world, but breeds normally in arctic and subarctic regions of both hemispheres, ranging in winter to South Africa, Australia, New Zealand, and portions of South America. It breeds abundantly in some localities in British America and Alaska, and is of common occurrence in the U. S. in winter, on both coasts and in the interior (Illinois, Colorado, etc.). It has many synonyms, of which *crepidatus* is the most prominent, and used by those who apply *parasiticus* to the next species; *richardsoni* was based on the melanotic state.

S. longicauda. (Lat. long-tailed. Fig. 683.) ARCTIC JÄGER. LONG-TAILED JÄGER. BUFFON'S JAEGER. ARCTIC BIRD (♂) of Edwards, 1750, pl. 148, and sharing most of the other names of the preceding species. Bill shorter than head, less than middle toe without claw; stout, compressed, higher than broad at base, its sides regularly converging. Cereal portion of culmen broad, flat, depressed, slightly concave in outline, ungual portion very convex to the greatly overhanging tip; narrower than the cereal. Tomia of upper mandible sinuate, at first concave and ascending, then convex and descending; again very concave as they decurve toward tip, just behind which there is an imperfect notch. Tomia of lower mandible nearly straight to tip, where decurved. Gonys short, slightly concave. Eminencia symphysis acute, but not large; rami long as compared with gonys, but absolutely rather short, from encroachment of feathers. Cere very short, not longer than unguis (compare last species). Encroachment of feathers on bill greater than in any other species; on upper mandible they extend within 0.50 of the distal end of cere, having a broad, rounded termination, the feathers of the two sides meeting on and covering culmen some distance from its real base. Feathers on sides of lower mandible extending nearly as far as on upper, and those between the rami quite to symphysis. Wings long; 1st primary much the longest, the rest rapidly graduated. Tail longer, both absolutely and relatively, than in any other species, being half as long as wings, graduated 0.75. Middle pair of rectrices exceeding wings; projecting 8.00–10.00 beyond the others, rigid at base, being there much stiffer than the other feathers, but gradually becoming flexible, and at length filamentous. Feet quite slender; tarsus equal to middle toe and claw. Tibiæ bare of feathers for 0.75; reticulation of feet identical with that already described under other species; scutella in front of tarsus, however, showing a tendency to degenerate into minute plates near tibio-tarsal joint. Proportions of toes as in other species, but claws comparatively small and weak. Adult ♂ ♀, in breeding plumage: Occiput decidedly suberested; lateronuchal feathers lengthened, with disconnected webs, but hardly acuminate or rigid. Bill dusky, its nail almost black. Tarsi leaden-blue in life, drying some indefinable color; tibiæ, toes, webs, and claws black. Cap brownish-black, which color extends on cheeks, the feathers before and below eye and on sides of bill being of this color. Neck all round, but especially the peculiarly-formed feathers on the lateronuchal region, light straw-yellow. Whole upper parts, with upper wing- and tail-coverts, deep slate, which, on primaries, secondaries, lateral tail-feathers, and distal half of central pair, deepens into lustrous brownish-black. Under surface of wings and tail deeper slate than the back, but not so deep as their upper surfaces. Chin, throat, and upper breast white, gradually obscured with dark plumbeous, which deepens posteriorly, so that abdomen and under tail-coverts are nearly as dark as back. Shafts of first two or three primaries pure white, turning into brownish-black at tips; of other primaries, and of tail-feathers (including central pair), brown, except just at base, blackening terminally. Under surfaces of all the shafts white for nearly their whole length. Chord of culmen 1.15; gape 1.70; cere 0.60; unguis about the same; gonys 0.30; from feathers on sides of bill to tip 0.90; wing 12.50; tail 6.25, its middle feathers 14.00 to 16.00, projecting 8.00–10.00; tibiæ bare 0.75; tarsus 1.60; middle toe without claw 1.40. In bulk of body this species is decidedly less than *S. parasiticus*; but the extreme elongation of the middle tail-feathers makes its total length as much or even more — up to 23.00 in some cases. The changes and states of plumage are identical with those of the preceding species, though the melanotic phase is extremely rare (Ibis, 1865, p. 217). Adults of the two species, with fully grown tail-feathers, cannot be confounded, but it is usually difficult to distinguish young birds: observe the small size, and some differences of proportions above described, especially the short cere; and in general a more ashy or grayish tone of the plumage. Eggs not distinguishable; averaging smaller, but dimensions overlapping; a fair specimen is 2.10×1.50 ; from this down to 1.90×1.40 . This Jaeger, like the last, inhabits the Northern Hemisphere, but is on the whole more northerly, breeding chiefly within the



FIG. 683. — Long-tailed Jaeger.

Arctic circle, and seldom wandering in winter so far south. It is less common in the U. S. at that season, and mainly observed in the Northern States; but is known to have reached the Gulf of Mexico. (*S. parasiticus* of many writers; *S. erepidatus* of some; *S. buffoni* of former editions of the Key; *S. longicaudus* A. O. U. Lists, No. 38.)

Family LARIDÆ: Gulls, Terns, Skimmers.

Long-winged Swimmers with horny covering of bill continuous (no cere); lateral nostrils pervious (and not tubular); middle tail-feathers not long-exserted; cœca of moderate length, and sternum double-notched on each side of posterior border. The characters of *Laridæ* as defined are simply those of the order *Longipennes* or *Gaviæ*, minus those of the family *Stercorariidæ* (see p. 975). This family is a large and important one, including 18 or 20 genera and some 110 species, of all parts of the world — all of the order excepting the 6 or 7 species of Skuas or Jaegers. It is obviously and naturally divisible into 3 subfamilies, according to the analysis on p. 975; and these subfamilies are more fully described under the following heads of *Larinæ*, *Sterninæ*, and *Rhynchopinæ*.

Subfamily LARINÆ: Gulls.

Bill more or less strongly epignathous, compressed, with more or less protuberant gonys; nostrils linear-oblong, median or sub-basal, pervious. Tail even or nearly so, rarely forked (in *Xema* and *Creagrus*) or cuneate (in *Rhodostethia*), without projecting middle feathers. Certain of the small slender-billed species resemble Terns, but may be known by the not forked tail (except *Xema*); in all the larger species, the hook of the bill is distinctive, and the short symphysis of the lower mandible makes a prominent gonydeal angle. Gulls average much larger than Terns, with stouter build; the feet are larger and more ambulatorial, the wings are relatively shorter and not so narrow; the birds winnow the air in a steady course unlike the buoyant dashing flight of their relatives. They are cosmopolitan; species occur in abundance on all sea-coasts, and over large inland waters; in general, large numbers are seen together, not only at their breeding-places, but during the migrations, and in winter, when their association depends upon community of interest in the matter of food. This is almost entirely of an animal nature, and consists principally of fish; the birds seem to be always hungry, always feeding or trying to do so. Many kinds procure food by plunging for it, like Terns; others pick up floating substances; some of the smaller kinds are adroit parasites of Pelicans, snatching food from their very mouths. They all swim lightly — a fact explained by the small bulk of the body compared with its apparent dimensions with the feathers on. The voice of the larger species is hoarse, that of the smaller shrill; they have an ordinary note of several abrupt syllables during the breeding season, and a harsh cry of anger or impatience; the young emit a querulous whine. The nest is commonly built on the ground; the eggs, 2-3 in number, are variegated in color, being heavily marked with dark brown shades on a pale brownish, greenish, or olivaceous ground. Nestlings in down are spotted.

Several circumstances render the study of these birds difficult. With some few generic exceptions, they are almost identical in form; while in size they show an unbroken series. Individual variability in size is high; northerly birds are usually appreciably larger than those of the same species hatched farther south; the ♂ exceeds the ♀ a little (usually); very old birds are likely to be larger, with especially stouter bill, than young or middle-aged ones. There is, besides, a certain plasticity of organization, or ready susceptibility to modifying influences, so marked that individuals hatched at a particular spot may be appreciably different in some slight points from others reared but a few miles away. One pattern of coloration runs

through nearly all the species; they are *white*, with a darker mantle (*stragulum*), and in most cases with black crossing the primaries near the end, and tips of the quills white. The shade of the mantle is very variable in the same species, according to climate, action of the sun, friction, and other causes; the pattern of the black on the quills is still more so, since it *continually* changes with age, until a final stage is reached. Incredible as it may appear, species and even genera have been based upon such shadowy characters. One group of species (genus *Chroicocephalus*) has the head enveloped in a dark hood in the breeding season, the under parts tinted with peach-blossom hue. The sexes are always alike; the moult appears to be twice a year, so that a winter plumage more or less different from that of summer results; the young are never quite like the old. The change is slow, with some of the larger species generally requiring 2-3 years; in the interim, birds are found in every stage. Young are always *darker* than old ones, often quite dusky; usually with black or flesh-colored bill; and if with black on primaries when adult, the young usually have these quills all black. There being no peculiar extralimital species, those of our country give a perfect idea of the whole group. Some 75 species have been current; but there are hardly over 50 good ones. Mr. Howard Saunders, the latest monographer of *Laridæ*, and a judicious one, describes 51 species of *Larinæ*. He has very ably completed the rescue of these much-abused birds from the clutches laid upon them by Bruch and Bonaparte in 1853-56, extricating them from the confusion which had been only partially done away with by my earlier writings. He adopts 7 genera, placing no fewer than 44 species in the single genus *Larus*; his only extralimital genera being *Gabianus* (*pacificus*), and *Leucophaeus* (*scotesbii*). Regarding North America, I only differ with my friend in continuing to keep *Chroicocephalus* apart from *Larus* proper, and in now recognizing *Creagrus* apart from *Xema*. *Creagrus* is sanctioned by the A. O. U., but *Chroicocephalus* is not. The only change from the 2d edition of the Key I now make is in adopting *Creagrus*.

Analysis of Genera.

- Tail square.
 - Head never hooded; under parts never rosy-tinted; size medium and large; bill stout.
 - Hallux well developed, with perfect claw.
 - Adult white, with a colored mantle, or dark, with white head *Larus*
 - Adult entirely white: feet black *Pagophila*
 - Hallux usually defective. (Tail emarginate in the young) *Rissa*
 - Head in summer hooded, and under parts rosy-tinted; size medium and small; bill slender . . . *Chroicocephalus*
- Tail wedge-shaped; head not hooded, but neck collared; size small. Highly Arctic *Rhodostethia*
- Tail forked; head hooded.
 - Size small; wing under 12.00; bill short; feet black *Xema*
 - Size large; wing about 16.00; bill long; feet red. (Extralimital?) *Creagrus*

LARUS. (Gr. *λάρος, laros*, Lat. *larus*, a gull.) **GULLS.** Bill shorter than head or tarsus, more or less robust, usually very stout, deep at base, higher than broad, compressed throughout, apex not very acute and never much attenuated. Culmen about straight to beyond nostrils, then convex, the amount of curvature increasing toward the end, varying in different species. Commissure slightly sinuate at its extreme base, then about straight to near end, where it is more or less arcuato-declinate. Eminentia symphysis prominent and well-defined, rather obtuse, seldom acute. Nostrils placed rather far forward in well-defined nasal fossæ, rather broader anteriorly than posteriorly. Feathers of forehead extending considerably further on sides of upper mandible than on culmen, but falling considerably short of nostrils. Wings when folded reaching beyond tail; 1st primary longest, 2d but little shorter, rest rapidly graduated. Tail of moderate length, never forked nor rounded. Legs of moderate length; tibiæ bare for a considerable distance above the joint, the naked part smooth. Tarsus about equal to or a little longer than middle toe and claw, varying but slightly in proportions among the different species: anteriorly sentellate, posteriorly and laterally reticulate. Hallux fully developed. Anterior claws stout, little curved, rather obtuse, inner edge of middle one dilated. Webs scarcely incised. Comprising the largest and many medium-sized species of the sub-

family, being those most typical of it. White, with a darker mantle, without a hood or collar; head and neck in winter streaked with dusky (*Larus* proper); or dark, with white head and red bill (*Blasipus*).

Analysis of Species.

- I. Tail and under parts white in adult; bill and feet not reddish. (*Larus*.)
- A. Large and robust: mantle whitish or pale pearly; no black on primaries at any age.
Mantle very pale pearly; primaries the same, fading insensibly into white far from tips.
Larger: length about 30.00 inches; wing 18.00 or more; bill and tarsus, each, about 3.00. Arctic, Pacific, Atlantic *glaucus* (and *barrovianus*?)
Smaller: length about 24.00 inches; wing 17.00 or less; bill about 2.00; tarsus 2.25. Arctic and Atlantic *leucopterus*
Mantle light blue; primaries the same, with definite white tips. Pacific *glaucescens*
Mantle very pale blue, as in *leucopterus*; primaries with slate-gray markings.
Smaller: wing 16.00-17.00. Atlantic *kumlieni*
Larger: wing over 17.00. Pacific *nelsoni*
- B. Very large: mantle slaty-blackish; primaries crossed with black.
Largest: size of *glaucus*; length 30.00; wing 18.00-19.00. Atlantic *marinus*
Not so large: length about 26.00; wing 17.00-18.00. Pacific *schistisagus*
- C. Large: mantle some shade of blue, darker than in A, lighter than in B; primaries crossed with black.
Mantle grayish-blue; bill moderately robust; feet flesh-colored. N. Am. at large
(*argentatus* or) *smithsonianus*
Mantle slaty-blue; bill very robust; feet flesh-colored. Pacific *occidentalis*
Mantle dark grayish-blue; bill moderately robust; feet flesh-colored. Pacific *vegæ*
Mantle dark slate; bill moderately robust; feet yellow. Greenland only *affinis*
- D. Medium and small: primaries crossed with black; feet greenish or yellowish; webs yellow.
Tarsus obviously longer than middle toe and claw; bill of adult greenish-yellow, encircled with black band; first primary usually with a sub-apical white spot; length about 18.00-20.00. N. Am. at large
delawarensis
Tarsus little if any longer than middle toe and claw; bill with red spot, but an imperfect black band, if any; first primary usually with end broadly white; length about 20.00-22.00. Western N. Am. *californicus*
Tarsus little or not longer than middle toe and claw; bill slender, greenish, without black band or red spot; size very small; length 16.00-18.00. Chiefly Arctic and Pacific (Labrador?) (*canus* or) *brachyrhynchus*
- II. Tail and under parts dark in adult. Head white; bill and feet reddish. (*Blasipus*.)
Back slaty-lead color. Pacific *heermanni*

(*Subgenus* LARUS.)

L. glau'cus. (Gr. *γλαυκός*, *glaukos*, Lat. *glaucus*, bluish.) GLAUCOUS GULL. ICE GULL. BURGOMASTER. Very large: Length about 30.00; extent 60.00; wing up to 18.50; tail up to 8.50; bill 2.75-3.00 (chord of culmen), along gape 3.75, its depth opposite nostrils 0.80, at angle 0.85; tarsus 3.00-3.25; middle toe and claw 2.75. No black anywhere at any age. Adult ♂ ♀ in summer: Bill large and strong, very wide, but not so deep at angle nor so convex at end as in *marinus*, about as long as middle toe and claw; chrome yellow, the tip diaphanous yellow, a vermilion spot at angle. Legs and feet pale flesh-color or yellowish. Iris yellow. Primaries entirely white, or palest possible pearly-blue, fading insensibly into white at some distance from their tips, their shafts straw-yellow. Mantle very pale pearl-blue. Otherwise, wholly white. In winter: Head and hind neck lightly touched with pale brownish-gray. A supposed immature stage (the so-called *L. hutchinsi*): Entirely white; bill flesh-colored, black-tipped. Young: Bill flesh-colored, black-tipped; plumage impure white, mottled with pale reddish-brown, sometimes quite dusky on back; under parts a nearly uniform pale shade of brownish; quills and tail imperfectly barred with the same. Smaller: wing 17.50; bill 2.40; tarsus 2.40, etc. Downy young: Pale gray, still paler below, the upper parts marked with dusky gray spots. Eggs 2 or 3, 3.15 × 2.15. Northern and Arctic seas, circumpolar; S. in winter in North America to the Middle States and San Francisco Bay, coastwise, and in the interior to the Great Lakes. This is one of the very largest and most powerful birds of the whole family, fully equalling *marinus* in these respects.

L. barrovia'nus? (Lat. relating to Sir John Barrow, for whom Point Barrow on the N. coast of Alaska was named.) POINT BARROW GLAUCOUS GULL. Identical with the last in

plumage and color of bill and feet; slightly smaller, on an average, but main dimensions overlapping the minima of those of *glaucus*, and I am at a loss to see upon what grounds it has been rated as a species. Measurements assigned by the describer are: Length "about" 25.00-28.00; wing 16.25-18.00; tail 7.00-7.50; culmen 1.88-2.30; depth of bill at base 0.70-0.80, at angle 0.72-0.85; tarsus 2.40-2.78; middle toe and claw 2.35-2.75. Eggs 3.05 × 2.03. The somewhat smaller bill and feet seem to be the only appreciable distinction. Point Barrow on the Arctic Ocean, through Bering Sea to Japan in winter. RIDGW. Auk, July, 1886, p. 330; Man. 1887, p. 26; A. O. U. List, 2d ed. 1895, No. 42.1. See COLES, Key, 4th ed. 1890, p. 906, and SAUNDERS, Cat. B. Brit. Mus. xxv, 1896, p. 292.

L. leucop'terus. (Gr. λευκός, *leucos*, white; πτερόν, *pteron*, wing.) WHITE-WINGED GULL. ICELAND GULL. Precisely like *L. glaucus* in plumage, but smaller. Length 24.00, rather less than more; wing 16.00-17.00; bill along culmen 1.75-2.00, along gape about 2.75; depth at angle 0.65; tarsus 2.00-2.25, not longer than middle toe and claw. Eggs 2.80 × 1.90. This counterpart of *glaucus* inhabits the same northerly regions, coming south to the same degree in winter. It appears to be much less characteristic of North America than of Europe.

L. glauces'cens. (Lat. *glaucescens*, growing bluish.) GLAUCOUS-WINGED GULL. Like a Herring Gull with the black of the primaries washed out; primaries of the color of the mantle to the very tips, which are occupied by definite small white spots; the 1st also with a large white subterminal spot. Bill long and rather weak: upper mandible acute and projecting considerably beyond tip of the under; convexity near end comparatively slight; angle pretty well defined, outline between it and tip about straight. Tarsus rather longer than middle toe and claw. Length about 27.00; wing 16.75; bill along culmen 2.25; gape 3.25; depth at angle 0.70; tarsus 2.60; middle toe and claw 2.50. Adult ♂ ♀, in summer: Bill light yellow, with an orange spot at angle of lower mandible, and often a dusky one just above it. Mantle pearl-blue, of about the same shade as in *argentatus* or *smithsonianus*. First primary at base not appreciably lighter than body of feather, with a large well-defined white spot on both webs near end, separated from the white tip by a transverse band of the color of body of feather; 2d, 3d, and 4th, basal portions notably lighter than the terminal, fading into pure white at their juncture with the latter, without spots except at tips; 5th, 6th, basal portions the color of back, fading into white near end, separated from the white apices by a band, narrowest on 6th, of the color of outer primaries. Inner primaries like secondaries, with plain broadly white ends. Feet light flesh-color. Adult ♂ ♀, in winter: Head, neck, and breast thickly clouded (not streaked or spotted) with light grayish-dusky; throat mostly immaculate. Approaching maturity: Bill dark-colored, yellowish along the culmen and gonys. Wings and tail light grayish-ash, the former without sharply-defined white tips or spots. Under parts generally marked with dusky; wing-coverts marked with dusky and white. Feathers of back narrowly edged with gray. Intermediate: Bill flesh-colored, the terminal portion black. Wings and tail darker than in the preceding, especially on outer webs of the former. Everywhere dusky-gray, more or less mottled with white, the gull-blue of upper parts appearing in patches of greater or less extent. Young-of-the-year: Bill black. Everywhere grayish-dusky, somewhat mottled with whitish; feathers of back, wings, and upper tail-coverts edged, tipped, and crossed with more or less regular transverse bars of grayish-white. Downy young: Bill and feet black; head and neck dull whitish, spotted with blackish; upper parts spotted with grayish-black and grayish-white; under parts more uniformly gray; abdomen white. Pacific coast of North America, common from Alaska to California; breeding range from Bering Straits to Juan de Fuca Straits; also on the Asiatic coast to Japan. This is one of the best known Pacific species. It commonly nests on cliffs, sometimes on low grassy ground, June, July. Eggs 3, 2.90 × 2.00.

L. kum'lien. (To Ludwig Kumlien.) KUMLIEN'S GULL. ATLANTIC GRAY-WINGED GULL. Adult ♂: Like *glaucescens*; rather smaller, with lighter mantle and different color

and pattern of the primaries. Mantle about as in *leucopterus*; primaries and secondaries mostly white on exposed surfaces, with markings of dull slate-gray. First primary white on both webs at end for about 2.00, inner web white to base excepting a slate-gray strip next the shaft, outer web (except at end) slate-gray, fading into white toward base; 2d, the gray confined to a space of about 4.00 on outer web, and both webs tinged with color of mantle which, on inner web, fades into white about 3.00 from tip, but on outer web is deepest where it joins the darker gray area; 3d with subapical gray bar on both webs, 0.50 wide on inner web, but running along outer web for 2.00; tip white, the rest tinged with color of mantle; 4th with a slate-gray subterminal bar, but narrower and paler; 5th with a pair of subterminal gray spots; remaining primaries and all secondaries plain, concolor with mantle to within about 2.00 of their tips, where the pearl-blue changes rather abruptly into white. Iris cream-color; bill yellow with red spot, as usual; orbital ring reddish; feet flesh-color. Length 24.00; extent 50.00; wing 16.00–17.00; tail 6.50; chord of culmen 1.75; gape 2.60; tarsus, or middle toe and claw, about 2.30. Cumberland Sound and Greenland, S. in winter to New England and New York. *L. glaucescens* KUMLIEN, Bull. U. S. Nat. Mus. No. 15, 1879, p. 98; BREWSTER, Bull. Nutt. Orn. Club, 1883, p. 125; MERRILL, *ibid.* Bay of Fundy and Grand Menan. *L. kumlieni* BREWSTER, Bull. Nutt. Orn. Club, viii, 1883, p. 216; PARK, Auk, 1884, p. 196, New York; COUES, Key, 2d, 3d, and 4th eds. 1884–90, p. 742; B. B. and R. Water Birds N. A. ii, 1884, p. 219; RIDGW. Man. 1887, p. 27; A. O. U. Lists, 1886 and 1895, No. 45; SAUNDERS, Cat. B. Brit. Mus. xxv, 1896, p. 288.

L. nelsoni. (To E. W. Nelson.) NELSON'S GULL. PACIFIC GRAY-WINGED GULL. Coloration as in the last; larger; wing over 17.00; chord of culmen over 2.00; bill along gape 3.00; its depth at angle 0.80; tarsus 3.00; middle toe and claw 2.90. Norton Sound, Alaska; a dubious Gull, which I admit with hesitation; but the material now known is insufficient for final decision regarding its specific validity or invalidity. It may prove to be *chalconotus* of Bruch, Bonaparte, Lawrence, and Coues. *L. nelsoni* HENSHAW, Auk, July, 1884, p. 250; B. B. and R. Water Birds N. A. ii, 1884, p. 222; A. O. U. List, 1886, p. 88; COUES, Key, 3d ed. 1887, p. 891; RIDGW. Man. 1887, p. 27; HENSHAW, Nelson's Rep. Alaska, 1887, p. 53; A. O. U. List, 2d ed. 1895, p. 17, No. 46; SAUNDERS, Cat. B. Brit. Mus. xxv, 1896, p. 287.

L. marinus. (Lat. *marinus*, marine.) GREAT BLACK-BACKED GULL. SADDLE-BACK. COFFIN-CARRIER. COBB. WAGELL. Size very large; form strong and powerful. Bill very stout, deep at angle, rather short for its height; culmen toward end exceedingly convex, so much so as to make a tangent to it at the point where the tip of the lower mandible touches it perpendicular to the commissure. Symphyseal eminence very prominent; tarsus but little if any longer than middle toe and claw, compressed, rather slender for size of the bird. Adult ♂ ♀, in breeding plumage: Bill bright chrome; tip of both mandibles diaphanous. A large bright vermilion spot occupies nearly the terminal half of lower mandible and encroaches a little on the upper. Edges of jaws bright vermilion. Palate and tongue pale orange-red. Eyelids vermilion. Iris pale lemon-yellow. Legs and feet pale flesh-color. Mantle intense slate-color, nearly black, with a purplish reflection; secondaries and tertiaries broadly tipped with white, the line of demarcation distinct. Primaries: 1st black, scarcely lighter at base, tip white for 2.50, shaft white inferiorly, and superiorly along the white portion of the feather; 2d like 1st, but its base lighter, the white tip less extensive, and interrupted by a narrow bar of black on one or both webs; 3d, 4th, 5th broadly tipped with white, their bases of a lighter shade of slate than the 2d, and fading into white at junction with the broad black subterminal band. Adult ♂ ♀, in winter: As in summer, but head and neck streaked with dusky. Young-of-the-year: As large as adult; bill as large, but not so strong, nor the eminence so well developed; wholly black. Upper parts dusky chocolate-brown, mottled with whitish and light rufous, the latter on back and wings, the feathers being tipped and wing-coverts deeply in-

dented with this color. Under parts mottled with white or rufous-white and dusky, throat mostly immaculate. Primaries and tail brownish-black, the former tipped, latter subterminally barred, and its outer feather mottled, with whitish. Nestlings in down: Gray, the upper parts mottled with darker gray, and on the head spotted with black. Length 30.00; extent 65.00; wing 19.00; bill above 2.50; rictus 3.50; height at nostril 0.85; at angle 0.95; tarsus 3.00; middle toe and claw slightly less. This great wary bird, the dark rival of the Ice-Gull, inhabits the Atlantic coasts of Europe and North America, ranging south coastwise in winter to Florida and casnally to the Bermudas, also to the Great Lakes, breeding beyond the U. S., especially in Labrador. Found on the larger inland waters as well as coastwise. Nest on the ground, of moss, grasses, and seaweed; eggs 2 or 3, 2.90-3.10 \times 2.15, pale drab or olive-gray, irregularly blotched with dark brown and blackish, with purplish or neutral-tint shell-spots.

L. schistisa'gus. (Gr. *σχιστός*, *schistos*, fissile, cleavable, that may be split, as slate, stone, or schistis, hence slate-colored; *σάγος*, *sagos*, cloak, mantle.) SLATY-BACKED GULL. Adult: White; mantle dark slate-gray. First primary with a long white tip and a gray wedge on inner web; 2d with a subapical white spot on inner web only, and the gray wedge farther down; 3d with the gray wedge reaching subapical spot; no gray wedge on outer webs of first 4 primaries. Feet pinkish flesh-color. Bill yellow, with red spot on gonys. Iris yellowish cream-color. Nearly the size of the last; length about 26.00; wing 17.00-18.00; culmen 2.25; depth of bill 0.85; tarsus 2.70; middle toe without claw 2.25. N. Pacific and Arctic Oceans, chiefly on the Asiatic side, but also on the coast of Alaska. This Gull has been variously called *argentatus*, *cachinnans*, *fuscescens*, *marinus*, *pelagicus*, *affinis*, *borealis*, by different authors, and named *schistisagus* in the Ank, i, July, 1884, p. 231, and Bull. U. S. Nat. Mus. No. 29, 1885, p. 67. See also Water Birds N. A. ii, 1884, p. 229; Proc. U. S. Nat. Mus. x, 1887, p. 119, pl. 8, fig. 1; Key, 3d ed. 1887, p. 892; Man. N. A. Birds, 1887, p. 29; Nelson's Rep. Alaska, 1887, p. 53; Ank, 1893, p. 123; A. O. U. List, 2d ed. 1895, p. 18, No. 48; Cat. Birds Brit. Mus. xxv, 1896, p. 258.

L. occidenta'lis. (Lat. *occidentalis*, western.) WESTERN HERRING GULL. Bill large, very stout and deep; culmen unusually convex at end; angle strongly developed, making the under outline doubly-concave. Feet large and stout; tarsus equal to middle toe and claw. Adult ♂ ♀, summer plumage: Bill bright chrome-yellow; a vermilion spot, more or less extensive, at angle. Mantle dark bluish-ash, almost slate-color; tips of secondaries and tertiaries white, the line of demarcation distinct. Primaries: first 3 black throughout their exposed portions, the outer one white for 1.75 at tip, crossed near end with an irregular black bar, the shafts black; 2d without a white subapical spot, but its tip, and tips of all the others, white. Legs and feet flesh-color. Approaching maturity: As in the preceding, but the upper parts rather lighter, and the tail with an imperfect subterminal bar of black. Intermediate: Bill much as in adult. White of head, neck, and under parts, more or less mottled with dusky; gull-blue of upper parts appearing in irregular patches; most feathers tipped with light-gray. Primaries and tail uniform blackish-brown, with scarcely lighter tips, the former without spots. Young-of-the-year: Bill entirely black, rather shorter than in adults, but with great comparative depth at angle. Everywhere deep blackish-brown, mottled with grayish-white, the feathers of the upper parts being tipped and edged with that color. Rump and upper tail-coverts barred with whitish and dusky. Wings and tail as in the preceding. Winter plumage: This species seems to form an exception to the rule which obtains so extensively among large Gulls, since in winter the head and neck behind are not streaked with dusky in fully adult birds. Dimensions of adults: Length 24.00; extent 55.00; wing 16.50; bill above 2.30; along gape 3.10; height at nostril 0.75; width 0.40; height at angle 0.85; tarsus, and middle toe and claw, 2.75. Pacific coast of North America, very common, breeding from British Columbia to Lower California. This and *L. glaucescens* are the two commonest large Gulls along the Pacific coast. Eggs usually 3, about 2.85 \times 1.90, not distinguishable from those

of related species. Nestlings in down pale gray with a buff tinge, blotched and spotted above with black or blackish, especially on the head.

L. affinis. (Lat. *affinis*, allied to *L. fuscus*.) REINHARDT'S GULL. SIBERIAN GULL. A slaty-backed bird, resembling *L. fuscus*, but belonging to the Herring Gull group in the pattern of the primaries. Mantle a shade paler than that of *L. fuscus*; feet yellow; bill yellow, with a red spot on the gonys. Length 24.00; wing 18.00; tail 7.50; culmen 2.90; tarsus 2.75; middle toe and claw 2.50. Asia; Africa; Europe; only North American as occurring accidentally in Greenland, whence the species was originally described by Reinhardt in 1853, and where it has never been found again. The bird is wide-ranging in Asia, and Siberian references are correct; but those which assign it to Alaska belong to *L. vegæ*.

L. argentatus. (Lat. *argentatus*, silvered, silvery.) EUROPEAN HERRING GULL. Precisely like the next to be described, excepting the following particulars: Average smaller size; wing averaging 1.50 shorter; feet about 0.50 shorter on an average; bill shorter and slenderer, particularly at base. The 1st primary has usually a white terminal space 2.00 long; the 2d a large rounded subterminal white spot, occupying both webs. The 1st primary of the American bird has usually a rounded white subterminal spot much like that on 2d primary of the European, almost always separated from the white apical spot, and if a spot is present on 2d primary, it is small. Birds typically like the European occur in eastern North America.

L. a. smithsonianus. (To the Smithsonian Institute at Washington, D. C., so named for its founder, James Smithson, son of Hugh Percy, Duke of Northumberland. Fig. 684.) AMERICAN HERRING GULL. Bill rather less than tarsus, shorter than head; ro-



FIG. 684. — American Herring Gull, Young. (From *The Osprey*.)

bust, its height at angle slightly more than at base. Culmen nearly straight at nostrils; then rapidly convex to the stout, deflected, overhanging apex. Outline of rami slightly concave; gonys about straight; eminence at symphysis large and prominent, but its apex not very acute. Adult ♂ ♀, in breeding plumage: Bill bright chrome, its tip diaphanous, a vermilion spot at angle, with sometimes a small black one just anterior to it. Legs and feet *pale flesh-color*; claws blackish. Mantle typical "gull-blue," much lighter than in *occidentalis*; lighter than in *brachyrhynchus*; of much the same shade as in *delawarensis* or *glaucescens*; darker than in *glaucus* or *leucopterus*. Bases of primaries same as back, or very slightly lighter, not so

light, nor of so great extent (being exceedingly short on the 1st primary), nor so broad at end, as in *californicus*. On the 1st primary this light basal portion is very short, hardly reaching within 6 or 7 inches of the tip. It is not lighter at its junction with the black, nor does it extend farther on central portion than on edge of the feather. On the 2d, 3d, and 4th primaries the bluish of the basal portions extends about the same distance on each (within

4.00 of tip of 2d), runs up farther on the centres of the feathers than on their edges, and grows nearly white at its junction with the black portions. First primary with a subapical white spot near its tip, small, rounded, not much over 1.00 in diameter; generally not longer on outer vane than on inner; sometimes wanting on the former; in oldest birds this spot enlarging to coalesce with the white tip of the feather; 2d primary usually without a subapical spot, or if one is present it is small. All the primaries with small rounded white tips, and black from these apical spots to their bluish-white bases; this band of black growing narrower from 1st to 7th, where it is a mere point. Winter plumage: Head and neck streaked with dusky; bill less brightly colored. Otherwise as in summer. Immature: The feathers of the back have gray margins; upper wing-coverts mottled with dusky-gray. An imperfect subterminal bar of dusky on tail. Young of first winter: Head, neck, and whole under parts more or less thickly mottled with dusky, as are the wing-coverts, secondaries, and tertials. The gull-blue of upper parts appears in irregular patches, mixed with gray. Reiniges and rectrices brownish-black, with very narrow whitish tips, the former wanting both apical and subapical white spots. Bill flesh-color, its terminal third black. Feet dull flesh-color. Younger: Entirely deep dull brownish; throat lightly streaked and rump transversely barred with whitish; feathers of back with yellowish or grayish-white edges; wings and tail black; bill blackish; legs and feet dusky flesh-color. Dimensions of adult: Length 24.00–25.00; extent 54.00–58.00; wing 17.00–18.00; bill along culmen 2.40; height at nostril 0.75; at angle 0.80; tarsus 2.75; middle toe and claw the same. ♀ a little, and young considerably less than foregoing; wing down to 15.50; bill to 2.20; tarsus to 2.40. North America at large, abundant, both coastwise and in the interior, especially numerous along the Atlantic coast in winter; less common on the Pacific coast. Breeds from Maine, Minnesota, N. Dakota, and Great Lakes northward, especially about the St. Lawrence, Newfoundland, and Labrador, but not especially Arctic; S. in winter to Cuba and Lower California. Nest on the ground, exceptionally in trees; eggs normally 3, averaging 2.80×1.95 ; ground-color from light bluish- or greenish-white to dark brownish-olive; markings of every size and shape, very irregularly disposed, dark brown and blackish, paler brown and neutral tint; June and early July. Nestlings covered with whitish down, mottled with angular dusky spots.

L. ve-gæ. (Lat. of the Vega, a ship so named.) VEGA GULL. Size, proportion of parts, pattern of primaries, etc., as in a common Herring Gull. Feet flesh-color (not yellow). Mantle *dark* bluish—darker than that of *argentatus*, yet not slate-colored as in *occidentalis*. Northwest coast of North America from Bering Sea, S. in winter to California; on the Asiatic side from the Arctic coast of Siberia S. in winter to Japan, China, Formosa, and the Bonin Islands. *L. cachinans* of most late American writers, as of the 2d and 3d eds. of the Key, but not of PALLAS, which is a Herring Gull with *yellow* legs, as wrongly given for the present species by most of our writers. *L. argentatus* var. *vegæ* PALMÉN, Vega Exped. v, 1887, p. 370; *L. vegæ* STEJ. Auk, July, 1888, p. 310; COUES, Key, 4th ed. 1890, p. 906; A. O. U. List, 2d ed. 1895, No. 52; SAUNDERS, Cat. B. Brit. Mus. xxv, 1896, p. 269, where the extensive synonymy is given. (*L. argentatus* d. *borealis* COUES, B. N. W. 1874, p. 626. *L. affinis*, NELSON, Cruise of the Corwin, 1883, p. 107.)

L. californicus. CALIFORNIAN GULL. Bill moderately stout, the angle well developed; varying in size, longer than in *delawarensis*, sometimes nearly equalling that of *argentatus*. Tarsus equal to or slightly longer than middle toe and claw. Adult ♂♀, summer plumage: Bill chrome-yellow, tinged with greenish; a vermilion spot on lower mandible at angle; a black spot just above, forming, with a very small black spot on upper mandible, an imperfect transverse band. Feet dusky *bluish-green*; webs *yellow*. Mantle pearl-blue, much as in *brachyrhynchus*, lighter than in *cavus*, slightly darker than in *argentatus*. Primaries: bases of all light bluish-white, internally almost white, especially on outer webs, and of great extent on all; 1st with a white space at end for about 2.00, the shaft white along the white portion

of the feather; 2d with a white spot near end on whole of inner and most of outer web, divided by the black shaft; tips of all white; black forming merely a narrow subterminal band on 6th. Tips of inner primaries white, as are also tips of secondaries, the line of demarcation between the white and the blue of the mantle pretty distinct. In breeding plumage: Eyelids bright saffron-yellow or red. Eyes brown. Upper mandible bright chrome, the greater part of the lower vermilion, the rest chrome. Gape of mouth deep crimson. Feet green. Winter plumage: Bill dully colored. Head and neck behind streaked and mottled with dusky. Nearly mature: As in the preceding. Tail with an imperfect subterminal black bar. Some feathers of upper parts edged with gray. White space at end of 1st primary crossed by a transverse black bar; no spot on 2d primary. Young: Bill black on terminal half. Head, neck, rump, wing-coverts, and secondaries, mottled with dusky. Primaries and tail uniformly brownish-black, scarcely lighter at tips. Back as in adults, but the feathers with grayish edges. Dimensions: Length 20.00–23.00; extent 50.00–54.00; wing 15.00–17.00; bill 1.60–2.00; depth at angle 0.56; tarsus 2.00–2.25; middle toe and claw about the same. Adults near the larger of these dimensions. Western and Arctic North America, breeding abundantly in the U. S., chiefly in the interior; extends S. in winter into Mexico; E. sometimes to Kansas. Eggs 2.60 × 1.80. Downy young pale gray, clouded on the back with dusky, and spotted on the head with black.

L. delawarensis. (Of Delaware.) RING-BILLED GULL. COMMON AMERICAN GULL. Bill rather stout, as long as middle toe and claw; upper mandible considerably convex at end; under mandible much thickened at angle, which is prominent; outline from base to angle, and from angle to tip, both concave. Middle toe and claw scarcely more than $\frac{3}{4}$ the tarsus. Adult ♂ ♀, in summer: Bill greenish-yellow, at tip chrome, encircled at angle with a broad band of black. Feet dusky bluish-green in dried state, greenish-yellow in life; edges of eyelids red; iris straw-yellow. Mantle light pearl-blue, fading into white at ends of secondaries, the line of demarcation indistinct. Primaries: 1st black, basal portion of inner web very light bluish-white (almost white), with a spot of white about 1.25 long near end, of equal extent on both webs, divided by black shaft; 2d with a small white spot on inner web, and inner web whitish at base for a longer distance; the whitish of bases of primaries regularly increases inward and the black decreases, until on 6th it is merely a transverse bar. Tip of 1st primary black, of others white, the spot being very minute on 2d, and gradually increasing; 7th and innermost primaries without any black, like secondaries. Adult in winter: As in summer, but head and neck behind spotted (not streaked nor nebulated) with dusky. Young, first winter: Upper parts irregularly mottled with dusky brown and the pearl-blue of adults, the wing-coverts being almost entirely dusky, with lighter margins to the feathers. Head, neck, and under parts, mottled with white and dusky. Primaries black; some secondaries with a patch of brownish-black near ends; inner ones wholly brownish-black, narrowly tipped with whitish. Tail with a broad subterminal band of black, narrowly tipped with white. Terminal half of bill black, the extreme tip yellowish. Young-of-the-year in August: Everywhere mottled thickly with brownish-black; on upper parts the feathers with yellowish-white edges, the pearl-blue of adults scarcely apparent, except on wing-coverts. Terminal $\frac{2}{3}$ of bill with tip black, the rest light flesh-color. Length 19.75; extent 48.50; wing 14.75; bill above 1.70; gape 2.30; height at nostril 0.45; at angle 0.50; tarsus 2.10; middle toe 1.80. North America at large, one of the commonest species, both coastwise and in the interior; breeds in some of the U. S. but mainly in British America, to far north; extends S. in winter to Mexico and Cuba. In summer this Gull is like the last, chiefly an inland species, nesting on lakes and marshes; but at other seasons it ranges coastwise. Eggs 2–3, usually 3, 2.40 × 1.70.

L. ca'nus. (Lat. *canus*, hoary gray.) EUROPEAN MEW GULL. Originally assigned to North America on strength of a specimen shot by me in Labrador in 1860. It is entirely like the next to be described excepting the following particulars: Somewhat larger. Tarsus $\frac{1}{4}$ longer than

middle toe and claw. Bill stouter, with less convex culmen and better developed angle. Bluish bases of primaries darker, not fading into white at their junction with the black, not running so far along the feathers, nor farther in the centres than along edges of inner webs. Northern Hemisphere, mainly Europe, Asia; California coast in winter; Labrador?

L. brachyrhynchus. (Gr. *βραχύς*, *brachus*, short; *ρύγχος*, *hrugchos*, beak.) AMERICAN MEW GULL. Bill small, somewhat stout for its length, much shorter than head or tarsus. Upper mandible straight to end of nostrils, rather more convex to the tip than in *canus*. Angle of lower mandible comparatively less developed than in *canus*; lower outline considerably concave posterior to it, somewhat so before it. Commissure about straight to near tip. Tarsus about equal to middle toe and claw, the former but little if any longer than the latter. Adult ♂ ♀, in summer: Bill bluish-green, its terminal third bright yellow. Legs and feet dusky bluish-green; webs yellowish. Mantle light grayish-blue or dark pearl-blue, a shade darker than in *canus*, much darker than in *delawarensis*. Primaries: bluish-gray bases rather lighter than in *canus*, much darker than in *delawarensis*, but fading into nearly pure white on all but the first, at juncture with the black portion; these bluish-gray bases extend toward the ends much farther than in *canus*, as far as in *delawarensis*, and, as in that species, on 2d, 3d, and 4th extend further along central portions of inner webs than at edges, so that they are bordered for some distance with the black of the terminal portions. The black takes in outer web of 1st primary and nearly the whole of the inner, but rapidly becomes narrower, till it is merely a subterminal transverse bar on 6th; 7th has frequently a spot of black on one or both webs. First, with a large white spot near end 2.00 long, longer on outer than on inner web, not divided by the black shaft, the tip black; 2d with a similar spot, but smaller, not longer on outer than on inner web, and divided by the black shaft; extreme apex white, as are the apices of all other primaries except 1st. Adult ♂ ♀, in high breeding plumage: Eyelid, ocular region, and gape of mouth bright orange-yellow, which color extends over tip and cutting edges of bill; green of bill with a peculiar hoary glaucescence. Legs and feet bluish-green; webs bright gamboge-yellow. Sometimes a faint pink blush of the plumage of under parts. Adults in winter: Head and neck all round, with upper part of breast, mottled with dusky. Approaching maturity: Head and neck faintly mottled. Primaries brownish-black, without decided white tips; the spots on 1st and 2d restricted. Inner secondaries with a dusky spot on each web near end. Tail with a more or less perfect subterminal band. Young, first winter: Bill flesh-color; black on terminal half. Legs and feet light yellowish. Head, neck, rump, and whole under parts, mottled irregularly with dusky. Back as in adult, but feathers with grayish edgings. Wing-coverts and inner secondaries dusky, the latter darkest; all with light edgings. Primaries uniform brownish-black, without white spots, tips, or lighter bases. Tail almost entirely brownish-black, with a narrow border of white. Young in August: Bill and legs as in the preceding. Everywhere whitish-gray; white of under parts appearing as mottling, and blue of upper parts as irregular patches. Length 17.50; extent 42.00; wing 13.75; bill above 1.40; gape 2.00; width at nostrils 0.25; height 0.35; height at angle 0.35; tarsus, and middle toe with claw, 1.80. Arctic and subarctic America in the breeding season, in winter ranging along the Pacific coast to southern California. It breeds on lowlands of Alaska and interior British America, laying in June and July 2-3 eggs, 2.30 × 1.60. Not authenticated as occurring on the Atlantic coast. The American representative of *L. canus*, and the smallest species of *Larus* proper in this country.

(Subgenus *BLASIPUS*.)

L. (B.) heer'manni. (To Dr. A. L. Heerman. Fig. 685.) WHITE-HEADED GULL. HEERMANN'S GULL. Very different from any of the foregoing, belonging to a different section of the genus (*Blasipus*). Bill shorter than head or tarsus, rather slender, moderately compressed,

tip rather acute; red in part in adult. Folded wings reaching beyond tail. Tail of moderate length, even, slightly emarginate in young. Feet rather large. Tarsus equal to middle toe and claw. General colors dark; tail mostly blackish. Adult ♂ ♀, in breeding plumage: Bill bright vermilion red, black on terminal third, sometimes wholly red; a red ring around eye. Head white; this color gradually merging on neck into plumbeous-ash, which extends over whole under parts, being lighter on abdomen and under tail-coverts than elsewhere. Back deep plumbeous-slate, lighter on rump. Upper tail-coverts clear ashy. Upper surfaces of

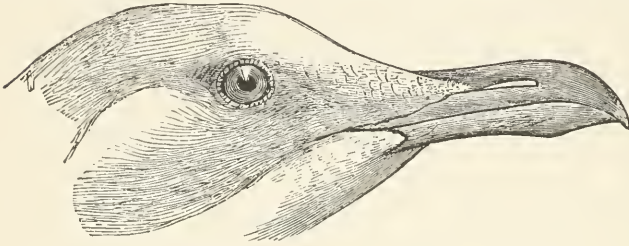


FIG. 685. — White-headed Gull, $\frac{2}{3}$ nat. size. (From Selater and Salvin.)

wings like back; primaries black; tips of all, except 2 or 3 outer ones, narrowly white. Tail black, narrowly tipped with white. Legs and feet reddish-black. Young-of-the-year: Smaller than adult. Bill and feet brownish-black. Entire plumage deep sooty or fuliginous-blackish; all the

feathers, but especially those of back and upper wing-coverts, edged with grayish-white. Primaries and secondaries black, as in adults, with only traces of white tips on the former. Tail black, very narrowly tipped with dull white. Immature: Bill as in adult. Head all round, and throat, mottled with brownish-black and dull white, the latter color predominating on forehead and throat. Upper tail-coverts lighter than in adult, and the white tips of the tail-feathers broader; otherwise generally as in adult, but with all colors rather deeper. Length 17.50-20.00; wing 13.50-14.00; tail 5.75; bill along culmen 1.80; along gape 2.40; depth at base 0.55; at angle about the same; tarsus 2.20; middle toe and claw a little less. Young: wing 12.25; tail 4.75; bill along culmen 1.00; depth at base 0.50; at angle 0.45; tarsus 1.90. Pacific coast of North America, from British Columbia to Panama; common on the California coast. This species is one of a dark-colored group, other members of which are *modestus* and *belcheri* of the Pacific coast of South America, *crassirostris* of Japan and China, etc.

RIS'SA. (Icelandic name, *rissa*, *ritsa*, *rita*, or *ritur*; old Danish, *ryttern*.) KITTIWAKES. THREE-TOED GULLS. Bill stout, rather short, little compressed at base, shorter than head, equal to middle toe without claw; tip decurved and attenuated; convexity of culmen regular and gradual from base to tip; gonys concave, in consequence of great deflection of apex of lower mandible; outline of rami slightly concave; eminentia symphysis well marked and acute, but not large. Wings very long, pointed, reaching beyond tail. Tail moderately long, even or (in young) emarginate. Tarsus remarkably short, less than middle toe alone; anterior toes long, and united by broad, full webs with unincised margins. Hallux rudimentary or not well developed, the ungual phalanx being generally obsolete. Pattern of primaries and livery of the young peculiar. Nestlings unspotted. Nests on cliffs over the water.

Analysis of Species and Subspecies.

- Feet dark; bill clouded with olivaceous, about 1.50; wing 12.00.
- Hallux rudimentary, without a claw-bearing phalanx. Arctic and N. Atlantic *tridactyla*
- Hallux better formed, usually bearing a claw N. Pacific *t. kotzebuei*
- Feet coral red (drying yellow); bill clear yellow, about 1.20; wing 13.00 N. Pacific *brevirostris*

R. tridactyla. (Gr. *τριάκτυλος*, *tridaktulos*, tridigitate, having three digits; *τρεῖς*, *treis*, in composition *τρι-*, *tri-*, three, and *δάκτυλος*, *daktulos*, a digit. Lat. *tres* or *tris*, three; *dactylus*, a digit.) COMMON KITTIWAKE OR CATTIWICKE. TARROCK. PICK-ME-UP. CODDY-MODDY.

Hind toe only appearing as a minute knob, its claw abortive. Adult ♂ ♀, in breeding plumage: Bill light yellow, more or less clouded with olivaceous. Head and neck all round, under parts and tail, pure white. Mantle rather dark bluish or cinereous-blue; secondaries of the same color nearly to their tips, which are white. Primaries: 1st bluish-white, without white tip, its outer web, and its inner web for about 2.00 from tip, black; 2d like 1st, but without the black outer web, its tip being black for nearly the same distance as 1st, with a minute white spot at tip; on 3d and 4th the black grows shorter, while the tips are more broadly white—this lessening of black on each feather exactly proportional to shortening of successive quills, bringing bases of all the black tips in the same straight line (a pattern peculiar to the species of *Rissa*). Feet blackish. Iris reddish-brown; eye-ring red. Adults in winter: Occiput, nape, and sides of breast clouded with color of back, deepening into slate over auriculars; a small but well-defined black crescent before eye. Bill more clouded with olivaceous. Otherwise as in summer. Young: Bill black; ante-ocular crescent and post-ocular spot dusky; a broad bar across neck behind, all lesser and median wing-coverts, bastard quills, inner secondaries except at their edges, and a terminal bar on tail, black. First 4 primaries with their outer webs, outer half of inner webs, and ends for some distance, black, the rest pearly white; 5th and 6th black only at the ends, their tips with a white speck. Nestlings in down whitish, shaded with gray and buff on the upper parts, but not distinctly spotted—thus unlike those of *Larus*. Length 16.00-18.00; extent 36.00; wing 12.25; bill above 1.40 to 1.50; along rectus 2.10; height at base 0.50; at angle 0.40; tarsus 1.30; middle toe and claw 1.80. Arctic America, Asia, and Europe, chiefly coastwise, very abundant; breeds from Magdalen Islands N. to beyond lat. 80°; ranges in winter S. to the Middle States and region of the Great Lakes. Nest of seaweeds, etc., not on the ground like those of most Gulls, but on ledges of rocks and cliffs overhanging the water, such as Guillemots and Auks select. Eggs 2, 3, or 4, about 2.25×1.70 , colored like those of other Gulls.

R. t. kotzebue'i. (To Otto von Kotzebue, the Russian navigator.) KOTZEBUE'S KITTIWAKE. It is a curious fact that the Kittiwake of the North Pacific usually has the hind toe better formed—sometimes nearly if not quite as long as in ordinary Gulls, with a nearly or quite perfect, though small, claw. But I cannot predicate a specific character on this score, since the development of the toe is by insensible degrees: see COUES, Proc. Phila. Acad. 1869, p. 207; Birds N. W. 1874, p. 644. N. Pacific coast, abundant; breeding far N., in winter S. sometimes to southern California; has been taken in Lower California; habits, nest, and eggs the same as those of the common Kittiwake. *R. t. pollicaris* of A. O. U. Lists, No. 40 a.

R. brevirostris. (Lat. *brevirostris*, short-billed; *brevis*, short; *rostrum*, beak.) SHORT-BILLED KITTIWAKE. RED-LEGGED KITTIWAKE. Bill very short, stout, wide at base; upper mandible much curved, though not attenuated nor very acute. Convexity of culmen very great toward tip; the culmen being, from nostrils to tip, almost the arc of a circle whose centre is the symphyseal eminence. Outline of mandibular rami and gonyx both somewhat concave: eminentia symphysis slightly developed. Tarsus hardly more than $\frac{2}{3}$ middle toe and claw. Folded wings reaching far beyond tail. Tail of moderate length, even. Adult ♂ ♀, breeding plumage: Bill straw-yellow, with little or no olivaceous tinge; iris hazel; eye-ring red. Head and neck all round, under parts and tail, pure white. Mantle deep leaden or bluish-gray, much darker than in *tridactyla*; this color extending on wings to within 0.50 of the tips of the secondaries, which terminal half-inch is white. Primaries: 1st with shaft and outer vane black, but on its inner vane a space of dull gray (not white), which at base occupies nearly all the vane, but gradually narrows until it ends by a well-defined rounded termination half as broad as the vane itself, about 2.50 from the tip, these $2\frac{1}{2}$ inches being black, like the outer vane; 2d: outer vane of the same leaden-gray as back, to within 1.00 of tip, inner vane of a rather lighter shade of the same color to within 3.00 of the tip, the gray ending abruptly; 3d like the 2d, but the gray extending farther, leaving only a space of 2.00 black, and

the tip has also a minute gray spot; 4th wholly bluish-gray to within 1.50 of the tip, which has a larger gray spot than has the 3d, so that the black is less than 1.50 long; 5th, the gray extending so far that it is separated from the well-defined white apical spot by a band of black less than 1.50 wide; 6th gray, fading into white at tip, and with the black reduced to a small subapical spot on one or both webs; other primaries like 6th, minus the black spot. (This "gray" of the primaries is the color of the mantle.) Feet coral-red, especially toes and webs (tarsi not quite so bright), drying yellow; claws black. Adults in winter: As before, but cervix and auriculars overlaid with plumbeous. Young: Similar, but cervical collar better marked and darker, and mantle variegated with grayish-white tips of the feathers; more dark color about eyes, but no black on wing-coverts, inner secondaries, or tail; bill and feet obscured. Nestlings covered with white down, with whitish bill and feet. Length 14.00–16.00; wing 13.00; tail 5.00; culmen 1.20; rictus 1.70; from nostril to tip 0.60; depth at base 0.50; width 0.42; depth at angle 0.42; tarsus 1.25; middle toe and claw nearly 2.00. A beautiful and very distinct species, swarming by thousands on rocky coasts and islands of Bering's Sea, where it is a permanent resident; nests on shelves of the most inaccessible crags, building a substantial structure of grass, moss, and seaweeds, mixed with mud; eggs 2–3, 2.25 × 1.65, of the usual pattern of coloration: June, July.

PAGOPHILA. (Gr. πάγος, *pagos*, ice; φίλος, *philos*, loving.) ICE GULLS. Bill much shorter than head, about equal to tarsus, very stout, little compressed; nasal fossæ deep, the nostrils placed far forward. Culmen straight to nostrils, then regularly convex; commissure gently curved to tip, where it is considerably deurved; gonys straight to near angle, which is well defined, the outline from angle to tip perfectly straight. Feathers extending between rami nearly to angle. Wings long and pointed, reaching beyond tail. Feet very short and stout; scales of tarsus and toes large and rough. Tibiæ feathered to near joint; tarsus about as long as middle toe without claw; claws large, much curved; webs narrow and much incised; a slight connection of hind with inner toe. Size moderate; form stout; color entirely white. One species. (*Gavia* BOIE, 1822, of A. O. U. Lists, 1886–95. *Pagophila* KAUP, 1829, A. O. U. Suppl. List, Auk, Jan. 1899, p. 98.

P. al'ba. (Lat. *alba*, white.) IVORY GULL. SNOW GULL. Adult ♂ ♀, breeding plumage: Entirely pure white; shafts of primaries straw-yellow. Bill greenish-gray, yellow at tip and along cutting edges; feet black; eyes brown; edges of eyelids red. Young: Front and sides of head dusky gray; upper part of neck, all round, irregularly spotted with the same. Scapulars, and upper and under wing-coverts, with brownish-black spots, most numerous along lesser coverts. Tips of primaries and tail-feathers with dusky spots. Nestlings covered with white down; fledglings gray. Length 16.00–19.00; extent 41.00; wing 13.25; bill above 1.40; along gape 2.10; height at nostrils 0.45; tarsus 1.45; middle toe and claw 1.75. Circumpolar regions, breeding only in very high latitudes, S. rarely to the U. S. in winter; New Brunswick casually. The bird abounds in summer in its Arctic breeding resorts, where it usually nests on cliffs like a Kittiwake, sometimes on low ground. Eggs 2–4, 2.25–2.45 × about 1.70, olivaceous-buff, marked with different shades of brown and gray; laid late in June and in July. *P. eburnea* of former editions of the Key, as of most authors, after *Larus eburneus* PULPUS, 1774, antedated by *L. albus* GUNN. 1767, whence *P. alba* COUES, Auk, July, 1897, p. 313. A. O. U. Suppl. List, 1899, p. 99.

CHROICOCEPHALUS. (Gr. χρωικός, *chroikos*, colored; κεφαλή, *kephale*, head.) HOODED GULLS. ROSY GULLS. Form as in *Larus*, but usually less robust; size averaging smaller; bill usually slenderer, more acute, and less hooked. Head enveloped in a dark hood in the breeding season, when white of under parts usually blushes pink or rosy. Markings of primaries varying with the species, but different from that of the larger Gulls. Tail square, or nearly so. There are no marked peculiarities of form of this genus, pattern of coloration being mainly its basis. The numerous species average much under those of *Larus* in size (though one, *C. ich-*

thyaëtus, is among the largest of *Larina*); they approximate toward *Xema* and *Rhodostethia* in some respects, but the tail is neither forked nor euneate.

Analysis of Species.

Tarsus longer than middle toe and claw.		
Bill reddish, feet the same. Length 16.00 or more		<i>atricilla</i>
Tarsus not longer than middle toe and claw.		
Bill reddish, feet the same. Length about 14.00		<i>franklini</i>
Bill black, feet red or yellow. Length about 14.00		<i>philadelphia</i>
Bill lake-red, feet vermilion. Length about 11.00		<i>minutus</i>

C. atricilla. (Lat. *atricilla*, black-tail: only applicable to the young. Fig. 686.) LAUGHING GULL. BLACK-HEADED GULL. Bill longer than middle toe and claw, shorter than tarsus or head, rather stout for this genus. Gouys concave in front of angle, which is well defined, but tip of bill so decurved that a chord thence to the base does not touch the angle. Middle toe barely $\frac{3}{4}$ the tarsus. Adult ♂ ♀, in summer: Bill and edges of eyelids carmine or lake-red; feet dusky-red; iris blackish. Hood plumbeous grayish-black, extending farther on throat than on nape. Eyelids white posteriorly. Neck all round, rump, tail, broad tips of secondaries, and whole under parts, white, the latter with a rosy tinge (like the tint of peach-blossoms). Mantle grayish-plumbeous. Outer 6 primaries black, their tips usually white, their bases for a very short distance on inner web of 1st, and for an increasing distance on both webs of the others, of the color of the back. Adult in winter: Under parts simply white, not rosy; hood lost, the head being white, mixed with blackish. Bill and feet obscured. Immature: Bill and feet brownish-black, tinged with red. Plumbeous of

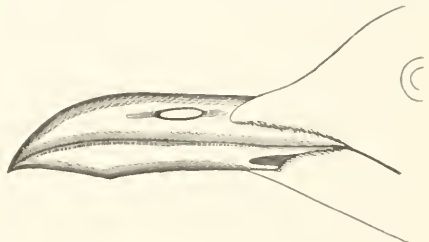


FIG 686.—Bill of Laughing Gull, nat. size. (Ad. nat. del. E. C.)

upper parts more or less mixed with irregular patches of light grayish-brown. Primaries wholly brownish-black, fading at tips. Secondaries brownish-black on outer webs. Tail-feathers more or less tinged with plumbeous, and with a broad terminal band of brownish-black, the extreme tips white. Upper tail-coverts white. Young-of-the-year: Entire upper parts, and neck all round, light brownish-gray; the feathers tipped with grayish or rufous-white, broadly on scapulars and inner secondaries, the blue of adults appearing on wing-coverts. Eyelids whitish; a dusky space about eye. Forehead, throat, and under parts, dull whitish, more or less clouded with gray, especially on breast, where this is the prevailing color. Wings and tail as before. Nestlings covered with buff down much variegated with dusky-brown. Length about 16.50; extent 41.00; wing 13.00; tail 5.00; bill 1.75; along gape 2.25; its height at nostril 0.45; tarsus 2.00; middle toe and claw 1.50. Tropical America and warm temperate North America; on the Atlantic north coastwise in summer to Maine and Nova Scotia; in the interior to Ohio or beyond; on the Pacific side to Lower California; Central America, both coasts, and various West India islands; South America to the Lower Amazon and Peru. By thousands along the Atlantic coast of the U. S. during migration, breeding in colonies anywhere along as far as Massachusetts, wintering in the South. Nest on the ground, of eel-grass, seaweeds, and other vegetable material; eggs 2-5, usually 3, 2.10 x 1.55, ground color some olive shade, ranging from dull grayish to dark greenish, thickly marked all over with spots and irregular splashes of brown, blackish, dull reddish, and pale purplish; sometimes the markings chiefly wreathed about the large end. The epithet "laughing" was applied to this Gull by Catesby in 1733; but its exclamations during the breeding season are not more vociferous than those of various other species under the same circumstances.

C. franklini. (To Sir John Franklin.) FRANKLIN'S ROSY GULL. "PRAIRIE PIGEON." Adult ♂ ♀, in breeding plumage: Bill shorter than head, rather slender, attenuated and a little decurved at the acute tip; outline of both rami and gonys concave. Tarsus equal to middle toe and claw. Bill red (carmine, lake, or vermilion), crossed with black near end. Legs dusky-reddish. Edges of eyelids orange. Eyelids white, this color also reaching a little behind eye. Hood deep slaty or plumbeous-black, encircling upper part of neck as well as head, and extending farther on throat than on nape. Mantle not quite so dark as in *atricilla* (more blue), darker than in *philadelphia*. First primary with outer vane black to within 1.00 of tip, the inner pearly-white, crossed 1.00 or more from the tip by an isolated black bar an inch broad, thus leaving the feather white on both webs for 1.00 or more from tip. Next 5 primaries basally of the color of the back, paler on inner web, both webs fading toward their tips into white, each crossed by a black bar near the end, 2.00 wide on 2d primary, narrowing on successive feathers to a small bar or pair of little spots on 6th; tips of all these primaries pure white. Other primaries, and all secondaries, colored like back, fading at tips into white; shafts white, sometimes black along the black portion of the feather. Tail very pale pearly-blue, the 3 lateral pairs of rectrices white—or rather tail white, lightly washed with pearly on 6 central feathers. Neck all around, rump, broad tips of secondaries, and whole under parts white, the latter rosy. Younger, that is to say, in summer plumage, and with a perfect hood, red bill, etc., but primaries not yet having attained their perfect pattern: General coloration exactly as before. Shafts of first 3 primaries black, of the rest gray, except along their black portions; 1st with outer web wholly black, inner web pearly-gray, much like back but lighter, to within 2.00–3.00 of tip, then black for the rest of its extent; 2d like 1st, but base of outer web like the inner; on 3d, 4th, and 5th, successively, the black decreases in extent, till on 6th it is merely a little bar, or pair of spots; tips of all primaries white; that of 1st smallest, that of others successively increasing in size. Winter plumage: As in summer; hood wanting or indicated by a few slaty feathers about eyes, on auriculars and nape; no rosy tint; bill and feet duller-colored. Young: Bill blackish, with pale base of under mandible; feet flesh-colored; eye black. Traces of a hood, or nape largely slaty, etc., according to precise age. Outer 5–6 primaries wholly black in their continuity, rather lighter and somewhat slaty at base, with or without a minute white speck at tip. Mantle gray or brown, more or less mixed with blue, according to age. Tail ashy-white, with a broad black subterminal bar. Under parts white. This appears to be the usual plumage of birds of the first autumn. Length about 14.00; extent 35.00; wing 11.25; tail about 4.50; culmen 1.30; gape 1.75; height of bill at nostril 0.35; tarsus 1.60; middle toe and claw the same. Young smaller than adults: bill 1.10–1.20; wing 10.00, etc. Winters to South and Central America; in North America migrating through the interior, chiefly west of the Mississippi, and east of the Rocky Mts. to the Arctic regions; abundant; has never been observed in the Atlantic States. Breeds from southern Minnesota northward, chiefly in British America; nests on the ground about lakes and along rivers, and in marshes and sloughs where it builds of rushes and grasses among standing rushes and grass in shallow water; nest often afloat. Eggs usually 3, averaging 2.05×1.45 , with great variation in size, shape, and coloration, closely resembling those of the Eskimo Curlew. Diet largely insectivorous, feeding much on grasshoppers.

C. philadelphia. (To the city of that name. Fig. 687.) BONAPARTE'S ROSY GULL. Bill shorter than head or tarsus, much compressed, very slender, like a Tern's; both mandibles with a slight but distinct notch near tip. Convexity of culmen slight, gradual from base to apex; rami slightly concave; gonys about straight. Nostrils very narrow. Tarsus equal to middle toe and claw. Tail somewhat emarginate in the young. Adult ♂ ♀, in breeding plumage: Bill black. Mouth and eyelids carmine. Legs and feet coral-red, tinged with vermilion. Webs bright vermilion. Hood plumbeous-slate, not so deep as in *franklini*, enveloping head and upper part of neck, reaching farther in front than behind. White patches on eyelids nar-

row, and half posterior to eye. Mantle pale pearl-blue, much lighter than in *franklini*. Ends of inner secondaries and scapulars scarcely lighter than back. Primaries: shafts of first 5-6 white, except at extreme tips, the others dark-colored; 1st, outer web and extreme tip black, rest white; 2d, white, its tip black for a greater distance than on 1st, and on one or both webs, for a greater or less distance (sometimes half-way down the feather) narrowly bordered with black; 3d to 6th, black at ends for about the same distance on each, the black bordering the inner web much farther than the outer; inner webs of 3d and 4th, and both webs of 5th and 6th, of a rather lighter shade of the color of the back. Other primaries like back; 7th and 8th with a touch of black on one or both webs near tip; 3d to 6th primaries with a white or pearly-white speck at extreme tip. As is not the case with either of the preceding species, the primary wing-coverts, bastard quills, etc., are wholly or in great part white, causing the whole



FIG. 687. — Bonaparte's Gull.

wing to be bordered with white as far as the carpus. Neck all around, and under parts, including under wing-coverts, pure white; belly rosy in breeding time. No difference in color between the sexes. Adult, winter plumage: Bill light colored at base below; feet flesh-color. Crescent before eye, and patch below auriculars, deep slate. Crown and occiput mottled with grayish-black and white. Back of neck washed over with color of mantle. Forehead, sides of head and throat, white, continuous with white of under parts. Young, first winter: Bill dusky flesh-color, except toward end; feet light flesh-color. Without slaty mottling of crown. Auricular patch distinct. Lesser wing-coverts and scapulars dusky-brown, lighter along their edges. Secondaries with a patch of dusky near end, which on the inner 3 or 4 becomes restricted to outer web. First primary with about half the inner web along shaft, black; 2d and 3d with outer webs wholly black, and a narrow line of black on inner webs along shaft. Tail with a subterminal brownish-black bar. Very young: Bill flesh-color, dusky on terminal half. Crown of head, and neck behind to interseapulars, clouded with dusky bluish-gray, heightening on sides of neck into light grayish-ochreous. Scapulars and middle of back light

gull-blue, as in adult, but the feathers so broadly (for $\frac{1}{2}$ inch) tipped with grayish-brown, fading into dull white at tip, that the original color is nearly lost. Lesser wing-coverts and inner secondaries brownish-black, the latter edged with the color of edgings of back. Bastard quills and feathers along edge of wing variegated with black and white. Primaries black; outer $\frac{2}{3}$ of inner vanes of the first four bluish-white to near the end; both vanes of the others of that color for a little distance; extreme tips of all but the two first white. Secondaries light gull-blue, each with a large terminal blackish spot continuous with black ends of inner primaries. Tail with a broad terminal bar of black, and very narrowly tipped with dull white. Length 14.00; extent 32.00; wing 10.25; culmen 1.20; gape 1.75; height of bill at nostrils 0.25; tarsus, or middle toe and claw, 1.40. North America at large, both coastwise and in the interior, migrating through and wintering in the U. S., breeding chiefly in high latitudes; abundant; especially numerous along the Atlantic coast during the migrations; Bermudas; accidental in Europe (Heligoland, once). One of the most airy, graceful, and elegant of the family. Eggs 1.80–1.95 \times 1.30–1.34, olive-gray, with a close wreath of very dark and lighter brown splashes around the larger end, and other scratches and spots of the same scattered over the whole surface. In the interior this species and the last may often be seen winnowing over ploughed land, seeking for earth-worms, grubs, etc.

C. minutus. (Lat. *minute*, very small, as this Gull is.) LITTLE GULL. LEAST GULL. Adult ♂ ♀, breeding plumage: Hood black. Mantle very pale pearl-gray. Primaries similar, shading darker toward the inner margins, very broadly edged and tipped with pure white, and not crossed with any pattern in black; white of under parts suffused with rosy. Bill dark lake-red, drying reddish-brown; feet vermilion, drying orange. Size very small; length 10.50–11.50, averaging 11.00; wing 9.00 or less; tail 4.00 or less; culmen, tarsus, and middle toe with claw, each about 1.00. Adults in winter lack the hood, the head white, more or less gray or dusky on occiput and auriculars. Young birds resemble adults in winter, but are extensively dark brown above, with buff tips of the feathers; wing-coverts and inner quills tipped with white; primaries sooty-blackish in their central fields, white edged and tipped; tail with a broad black subterminal band. This Gull, the smallest of its tribe, originally described as Asiatic in 1771 by Peter S. Pallas, and well known to be also European and African, was ascribed to North America in 1831 by Swainson and Richardson (F. B.-A. ii, p. 426), on the strength of a specimen said to have been procured in 1821 on Sir John Franklin's first expedition, and identified by Sabine. In 1862 I included it in my Monograph of the *Larinae* (Proc. Phila. Acad. p. 311), but with doubt, as its alleged occurrence had never been accredited. It has therefore been omitted from most of our late works. But quite recently it has been found on Long Island (DUTCHER, Auk, Apr. 1888, p. 171), and is also known to have occurred in the Bermudas. *Chroicocephalus minutus* of Key, 4th ed. 1890, p. 906. *Larus minutus*, A. O. U. List, 2d ed. 1895, No. [60.1.]

RHODOSTETHIA. (Gr. *ῥόδον*, *hrodon*, the rose; *στήθος*, *stethos*, the breast.) WEDGE-TAIL GULLS. Tail cuneate (here only among *Laridae*). Otherwise, form much as in other small Gulls; bill weak and slender, with little salience of the angle; wings folding beyond tail. No colored hood, but a black collar round neck. Under plumage blossoming in the breeding season. One species.

R. ro'sea. (Lat. *roseus*, rosaceous, rosy.) WEDGE-TAILED GULL. ROSY GULL. ROSS' GULL. Adult in summer: White, rosy-tinted; a black collar, but no dark hood; mantle pearly-blue; under side of wings the same; secondaries and inner primaries broadly tipped with white; outer web of 1st primary black. Bill black; eye-ring and feet red. Length 14.00; wing 10.50; tail 5.50, graduated 1.00 or more; bill 0.75, very slender; tarsus 1.20; middle toe and claw the same. Adult in winter: No black collar; a dusky spot before eye; pearl-blue of mantle extending on head; otherwise as in summer. Young: Extensively marked with blackish on upper parts, including wings; tail tipped with black; at an early

age with buff tips of many feathers; no collar; some dark bars on sides of neck. Later the pearly-blue of the mantle appears in patches, while the tail is still black-tipped, before the black collar is formed. Bill black; feet dull reddish. Length 12.50; extent 29.00; wing 9.50; tail 4.00, graduated less than 1.00; bill 0.50 (NELSON, Rep. Alaska, 1887, p. 55, pl. iii). A highly circumpolar species, perhaps the most exclusively so of all birds, inhabiting the Arctic coasts and islands of North America, Europe, and Asia; S. to St. Michael's, Alaska, southern Greenland, the Faroes, casually to Heligoland (once, Feb. 5, 1858) and England (once, Yorkshire, Feb. 1847; Zool. p. 1694 and p. 1784). This exquisite Gull, discovered on Melville Peninsula, June 23, 1823, and first described in 1824, long remained one of the rarest of birds in collections; for many years only about 12 specimens were known, none of them in any American museum. In 1879 Mr. R. L. Newcomb, naturalist of the ill-fated ship *Jeanette*, secured 8 specimens, 3 of which were preserved. On Oct. 10, 1879, Mr. E. W. Nelson took a young bird at St. Michael's, Alaska. In 1881 many specimens were procured at Point Barrow by Mr. J. Murdoch (Rep. 1885, p. 123, pl. i, ii). In Nov. 1896, F. Nansen announced discovery in August of presumed breeding grounds northeast of Franz Josef Land, lat. 81° 38', E. long. 63° (Ornith. Monatsb. Dec. 1896, p. 193; Science, Jan. 29, 1897, p. 175). An egg from Disco Bay, Greenland, lat. 69°, June 15, 1885, measuring 1.90 × 1.30, colored like that of Sabine's Gull, is described in P. Z. S. 1886, p. 82, Ank, 1886, p. 293; but these records are discredited. Best historical notice of the bird is by MURDOCH, Ank, Apr. 1899, pp. 146-155.

XEMA. (A nonsense word—*sonus sensu carens*. It has been conjectured to have been meant by Leach for *Xenia*, from Gr. *ξένια*, *xenia*, a guest, and also written *Chema*, as if from Gr. *χῆμη*, *cheme*, a yawning or gaping, in supposed allusion to the forked tail.) **FORK-TAILED GULLS.** Tail forked. Head hooded, with a darker collar. Bill shorter than tarsus, black, with light tip. Size small. With a general bearing toward *Chroicocephalus*, in the hooded head and other features, *Xema* is distinguished from this or any other genus of *Larina* by the tern-like character of the forked tail, in connection with the small size (wing 11.00 or less).

X. sabinei. (To E. Sabine. Fig. 688.) **FORK-TAILED GULL. SABINE'S GULL.** Adult ♂ ♀, breeding plumage: Bill black to angle, abruptly bright chrome or orange from angle to tip. Mouth bright orange or vermilion; edges of eyelids orange; feet black. Hood uniform clear deep slate, bounded below by a ring, narrowest on nape, of velvety-black. Lower part of neck all round, tail and its coverts, 4 inner primaries, most of the greater coverts, all the secondaries except tips of some of the innermost, and whole under parts, pure white. Mantle slate-blue, extending quite to tips of inner secondaries. Edge of wing from carpal joint, including bastard wing, black. First 5 primaries, including their shafts, black; their extreme tips, and outer half of inner webs to near end, white. Other primaries white, 6th with a touch of black on outer web. Length 13.75; wing 10.75; tail 5.00, forked 1.25; bill along culmen 1.00; along gape 1.50; height at angle 0.30; tarsus 1.25; middle toe and claw the same. Adult in winter: Without hood or collar; head white, usually with some dark touches on auriculars and occiput; bill obscured, and feet not pure black. Young-of-the-year: Tail forked, nearly as in adult, but at an early age only emarginate about 0.50. Bill small and weak, flesh-color and dusky. Legs apparently flesh-



FIG. 688.—Sabine's Gull. (L. A. Fuertes.)

colored. No hood nor collar. Most of head, back of neck, and upper parts in general, slaty-gray, transversely waved with brownish-white, each feather being tipped with this color. Under parts white. Tail white, with a terminal bar of black, 1.00 wide on middle feathers, growing narrower on the others successively, on outermost sometimes invading only one web; this black bar very narrowly edged with white. Wings similar to those of adult, but white on inner webs more restricted, and white tips very small or wanting altogether. Dimensions less than those of adult; length about 13.00; wing 10.25, etc. Young not distantly resembling the same age of *Ch. philadelphia*. Arctic America, both coastwise and in the interior, irregularly S. in winter through the U. S., as in New York, Utah, Colorado, Texas; Bermudas; Peru! Europe. Common in high latitudes, but less so in the U. S., especially on the Atlantic side; breeding range circumpolar. Eggs 3, 1.75 × 1.25, brownish-olive, sparsely splashed with brown, laid in June, July. Nestlings spotted with black above, pale gray below.

CREAGRUS. (Gr. κρεάγγρα, *kreagra*, a pot-hook, flesh-hook; κρέας, *kreas*, flesh, ἀγρεύω, *agreuo*, I seize, catch, take.) SWALLOW-TAILED GULLS. Tail deeply forked. Head hooded, but neck not collared. Bill about as long as tarsus, stout at base, where deeper than at angle, tip strongly hooked. Tarsus rather shorter than middle toe and claw. Size large, about equaling that of a Herring Gull. One species. Neotropical. (*Xema*, in part, of former editions of Key.)

C. furcata. (Lat. *furcata*, forked.) SWALLOW-TAILED GULL. NEBOUX'S GULL. Adult ♂ ♀, breeding plumage: Head and upper neck hooded with slate color, interrupted by a conspicuous white patch at base of bill. Mantle pearl-gray, interrupted with white outer edges of scapulars; outer six primaries marked with black; other primaries pale gray, edged with white; most of the secondaries and coverts, tail, and under parts, white. Bill black, broadly tipped with grayish-white; gape and edges of eyelids orange-red; iris brown; feet red. Young: No hood; head white, with dusky spots about eyes and ears; mantle and tail-feathers spotted with black. Bill dusky; feet pale, probably flesh-colored in life, drying brownish. This Gull runs through the usual changes of plumage, but is unmistakable in any guise; the most remarkable feature is the white mark on the face, in the dark hood. Length of adults 20.00–22.75; extent up to 52.50; wing about 16.50; tail 7.50, forked 3.00; bill along culmen 2.00, its depth at base 0.67, at angle 0.50; tarsus 2.00; middle toe and claw rather more. ♀ averaging smaller than ♂, and young with wing under 16.00, tail less forked, etc. Originally described from Monterey, California, perhaps in error; but see Auk, 1895, p. 291, for probable occurrence at San Diego, Cal. This bird is native to the Galapagos; found also on the coast of Peru, at Paracas Bay, and on Malpelo Island, off Bay of Panama. At date of 2d edition of Key, 1884, only 3 specimens were known, as then stated; in 1895 there were 9, as noted by the A. O. U.; and 20 were catalogued soon afterward. *Larus furcatus* NÉBOUX, Voy. Venus, Atlas, 1846, pl. x. *Xema furcatus* BRUCH, 1853. *X. furcatum* GRAY, 1871; COUES, Key, 1872, p. 317; SAUNDERS, P. Z. S. 1878, p. 210, 1882, p. 523, pl. xxxiv; *X. furcata* COUES, 1882; Key, 2d–4th eds. 1884–90, p. 753; SAUNDERS, Cat. B. Brit. Mus. xxv, 1896, p. 165. *Creagrus furcatus* BP. 1854; A. O. U. Hypothetical List, 2d ed. 1895, p. 326; RIDGW. Pr. U. S. Nat. Mus. xix, for 1896, p. 638, with detailed descriptions and measurements of 20 specimens.

Subfamily STERNINÆ: Terns, Sea-swallows.

Covering of bill continuous (no cere), hard and horny throughout. Bill *paragnathous*, relatively longer and slenderer than that of Gulls, very acute; commissure straight or nearly so to the very end; curve of culmen gentle from base to tip. Symphysis of inferior mandibular rami much more extensive than in *Stercorariinæ* or *Larinæ*, but eminentia symphysis less marked. Interramal space narrow. Encroachment of feathers on bill as in *Larinæ*. Nostrils linear-oblong, lateral, direct, pervious, varying with genera as regards nearness to base of bill.

Wings extremely lengthened, narrow, and acute; 1st primary much the longest, the rest rapidly graduated. Secondaries short and inconspicuous. Tail *usually* much elongated and deeply forked, the lateral feathers being more or less attenuated and filiform, forming streamers; only occasionally short and broad (*Gelochelidon*, *Hydrochelidon*, subgenus *Thalasseus* of *Sterna*, etc.), or graduated (*Anous*, etc.). Legs placed rather farther back, and less decidedly ambulatorial than in *Larinae*. Tibia denuded for a varying distance. Tarsi short and usually slender; scutellate and reticulate, as in *Larinae*. Toes of moderate length, and of the usual relative proportions. Webs rather narrow, and (except in *Anous*, etc.) more or less incised. Claws small, compressed, but much curved and acute. Size moderate, or very small. General form slender and delicate. Plumage as in other subfamilies, but pterygæ narrow; sexes hardly differing in coloration, but variations with age and season very great.

Terns are not distinguished from Gulls by any strong structural peculiarities, but they invariably show a special contour, in the production of which the longer, slenderer, and acutely paragnathous bill is conspicuous. Only one species has the bill in any noticeable degree like a Gull's. A few of the Terns are as large as middle-sized Gulls, but the usual stature is much less; and they are invariably of a slenderer build, more trim in shape, with smoother, closer-fitting plumage. Great length and sharpness of wing relative to bulk of body confer a dash and buoyancy of flight wanting in Gulls; in flying over the water in search of food, they hold the bill pointing downward, which makes them look curiously like colossal mosquitoes; and secure their prey by darting impetuously upon it, when they are usually submerged for a moment. The larger kinds feed principally upon little fish, procured in this way: but most of the smaller ones are insectivorous, and flutter about over marshy spots like Swallows or Nighthawks. The general appearance and mode of flight have suggested the name of "sea-swallow," the equivalent of which is applied in nearly all civilized languages. Forking of the tail is an almost universal character. In the Caspian and Marsh Terns, the Black Tern and its allies, and a few others, the forking is moderate, and not accompanied by attenuation of lateral feathers; but ordinarily, these are remarkably lengthened and almost filamentous, as in the Barn Swallow. It should be observed that in all such cases the narrowing elongation is gradual, and consequently less evident in the young; and that it is very variable in its development. Noddies offer the peculiarity of a tail lightly forked centrally, but rounded laterally. The feet are small and relatively weak throughout the group; Terns walk but little, and scarcely swim at all. Ordinarily, the webbing is rather narrow, and much incised, particularly that between the middle and inner toe; in *Hydrochelidon*, this occurs to such extent that the toes seem simply semipalmate. The webs are fullest in *Anous*, where also the hallux is unusually long; in some species, this toe is slightly connected with the tarsus by a web. The inner toe is shorter than the outer, and much less than the middle, which, especially in *Hydrochelidon*, is much lengthened, and has the inner edge of its claw dilated, or even slightly serrate. The pattern of coloration is very constant, almost throughout the subfamily. Most of the species are white (often rosy-tinted below), with a pearly-blue mantle, a black cap on the head, and dark-colored primaries, along the inner web of which *usually* runs a white stripe. These dark-colored quills, when new, are beautifully frosted or silvered over; but this hoariness being very superficial, soon wears off, leaving the feathers simply blackish. The black cap is often interrupted by a white frontal crescent; it is sometimes prolonged into a slight occipital crest; in a few species, it is replaced by a black bar on each side of the head.



FIG. 689. — Roseate Tern. (From Tenney, after Audubon.)

One species, *Nænia inca*, has a curious bundle of curly white plumes on each side of the head. Another, *Gygis candida*, is pure white all over; *Procelsterna cinerea* and *P. cærulea* are mostly ashy; the Noddies (*Anous* and *Micranous*) are all fuliginous, with white or gray caps; the upper parts of *Haliplana* are dark; the species of *Hydrochelidon* are largely black. These are the principal if not the only exceptions to the usual coloration just given. The sexes are distinguishable neither by size nor color; but nearly all the species, in the progress toward maturity, undergo changes of plumage, like Gulls; while seasonal differences are usually considerable. As a rule, the black cap is imperfect in young and winter specimens, and the former show gray or brown patching instead of the pure final color of the mantle. In all those species in which the bill is red, orange, or yellow, it is more or less dusky in the young. The changes are probably greatest in the Black Terns (*Hydrochelidon*).

The general economy is much the same throughout the group. The eggs are laid in a slight depression on the ground — generally the shingle of beaches — or in a tussock of grass in a marsh, or in a rude nest of sticks in low thick bushes; they are 1–3 in number, variegated in color. Most species are maritime, and such is particularly the case with the Noddies; but nearly all are also found inland. They are noisy birds, of shrill, penetrating voice; and no less gregarious than Gulls, often assembling in multitudes to breed, and generally moving in company. Species occur near water in almost every part of the world, and most of them are widely distributed; of those occurring in North America, the majority are found in corresponding latitudes in the Old World. Some 70 species are currently reported; the true number is just about that of the Gulls (about 50).

The generic and subgeneric groups of *Sterninae* are rather better marked than those of *Larinae*. *Phaethusa*, *Seena*, *Nænia*, and several genera near *Anous* (*Procelsterna*, *Micranous*, and *Gygis*) are extralimital. The North American forms may readily be distinguished by the following analysis.

Analysis of North American Genera.

Nostrils sub-basal. Frontal antiæ prominent, embracing base of culmen. Tail more or less forked. Tarsus not shorter than middle toe without claw. Lateral toes much shorter than the middle. Webs incised. (Group STERNEÆ.)

 Webs moderately incised. Under parts white or light.

 Bill short and stout, somewhat gull-like, black *Gelochelidon*

 Bill otherwise *Sterna*

 Webs deeply incised (feet little more than semipalmate). Under parts in summer black . . . *Hydrochelidon*

Nostrils nearly median. No frontal antiæ, the feathers extending farther on culmen than at the sides. Tail double-rounded. Tarsi very short. Toes lengthened, the lateral nearly as long as the middle, with full webs. (Group ANOÆÆ.)

 Color fuliginous, with white or light cap *Anous*

GELOCHELIDON. (Gr. γέλωσ, *gelos*, laughter; χελιδών, *chelidon*, a swallow.) GULL-BILLED TERNS. Bill gull-like, rather shorter than head, robust, not very acute, compressed; culmen nearly straight to beyond nostrils, then very declinato-convex to tip; gonys about straight; rami slightly concave; symphyseal eminence well marked; tomia of lower mandible inflected; commissure gently curved. Height of bill at base $\frac{1}{3}$ of total length. Nasal groove short and broad, not deep; nostrils short, widely oval, very near base of bill, just beyond the feathers. Wings exceedingly long and acute, each primary surpassing the next by a full inch; secondaries short, soft, obliquely incurved at their extremities. Tail short, contained about $2\frac{1}{2}$ times in wing; deeply emarginate, but its lateral feathers not attenuated. Feet long and stout for this subfamily; tarsus shorter than bill, longer than middle toe and claw; hind toe remarkably developed; inner shorter than outer; interdigital membranes well incised, especially the inner. One wide-ranging species, of moderate size. (As subgenus of *Sterna*, in former editions of the Key.)

G. nilotica. (Gr. Νειλωτικός, *Neilotikos*, Lat. *Niloticus*, of the river Nile in Egypt.) GULL-BILLED TERN. NILOTIC or EGYPTIAN TERN. ANGLICAN TERN. MARSH TERN. NUT-

TALL'S TERN. Adult ♂ ♀, in summer: Crown and long occipital crest glossy greenish-black, extending to lower border of eye, leaving only a very narrow line of white along edge of feathers on side of upper mandible. Neck all round and under parts white. Mantle light pearl-blue, this color extending over rump and tail; tail-feathers deepest colored at their tips, fading into nearly pure white toward their bases, on that portion of each which is covered with the next one; color of mantle also extending to tips of inner secondaries. Primaries grayish-black, deepest on the outer vane of the 1st, but this color so heavily silvered as to appear much lighter. All the primaries have pale yellowish shafts; on their inner webs is a space of white which on the 1st is largest, purest, and extends farthest, is distinctly defined from the black, and has not a margin of black along its inner border, except just at its apex. The amount of white diminishes in length and breadth with each successive primary, until on the last one it is inconspicuous. Bill black, with or without a minute yellowish tip; legs and feet greenish-black; iris brown. In winter: The black cap restricted chiefly to the hind head and nape, on sides of head reaching forward to eye; sometimes extinct, except in dusky eye-stripe and spot before eye, when whole head otherwise white. Young: Bill blackish-brown, pale at base below; feet dull brownish. Upper parts pearl-blue, interrupted by numerous prescentic or hastate spots of dull brownish, one on each feather, the extreme tip of which is whitish. A brownish-black bar along lesser wing-coverts. Forehead and most of crown white, with dark shaft-lines, increasing to exclude white on hind head and nape; blackish spot before and behind eye. Neck all around, upper tail-coverts, and whole under parts, white. Tail-feathers whitening at ends, each with a dusky space. Fledglings chiefly buff and brown above, before any pearly-blue appears; nestlings in down grayish-buff above, streaked, spotted, and mottled with dusky; under parts white, tinged with gray to some extent. Length 13.00-15.00; extent 33.00-37.00; wing 11.75-12.25; tail 5.50, forked 1.20-1.75; bill 1.40; along gape 2.00; its height at base 0.45; tibiae naked 0.50; tarsus (average) 1.30; middle toe and claw 1.10; hind toe and claw 0.40. Nearly cosmopolitan; Europe, Asia, Africa, Australia; in North America, chiefly from Texas to New England; not abundant anywhere, and rare inland; S. on Atlantic coast to Argentina, and on Pacific coast of southern Mexico and Central America; breeds in the U. S. north to New Jersey, on sandy shores, and also in marshes, like the Black Tern; eggs usually 3, laid on broken-down reeds or grasses, 1.75 × 1.30, olivaceous-buff, largely and irregularly splashed with stone-gray, umber-brown and blackish, especially about the greater end, but very variable, like all Terns' eggs. *S. (G.) anglica* of former editions of the Key. Among the numerous names of this Tern the first is no doubt *S. nilotica* of Hasselquist's *Iter* or *Reise*, 1757 and 1762: see Gray's *Hand-list*, iii, 1871, p. 119, and *Auk*, 1881, p. 364. *G. nilotica*, A. O. U. Lists, 1886 and 1895, No. 63.

STERNA. (Latinized by Turner, 1544, from English *stern*, *starn*, or *tern*.) TERNS. SEA SWALLOWS. Form typical of the subfamily. Nostrils sub-basal. Frontal antie prominent. Tail more or less forked. Tarsus not shorter than middle toe without claw. Lateral toes much shorter than middle. Webs moderately incised. Under parts of adult white, or like back. Upper parts of most species with pearly-blue mantle and black cap. This is much the largest genus of *Sterna*, containing over 30 species, or more than half of the subfamily. They differ a good deal among themselves in minor details of form and coloration, and consequently represent several subgenera. Those of North America may be readily determined by the following:

Analysis of Subgenera and Species.

- Of large to largest size; wing over 12.00; bill over 2.00. Head crested. Feet black. Mantle pearly. Cap black.
- Tail contained about 3 times in length of wing, lightly forked. Primaries without white spaces on inner webs. Crest slight. (THALASSEUS.)
- Bill red, stout. Wing 16.00; tail 5.50; bill nearly 3.00 *caspia*
- Tail contained about twice in length of wing, forked about half its length. Primaries with white spaces on inner webs. Crest well marked. (ACTOCHELIDON.)

- Bill orange, stout. Wing 14.50; tail 7.00; bill 2.50, its depth at base 0.50 or more; gonys 1.00 . . . *maxima*
- Bill orange, slender. Wing 12.50; tail 7.50; bill 2.50, its depth at base under 0.50; gonys 1.50 . . . *elegans*
- Bill black tipped with yellow. Wing 12.50; tail 6.00; bill 2.25 *sandvicensis aculeata*
- Of medium to smallest size; wing 12.00 or less; bill under 2.00. Head not crested.
- Mantle pearly. Wing over 8.00. (STERNA proper.)
 - No black cap.
 - Head whitish, with black bar through eye; under parts like mantle *trudeaui*
 - A black cap
 - No white frontal crescent; black cap reaching bill. Feet not black.
 - Bill wholly or mostly red or reddish.
 - Bill red, blackening at end; feet coral-red. Outer web of outer tail-feather white; inner gray or dark. Under parts white. Tarsus 0.90 or more *forsteri*
 - Bill red, blackening at end; feet coral-red. Outer web of outer tail-feather gray or dark, inner white. Under parts paler than upper. Tarsus about 0.75 *hirundo*
 - Bill wholly red; feet vermilion. Outer tail-feather as in the last. Under parts nearly like upper. Tarsus 0.65 or less *paradisica*
 - Bill black, or only red at base; feet red. Both webs of outer tail-feather white. Under parts white. Tarsus 0.85 *dougalli*
 - A white frontal crescent Bill and feet black *aleutica*
- Mantle pearly. Wing under 8.00. (STERNULA.)
 - A white frontal crescent. Bill and feet yellow, former black-tipped *antillarum*
- Mantle dusky. Wing over 8.00. A white frontal crescent. Bill and feet black. (ONYCHOPRION.)
 - Mantle blackish-brown; cap the same *fuliginosa*
 - Mantle sooty-gray; cap black *anastheta*

Obs. — Above analysis based on adult summer birds, and not entirely available for young and winter ones, in which the characters of the cap, and colors of bill and feet, may be entirely different. These must be determined by reference to the detailed descriptions.

(Subgenus THALASSEUS.)

S. (T.) cas'pia. (Of the Caspian Sea. Fig. 690.) CASPIAN TERN. IMPERIAL TERN. Of maximum size. Length 20.00–23.00; extent 50.00–55.00; wing 15.00–17.00, usually about 16.00; tail only 5.00–6.00, forked about 1.50, middle feathers broad to their rounded ends, rest growing successively more acute, but lateral pair *without* any slender filamentous development.

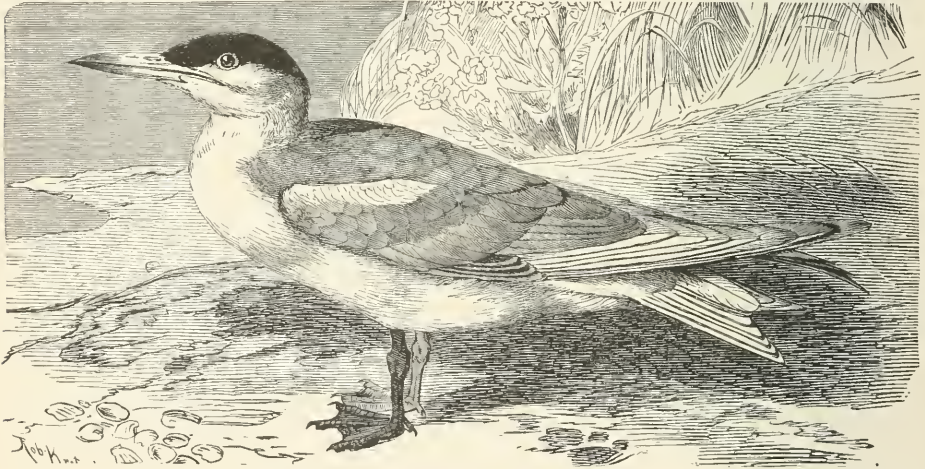


Fig. 690. — Caspian Tern, ♂ nat. size. (From Brehm.)

Bill extremely large, 2.75 along culmen, 4.00 along gape, 0.90 deep at base, 0.50 wide at nostrils; culmen regularly curved from base to tip; outline of mandibular rami slightly concave; gonys about straight; angle not very well marked. Tibiæ bare about 0.75; tarsus 1.75, rather exceeding middle toe and claw, the scutella in front replaced by polygonal scales similar

to but larger than those on its sides, which are rough; hind toe extremely small; outer lateral nearly as long as middle toe and claw, which is 1.65. Adult ♂ ♀, in breeding plumage: Bill vermilion red, lighter and somewhat "diaphanous" toward the tip. Pileum and occipital crest glossy greenish-black, extending below the eyes, and occupying the termination of the feathers on sides of upper mandible to the exclusion of white; lower eyelid white, forming a noticeable spot; a white streak along sides of upper mandible, *not* extending to the end of the feathers. Mantle pearl-blue, the line of demarcation between it and the white indefinite, both on nape and rump; most tail-feathers, especially the central ones, having a more or less pearly tint. Shafts of primaries yellowish-white; primaries grayish-black, but, when new, so heavily silvered over as to appear of a light hoary gray, especially on their upper surfaces. On the inner web of all there is a central light field; this is very narrow, even on the first primary, although it runs for some considerable distance, and on the others it rapidly grows less; and it has no trenchant line of division on any of the primaries from the darker portions of the feather. Whole inner web of secondaries pure white, outer pearl-blue. Feet black. Adult, winter plumage: Chiefly distinguished by a diminution in the brightness of the bill, and by a change in the character of the pileum. The vermilion is replaced by light orange-red, growing still yellower toward tip of bill and along tomtia. Forehead white, usually quite pure; crown white, with narrow, distinct shaft-streaks of brownish-black. On the sides of the head, before and behind the eyes, and over the auriculars, black is more mixed with white; and on the nape black prevails, being only slightly variegated with white. Young-of-the-year: much smaller than the adult, the bill especially shorter and weaker, and of a duller red, more inclining to orange. Upper parts as in the adult, but the pearl-blue everywhere spotted with rather small roundish or hastate spots of brownish-black, largest on the inner secondaries. Forehead grayish-white; vertex speckled with grayish-white and black, the latter color increasing in amount until it becomes nearly or quite pure on the short occipital crest. Wings much as in the adult. Tail much shorter and less forked; the rectrices with brownish spaces near the tips, chiefly on the inner webs. Under parts dull white. Feet blackish. Downy young: Grayish-white above, faintly mottled with blackish not aggregated into spots; white below, dusky across throat. Nearly cosmopolitan. In North America irregularly distributed, not only during the extensive migrations, but also during the breeding season; known to breed at various points on the Atlantic coast N. from Texas, in the interior from Great Slave Lake to Lake Michigan, Nevada, and California, but seldom observed on the Pacific coast. Eggs 2-3, in hollow scooped in dry sand without nest, 2.65-2.75 × 1.80-1.90, broader and more elliptical than those of *S. maxima*, with smoother and harder shell; ground-color pale olive-buff, evenly marked all over with small spots of dark-brown and lavender. Breeds commonly by single or few pairs. This greatest of all Terns may be worthy of the generic distinction accorded to it by many authors, under the several names of *Thalasseus*, *Hydroprogne*, *Gylochelidon*, and *Helopus*; but I do not alter the status I gave it in former editions of the Key, as this is sanctioned by the A. O. U. I could not, however, follow the A. O. U. in changing the established name *caspia*, given by PALLAS in 1770, to the barbarous designation *tsehgrava* bestowed by LEPECHIN a few pages before *caspia*, in the same Part of the same Vol. of the same publication of the same date — why then the change? See A. O. U. List, 2d edition, p. 23. But *S. caspia* (as always in the Key), A. O. U. Suppl. List, Auk, Jan. 1899, p. 99. The North American *Thalassens* has been separated as *T. imperator* COUES, 1862 (*Sterna caspia* var. *imperator* RIDGW. 1874), on the ground of average greater size.

(Subgenus ACTOCHELIDON.)

S. (A.) max'ima. (Lat. *maxima*, largest; not true of this species, if the Caspian Tern is kept in the genus *Sterna*. Fig. 691.) CAYENNE TERN. ROYAL TERN. Bill about as long

as that of *S. caspia*, but of different shape, much slenderer, its height at base only $\frac{1}{4}$ – $\frac{1}{3}$ the length of culmen, which is gradually convex from base to tip, the curvature increasing but slightly toward the rather obtuse tip. Commissure somewhat sinuate basally, regularly convex for the rest of its length; rami a little concave along their edges; gonys straight, shorter than rami, the angle between the two illy developed. Tibiæ bare (0.90). Tarsus not longer

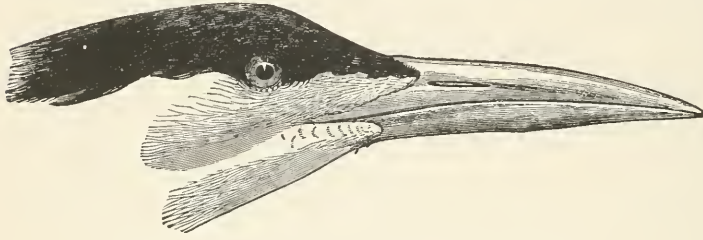


FIG. 691. — Royal Tern, ♂ nat. size. (From Sclater and Salvin.)

than middle toe and claw; its anterior aspect shows a tendency toward reticulations instead of transverse scutella, but there are usually some scales which extend quite across it; lateral and posterior aspects reticu-

lated, as in *caspia*, but the plates not so rough. Tail deeply forked; middle feathers broad to their rounded tips; lateral ones successively elongated and narrower toward their tips, the external pair slender and streaming. Adult ♂ ♀, in summer: Pileum glossy greenish-black, not extending below eyes, so narrow on side of upper mandible that a broad white streak extends to extreme tip of the feathers. Mantle very pale pearl-blue, fading imperceptibly into white on the rump and toward the ends of the inner secondaries. Tail white, with a faint pearly tinge, especially on the middle feathers and inner webs of the others. Most of the secondaries pure white, except a small space on the outer web near the tip, which is grayish-blue, deeper than the mantle. Outer web of first primary grayish-black; inner web with a space of black extending the whole length, very narrow at the base, widening as it runs toward the tip, within 1.50 of which it occupies the whole web; rest of the web white, separated from the black by a straight distinct line. The 2d–5th primaries have the same general characteristics, but the white space rapidly grows narrower and shorter, and runs up farther in the centre than along the edge of the web, so that for a little way from its end it has a border of blackish along its outer margin; other primaries pearl-blue, their inner webs margined with white. Bill coral or orange-red, with a slightly lighter tip; feet blackish, their soles dull yellowish. Winter plumage: Bill less brightly colored, its tip and tomia dull yellowish. Front white; crown variegated with black and white, the former color increasing on the occiput and nuchal crest, which latter is almost or quite unmixed with white. This black extends forward on the sides of the head to include the eye. (But frequently found breeding in this condition, the complete black cap being worn but a short time in spring and early summer, and doffed just after pairing.) Tail not pure white (except perhaps in very old birds), but tinged with the bluish of the mantle, which deepens toward the tips of the feathers into dusky-plumbeous; also considerably less forked, the lateral feathers having little or nothing of a filamentous character. Young-of-the-year in August: Bill much smaller than in the adult, its tip less acute, its angles and ridges less sharply defined; mostly reddish-yellow, but light yellowish at tip. Crown much as in the adult in winter, but an occipital crest scarcely recognizable. Upper parts mostly white; but the pearl-gray of the adult appearing in irregular patches, and whole back marked with small, irregular, but well-defined brown spots, largest on the inner secondaries; lesser wing-coverts dusky plumbeous. Primaries much as in the adult, but the line of demarcation of the black and white wanting sharpness. Tail-feathers white at base, then plumbeous, next decidedly brownish, the extreme tips again white. Adults: Length 18.00–20.00; extent 42.00–44.00; wing 14.00–15.00; tail 6.00–8.00, forked 3.00–4.00; bill along culmen 2.50–2.75; along commissure 3.75; height at base 0.70; width 0.50; gonys

1.00–1.25; tibiæ bare 0.90; tarsus 1.37; middle toe and claw 1.40. Tropical and temperate America; Brazil and Peru to California and New England, chiefly coastwise, sometimes in the interior, as in Nevada and the region of the Great Lakes; but Audubon's Labrador record belongs to *S. caspia*; also ascribed to West Africa. A fine species, second in size only to *S. caspia*; linear measurement nearly as great, owing to elongation of tail, but bulk much less. Breeds in great colonies along our Atlantic coast at various points from Texas to the Middle States; eggs laid on the sand, mostly 2 or 3, sometimes 1 or 4 (?), 2.60–2.70 × about 1.70, narrower and especially more pointed than those of *caspia*, rougher; yellowish-drab, creamy, or nearly white, irregularly blotched with dark umber and pale purplish, some of the brown spots almost black, at least in part, with washed out edges, and some of the markings tending to be scrawly. Chicks boldly spotted above with dusky. (*Sterna (Thalasseus) regia* of former editions of the Key.)

S. (A.) e'legans. (Lat. *elegans*, choice. Fig. 692.) ELEGANT TERN. PRINCELY TERN. Similar to the last; smaller and differently proportioned; bill as long, much slenderer; tarsus if anything longer than middle toe and claw; mantle very pale; under parts rosy in high plumage. Bill much longer than head, exceeding the tarsus, middle toe and claw together; much compressed, very slender, scarcely $\frac{1}{2}$ as deep at base as long; culmen quite straight to beyond nostrils, then slightly convex for the rest of its length; commissure curved for nearly its whole length; mandibular rami very short, concave in out-

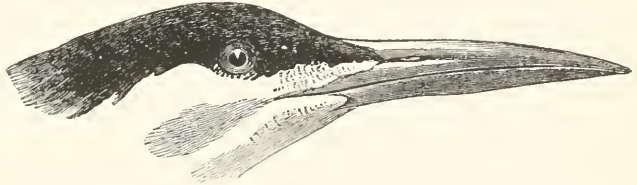


FIG. 692.—Elegant Tern, ♂ nat. size. (From Selater and Salvin.)

line, their angle of divergence very acute. Gonyes extremely long, exceeding the mandibular rami, its outline straight. Tonia much inflected. Nasal groove long, fully half the culmen, narrow, not deep, directed obliquely downward and forward toward the tonia. A few indistinct oblique striae on both mandibles. Outline of feathers on bill as usual. Adult ♂ ♀, in summer: Bill bright red, salmon-colored toward tip. Feet black; soles and under surfaces of claws slightly yellowish. Crown, including long-flowing occipital crest, pure black, reaching on sides of head to a level with lower border of eye, white of cheeks accompanying the black to end of feathers in nasal fosse. All the under parts rosy-white, with satin gloss. Tail pure white. Mantle pale pearl-blue; usual pattern of coloration of primaries. "Length 19; extent 48" (label); culmen 2.75; gape nearly 4.50; depth of bill at base 0.50; gonyes 1.50; not shorter than mandibular rami; wing 12.25; tail 7.50; depth of fork 3.50; tarsus 1.25; middle toe and claw the same, or rather less. In winter: Bill orange, fading to yellow at tip and along cutting edges. Forehead entirely white; crown varied with dusky and white, black prevailing on hind head, complete on occipital crest and sides of head to eyes. No pink blush of under parts. Tail shorter than in summer, 5.00 or less, forked only about 2.00, washed over with pearly-blue. Total length less, owing to less development of tail, 16.00–17.00. Young not seen; said to differ from the adults as those of *S. maxima* do; bill short and blackish. A truly elegant species, resembling the Royal Tern, but easily distinguished. South and Central America on the Pacific side, Chili to San Francisco, California; almost unknown on our Gulf or Atlantic coast, but a specimen from Corpus Christi, Texas, reported. Eggs 2.45 × 1.45, creamy, with bold dark brown and blackish spots. (*Sterna (Thalasseus) elegans* of former editions of the Key.)

S. (A.) sandvicens'is acutifl'ida. (Lat. of Sandwich, one of the Cinque Ports in Kent, England, where this Tern was taken in Latham's time (1784) by a Mr. Boys. Lat. *acus*, a needle, point, tip, and *flavidus*, yellowish, referring to the colored tip of the yellow bill.

Fig. 693.) SANDWICH TERN. KENTISH TERN. BOYS' TERN. CABOT'S TERN. DUCAL TERN. Bill slender, much longer than head, exceeding tarsus, middle toe, and claw together; tip very acute; convexity of culmen regular from tip to base, but slight; commissure a little curved throughout; outline of mandibular rami concave; that of gonys about straight; eminentia symphysis hardly appreciable. Hind toe very small. Adult ♂ ♀, breeding plumage: Bill black, the tip for $\frac{1}{2}$ to $\frac{3}{4}$ of an inch bright yellow, sharply defined; "inside of mouth deep blue." Feet dull black. Pileum and occipital crest glossy black, with a tinge of green extending just below eyes, but leaving a space along side of upper mandible white to the end of the feathers; this black cap worn but a short time, in late spring and early summer. Mantle light pearl-blue, fading on rump and upper tail-coverts into pure white; but the rec-

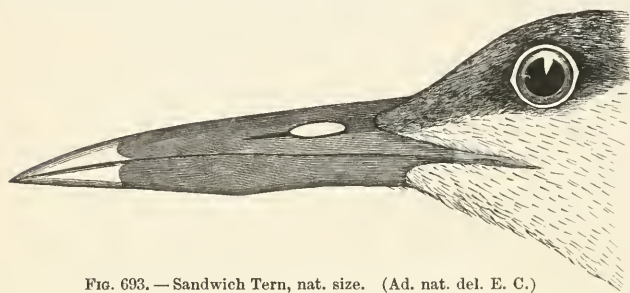


FIG. 693. — Sandwich Tern, nat. size. (Ad. nat. del. E. C.)

trices have a slight pearly tinge. Primaries colored as in *S. maxima*, heavily silvered or frosted when new. On the inner web of the first the black space is broad, and deep in color; about $1\frac{1}{2}$ inches from the tip it abruptly widens, so as to exclude the white portion from the tip altogether. The 2d-

4th primaries have the same pattern, but the white runs up farther on the central portion than on the edge of the web, so that toward its end it receives a narrow edging of blackish. The other primaries have no blackish, being pearl-blue, with broad white margins along the whole length of their inner webs. Length 15.00–16.00; extent 34.00; wing 12.50; tail 6.00, forked 2.50; bill along culmen 2.25; along gape 3.00; height at base 0.48; width there 0.37; length of rami from feathers on side of lower mandible 1.00; gonys 1.20; tarsus 1.00; middle toe and claw slightly longer. Adult, winter plumage: Yellow tip of bill less in extent and intensity of color; front white, either pure or speckled with black; crown white, variegated with distinct black shaft-streaks; but the long occipital crest, which does not entirely disappear at this season, is usually unmixed brownish-black. Lateral tail-feathers shorter than in summer. Young-of-the-year: Smaller than the adult, as usual in this subfamily; wing 0.50 shorter. Bill shorter and weaker, brownish-black, the extreme point only yellowish. Crown, front, and occiput brownish-black, variegated with white; white touches very small on forehead. Upper parts everywhere marked with irregular but well-defined spots and transverse bars of brownish-black. No well-formed occipital crest until after the first moult. Primaries like those of adult. Tail-feathers for $\frac{3}{4}$ their length of the color of the back, but toward the tips brownish-black, each having a whitish terminal edge. Tail simply deeply emarginate, the outer feathers being but slightly longer than the second. A fine large species, easily known by its black yellow-tipped bill. The greater width of the black area on the outer primaries is the chief if not the only distinction of *acutifurda* from *sandvicensis*, as I pointed out in Proc. Phila. Acad. 1862, p. 541; it is not very well marked, but may be allowed subspecific validity. The typical form inhabits much of Europe, Asia, and Africa; the North American is observed chiefly along the S. Atlantic and Gulf coasts, casually N. to New England in summer, regularly S. in winter to the West Indies and both coasts of Central America; not known inland. Breeds in colonies, like most Terns, laying on the dry sand of the shore. Eggs 2–3, 2.10×1.40 , rather pointed, yellowish-drab or creamy, irregularly spotted and scrawled with dark brown, reddish-brown, and blackish, with lilac shell-spots. Nestlings mottled gray above, white below. (*Sterna (Thalasseus) cantiaea* of former editions of the Key. The species is type of the genus *Actocheilidon* KAUP, 1829, and stands somewhat alone,

between the foregoing large crested Sea Terns and the smaller species following; but the former agree best with it, and may be brought under the same genus, *Thalasseus* being now restricted to the Caspian Tern.)

(Subgenus STERNA.)

S. trudeau'i. (To Dr. James Trudeau.) TRUDEAU'S TERN. WHITE-HEADED TERN. Size and proportions nearly as in *S. forsteri*, the bill especially of same size and shape. Coloration very different, unique in the subfamily. Adult: Bill straw-yellow at end, brighter yellow on basal half, with a broad black intervening band. Whole head pure white, deepening insensibly into pearly color all around the neck. A narrow bar of slaty-black on side of head, passing through eye from the auriculars, where the fascia widens and bends down a little. Rest of the plumage, below as well as above, uniform pale pearly, with the following exceptions: Under surfaces of wings pure white; tail, with its coverts and rump, white, with an appreciable pearly tint; tips, and part of inner vanes of secondaries white; primaries with a white space on inner webs, their darker portions beautifully silvered; shafts white above and below, except at extreme tips. Feet reddish. Length 14.00; wing 10.25; tail 6.50, forked 2.75; bill along culmen 1.50-1.70; its depth at base 0.38; length of gonyx 1.75; tarsus 0.90; middle toe and claw 1.05. A rare and remarkable South American species, questionably occurring in North America, ascribed to New Jersey and Long Island by Audubon. (*Phaëtusa sellovii* LICHT. 1854. *Sterna frobenii* PIL. and LDB. 1863.)

S. for'steri. (To John Reinhold Forster. Figs. 50, 694.) FORSTER'S TERN. HAVELL'S TERN. Similar to *S. hirundo* (see next); larger; bill longer, stouter; wings shorter, tail longer; feet larger. Length about 15.00; extent 30.00; wing 9.50-10.50; tail 5.00-8.00, forked 2.50-5.00; bill along culmen 1.50-1.75, averaging 1.60, its depth at base 0.40; tarsus 0.90-1.00; middle toe and claw 1.00-1.10; whole foot averaging 2.00. Adult ♂ ♀, breeding plumage: Bill orange-yellow, black for nearly its terminal half, the extreme points of both mandibles yellowish; robust, deep at base, and 0.10-0.20 longer than that of *S. hirundo*. Black cap not extending so far down on sides of head as in *hirundo*, barely embracing eye (the lower lid of which is white), thus leaving a wider white space between eye and edge of upper mandible. Mantle perhaps a shade lighter than that of *hirundo*. Wings absolutely a little shorter (though *forsteri* is a larger bird); primaries strongly silvered; outer web of 1st not black, but silvery like the others; all wanting the decided white space on the inner webs which exists in *hirundo* and *paradisca*; there are indications of it on the 3 or 4 outer primaries, the others are nearly uniform dusky gray, moderately hoary. Entire under parts white, with scarcely a trace of the plumbeous so evident in *hirundo*, and so decided in *paradisca*. Tail slightly lighter than the mantle, separated from the latter for a short space by the decidedly white rump; lateral feathers much more streaming than in *hirundo*, the elongation generally equalling and sometimes exceeding that of *paradisca*. The two streamers are white on the outer web, dusky-gray on the inner. (This being exactly the reverse of *hirundo*, and a very noticeable feature, was the first to draw attention to *forsteri*; and this character being so convenient, writers have perhaps laid too much stress upon it.) Feet bright orange, tinged with vermilion; tarsus shorter than middle toe and claw; feet longer and stouter by over 0.10 of an inch than the same parts in *hirundo*. Adult, winter plumage: Bill

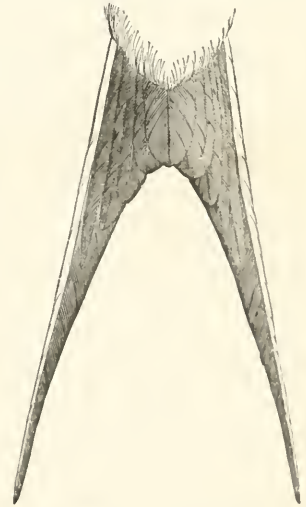


FIG. 694. — Tail of Forster's Tern, about $\frac{2}{3}$ nat. size. (From Elliot.)

dusky, except at base of under mandible, and a terminal space of varying extent; feet dusky yellowish. The black cap more or less variegated with white; but there is always considerable black on the nape, and a distinct black bar extends along sides of head, embracing eyes. Lateral tail-feathers not streaming like those of summer, being but little, if any, longer than those of *hirundo* during the breeding season; inner web usually darker, and this color may extend on the outer web, especially toward the tip. (In this plumage the bird is *S. havelli* AUD.) At the moult the old primaries lose their silvering, becoming plain brown and white, their shafts decidedly yellow; inner webs at this season with white spaces, as distinctly defined as in *hirundo* and *paradisæa*. Young: Bill smaller and weaker than that of the adults, brownish-black, dull flesh-color at base of under mandible. Front white, but crown and nape showing traces of the black that is to appear, now mixed with light brown. Pearl-blue of mantle interrupted by irregular patches of light grayish-brown, tending to become transverse bars; on the inner secondaries deepening into brownish-black, and occupying nearly the whole extent of each feather. Primaries less silvery than those of the adult, with better marked white spaces, like those of adult *hirundo*. Rump and under parts pure white. Tail deeply emarginate, but lateral feather not streaming, surpassing the 2d pair by scarcely more than the latter surpass the 3d; inner web, for about 1.00 from the tip, and both webs of the other feathers, grayish-black; outer web of lateral feather white, but sometimes is invaded at the tip by the darker color of its inner web. Nestlings buffy-brown, whitening on the belly, blotched with black on the upper parts. North America at large, common; breeds locally from Texas to the Fur countries, both coastwise and inland; winters as far as Guatemala and even Brazil. Nest commonly in marshes; eggs 2-3, 1.75-1.85 × 1.25-1.35, of variable tone from buffy or pale brownish to olivaceous, freely but irregularly spotted and dashed with different shades of brown and blackish; commonly laid on grass or seaweed.

S. hirundo. (Lat. *hirundo*, a swallow. Fig. 695.) COMMON TERN. WILSON'S TERN. SEA SWALLOW. Bill as long as head, about equalling tarsus and middle toe without claw, moderately robust; height at

base contained a little more than five times in length of culmen; gonys as long as rami, measured from feathers on side of mandible to angle, which latter is but slightly marked. Adult ♂ ♀, breeding plumage: Bill bright coral or light vermilion on basal half or rather more, the rest black, except the extreme yellowish tips. Iris dark brown. Pileum lustrous black, with tinge of green; it extends to lower level of eyes, but leaves the lower lids white, and it is so broad



FIG. 695.—Nest and Eggs of Common Tern.

on the lores that the white line of feathers along side of mandible hardly reaches to their end. Mantle pearl-blue, beginning insensibly on neck, deepening on back, extending undiluted

almost to ends of inner secondaries, but ending abruptly on rump, the upper tail-coverts being pure white. Under parts considerably lighter than the mantle. On the throat, toward chin and along borders of the black cap, this color fades into nearly or quite pure white, as it does also on lower tail-coverts; under surface of wings and axillary feathers pure white. Shafts of all the primaries white, deepening into blackish toward their tips. Outer web of 1st primary black, with scarcely any hoariness. First 4 or 5 primaries grayish-black, strongly silvered; their inner webs with a space of white along their inner margins. This space on the 1st primary at base occupies the whole web, becomes narrower as it ascends, and ends, or becomes a mere line, about 1.00 from the tip; on other primaries it is of less extent, and runs up along the centre of the web a little farther than on the edge; on the innermost primaries it is very narrow, but forms an entire margin to the inner webs, running to their tips. The inner primaries have scarcely any grayish-black, being mostly of the color of the mantle. Secondaries mostly pure white, but toward their ends grayish-blue to about equal extent on both webs. Tail moderately forked, contained about $1\frac{2}{3}$ times in length of wing; the folded wings reach 1.00-2.00 beyond it; middle feathers broad to their rounded tips; lateral ones successively narrower and more "streaming," their *outer* webs light pearl-gray (like the back), their *inner* webs nearly pure white. The outer pair, however, are grayish-blue on most of their inner webs, especially terminally, while their outer webs are grayish-black. Feet light coral-red. Adults in winter: As above, but cap imperfect, marked with white on front and crown; under parts less pearly or quite white; bill and feet dull. There is much less decided difference in seasonal plumage of this species, *forsteri*, and others of the same subgenus, than there is in the large Terns of the section *Actocheilidon*, the pure black cap being worn longer. Length (average) 14.50; extent 31.00; wing 10.50; tail 6.00, forked 3.50; bill along culmen 1.35; height at base 0.33; from feathers on side of lower mandible to tip 1.60; gonys 0.80; gape 2.10; tibiae bare 0.50; tarsus 0.80-0.85; middle toe 0.75, its claw 0.30; outer 0.70, its claw 0.18; inner 0.48, its claw 0.14; hallux with its claw 0.28; whole foot about 1.75. Extremes: Length 13.00-16.00; extent 29.00-32.00; wing 9.75-11.75; tail 5.00-7.00; tarsus 0.66-0.87; bill 1.25-1.50; ♀ averages a little less than ♂. Young fall under the above minima: length down to 12.00, wing to 9.00, tail to 4.00, bill to 1.12, etc. Young-of-the-year in August: Upper mandible brown, becoming blackish on culmen toward tip, and somewhat flesh-colored basally along tomlia; under mandible light yellow, darkening into brown toward tip. Mouth yellow; feet dull yellow, with scarcely a tinge of reddish. Forehead grayish-white; on crown mixed with large, illy-defined blackish spots; on occiput and nape black prevailing, the extreme tips of the feathers only being gray; on sides of head, as far as eyes, the black also nearly pure. Ground-color of upper parts a rather lighter shade of the pearl-blue of the adults, but every feather is tipped with dull light gray, and has a subterminal spot (generally a crescent or semicircle) of light brown. These conspicuous spots and tips usually give the predominating color to the upper parts; but are neither so distinct nor so dark as in *paraliscæ*. Lesser wing-coverts brownish-black, forming a continuous band. Lesser and median coverts conspicuously tipped with yellowish-gray; inner secondaries nearly pure white at their tips; other secondaries white, with the outer web, except at tip, and the median portion of the inner web, dark plumbeous or ashy-gray. Primaries colored almost exactly as in the adults. Rump white, with a tinge of pearl-blue. Tail forked 1.00 or a little more; inner webs of all the rectrices nearly pure white, but outer webs plumbeous-gray, increasing in intensity from within outward, so that the outer pair, which are but little elongated, have their outer webs grayish-black, deepest toward their tips. Entire under parts, including under wing-coverts, pure white, with no trace of the pearly wash of the adults. Nestlings grayish-buff of variable shade, mottled with dusky on the upper parts, white below, with dusky throat and pale buff sides; feet yellow. Eggs 2-3, rarely 4. 1.55-1.65 × 1.20-1.25, buff or pale brown with variable olivaceous shade, fully spotted with dark brown or

blackish, indistinguishable with certainty from those of several related species, with some of which the present species often breeds in colonies; they are laid on the bare sand or shingle of the seashore or large inland waters; but (together with those of *dougalli*) on pasture sward at Penikese Island. A very common species, wide-ranging in many parts of the world; Europe, Asia, Africa, and South America; in North America throughout, both coastwise and inland, but most numerous east of the Great Plains; breeding irregularly from Arctic regions to Gulf of Mexico, and wintering from the Southern States southward.

S. paradisæa. (Old Persian *pairidaeza*, Arabic *firdaus*, late Lat. *paradisus*, Gr. *παράδεισος*, *paradeisos*, a park or pleasure ground, used for the alleged Garden of Eden or Paradise, by uneritical Biblical scribes, and hence for heaven as the abode of the blessed after death. Figs. 696, 697.) PARADISE TERN. ARCTIC TERN. CRIMSON-BILLED TERN. LONG-TAILED TERN. SHORT-FOOTED TERN. PORTLAND TERN. PIKE'S TERN. Bill shorter than head, equal to middle toe and tarsus together, slender, compressed, acute. Feet remarkably small and weak; tibiae bare for a moderate distance; tarsus shorter than middle toe without claw, or only equal to it; toes rather long for the size of the feet; the outer falls but little short of

the middle one, while the claw of the inner hardly reaches beyond the third joint of the middle one. Adult ♂ ♀, in breeding plumage: Bill carmine or lake-red, usually without any black; feet a lighter tint of the same, tending to vermilion or coral-red, but not so light as those of *hirundo*. Shafts of primaries white, with scarcely darker tips. Outer web of 1st primary grayish-black, lightening into silvery-gray at tip; inner web white, with a line of grayish-dusky along the shaft, narrower and lighter than in *hirundo*; next 4 or 5 primaries silvery-gray, darkest toward tips, the inner webs mostly white (wholly so at their bases); but the white does not extend so far toward the tip as on the 1st primary, and runs up farther in the centre of the web than on the edge of it. Inner primaries of the color of the back, broadly tipped and margined internally with white. Tail exceedingly long, the streamers as much lengthened, and as narrow, as in *dougalli*, reaching beyond the tips of the folded wings. Tail pure white; outer web of its exterior feather grayish-black, lighter basally; its inner web, and the outer webs of the next two rectrices, having a tinge of pearl-blue. Cap lustrous greenish-black, so broad as to leave only a slender line



FIG. 696. — Arctic Tern. Right foot. (L. A. Fuertes.)

of white along edge of feathers on side of upper mandible. Mantle pearl-blue, of about the same shade as in *hirundo*, fading into white at tips of inner secondaries. Under parts but a little lighter shade of the color of the back, fading insensibly into whitish on chin, throat, and edges of the black cap, and ending abruptly at the under tail-coverts, which are white, in marked contrast to the rest of the under parts; lining of wings and axillars also white. Winter plumage of adult: Differs from the above chiefly in the color of the cap; forehead white; crown white, but marked with narrow black shaft-lines which increase backward until the nape is nearly or quite black. A dark lateral stripe, more or less distinct, extends over auriculars beyond eye, leaving eyelids white. Upper parts much as in summer, but under parts from chin to vent, much lighter. Young-of-the-year: Bill small, only about 1.08, brownish-black toward tip, gonys and sides of lower mandible toward the angle of the mouth dull orange; feet only orange on the soles, otherwise brownish-red. Tail only 4.75–5.00, the outer rectrices scarcely streaming. Forehead white; crown with narrow, longitudinal spots of white upon a black ground which extends to the eyes, and runs back over the auriculars to the nape. Whole under parts, including under tail-coverts and under surfaces of wings, pure white. Back light bluish-gray (somewhat darker than in *hirundo*), all the feathers tipped with yellowish-white or white, most of them with a blackish-brown streak or crescentic spot near the end, darkest on inner secondaries, and forming one broad streak on the least wing-

coverts. Primaries slate-color toward the tips; shafts white, inner webs with a longitudinal space of white, outer web of the 1st slaty-black. Inner tail-feathers white, as are their shafts, each with a subterminal crescent-shaped spot of brownish-black. Nestlings indistinguishable from those of *hirundo* in coloration, but averaging darker. Adult: Length (extremely variable from varying length of tail) 14.00–17.00; extent 29.00–33.00; wing 10.00–10.75; tail usually 7.00–8.00, sometimes 6.50–8.50, forked 4.00–5.00; tibiae bare 0.45; tarsus 0.55–0.65; middle toe and claw 0.80–0.85; inner toe and claw 0.55; whole foot about 1.50; bill along culmen 1.20–1.40; height at base 0.30; from feathers of side of lower mandible to tip 1.40; gape 1.90; gonys 0.75. A beautiful Tern, easily recognized by points of size and form, aside from color; this varies much with age and season, giving rise to many nominal species; among American synonyms are *S. pikei* LAWR., *S. longipennis* COUES nec NORDM., *S. portlandica* RINGW. Others are: *S. hirundo* LINN., in part; *S. macrura* NAUM., of 2d–4th eds. of the Key, as of most authors, which unfortunately must yield to *S. paradisæa* BRÜNN. 1761, though the latter name used to be given to the Roseate Tern; *S. arctica* TEMM.; *S. argentata* BREHM;



FIG. 697. — Arctic Tern.

S. coccineirostris REICH.; *S. brachytarsa* GRABA; *S. brachypus* and *senegalensis* Sw. Northern Hemisphere. The bird is wide-ranging like most Terns; Europe, Asia, Africa; North America at large; breeds from Massachusetts N. to the Arctic regions: S. to Middle States and California in winter, but also then passing on to South America. Eggs 2–3, not distinguishable from those of the two foregoing species, but averaging smaller, say 1.65×1.15 .

S. dou'galli. (To Dr. McDougall. FIG. 689.) ROSEATE TERN. McDOUGALL'S TERN. GRACEFUL TERN. Bill about as long as head or foot, straight, slender, compressed, very acute; gonys longer than rami, former straight, latter concave in outline, with acute but not prominent angle between them. Wings shorter than usual; 1st primary little longer than next. Tail deeply forked, with very long narrow streamers. Tibiæ slightly denuded; tarsus a little shorter than middle toe and claw. Whole form trim and elegant. Adult ♂ ♀, breeding plumage: Bill black, the extreme point yellowish, the base for a little distance, and inside of mouth, red. Feet bright red; claws black. Cap lustrous black, very ample, reaching to lower border of eyes; under eyelid white, as is a streak to end of feathers on bill. Neck all around and entire under parts snowy white, tinted with lovely rose-pink. Mantle delicate pale pearly, over all the upper parts from the neck, including rump and base of tail, fading to white on tips of inner secondaries and inner webs of the others. Streamers white on both webs, sometimes with a faint pearly tint. Primaries grayish-black, strongly silvered when

fresh; outer web of 1st blackish; inner webs of all white for more than half their breadth, this white stripe broadest on the first, toward the base of which it occupies the whole web, and on all of them continued to and usually around the very tips; shafts of all white both sides nearly to end. Adult in winter: Bill dull black, with yellowish tip and brown base. Forehead and cheeks white; crown, hind-head, nape, and sides of head, brownish-black, mixed with white on vertex. No rosy tint. Lesser wing-coverts brownish. Tail without much elongation or forking, and pearly like the back. Young, newly fledged: Bill small, slender, blackish, hardly 1.10. Wings like those of adults. Tail merely forked an inch or so, pearly-blue on outer webs, almost white on inner, with subterminal edging of blackish. Mantle light pearly-blue, variegated with a delicate mottling of black and buff, the black chiefly in narrow zig-zag cross-bars, broken by the fawn-color; on the wings the variegation in larger pattern, the feathers mostly black with yellowish borders. Forehead and cheeks light grayish-brown, resolved on crown and hind-head into streaks of blackish and tawny, lost in blackish on nape. A silvery white spot before and above eye; eye surrounded by black. A band of black along edge of forearm, where some of the feathers have yellowish tips. Under parts pure white, a little obscured with gray on the breast. Adult: Length 14.00–15.00; extent about 30.00; wing 9.25–9.75; tail 7.00–8.00, forked 3.50–4.50; bill along culmen 1.50; height at base 0.35; gonys 1.00; mandibular rami 0.75; tibial bare 0.40; tarsus 0.85; middle toe and claw 1.00. This exquisite species inhabits Europe, Asia, Africa, etc.; in North America it occurs along the whole coast of the Atlantic and Gulf States, in various West India Islands, and Central America; breeds nearly throughout its U. S. range, wintering extralimital. It is a beach bird, nesting on the sand of the seashore; eggs 2–3, about 1.65×1.20 , indistinguishable from those of several related species, especially the Arctic Tern; said to average rather lighter colored, with smaller spots.

S. aleutica. (Of the Aleutian Isles. Fig. 698.) ALEUTIAN TERN. Form of *Sterna* proper; tail deeply forked, with long streamers as in *forsteri*, etc. Coloration darker than that of any of the foregoing species, approaching that of the section *Onychoprion*, and presenting a white



FIG. 698. — Aleutian Tern, much reduced.

frontal lunule as in *Sternula* and *Onychoprion*. Adult ♂ ♀, in summer: Bill and feet black. Crown and nape black; a large white frontal crescent, the horns of which reach over the eyes, and the convexity of which extends into the nasal fossæ. The black vertex sends through the eye a band that crosses the cheek and reaches almost to the point of greatest extension of feathers on the bill. Chin and side of head bordering this vitta below pure white, presently deepening insensibly into the hue of the under parts. Tail and its coverts pure white — no pearly wash on any of the feathers. Mantle dark pearl-gray, with a leaden hue, different from the clear pearly of *paradisæa*, etc., yet not of the smoky cast of *anæsthera*, etc. — a tint intermediate between these, difficult to name satisfactorily; it extends on the neck behind to the black of the nape without intervention of white. All under parts, from the white chin to under tail-coverts, paler and more decidedly pearly than the mantle, nearly as in full-plumaged *paradisæa*, yet grayer. Under wing-coverts, edge of wing, and shafts of primaries, pure white. Primaries blackish, with the usual silvery hoariness, and with large white spaces on inner webs; this space on the 1st primary occupies at base the whole width of the web, but grows narrower and ends about 1.00 from the tip, which is wholly blackish, this color running down as a narrow margin for 2.00 or more. On other primaries successively this white space diminishes, and is also less distinctly defined. Secondaries like the back, but most of the inner web of all white, and a narrow oblique touch of white on outer web near its end, forming a bar across the wing when closed. Length 13.50–15.00; wing 9.75–10.75; tail 6.50–7.00, forked 2.40–3.75; bill along culmen 1.40; along gape 1.70; height at base 0.30; length of gonys 0.80; tarsus 0.60–0.75; middle toe alone 0.80; its claw nearly 0.30. Alaska and Aleutian

Islands; also on opposite side of Bering Sea to Japan; common June-Sept. about St. Michael's, where it breeds with Arctic Terns, laying on the bare ground; eggs 1-2, 1.70×1.12 , indistinguishable from those of several related species. The bird is near *S. lunata*, an extralimital species, coming between the species of *Sterna* proper and the sooty Tern group.

(Subgenus STERNULA.)

S. antillarum. (Lat. *Antillarum*, of the Antilles.) AMERICAN LEAST TERN. ANTILLEAN TERN. SILVER TERNLET. Much smaller than any of the foregoing: Length about 9.00; extent 20.00; wing 6.60; tail 3.50, forked 1.75; bill along culmen 1.20; depth at base 0.28; tarsus 0.60; middle toe and claw 0.75. Young smaller: Length 8.50; wing 6.25; tail 3.00; bill 1.00. Tail moderately forked, the lateral feathers scarcely filamentous, rapidly narrowing to acute tip. Bill about as long as head, rather shorter than whole foot. Adult ♂ ♀, in breeding plumage: Bill yellow, usually tipped with black for 0.10-0.25. Cap glossy greenish-black, with a narrow white frontal crescent whose horns reach over eyes, the convexity extending to bill, but cut off from white of cheeks by a line of black through eye to end of feathers on bill. Entire upper parts, including tail, pearly-blue, rather dark and of a leaden shade, reaching quite to the black cap, fading on sides of neck and head into the snowy satiny-white of all the under parts. Tail-feathers paler basally, white on their under surfaces and outer web of outer feather. Mantle extending to very tips of secondaries, but inner webs of these feathers nearly white toward the base. Shafts of first two primaries black on top, white underneath; webs black, the inner with a distinct white space, not reaching ends of the feathers; other primaries like back, but darker plumbeous, fading to white on their inner borders. Feet orange-yellow; claws black. Adult in winter: Bill blackish; feet dull yellowish. Forehead and lores white; crown white, with black shaft-lines; occiput and nape blackish, sending forward a band through eye. Mantle darker than in summer, and more restricted, leaving hind-neck white; a band of grayish-black along fore-arm, and whole edge of wing of this color; most primaries blackish, without silvering. Young of first winter: Similar; forehead not pure white, nor hind-head quite blackish; mantle varied with lighter tips of most feathers; tail with traces of dark spots. Young in August: Bill brownish-black, pale at base below. Forehead mostly white; crown and hind-head varied with white and brownish-black, the latter color especially forming an auricular patch. Pearl-gray mantle appearing, but interrupted with brown hastate or crescentic spots, one or more on each feather, mottling the whole upper parts. Primaries grayish-black, growing lighter from first to last, margined on inner webs with white, broadly and briefly on outer primaries, more narrowly and lengthily on successive ones; outer web of first, and shafts of all on upper side, black. Tail merely emarginate, pearly-blue, shading toward ends of the feathers to dusky-gray, the tips white. Whole under parts pure white. A pretty little Sea-Swallow, inhabiting temperate North America, especially along the Atlantic coast of the U. S., casually to Labrador, and also on larger inland waters to Minnesota; on the Pacific side to California; S. into the Antilles and Middle America and to northern South America: intimately related to the South American *superciliaris* and European *minuta*, but subgenerically distinct from any North American Tern. In former editions of the Key I combined it with *S. superciliaris*, but I now revert to the opinion of its specific character which I originally expressed in Proc. Phila. Acad. 1862, p. 552, and which has meanwhile acquired the powerful support of the A. O. U. Eggs dropped on bare dry sand of beaches, or in a little shelly depression, 1, 2, 3, or 4, 1.20 to 1.30 by 0.99; ground color varying from pale clear greenish to dull pale drab, speckled all over with small splashes, irregular spots, and dots of several shades of clear brown, with paler and more lilaceous shell-spots; the markings often evenly distributed, more frequently tending to wreath at or around the larger end, the point often free from marks or with only a few dots.

(Subgenus ONYCHOPRION.)

(Haliplana of former editions of Key and of A. O. U. 1886-95.)

S. fuliginosa. (Lat. *fuliginosa*, sooty. Fig. 699.) SOOTY TERN. EGG BIRD. WIDE-AWAKE. Bill as long as head, not much exceeded by whole foot, straight, stout at base, tapering, acute, gonyes ascending, commissure not decurved; nostrils rather far forward. Tail deeply forked, as in *Sterna* proper; feet stout; toes short, with much incised webs. Plumage bicolor. Adult ♂ ♀, in summer: Bill and feet black; iris red. On forehead a white crescent reaching



FIG. 699. — Foot of Sooty Tern, nat. size. (From Saunders.)

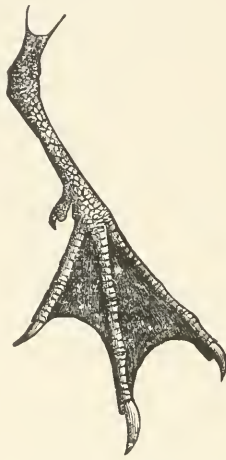


FIG. 700. — Foot of Bridled Tern, nat. size. (From Saunders.)

above eyes, separated from white of cheeks by a black bridle from eye obliquely downward and forward to bill. Entire upper parts black, with slight greenish gloss. Entire under parts white, reaching on sides of head to eyes, and more than half-way around neck. Primaries blackish, lighter on inner webs but without any white wedges, their shafts brown above, white below; secondaries like primaries, but most of their inner webs whitish; lining of wings white. Tail like back, duller on under surface, the streamers white, with white shafts, darkening toward end, especially on inner webs. In winter: Similar, but with some white spots in black of

crown. Young entirely different: Bill black above, dull reddish below; eyes and feet dull reddish. Whole plumage smoky-brown, darkest above, paler and grayish or whitish on belly, almost black on primaries; upper wing-coverts and scapulars tipped with white, giving a peculiar spotty appearance; feathers of back, rump, and upper tail-coverts margined with dull rufous. Tail like wings in color, little forked, lateral feathers not elongated. Downy young, gray dotted with whitish on upper parts, mostly white below. Adults: Length 15.00-17.00, averaging about 16.50; extent about 34.00; wing 12.00; tail 7.50, forked 3.00-3.50; bill along culmen 1.80; gape 2.50; depth at base 0.50; tibia bare 0.70; tarsus 1.00; middle toe and claw 1.20; outer do. 1.05; inner do. 0.75; hind do. 0.30. A well-known inhabitant of most of the warmer parts of the globe, with a host of synonyms, both generic and specific. In North America N. in summer along Atlantic coast regularly to the Carolinas, casually to New England. Eggs 1-3, dropped on the sand, 2.00-2.12 × 1.40-1.50, buff, creamy, or white, sparingly spotted and splashed with light brown, rich brown, and pale purplish. This bird is type of 3 different generic names by WAGLER — *Onychoprion*, *Isis*, 1832, p. 277; *Planetis*, *Isis*, 1832, p. 1222; and *Haliplana*, *Isis*, 1832, p. 1224; the first of these has priority, as I have remarked before, *Proc. Phila. Acad.* 1862, p. 556, and *Auk*, July, 1897, p. 314. *Onychoprion* has therefore been adopted instead of *Haliplana* by the A. O. U. in *Suppl. List*, *Auk*, Jan. 1899, p. 99.

S. f. crissalis. (Lat. *crissalis*, crissal, relating to the crissum.) CRISSAL SOOTY TERN. Like the last; crissum ashy instead of white. W. coast of Mexico up to the Gulf of California, and widely dispersed in the Pacific. Not in former editions of the Key. BAIRD MS. apud LAWR. *Pr. Bost. Soc. Nat. Hist.* xiv, June, 1871, p. 285 and p. 301; *Mem. Bost. Soc. Nat. Hist.* ii, 1874, p. 318. Not in A. O. U. Lists.

S. anæsth'eta. (Gr. ἀναίσθητος, *anaisthetos*, stolid, stupid, insensate, apathetic. Fig. 700.)

BRIDLED TERN. PANAYAN TERN. Form of *S. fuliginosa*, but webbing of toes less extensive (almost as deeply incised as in *Hydrochelidon*). Adult ♂ ♀, in summer: Bill and feet black. Crown and stripe through eye to nostril black. A white frontal lunula, narrower than in *fuliginosa*, extending beyond eye. Black pileum sharply defined on nape against ashy-white, which insensibly shades into cinereous-brown, the prevailing color of the upper parts. Wings, especially primaries, darker than rest of upper parts, with scarcely a shade of cinereous; tail, with its coverts, much lighter and more ashy, approaching nape in color. Primaries with well-defined, pure white spaces running for a considerable distance from their bases along inner webs (in *fuliginosa* these webs simply grayish-brown with no well-marked wedges). A large part of inner webs of secondaries white; under wing-coverts white. Middle tail-feathers brownish-ash, concolor with their coverts; lateral ones with much white toward their bases, especially on inner webs, increasing on each feather successively to such an extent that the next to the outer one is wholly white except a small space at its tip, while the outermost is entirely white. Shafts of primaries brownish-black above, white beneath; of rectrices dark along the cinereous and white along other portions. Under parts entirely white. Length 14.00–15.00; wing 10.50; tail 6.00–7.00, forked about 3.50; bill 1.40–1.60; height at base 0.35–0.40; width slightly less; tarsus 0.85; middle toe the same, with claw 1.20; outer toe and claw 1.00; inner 0.75. Immature: Black cap imperfect, largely mixed with white on vertex, so that it fades insensibly into the white of lunula, which latter is thus undefined; black bridle correspondingly imperfect. Upper parts paler and grayer than in the adult, some of the feathers margined with whitish. Lateral rectrices not wholly white. Under parts pure white, as before. This is not the youngest plumage, but one that closely resembles, if it be not identical with, the ordinary winter plumage of the adult. Young: As before; but more white on head; whitish tips of most feathers of the mantle; a dark band along lesser wing-coverts, less white on outer tail-feathers: still younger, with rufous tips of the mantle feathers, but under parts white from the first fledging; bill and feet brownish. This perfectly distinct species inhabits most warm parts of both hemispheres; West Indies, and casually Florida. It has many synonyms, among them *Haliplana discolor* COUES, 1864. The absurd specific name was originally misspelled *anaethetus* by SCOPOLI, 1785 — a misprint perpetuated by the A. O. U. I made it *anostheta* in 1st edition of the Key, 1872, after *anosthæctus* GRAY, 1871; but this is as bad spelling as almost any other. The word appears as *anæstheticæ* in the Key, 2d–4th editions, 1884–90; this is an improvement, but *anæstheticæ* is perfectly good Latin form, as a transliteration of the Greek, and no doubt what was originally intended. I used this form in B. N. W. 1874, p. 701. Some authors have perpetrated *aenothetus* and *anastæctus*!

HYDROCHELIDON. (Gr. ὕδωρ, *hudor*, water; χελιδών, *chelidon*, a swallow.) **BLACK TERNS.** Bill a little shorter than head, longer than middle toe and claw, very slender and acute; culmen and commissure convex, the curvature increasing toward tip; outline of rami and gonys both concave, the former most so; angle very acute. Wings extremely long, pointed, of same color as back, without distinct markings. Primaries broad and not acute; secondaries not slender nor flowing, reaching in the folded wing only half-way to tip. Tail short, only moderately emarginate, the lateral feathers little exceeding the next, not streaming; all broad and rounded. Feet slender and short; tarsi rather less than middle toe. Toes moderately long; webs narrow and very deeply incised (fig. 51). Size small; form delicate; colors mostly black, the wings and tail plumbeous. A small genus of 3 species, a subspecies of one of which is common in North America, where a second species has occurred as a straggler; the third is the Whiskered Tern, *H. hybrida*.

Analysis of Species.

Wings and tail above like back	<i>nigra surinamensis</i>
Wings whitening along border of forearm; upper tail-coverts white	<i>leucoptera</i>

II. *nigra surinamensis*. (Lat. *niger*, *nigra*, *nigrum*, black. Lat. *surinamensis*, of Surinam or Dutch Guiana in South America.) SURINAM TERN. AMERICAN BLACK TERN. SHORT-TAILED TERN. SEMIPALMATED TERN. Adult ♂ ♀, in summer: Head and neck all around and under parts to the vent, jet black; under tail-coverts pure white. On back of neck, and between shoulders, the black lightening into leaden-gray or plumbeous, which extends over all the upper parts to the very tips of the tail-feathers. Inner secondaries like back; others darker, tending to the color of the primaries, which are grayish-black, silvered, with paler margins of inner webs, their shafts white except at tips. Lining of wings ashy-white, this color reaching a little over fore border of wing on to lesser coverts, so that it shows to some extent on the upper surface. Bill and claws black; angle of mouth lake red; feet dark reddish-brown; eyes brown. In winter: Very different; forehead, sides of head, neck all round, and entire under parts, white; under wing-coverts ashy-gray. Crown white varied with grayish or ashy, darker on nape, with dusky auricular and orbital bar. Upper parts generally as in summer, but paler, many feathers with whitish edges. While changing, head and under parts patched with white and black. Young: Bill brownish-black, base below flesh-color; mouth yellow; feet light brown. Forehead grayish-white, deepening on crown and nape to grayish-brown which reaches down to the back, obscuring the plumbeous; interseapulars quite brown; on other upper parts brown edges of the feathers. Lesser wing-coverts grayish-black. A black crescent before eye. Under parts pure white; sides of breast ashy-brown, sides of body and lining of wings ashy; shafts of primaries brown. Length about 9.25; extent 25.00; wing 8.25; tail 3.75, forked 1.00; bill along culmen 1.10; along gape 1.60; height at base 0.25; gonys 0.60. Young smaller, about 8.00; bill 1.00; tail shorter and less forked. Nestlings in down, brown above mottled with black, sootier on head, whitish on sides of head and middle of belly. North America at large, interior and coastwise, abundant; S. in winter through much of South America. Breeds from our interior middle districts N. to Alaska and the Fur Countries, often in large colonies, in marshes and reedy sloughs, in June. Nests usually on débris of dead reeds, often wet and floating in shallow water; eggs 2-4, 1.35 × 0.95 average, pointed, yet with considerable bulge of the sides; ground color brownish-olive, rather pale and clear, thickly marked with spots and splashes of every size from dots to masses, but mostly large and bold, of light brown and blackish-brown, and the usual neutral-tint shell-markings; tendency to aggregate at or around the larger end. This is the American representative of *H. nigra* of Europe, etc., but darker colored and otherwise distinguishable; some authors rate it as a good species. The European bird is *Rallus lariformis* and *Sterna fassipes* LINN. 1758, whence *H. lariformis* and *H. fassipes* of former editions of the Key — a position from which I now recede. Our bird was described as *S. plumbea* by WILSON, 1813; but a prior name is *S. surinamensis* G.M. 1788.

II. *leucoptera*. (Gr. λευκός, *leukos*, white; πτέρον, *pteron*, wing.) WHITE-WINGED BLACK TERN. Adult in summer: Bill black, tinged with red; feet red; claws black. Head and neck all around and under parts pure black, shading on back and scapulars into dark slaty plumbeous; wings dark silvery-plumbeous, fading to white along border of forearm; primaries silvered-dusky with white shafts and dull white area on inner webs; lining of wings blackish, varied with white along the border. Tail and its coverts, above and below, white, abruptly contrasting with dark slate of rump and black of belly; tail-feathers shaded with pearly-gray toward their ends. Length 8.50-9.50; wing 7.50-8.00; tail 2.75-3.10, forked 0.50; bill along culmen 0.90-1.00; along gape 1.20, height at base 0.20; tarsus 0.75; middle toe and claw 0.87. Resembling the last, and changes of plumage correspondent; distinguished in any

plumage by white upper tail-coverts and lesser wing-coverts. Europe, Asia, Africa, etc.; Barbadoes (once); accidental in North America in one alleged instance (Lake Koshkonong, Wisconsin, Am. Nat. viii, 1874, p. 188).

ANOUS. (Gr. *ἄνους*, *anous*, mindless, regardless; *i. e.*, stupid.) **NODDIES.** Bill about as long as head or longer, much longer than tarsus, moderately robust, as broad as high at base; elsewhere depressed, tapering to the somewhat decurved tip. Fore end of nostrils nearly half-way to end of bill, the fosse long and deep. No frontal antæ; outline of feathers on base of bill convex (reverse of *Sterna*, etc.). Wings moderately long for *Sterninæ*; 2d primary little shorter than 1st. Tail very long, broad, *fan-shaped, double-rounded, i. e.*, graduated laterally, yet with middle feathers shorter than next pair. Tarsi shorter than middle toe without claw. Lateral toes, especially the inner, lengthened; hallux well developed. Webs broad and full, not incised. Claws short, stout, little curved, very acute; edge of middle claw dilated and somewhat pectinate. Podotheca nearly smooth, from fusion of the plates, but a single defined row of scutella in front, with delicate reticulations elsewhere; soles of webs perfectly smooth. Plumage dark, nearly unicolor. A remarkable genus forming (with *Micranous*, etc.) a supergeneric group (*Anoæ* or *Megaloptercæ*) of *Sterninæ*. There are several species of warmer parts of the world, all alike sooty-brown, with hoary or whitish cap. They alight with ease on trees and bushes, where the bulky nest is usually built of sticks, etc., contrary to the rule in the family *Laridæ*.

A. stolidus. (Lat. *stolidus*, stolid, stupid.) **NODDY TERN.** Adult ♂ ♀, breeding plumage: Bill and claws black; mouth black to a little beyond the angle of the jaws, the fauces yellowish; eyes brown; feet dark reddish-brown, nearly black in the dried skin. Occiput bluish-plumbeous, becoming pure white on the front. Sides of head and neck all round with a wash of bluish-plumbeous, with a very dark spot anterior to and just above eye; coloration otherwise deep fuliginous brown, blackening on remiges and rectrices. Young: Similar, not so dark, but rather umber-brown, with pale grayish-brown cap, and whitish line over eye. Length 16.00; extent 31.00; wing 10.00–11.00; tail 6.00; bill along culmen 1.75; height or width at base 0.38; tarsus 1.00; middle toe and claw 1.45; outer but slightly shorter; inner 1.20; hallux 0.40; breadth of webs 0.90; diameter of eye 0.30. Widely distributed over warmer parts of the globe; in North America, South Atlantic and Gulf States in summer; breeds by thousands on the low mangrove and other bushes, on which the nest is placed; eggs sometimes laid on shelves or in crevices of rocks, or on beaches. Egg averaging 2.05×1.35 , warm buff, spotted and splashed with reddish-brown and neutral tints, chiefly about the larger end.

Subfamily RHYNCHOPINÆ: Skimmers.

(Family RYNCHOPIDÆ of A. O. U.)

Bill hypognathous. Among the singular bills of birds that may excite our wonder, that of the Skimmers is one of the most anomalous. The under mandible is much longer than the upper, compressed like a knife-blade; its end is obtuse; its sides come abruptly together and are completely soldered; the upper edge is as sharp as the under, and fits a groove in the upper mandible; the jaw-bone, viewed apart, looks like a short-handled pitchfork. The upper mandible is also compressed, but less so, nor is it so obtuse at the end; its substance is nearly hollow, with light cancellated structure, much as in a Toucan; it is freely movable by means of an elastic hinge at the forehead. There are also cranial peculiarities. Conformably with the shape of the mouth, the tongue differs from that of other *Longipennis* in being very short and stumpy, as in Kingfishers and *Steganopodes*. The wings are exceedingly long, and the flight more measured and sweeping than that of Terns; the birds fly in close flocks moving simultaneously, rather than in straggling companies. They seem to feed as they skim low over the water, with the fore parts inclined downward, the under mandible probably grazing or cutting the surface: but they are also said to use their odd bill to pry open weak bivalve

mollusks. The voice is very hoarse and raucous, rather than strident. They are somewhat nocturnal or at least crepuscular; their general economy is the same as that of Terns, as are all points of structure excepting those above specified; but these are so remarkable that the Skimmers might form a family apart from *Laridae*. Besides the following, there are four extralimital species: *R. melanura* and *R. intercedens* of South America; *R. flavirostris* of Africa; and *R. albicollis* of Asia.

RHYN'CHOPS. (Gr. ῥύγχος, *hrugchos*, beak; ὤψ, *ops*, the face: well applied to the bird whose beak is such an extraordinary feature.) **SKIMMERS.** Character as above. (A. O. U. misspells *Rynchops*, after LINN. 1758.)

R. ni'gra. (Lat. *nigra*, black. Fig. 701.) **BLACK SKIMMER. CUT-WATER. SCISSOR-BILL.** Adult ♂ ♀, in summer: Bill with basal half carmine (drying yellowish), rest black. Iris hazel. Feet carmine (drying yellowish) with black claws. Crown of head, its sides to just

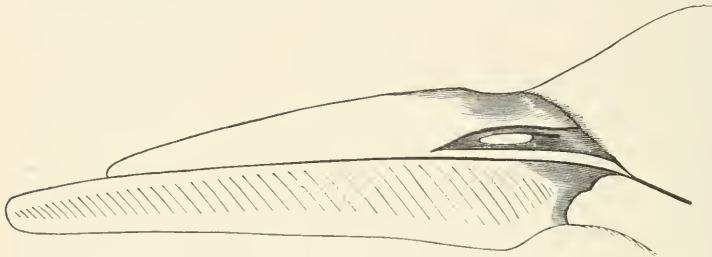


FIG. 701.—Bill of Skimmer, nat. size.

below eyes, back of neck and whole upper parts, glossy jet-black. Forehead, sides of head below eyes, sides of neck and whole under parts, pure white, tinted rosy or creamy in

the nuptial season. Lining of wings black. Primaries black, with black shafts, their inner webs blackish, the inner four with inner webs and tips of both webs white; secondaries white, with a space of dark color on outer and small part of inner webs, increasing in amount inwards, till the inner four are dark with only white tips. Tail-feathers white, the inner webs more or less obscured with dark brown. In winter: Upper parts only blackish, interrupted with white on the hind neck. Length 16.00-20.00; extent 42.00-50.00; wing 13.00-16.50; tail 4.00-6.00, forked about 1.50; tibiae bare 1.00; tarsus 1.45; middle toe and claw 1.30. Length of under mandible 3.50-4.50, of upper about 3.00; height opposite nostrils 0.65; width 0.45; gape 4.50 or more; fused tomia or gonyes of under mandible 4.00 or less; greatest depth of under mandible 0.60. ♀ smaller than ♂. Young at minimum dimensions given. Young-of-the-year: Bill smaller than in adult, thinner, weaker, its ridges less sharply defined, and the two mandibles of less unequal lengths; striae on sides of lower mandible as numerous as, but much less distinct than, in the adult. Tail shorter, less forked. Bill brownish-black for $\frac{3}{4}$ its length, dull horn-color at tip, flesh-color or light reddish toward base. Feet light reddish. Entire upper parts light grayish-brown, deepest on wing-coverts and inner secondaries, each feather edged and tipped with white, broadest and most conspicuous on wing-coverts and inner secondaries. Forehead, sides of head below eyes, neck all round, edge of forehead, inferior surfaces of wings, and whole under parts, white. Primaries almost exactly as in the adults, except that the innermost have more white, and there is a slight white terminal margin as far as the 4th or 5th; secondaries about as in the adults, but their brown portions lighter. Tail white; greater part of two middle rectrices, and inner webs of the others, tinged with grayish-brown, deepest on the middle pair. Younger birds buff above, much spotted with blackish and ashy; bill and feet livid brownish. Nestlings in down grayish buff mottled with blackish above, white below. Atlantic and Gulf States, strictly maritime, abundant; N. regularly to New Jersey, casually to New England and Nova Scotia; S. in winter to South America; also on the Pacific coast of Mexico. Nesting like that of Terns, in communities; eggs dropped on the sand, about 4 in number, about 1.75×1.30 , pure white to pale buff, spotted and splashed with dark browns and blackish, and pale neutral-tint.

Order TUBINARES: Tube-nosed Swimmers.

Nostrils tubular.

Bill epignathous; its covering discontinuous, consisting of several horny pieces¹ separated by sutures. Hallux small, elevated, functionless, appearing merely as a sessile claw, often minute, or absent.

These are cosmopolitan oceanic birds, rarely landing except to breed, unsurpassed in powers of flight, and usually strong swimmers. Excepting the Diving Petrels or Sea-runners (*Pelecanoididae*), none of them dive well. With the same exception, the wings are long, strong, and pointed, of 10 stiff primaries and usually numerous short sec-



FIG. 702. — Nest of the Fulmar. (Designed by H. W. Elliott.)

ondaries (no 5th secondary in any, and the number reduced to 10 in one group); upper arm and forearm sometimes extremely lengthened. Tail short or moderate, of fewer than 20 feathers, usually 12 or 14, variable in shape. Feet usually short, with long full-webbed front toes, and rudimentary hallux, or none. Among anatomical characters may be noted: Palate schizognathous; nasals hololrinal; vomer large, flat, pointed; basipterygoids present or absent; mandible truncated; top of skull with large depressions for the supraorbital glands. Great pectoral muscle double, and 3d pectoral well developed; outer humeral condyle large; acromial ossicles present as a rule; coraco-humeral groove shallow. Femoroacanal and semitendinosus present, and usually also the accessory femoroacanal and the ambiens. Proventriculus very large; gizzard small, of peculiar shape; duodenum at first ascending; tongue small or rudimentary; caeca variable; tracheo-bronchial muscles attached to 7th or 5th bronchial rings. Oil-gland tufted. Spinal pterygia marked in the neck by lateral apertures. (FORBES. GADOW.)

In size, these birds vary remarkably, ranging from that of a Swallow up to the immense Albatrosses, unsurpassed by any birds whatever in alar expanse, and yielding to few in bulk

¹ The formal nomenclature of these pieces is: 1. *Naricorn* or *rhinotheca*, the nasal tube. 2. *Culminicorn*, covering the culmen. 3. *Latericorn*, the side-piece of the upper mandible. 4. *Superior unguicorn*, forming the hook of the upper mandible; also called *dextrorhetheca*. 5. *Ramicorn*, the side-piece of the lower mandible. 6. *Inferior unguicorn*, forming the tip of the under mandible; also called *myrorhetheca*. 7. *Interyunguicorn*, along the gonys, a small piece best seen in Albatrosses, in which all the others may also be most conveniently studied. (COOKS, Proc. Phila. Acad. May, 1866, pp. 175, 176.)

of body. The plumage is compact and oily, to resist water; the sexes are always alike, and no seasonal changes are determined; but variation with age, or as a matter of individual peculiarity, occurs in many cases, though it is seldom so conspicuous as it always is in *Longipennes*, and does not run through the whole order. The food is entirely of an animal nature, and fatty substances, in particular, are eagerly devoured. When irritated, many species eject an oily fluid from the mouth or nostrils, and some are so fat as to be occasionally used for lamps, a wick being run through the body. The egg of each species is white or only faintly marked, laid in a rude nest or none, on the ground or oftener in a burrow; the young are nidicolous and ptilopædic, covered with notably fluffy down. Petrels are silent birds, as a rule, contrasting with Gulls and Terns in this particular; many or most are gregarious, congregating by thousands at their breeding places or where food is plentiful.

Birds of this order abound on all seas; but some are still imperfectly known. Bonaparte gave 69 species in 1856; my memoirs upon the subject (1864-66) present 92; in 1871 Gray recorded 112 — which happens to be almost exactly the total given by Osbert Salvin in 1896, though the discrepancies in detail are numerous. Mr. Salvin describes 110 species (many of them unknown in 1871), which he arranges in 25 genera; with a dubious residuum of 11 species. This accomplished monographer divides the *Tubinares* into 4 families: (1) *Procellariidæ* in a restricted sense, with subfamilies *Procellariinæ* and *Oceanitinæ*; (2) *Puffinidæ*, containing most of the order, with subfamilies *Puffininae* and *Fulmarinæ*; (3) *Pelecanoididæ*; (4) *Diomedeidæ*. This is certainly a great improvement upon the fanciful arrangement of Garrod and Forbes, who proposed to divide the order primarily into two groups, according to the presence or absence of cœca and the accessory semitendinosus muscle, — one family *Oceanitidæ* for certain of the “Stormy” Petrels, and the other family for all the rest of the Petrels. I also think my friend Salvin’s arrangement better than that of former editions of the Key, which made the single family *Procellariidæ* coextensive with *Tubinares*, and divided it by the character of the nostrils into three subfamilies: (1) *Diomedeinæ*, Albatrosses; (2) *Procellariinæ*, all Petrels except (3) *Halodrominæ*, the Sea-runners or Diving Petrels. These last, consisting of one genus (*Pelecanoides*) and three species, resemble Auks in external appearance and habits; wings and tail very short; no hind toe; throat naked and distensible — the tubular nostrils, in fact, are the principal if not the only outward petrel-mark, and these organs are unique in opening directly upward, the nasal tube being vertical instead of horizontal. The Sea-runners — now called *Pelecanoididæ* — are extralimital; the other three families of Salvin are well represented in North America. I see force in any of the various reasons alleged by some late systematists for removing the *Tubinares* from their usual position, and shall leave them to stand as heretofore between *Longipennes* and *Pygopodes* — what better links could be desired between Petrels and Gulls than the Fulmars, or between Petrels and Auks than the Halodromes?

Analysis of North American Families of Tubinares.

Nostrils separated, lateral.	Hallux rudimentary	<i>Diomedeidæ</i>
Nostrils united, culminal.	Hallux evident, though small	<i>Procellariidæ</i>

Family DIOMEDEIDÆ: Albatrosses.

Nostrils disconnected, placed one on each side of bill near base. Hallux rudimentary; apparently wanting in most cases, but minute in one genus. Three front toes long, fully webbed, and with lateral fringes. Interramicorn well developed. Wings extremely long, especially in the upper arm and forearm, very narrow, with very numerous (40-50) flight-feathers, of which 10 are developed primaries, 1st longest. Unequalled powers of sailing flight are conferred upon Albatrosses by such a wing, the bony mechanism of which includes a sternum very broad

for its length, coracoids short, with broad bases and widely divergent axes and a small manubrium of the furcula. The skull lacks basipterygoids. The species are of maximum size in the order *Tubinures*, and among the very largest of swimming birds, equalling or exceeding a Goose in bulk of body. The adult and young generally differ in plumage, contrary to the rule in this order. The nest is built on open ground, not in a burrow as is common among Petrels. The egg is single, colorless or nearly so; both sexes incubate. There are about 15 good species of Albatrosses, besides 2 or 3 doubtful ones, representing 3 genera; most of them belong to Southern seas; only 3 are properly North American, but I describe 3 others as stragglers to our shores. Among well-known extralimital species are *Diomedea melanophrys*, *Thalassogeron chlororhynchus*, and *T. cautus*. A fossil species, *D. anglica*, occurs in the Pliocene of England.

Analysis of Genera.

- Tail rounded, contained about thrice in length of wing. Bill stout; under mandible not sulcate.
 - Culminicorn wide at base, there joining latericorn *Diomedea*
 - Culminicorn narrow at base, there separated from latericorn *Thalassogeron*
- Tail cuneate, contained about twice in length of wing. Bill compressed, with frontal re-entrance and lateral salience of feathers at base; under mandible with a long lateral groove *Phæbætria*

DIOMEDEA. (Gr. Διομήδης, *Diomedes*, a Grecian hero at the siege of Troy; literally, counselled from Zeus; Ζεὺς (in compos. Διο-, *Dio-*), *Zeus*, and μήδεια, *medea*, pl. of μῆδος, *medos*, counsel. But Newton observes that the *Aves Diomedæ* of Pliny, inhabiting certain Adriatic islands of the same name, “seem to have been Shearwaters of some sort.”) ALBATROSSES. Bill thick, stout, and heavy, especially broad at base, without colored groove along lower mandible, or other special particoloration. Nasal tubes ample. Tail short, rounded, less than half the wing (in one species about one-third the wing). Coloration variegated with white and black, or uniformly fuliginous. Of largest size. *D. exulans* is type of this genus; our two species fall in a subgenus *Phæbætria*.

Analysis of Subgenera and Species.

- Bill very large, with outline of culmen very concave from base to hook, and outline of feathers at base strongly angulated on both mandibles. (DIOMEDEA proper.) *exulans*
- Bill small, with little culminal concavity, and nearly straight outline of feathers around the base. (PHÆBÆTRIA.)
 - Adult white, with yellowish head and dark wings and tail; bill and feet light *albatrus*
 - Adult white, with dark spot before eye, and dark wings and tail; bill dark, feet flesh-color . . . *immutabilis*
 - Adult chiefly fuliginous; bill dark and feet black *nigripes*

(*Subgenus DIOMEDEA.*)

D. exulans. (Lat. present participle of *exulare*, *exulare*, to banish, be or make an exile or wanderer.) WANDERING ALBATROSS. Adult: White; the flight-feathers dusky or blackish, the back, scapulars, and wing-coverts more or less barred or otherwise variegated with black; tail mostly white, but somewhat variegated. Bill dull yellowish tinge, very large and stout, strongly hooked, with deeply concave culmen, and strongly angulated outline of feathers on both mandibles. Feet flesh-colored. Young: Dark brown, paler or whitish on the under parts and neck; face and lining of wings white; flanks variegated; a dark crown-patch; upper surface of wings uniformly dusky; under tail-coverts dark. Very large; length 3½ to 4½ feet; extent 10 feet or more; wing 2 feet or more; tail 8.00 inches; bill about 7.00; tarsus 5.00; middle toe and claw 6.50. Egg single, 4.75 × 3.25, ovate-elliptic, white, but minutely dotted in part. A species of most extensive distribution in Southern seas, repeatedly attributed to North America, and as often dropped for lack of conclusive evidence of its occurrence. It probably requires to be reinstated; but its present status is hypothetical, as late records from Tampa Bay, Florida, and the mouth of the Columbia River are considered unsatisfactory. See COUES, Auk, Oct. 1885, p. 387; Apr. 1895, p. 178;

New Light on the Greater Northwest, 1897, p. 853; Key, orig. ed. 1872, p. 325; 2d ed. 1884, p. 774; 3d ed. 1887, p. 892; 4th ed. 1890, p. 906; RIDGW. MAN. 1887, p. 51; A. O. U. LIST, 2d ed. 1895, Hypothetical List, No. 4.1.

(Subgenus PHEBASTRIA.)

D. albatrus. (New Lat. *albatrus*, Span. or Port. *albatroste*, *albatroz*, *alcatraz*, *alcaquiz*, from Arabic *al-câdous*, after Gr. *κâdos*, *kados*, a bucket or water-pot; first applied to the Pelican of Europe, from its great pouch, subsequently extended to other large water-birds, and then limited as the name of the *Diomedeidae* in ornithology; Ital. *albatro*, Fr. *albatros*, earlier, *alगतros*, Dutch *albatros*, Germ. *albatross*, English, *alcatraze*, *alगतross*, *albetross*, *albitross*, *alगतross*, and *albatros*.) SHORT-TAILED ALBATROSS. JOHAIKI. Bill 5.00 or 6.00 long, 2.00

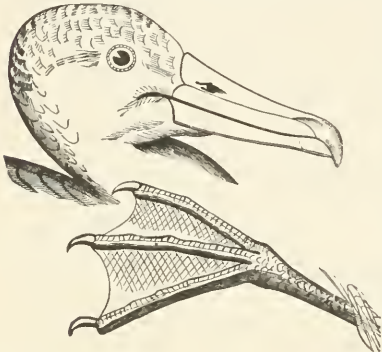


FIG. 703. — Bill and Foot of Short-tailed Albatross. (After Cassin.)

deep at base, with moderately concave culmen and prominent hook. Frontal feathers forming almost no re-entrance on culmen, running nearly straight around base of upper mandible, and extending scarcely farther on sides of under mandible, with hardly any convexity. Tail very short, contained more than 3 times in length of wing. Length 33.00–37.00, averaging about 3 feet; extent about 7 feet; wing 20.00; tail 5.50–6.00; tarsus nearly 4.00; middle toe and claw 5.50. Adult: White; head and neck usually washed with shining rusty-yellow; wings and tail dark or blackish, with a wholly indeterminate amount of white on the coverts and inner quills — sometimes nearly all the wing-coverts white excepting a line along border of fore-arm — sometimes the white restricted to a

small space at elbow; shafts of primaries yellow. Bill pale reddish-yellow, drying dingy-yellowish; feet livid flesh-color or bluish-white, drying dark. Young: Dark-colored, resembling *nigripes*, but easily distinguished. North Pacific Ocean; common off our coast from Alaska to California; Japan; China. Egg nearly equal ended, 4.20 × 2.60, white. This Albatross shares with the next the sailors' name of *Gony* or *Goney*, from *gooney*, a provincial English word for a stupid person. *D. albatrus* PALL. 1780; *D. brachyura* TEMM. of most authors, as of former editions of the Key; *D. chinensis* TEMM.; *D. derogata* SWINH.

D. immutabilis. (Lat. *immutable*, *unchanging*.) LAYSAN ALBATROSS. Head, neck, lower rump, and all under parts white; wings and their coverts blackish-brown; interseapulars and back paler, more smoky brown; tail black, fading to white at base; lining of wings mixed dusky and white; a sooty space in front of eye. Bill gray, darker at base, blackish at tip, base of under mandible yellow; feet fleshy pink; iris brown. Wing 19.00; bill 4.00; tarsus 3.20; middle toe and claw 4.30. Young in down pale brown with blackish bill, passing to adult coloration on first plumage. Laysan Island, North Pacific; San Geronimo and Guadalupe Island, Lower California. ROTHSCHILD, Bull. B. O. C. i, No. IX, May 17, pub. June 1, 1893, p. xlviii; Ibis, 1893, p. 448; 1894, p. 548; Avifauna Laysan, 1893, p. 57, plates. New to the Key: see ANTHONY, Auk, Jan. 1898, p. 38; A. O. U. Suppl. List, Auk, Jan. 1899, p. 99, No. 82.1.

D. nigripes. (Lat. *nigripes*, black-footed.) BLACK-FOOTED ALBATROSS. GONY. Bill about 4.00 (never 5.00), $\frac{1}{3}$ longer than head, slightly longer than tarsus, equal to middle toe without claw, extremely stout; culmen and commissure almost straight to the hook, which is comparatively small, scarcely rising above level of culmen. Culminicorn very broad, especially at base, where it widens and descends to overlap the latericorn. Outline of feathers

much as in *albatrus*, yet a slight re-entrance on forehead, and feathers on sides of under mandible salient with a slight convexity. Tail contained 3 times in length of wing. Adult and young: Bill dark reddish-brown; feet black. Plumage dark chocolate-brown, paler and grayer, rather plumbeous, below, lightening or whitening on front of head and at base of tail; feathers of upper parts with paler edges, as if faded; spot before eye and streak over eye quite black. Primaries black, duller on inner webs, with yellow shafts; tail blackish, duller below, with whitish shafts except at tip. A final plumage may be lighter than as described, but is never extensively white, and other characters prove the validity of the species. Young with dusky upper tail-coverts. Length 36.00 or less, generally not over 30.00; wing usually 19.00–20.00; tail about 6.50. Bill 1.50 deep and 1.25 wide at base; chord of culmen 4.00, its curve 4.60; from feathers on side of upper mandible to tip 3.50; ditto lower mandible 3.20; tarsus 3.70; middle or outer toe and claw 4.50; inner ditto 4.00. North Pacific coast, abundant from California to Alaska; Japan; China.

THALASSOG'ERON. (*G. θάλασσα, thalassa*, the sea; *γέρων, geron*, an old man.) CULMINATING ALBATROSSES. Culminicorn high and narrow throughout, at base of bill separated from latericorn by a skinny interval between nasal tubes and feathers. General proportions as in *Diomedea* proper. Albatrosses of medium size, in adult plumage with distinctly colored areas; bill in our species brightly particolored with black and yellow. Extralimital species are *T. T. chlororhynchus, eximius, cautus, layardi*, and *salvini*.

T. culminatus. (Lat. having the culmen of a particular character.) YELLOW-NOSED ALBATROSS. Culminicorn with convex base. Adult: Above, grayish-brown, lightening to ashy-gray on neck and head, whitening on under parts, darkening on wings to the dusky brown of the flight-feathers; lower eyelid, rump, and upper tail-coverts white; tail slate-gray; shafts of primaries and tail-feathers yellowish. Bill blackish; culmen and most of side of lower mandible yellow. Feet yellow. Length 36.00; wing 20.00–21.00; tail 8.00–9.00; bill along culmen 4.50, its depth at base 1.75; tarsus 3.25; middle toe and claw nearly 5.00. Egg 4.20 × 2.65.

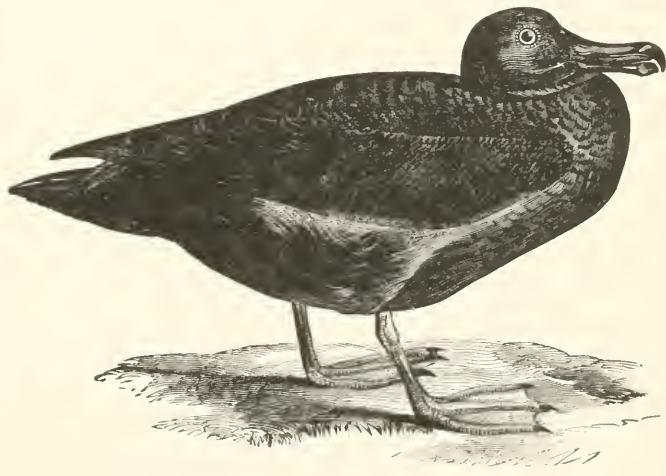


FIG. 704. — Sooty Albatross, much reduced. (From Tenney, after Audubon.)

A handsome Albatross of medium size, inhabiting Southern seas, said by Audubon in 1839 to have occurred off the Columbia River. He described it as *D. chlororhyncha*; but his specimen is clearly of this species, as I first pointed out in *Pr. Phila. Acad.* 1866, p. 183. The true *D. chlororhyncha* of Gmelin, based on the Yellow-nosed Albatross of Latham, and now known as the Green-billed Albatross, has never occurred in North America; it is easily distinguished by the perpendicular orange or yellow stripe on each side of the base of the bill, and by the acute base of the culminicorn. *T. culminata* was first admitted to the Key in the 3d edition, 1887, p. 893, on the strength of Audubon's specimen; but one was taken in the Gulf of St. Lawrence, at the mouth of the Moisie River, Aug. 20, 1885; *Auk*, Jan. 1888, p. 107. and July, 1888, p. 318. *A. O. U. List*, 2d ed. 1895, p. 29, No. [83].

PHŒBE'TRIA. (Gr. *φοιβήτρια*, *phoibetria*, a soothsayer, presager.) BLACK ALBATROSS. Bill comparatively slender, strongly compressed, with sharp culmen; side of under mandible with a long colored groove. Frontal feathers forming a deep acute re-entrance on culmen, and a long acute salience on side of lower mandible. Nostrils low and strict. Tail euneate, contained twice in length of wing. Plumage uniformly dark. One species.

P. fuliginosa. (Lat. *fuliginosa*, sooty. Fig. 704.) SOOTY ALBATROSS. EYEBROW ALBATROSS. Bill with shape and outline of feathers as above said; chord of culmen 4.00–4.50; height of bill at base 1.50, at hook 1.00; width at base 0.75; from feathers on side of upper mandible to tip 3.50, ditto lower mandible 2.50. Length 36.00; extent 80.00; wing 20.00–22.00; tail 10.00–11.00, graduated 3.50–4.50; tarsus about 3.00; middle toe and claw 4.75; outer ditto 4.50; inner ditto 4.00. Plumage ordinarily uniform sooty-brown; quills and tail blackish with white shafts; eyelids white; bill black, with long yellow groove; feet pale or flesh-color, drying yellow. In some cases the plumage lightens to a clearer, more ashy-gray coloration on various parts. The head and neck frequently washed with rusty-yellow. Egg white, minutely dotted at the larger end, 4.00 × 2.60. Pacific and Southern oceans at large; off west coast of North America to Oregon.

Family PROCELLARIIDÆ: Petrels.

Nostrils united in one double-barrelled tube laid horizontally on the culmen at base. Hallux present, though it may be minute. Five or six groups of Petrels may be distinguished, although they grade into one another; all but one of them are abundantly represented on our coasts. The *Fulmars* are large gull-like species (one of them might be taken for a Gull were it not for the nostrils), usually white with a darker mantle, the tail large, well formed of 14–16 feathers, the nasal case prominent, truncate and more or less emarginate at the end, with a thin partition which hardly reaches to the end of the case; the end of the under mandible is not hooked like the upper, the gonys being short, straight or scarcely concave, and rather ascending than descending. They shade through the genus *Daption* into an exotic group of saw-billed genera; and all these constitute the subfamily FULMARINÆ. The group of Petrels of which the genus *Āstrelata* is typical embraces a large number of medium-sized species, chiefly of Southern seas, in which the bill is short, stout, strongly hooked, with prominent nasal case; the tail rather long, usually graduated, 12-feathered. The *Shearwaters* (*Puffinus*) have the bill longer than usual, comparatively slender, with short low nasal case, obliquely bevelled off at end; partition between nostrils thick and under as well as upper mandible hooked at the end; tail usually short and rounded; wings extremely long; feet large. All the foregoing have basipterygoids, and share some other osteological characters; whence they are sometimes associated as a family *Puffinidæ* apart from *Procellariidæ*; and at any rate, the groups represented by the genera *Āstrelata* and *Puffinus* form a subfamily PUFFININÆ, as distinguished from *Fulmarinæ*, and from any of the two following groups, which have no basipterygoids, and which have the 2d or even the 3d primary longer than 1st. Such are the elegant little “Mother Carey’s chieken” or Stormy Petrels (*Procellaria* proper and its relatives); marked by their small size, slight build, and other characters; their flight is peculiarly airy and flickering, more like that of a butterfly than of ordinary birds; they are almost always seen on wing, appear to swim little if any, and like other Petrels gather in troops about vessels at sea, often following their course for many miles, to pick up the refuse of the cook’s galley. Some of these, as the species of *Oceanites*, are remarkably distinguished, in fact unique in the family, by having only 10 secondaries, long legs of somewhat grallatorial character, the tarsal envelop with fused scutella, flat obtuse claws, and hallux exceedingly minute. Thus the Stormy Petrels furnish two more subfamilies, PROCELLARIINÆ and OCEANITINÆ, the latter of which is the most distinct division of the whole family.

Analysis of Subfamilies.

Large: length over 10.00; wing over 7.00; 1st primary not shorter than 2d. (Basipterygoids.)	
<i>Fulmars, etc.</i> Under mandible not hooked at end	<i>Fulmarinæ</i>
<i>Shearwaters, etc.</i> Under mandible hooked at end	<i>Puffinæ</i>
Small: length 10.00 or less; wing 7.00 or less; 1st primary shorter than 2d. (No basipterygoids.)	
<i>Stormy Petrels, short-legged, with secondaries more than 10</i>	<i>Procellariinæ</i>
<i>Stormy Petrels, long-legged, with secondaries only 10</i>	<i>Oceanitinæ</i>

Analysis of North American Genera, without special reference to Subfamilies.

<i>Fulmars, with prominent nasal tube, vertically truncate and with thin partition; under mandible not hooked at end.</i>	
(FULMARINÆ.)	
Tail 16-feathered. Length about 36.00	<i>Ossifraga</i>
Tail 14-feathered. Length 15.00-20.00.	
Bill very stout, much shorter than tarsus, not lamellate. Gull-like	<i>Fulmarus</i>
Bill slenderer, little shorter than tarsus, not lamellate. Gull-like	<i>Priocella</i>
Bill dilated, lamellate. Not Gull-like. Plumage checkered above	<i>Daption</i>
<i>Petrels, with nasal tubes as before; bill stout, under mandible hooked. Tail 12-feathered. Length 10.00-16.00.</i>	
(PUFFININÆ.)	
Plumage dark above, white below	<i>Æstrelata</i>
Plumage entirely fuliginous	<i>Bufoeria</i>
<i>Shearwaters, with nasal tubes variable; bill slender, under mandible hooked. Tail 12-feathered. Length 10.50-20.00.</i>	
(PUFFININÆ.)	
Nasal tube somewhat as in Fulmars; under tail-coverts blackish	<i>Priofinus</i>
Nasal tube short, broad, low, obliquely bevelled off, with thick partition	<i>Puffinus</i>
<i>Stormy Petrels, with nasal tube and bill variable. Length under 10.00.</i>	
Claws hooked, acute; tarsus little if any longer than middle toe and claw; secondaries more than 10. (PROCELLARIINÆ.)	
Tail cuneate. Color uniform fuliginous	<i>Haloccyptena</i>
Tail nearly square. Color fuliginous, with white upper tail-coverts	<i>Procellaria</i>
Tail forked. Color fuliginous, or dark with white	<i>Oceanodroma</i>
Claws flat, obtuse; tarsus much longer than middle toe and claw; secondaries only 10. (OCEANITINÆ.)	
Color fuliginous; upper tail-coverts white; webs yellow	<i>Oceanites</i>
Color dark, the under parts white; webs black	<i>Fregetta</i>
Color largely white; webs yellow	<i>Pelagodroma</i>

Subfamily FULMARINÆ: Fulmars, etc.

Nasal tube prominent, vertically truncate and usually emarginate at end, with short thin partition between openings of the nostrils. End of under mandible not sharing the hooking of the upper mandible; gonyis short, ascending, with straight or scarcely concave under outline (much as in Gulls). Bill otherwise variable in size and shape, but stout or very stout, with a tendency at least to lateral expansion and formation of a series of striæ or lamellæ on inside of edge of upper mandible. This last character is obsolete in the true Fulmars (*Fulmarus* and *Priocella*); but evident in *Daption*, and carried to such an extreme in the exotic genus *Prion* that the bill is as decidedly lamellirostral as that of a Duck or Goose. No such formation exists in other Petrels, and Salvin makes it the distinction between his two subfamilies *Fulmarinæ* and *Puffinæ* of his family *Puffinidæ*. Skull with basipterygoid processes; furcula with short hypocleidium; sternum with uneven hind border; coracoids short, with broad bases and widely divergent axes. (SALVIN.)

The *Fulmarinæ* as here defined correspond to the two sections *Fulmaræ* and *Prionæ* of my early papers (1866), which seem to be connected by the genus *Daption*; and this last genus probably affords also a link between the Petrel family and the *Pelecanoididæ*. The true Fulmars are decidedly Gull-like birds in general aspect and coloration. The saw-billed group of *Fulmarinæ* consists of the exotic genera *Prion*, with dilated bill and numerous highly developed serrations; *Pseudoprion*, with narrower bill and fewer serrations; and *Halobaena*, with bill much as in *Pseudoprion*, but tail square (it is graduated in the other two genera, and of 12 feathers in all three). The 4 North American forms of *Fulmarinæ* are readily distinguished by the following

Analysis of Genera.

Fulmar Petrels, without evident ridges inside the edge of upper mandible.

Tail 16-feathered. Length 30.00 or more *Ossifraga*

Tail 14-feathered. Length 15.00-20.00. Plumage Gull-like.

Bill very stout, much shorter than tarsus *Fulmarus*

Bill less stout, little shorter than tarsus *Prionocella*

Pintado Petrels, with evident ridges inside the edge of upper mandible

Tail 14-feathered. Length 15.00. Plumage spotted above, white below *Daption*

OSSIFRAGA. (Lat. *ossifragus*, bone-breaking; *os*, gen. *ossis*, bone, and *frangere*, to break. As a noun, feminine *ossifraga* was applied to the ossifrage, osprey, or sea-eagle, before it was transferred to this genus of Petrels as equivalent to *quebrantahuesos*.) **GIANT FULMAR.** Of immense size and powerful organization; as large as most Albatrosses. Bill longer than head, not shorter than tarsus, very robust, deeply grooved; nasal tube very long, reaching half-way or more from base to tip of bill, depressed, carinate, with contracted orifice. Hook of upper mandible large and strong; under mandible not hooked. Commissure sinuate; gape restricted, not reaching under eye. Frontal feathers extending obtusely upon root of nasal case; mental feathers extending to gonys. Outline of lower mandibular rami about straight; gonys straight, ascending, with obtuse angle. Feet large; tibiae bare below; tarsus short, much less than middle toe without claw, reticulate; outer and middle toes with claws, of equal lengths; hind toe merely a stout claw; webs full. Wings short, not very acute, folding short of end of tail. Tail moderate, graduated, 16-feathered. One species.

O. gigantea. (Lat. *gigantea*, gigantic.) **GIANT FULMAR. BONE-BREAKER. QUEBRANTAHUESOS. OSPREY PETREL.** Largest of Petrels. Length 30.00-36.00; extent 6 or 7 feet; wing 17.50-20.50; tail 7.00-8.00, graduated about 2.50; bill 3.50-4.00, the nasal case nearly 2.00; tarsus 3.50; middle or outer toe and claw nearly 6.00; inner ditto 4.50. Plumage very variable with age or other circumstances; usually dark dingy gray or uniform fuliginous above, paler, whitish or white below; wings and tail dusky; in some states believed to be normal to the adult ♂ ♀, entirely sooty; in others nearly white all over. Bill mostly yellow, varying to olivaceous, grayish, or whitish; feet dingy yellowish or brownish-black. Southern seas; casually N. to Oregon. The giant Fulmar Petrel has been called by Cooper "common off Monterey," perhaps by mistaking one of the dark-colored Albatrosses for it.

FULMARUS. (Latinized from Eng. *fulmar*, Gaelic *falmar* or *fulmaire*.) **FULMARS.** Of moderate size, and general Gull-like aspect; white with pearly-blue mantle, or smoky-gray. Bill shorter than tarsus, about $\frac{2}{3}$ as long as head, very robust, especially at base, with turgid sides; hook short, stout, very convex, rising almost from the end of the nasal case; commissure greatly curved; outline of mandibular rami a little concave; gonys ascending; grooves of both mandibles profound. Nasal tube longer than gonys, nearly half the culmen, prominent, turgid, with straight upper outline, truncate emarginate end and thin partition. Wings of moderate length, folding about to end of tail; primaries broad, tapering rapidly to rounded ends, 2d nearly as long as 1st. Tail of 14 feathers broad to their ends, somewhat graduated. Feet rather small, Gull-like; tibiae bare below; tarsus compressed, $\frac{3}{4}$ as long as middle toe and claw. Outer and middle toes with claws of about equal lengths; hind toe appearing as a stout sessile claw. One species.

Analysis of Subspecies.

N. glacialis.

Larger: wing about 13.00 *glacialis*

Smaller: wing about 12.00 *minor*

N. pacific.

Mantle uniform *glupischa*

Mantle mixed with white *rodgersi*

F. glacialis. (Lat. *glacialis*, icy.) **COMMON FULMAR. ST. KILDA PETREL. HAFFHERR OR SEA-HORSE. JOHN DOWN. MOLLY MAWK. MOLLEMOKE. MALLEMUCK, etc.** (corrup-

tion of Dutch *malleugge*.) Length 18.00–20.00; wing 12.50–13.50; tail 4.50–5.00; chord of culmen 1.50 (1.30–1.80); bill about 0.75 deep at base, and nearly as wide; nasal tube 0.60 long; tarsus 2.00 (average); middle toe without claw 2.25. Adult ♂ ♀, normal plumage: White; mantle pale pearly-blue, restricted to back and wings, or extending on head and tail; usually a dark spot in front of eye; quills dark ashy-brown. Bill yellow, tinged with sea-green on culmen and lower mandible, the opening of the nostrils black; feet drying dingy yellowish, said to be delicate french gray in life; iris brown. Young: Smoky-gray, paler below; feathers of upper parts with darker margins; primaries as in the adult; bill and feet obscured. Some individuals appear to be permanently dark-colored, like this, and it is certain that Fulmars breed in such state. They are therefore “adult”; but it may easily be that a change requiring several years for its completion goes on, tending to the final white and pearly-blue plumage of sufficiently old birds. The Fulmar is extraordinarily abundant in the N. Atlantic, swarming at some of its favorite breeding places, especially St. Kilda, where some 20,000 young have been taken in one month of August, wide ranging at other seasons; in North America S. usually to New Jersey in winter. Nest on crags over the sea; egg single, white, with rough brittle shell, resembling a hen’s egg in size and shape, about 2.85×2.00 ; young covered with whitish down, fed in the nest by regurgitation of an oily fluid. Fulmars are very greedy of fatty substances, and constantly attend the whale-fishery to feed upon blubber.

F. g. minor. LESSER ATLANTIC FULMAR. Like the last: Smaller; wing 12.00 or less; bill 1.35, its depth at base 0.65; tarsus 1.75; middle toe 2.15, but the difference is slight, and the alleged distinction arbitrary: see COUES, Proc. Phila. Acad. 1866, p. 27. N. Atlantic, with the last; in North America S. in winter to Massachusetts. *Proc. minor* KJÆRBØLLING, 1854. *F. g. minor* Bp. 1855; COUES, Key, 3d ed. 1887, p. 893; A. O. U. No. 86 a.

Obs. — *F. g. columbi* ANTHONY, Auk, 1895, p. 105, is described as differing from *glupischa* in smaller size, as *minor* does from *glacialis*. San Diego, Cal., in winter.

F. g. glupis'cha. (Latinized from the Russian name.) PACIFIC FULMAR. GLUPISCH. Averaging darker than *glacialis*; mantle bluish-cinereous rather than pearly-blue in the light phase; in the frequent dark phase the whole plumage sooty-gray, little lighter below than above; bill rather weak, usually light-colored. Size of *glacialis* or rather less; length 17.00–19.00; wing about 12.00; bill 1.50, its depth at base 0.67. N. Pacific, in vast numbers; on our side S. in winter to Mexico. Habits, nest and egg, the same as those of the Common Fulmar. *Proc. glacialis* PALL. 1811. *Proc. pacifica* AUD. 1839, nec GM. 1788. *Fulmarus glacialis pacificus* Bp. 1855, and of former eds. of the Key. *F. g. glupischa* STEJ. Auk, 1884, p. 234; A. O. U. No. 86 b.

F. g. rod'gersi. (To Com. John Rodgers, U. S. N.) RODGERS' FULMAR. Mantle dark, as in *glupischa*, but much restricted, most of the wing-coverts and inner quills being white; primaries mostly white on inner webs, their shafts yellow. No sooty plumage recognized. Size and shape as before. N. Pacific, swarming to breed on some of the rocky islands in Bering Sea; S. in winter to San Diego, Cal. Nest on crags; single egg white, nearly equal-ended, rough, with innumerable pits and points, 2.90×1.90 ; chick hatches like a puff-ball of white down.

PROCELLA. (Name compounded of *Prion*, an exotic genus of this family (Gr. *πίον*, *prion*, a saw, with reference to the lamellæ of the bill), and Lat. *procella*, a storm, tempest: see *Procellaria*, beyond.) GULL FULMAR. Bill little shorter than head or tarsus, about $\frac{1}{2}$ the middle toe and claw, compressed, but hardly higher than broad at base, not very robust, sides regularly tapering to rather narrow tip; sutures not so well marked as usual; hook moderate; commissure a little curved; outlines of inferior mandibular ramus and gonys both slightly concave; nasal tube $\frac{1}{3}$ – $\frac{2}{3}$ the culmen, depressed at base, high and narrow at end. Feet, wings, and tail as in *Fulmarus*. One species, curiously resembling a Gull. This is a good genus,

wrongly reduced to a subgenus of *Fulmarus* by the A. O. U. 1886-95. Mr. Salvin, indeed, places it in a different subfamily. It is closely related to the exotic genus *Thalassæca*, with which I once combined it (Proc. Phila. Acad. 1866, p. 29) but the rectrices are 14, as in *Fulmarus* (not 12). The A. O. U. reverted to the Key in 9th Suppl. List, Auk, Jan. 1899, p. 100, after COUES, Auk, July, 1897, p. 315.

P. glacialoides. (Lat. *glacialis*, icy, and Gr. εἶδος, *eidos*, resemblance; i. e. like the Fulmar, *F. glacialis*. Fig. 705.) **SLENDER-BILLED FULMAR.** Adult ♂ ♀: Plumage white, with clear pearly-blue mantle and black primaries, just like a Gull. Mantle beginning faintly on nape, continuing over whole back, rump, tail, wing-coverts, and inner quills; edge of wing slaty-gray; lining of wing mostly white; primaries black, their shafts yellowish-white at base, their inner webs pearly-white to near the ends; white of first primary extending to within 2.00 of the tip, farther on the rest successively, reaching end of 6th; outer webs of secondaries slaty-black, inner white; a small dusky spot before eye; a faint pearly shade on sides of breast and body. Bill yellow; nasal tube, hook, and sometimes base of upper mandible obscured with bluish horn-color or blackish; feet pale flesh-color, obscured on outer toe, drying yellowish. Length about

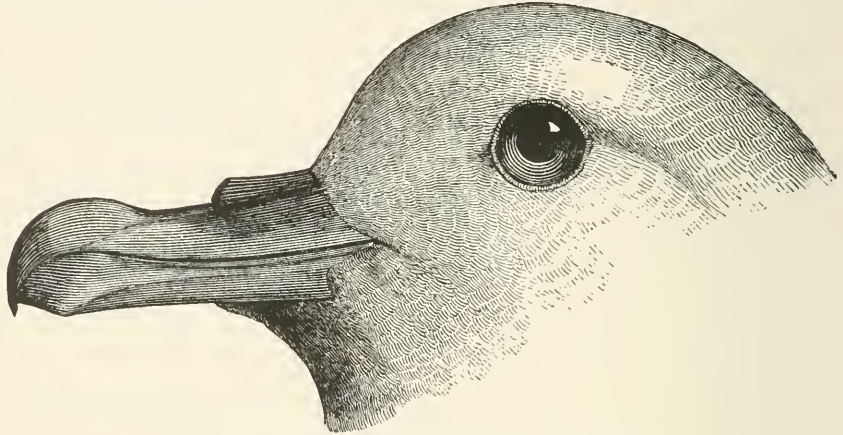


FIG. 705. — Slender-billed Fulmar, nat. size. (From Elliot.)

18.50; extent about 36.00; wing 13.00; tail 5.25, the feathers graduated about 1.00; tarsus 2.00; middle toe and claw 2.60; outer ditto 2.70; inner ditto 2.25; chord of culmen 2.00; height or width of bill at base 0.75; nasal tube 0.67; the bill is really very stout, only "slender" in comparison with that of the Common Fulmar. Young not seen; stages of plumage probably coincident with those of *Fulmarus*. A species described under a large and not select assortment of names, both generic and specific, but easy to identify; wide-ranging over much of the water of the world; occurs on the Pacific coast of North America N. to Vancouver Island; but the Kotzebue Sound record is erroneous (mistake for *Puffinus tenuirostris*, the Slender-billed Shearwater: see Auk, 1884, p. 233). *Proc. tenuirostris* AUD. 1839, nec TEMM. 1835. *Fulmarus tenuirostris* COUES, Key, 1872, p. 328. *Priocella tenuirostris* of later eds. of Key, p. 778. *Proc. glacialoides* SMITH, 1840. *Thalassæca glacialoides* BP. 1855; COUES, 1866. *Fulmarus (Priocella) glacialoides* A. O. U. No. 87. *Priocella garnoti* HOMBRON & JACQUINOT, 1844.

DAP'TION. (Gr. δάπτειν, *daptein*, to devour. The form is irregular, and may be taken as for δάπτων, *daptōn*, devouring, present participle masculine of the verb; or δάπτειν, *daptōn*, present participle neuter, or as if the unrecorded δαπτίον, *daption*, an irregular neuter form. *Daptium* is also found, as in 2d-4th eds. of the Key; and also *Daptrion*. The proper noun of

agent from the verb is δάπτῃς, *daptes*, devourer.) PIGEON PETREL. Bill much shorter than head or tarsus, very stout and especially wide, as broad as high to the hook, where abruptly compressed; culmen nearly straight from tube to hook, which latter is neither large nor much decurved; sides of bill turgid, with convex outline from base to hook; forks of lower mandible wide apart, enclosing a flat-iron shaped space; rictus ample; skin of throat loose and distensible, partly naked; gonys very short, with slight angle; inside the edge of upper mandible a series of oblique ridges; nasal case $\frac{1}{3}$ as long as culmen, broad, depressed, with circular truncate orifice. (Characters of bill approaching those of *Prion*.) Wings folding about to end of the short rounded tail, which is contained $2\frac{1}{2}$ times in length of wing, and is 14-feathered. Tibiæ little bare below; tarsus much shorter than middle toe and claw, stout, compressed, reticulate with small circular plates outside, large ones inside; outer toe without claw longer than middle toe alone; hind toe well developed for this family. Small; plumage spotted. One species.

D. capen'sis. (Of the Cape of Good Hope.) PINTADO PETREL. CHECKERED PETREL. CAPE PIGEON. PARDELA. DAMIER. Spotted above with blackish and white; white below; tail black-barred; bill and feet black. Length 15.00; wing 11.00; tail 4.50; bill 1.33; tarsus 1.67. Southern seas at large; accidental on coast of California and in Maine. (See especially N. Eng. Bird-Life, ii, 1883, p. 386.)

Subfamily PUFFININÆ: Shearwaters, etc.

Nasal tubes usually short and low, with more or less thickened partition between the nostrils, and obliquely truncated at the end, so that separate openings of the nostrils are usually visible from above (best seen in *Puffinus*; little different in some other genera from *Fulmarinæ*). Bill variable in size and shape, from slender and strict to stout and short; both mandibles well hooked at their ends; no sign of ridges inside edge of upper mandible. Tail variable in length and shape, but constantly 12-feathered. Wings very long and pointed; 1st primary never shorter than 2d. Coloration as a rule bicolor, dark above and white below, but in some cases wholly fuliginous. Cranial and other osteological characters as in *Fulmarinæ* (see p. 1026).

This is the largest subfamily of *Procellariidæ*, including over 50 species, or about half the family. It corresponds to the sections *Puffinæ* and *Æstrelatæ* of my early papers (1864-66), and most of the species belong to the two genera *Puffinus*, with about 20 species, and *Æstrelata*, with probably over 30. The large sooty *Majaqueus* and the small snowy *Pagodroma* are extralimital genera. The North American forms are readily determined by the following

Analysis of Genera.

- Shearwaters*, with tarsi much compressed, thin-edged in front; bill strict, with low broad nasal tube.
 - Nasal tube ending somewhat as in Fulmars. Bicolor, but with dark under wing- and tail-coverts. Wing over 12.00 *Prionifinus*
 - Nasal tube ending very obliquely, so much bevelled off that both nostrils are visible from above, separated by a thick partition. Bicolor or unicolor; size medium to small *Puffinus*
- Petrels*, with tarsi not notably compressed nor thin-edged in front; bill stout, with short strict nasal tube. Tail graduated.
 - Tail less than half as long as wing, graduated less than one-third its length. Plumage white below (in all our species) *Æstrelata*
 - Tail more than half as long as wing, graduated more than one-third its length. Plumage fuliginous *Bulweria*

PRIOFINUS. (Name compounded of *Prion* + *Puffinus*.) FULMAR SHEARWATERS. Bill a little shorter than head, about $\frac{3}{4}$ as long as tarsus, broad and stout at base, narrowing regularly to the strong, much compressed and hooked tip; under mandible hooked to correspond with upper, with concave gonys (as in *Puffinus*). Nasal tubes long for this subfamily, broad, depressed (as in *Puffinus*), but truncate and with thin partition (as in *Fulmarus*), so that the

nostrils do not or only partly appear from above; tube also higher and wider at end than at base. Wings comparatively rather short; primaries broad and stiff, 2d as long as 1st. Tail rather short, of 12 feathers, the middle pair projecting and a little acuminate, lateral ones more rounded and rapidly graduated. Feet large and stout, as in *Puffinus*; tarsus compressed, shorter than middle toe and claw; outer toe longer than middle; tip of outer claw about reaching base of middle. A genus remarkably connecting Fulmars with Shearwaters; but so near the latter that it was made a sub-genus of *Puffinus* in the A. O. U. Lists, 1886-95. Two species of large size and robust form, chiefly of Southern seas; *P. gelidus*, the Ice Shearwater of Antarctic seas and the following:

P. cinereus. (Lat. *cinereous*, ashy.) SMUTTY-NOSED SHEARWATER. BLACK-TAILED SHEARWATER. Adult: Upper parts cinereous, nearly uniform, but some feathers with paler edges; under parts white, without line of demarcation from color of upper parts: *tail, crissum, and vent blackish*; lining of wings, axillars, and some feathers on flanks, brownish-cinereous; quills blackish-cinereous on outer webs and tips, paler internally and basally, with brown shafts. Bill *yellow*; nasal case, culmen to the hook, cutting edge and groove of lower mandible *black*, these varied colors conspicuous in life; feet (dried) dingy greenish with yellow webs. Large: Length about 19.00; wing 12.50-13.50, averaging 13.00; tail 5.00-5.75, wedge-shaped, 12-feathered, outer feathers 1.25, shorter than middle; bill (chord of culmen) 1.80, 0.67 high and 0.60 wide at base; nasal tubes nearly 0.50; tarsus 2.40; middle toe and claw 2.88. Southern Seas; accidental off coast of California (Monterey). A peculiar species, very different from any of the following, approaching the Fulmars. *Cinereous Fulmar* or *Petrel* of Latham, whence *Proc. cinerea* GM. 1788; *Proc. melanura* VIEILL, 1823. *Proc. hesitata* FORST. Deser. Anim. 1844, p. 208; GOULD, B. Aust. 1849, pl. 47. *Puffinus hesitatus* LAWR. Ann. Lyc. Nat. Hist. N. Y. vi, 1853, p. 5. *Proc. adamastor* SCHLEGEL, 1863. *Adamastor typus* BP. 1855. *Puffinus cinereus* STEPH. 1825; LAWR. in Bd. B. N. A. 1858, p. 835. *Adamastor cinereus* COUES, Proc. Phila. Acad. 1864, p. 119, p. 142. *Priofinus cinereus* JACQ. and PUCH. Voy. 1853, Zool. iii, p. 145; COUES, Proc. Essex Inst. v, 1868, p. 303; A. O. U. Suppl. List, Auk, Jan. 1899, p. 101. *Puffinus (Priofinus) cinereus* A. O. U. Lists, 1886-95, No. [97]. *Puffinus (Priofinus) melanurus* COUES, Key, 1st ed. 1872, p. 330. *Priofinus melanurus* COUES, Check-List, 2d ed. 1882, p. 127; Key, 2d-4th eds. 1884-90, p. 783. *Puffinus kuhlii* CASS. Proc. Phila. Acad. 1862, p. 327 (error; not of Boie).

PUFFINUS. (Latinized from Eng. *puffin*, a very old name of *Fratercula arctica*, a bird of the Auk family, transferred by mistake of Ray's to the "Puffin of the Isle of Man, *Puffinus anglorum*," the Manx Shearwater; origin and meaning uncertain.) SHEARWATERS. Bill nearly or about as long as head, varying in slenderness, a little higher than broad at base, compressed for the rest of its extent; end much hooked, tips of both mandibles decurved; gony concave. Nasal tubes short, only about $\frac{1}{4}$ the length of culmen, falling short of the hook by a space equal to or greater than their own length, broad and depressed, obliquely bevelled off at end, the partition thick; nostrils oval, in full view from above. Wings long, thin, and pointed, folding beyond tail; 1st primary longest. Tail rounded or rather wedge-shaped, of 12 feathers. Feet very large and stout; tarsus much compressed, thin-edged in front as behind, equal to middle toe with or without claw; outer toe about as long as middle, but its claw much smaller; tip of inner claw scarcely or not reaching base of middle; hind toe a mere knob. Embracing numerous species, of moderate and small size; most of them bicolor, dark above and white below, others uniformly sooty. These birds shear the waters of all oceans, and seem independent of land except in the breeding season, when they come ashore to lay their single white egg in holes under ground. Their restlessness, or some other characteristic, has shrouded them in mystery and made at least one species (*P. yelkouan* of the Bosphorus) the subject of a myth; for these uneasy birds are supposed to embody lost human souls.

Analysis of Species.

- Tail long, cuneate. (Subgenus THYELLODROMA.)
 Two-colored; white below, dark above *cuneatus*
 Tail shorter and more rounded. (PUFFINUS proper.)
 Two-colored; white below, dark above.
 Large: length 16.00 or more; wing 12.00 or more.
 Pale brownish-ash; under tail-coverts white, upper largely dark. Atlantic *borealis* or *kuhli*
 Dark brown; under tail-coverts dark, upper largely white. Atlantic *gravis*
 Dark brown; under and upper tail-coverts dark; feet flesh-color. Pacific *creatopus*
 Medium; length under 16.00, over 13.00; wing 9.25. Above blackish. Atlantic *puffinus*
 Small; length 13.00 or less; wing 9.00 or less, but over 7.00.
 Under tail-coverts mostly white. Atlantic *auduboni*
 Under tail-coverts black. Pacific *opisthomelas* and *auricularis*
 Smallest; wing 7.00 or less; under tail-coverts white. Straggler to Nova Scotia *assimilis*
 One-colored; sooty.
 Large; length 16.00 or more; wing 11.00 or more.
 Under wing-coverts mostly dark. Atlantic *fuliginosus*
 Under wing-coverts mostly whitish. Pacific *griseus*
 Small: length about 14.00; wing 10.00. Pacific *tenuirostris*

(* Bicolor species, white below.)

(Subgenus THYELLODROMA.)

P. (T.) cuneatus. (Lat. *cuneatus*, wedged, as the tail is; *cuneus*, a wedge.) KNUDSEN'S WEDGE-TAILED SHEARWATER. Two-colored; white below, dark above. Feathers of upper parts not edged with white; back and wings sooty, former, including rump and upper tail-coverts, sometimes mixed with more grayish or ashy feathers. Primaries and tail-feathers blackish. Top and sides of head and neck grayish-brown, edged with lighter on forehead, lores, and thence backward below eyes. White of under parts shaded with ashy or dingy, especially along sides; under tail-coverts mixed lighter and darker brown; under wing-coverts white with touches of gray on some feathers, and a brownish border. Bill horn-colored or bluish; feet flesh-colored. A dark phase lacks white of under parts. Length about 17.00; wing 11.75; tail 5.50, with lateral rectrices only 3.60, thus graduated nearly or about 2.00; bill 2.25; tarsus 1.90; middle toe 2.33, outer 2.20, inner 1.90. A strongly marked species (in comparison with any of the following). N. Pacific, from Sandwich Islands to Japan and Mexico; breeds on San Benedicto Island of the Revillagigedo Group; Lower California (Cape San Lucas, Anthony); Gulf of California (Tres Marias Isls., Nelson). Not in former editions of the Key. SALVIN, Ibis, 5th ser. vi, July, 1888, p. 353; Cat. B. Brit. Mus. xxv, 1896, p. 371; ANTHONY, Auk, 1898, pp. 38, 313; NELSON, N. Am. Fauna, No. 14, April 29, 1899, p. 27. *P. knudseni* STEJ. Pr. U. S. Nat. Mus. xi, Nov. 8, 1888, p. 93.

(Subgenus PUFFINUS.)

P. kuhli. (To Dr. Heinrich Kuhl, an early monographer of Petrels, who died Sept. 14, 1821, aged 25.) CINEREOUS SHEARWATER. MEDITERRANEAN SHEARWATER. Bill scarcely or not shorter than head, equal to tarsus, moderately hooked, with short nasal tubes, about $\frac{1}{2}$ as long as culmen, but rather high for this genus, with trace of a median ridge; nostrils opening roundish. Wings folding a little beyond tail, which is graduated, with lengthened middle feathers. Feet rather weak; outer toe and claw longer than middle toe and claw; tip of inner claw about reaching base of middle. Adult: Upper parts light smoky-gray, or pale brownish-ash, uniform on crown and nape, interrupted on back by white or grayish-white edges of the feathers, especially on scapulars, darkening on wing-coverts and inner secondaries to grayish-brown; rump like back; upper tail-coverts successively acquiring white till the longest ones are mostly of this color, only touched with brown. Primaries grayish-black, with large white spaces on basal half or two-thirds of inner webs; outer webs and tips of most secondaries grayish-plumbeous; most of their inner webs white. Entire under parts, from chin to ends of under tail-

coverts, pure white, except some slight touches of gray on flanks; lining of wings and axillars white, except just along the edge. On sides of head and neck, no line of demarcation between color of upper and under parts, the two merging through a cloudy or wavy area; under eyelid white. Bill yellowish, darker on culmen and hook; feet yellowish, the webs clearer. Length about 18.00; wing 13.00; tail 5.50, graduated 0.75; chord of culmen 1.90; gape 2.60; height of bill at base 0.70; width 0.60; tarsus 1.90; middle toe and claw 2.50, outer ditto 2.55. (Described from a European specimen.) N. Atlantic, European coast, especially of the Mediterranean. Greenland? Introduced to our Fauna in 1872, in original edition of the Key, p. 331, upon strength of its general range, and Schlegel's ascription of it to Greenland; but I have never seen an unquestionable North American specimen. A. O. U. Hypothetical List, No. 5.

P. borealis. (Lat. *borealis*, northern.) CORY'S SHEARWATER. "Above brownish-ash, the feathers of the back becoming pale at the tips, those on the nape and sides of the neck narrowly tipped with white; on the sides of the head and neck the ash and white gradually mingling as in *P. kuhlii*. Tips of the upper tail-coverts white. Under eyelid white, showing clearly in contrast with the ashy-gray of the head. The first three primaries are light ash on the inner webs. Wings and tail brownish-gray. Under parts white, slightly touched with ash on the flanks, lining of wings white. Under tail-coverts white, the longest tinged with ash near the ends, which extend nearly to the tips of the longest tail-feathers. Outside of foot greenish-black, inside and webs dull orange; bill pale yellowish at the base, shading into greenish-black, but again becoming pale near the tip. Length 20.50 inches; wing 14.50; bill (straight line to tip) 2.25; depth at base 0.75; tail 6.50; tarsus 2.20." I copy the original description (CORY, Bull. Nutt. Club, vi, 1881, p. 84). The bird is perfectly distinct from *P. gravis*, but too near *P. kuhlii*, with which it is identified by SALVIN. Coast of Massachusetts, Rhode Island, and Long Island. A. O. U. No. 88.

P. gravis. (Lat. *gravis*, heavy.) GREATER SHEARWATER. WANDERING SHEARWATER. COMMON ATLANTIC SHEARWATER. HAGDON. HAG. Bill little shorter than head or tarsus, stout and subcylindrical at base, gradually compressed to the strong hook. Nasal tube straight, about $\frac{1}{4}$ as long as culmen, with widely separated subelliptical openings. Culmen rising with slight continuous concavity from nostrils to top of the hook; commissure a long regular curve, convex downward, from feathers to curve of the hook. Outline of inferior mandibular rami about straight. Bill about 3 times as long as high at base, not so wide as high. Wings long and pointed; 1st and 2d primaries nearly equal. Tail contained about $2\frac{1}{2}$ times in length of wing, much rounded, almost wedged. Tarsus as long as middle toe without claw; outer toe as long as or longer than middle, but its claw smaller, falling short of tip of middle claw; tip of inner claw not reaching base of middle. Adult: Above, dark bistre-brown, on head inclining a little to plumbeous or grayish-brown; usually lighter on hind neck, darkest on inner secondaries and rump; each feather of back, rump, and wing-coverts edged with pale brownish-ash or even ashy-whitish. On head the color uniform, without these light margins, extending below eyes to level of gape, with distinct line of demarcation from white of throat. On side of neck the white reaches farther around, and is less distinctly outlined; farther back, on sides of breast, the dark color encroaches on the white. Upper tail-coverts, especially the longest ones, mostly white, with dark bars or central fields. Primaries brownish-black, lightening on inner webs toward base. Under parts white from chin to anus, with large dark brown patches on flanks; under tail-coverts dark grayish-brown, with whitish tips; lining of wings white, mottled with dark along the border and on ends of axillars. Tail-feathers like primaries. Bill blackish horn-color; outside of tarsus and outer toe brownish; rest of feet and webs yellowish flesh-color; iris brown. The intensity and uniformity of coloration of the upper parts varies much with age of the plumage. Fresh plumages are deep plumbeous-brown with narrow pale or whitish margins; old worn feathers are duller brown with broader less distinct grayish-brown edgings. Observe line of demarcation of dark and white on head, neck, and breast; uniform

feathers of head; dark under and partially white upper tail-coverts. Length 18.00–20.00; extent 42.00–45.00; wing about 13.00; tail 5.75, graduated 1.00; tarsus 2.40; middle toe and claw 2.90; outer ditto 2.75; inner ditto 2.30; chord of culmen 2.00; depth of bill at base 0.65, width 0.60. Wanders over the whole Atlantic, Greenland to Cape Horn and Cape of Good Hope; abundant in summer off the coast of New England. Sometimes seen in flocks of thousands, shearing the crests of the waves, and skimming the billows with marvellous ease, without a visible motion of the pinions. It is a very well known bird, yet its breeding-resorts are much of a mystery. *P. major* of former editions of the Key, as of most authors. *P. cinereus* of NUTTALL and AUDUBON. *Proc. gravis* O'REILLY, Voy. Greenl. 1818, p. 140, pl. 12, fig. 1. *Puffinus gravis* SALV. Cat. B. Brit. Mus. xxv, 1896, p. 373; A. O. U. Suppl. List, Auk, Jan. 1897, p. 124, No. 89.

P. creatopus. (Gr. κρέας, *kreas*, flesh; ποῦς, *pous*, foot.) PINK-FOOTED SHEARWATER. Bill short, less than head or tarsus, turgid at base, where as wide as high. Nasal tubes short, hardly $\frac{1}{4}$ the length of culmen, turgid, with slight median furrow and very oblique truncation. Frontal feathers running forward on median line. Form otherwise as in *P. gravis*. Adult: Bill pale yellowish flesh-color; nasal tubes, culmen, and tip blackish. Feet flesh-colored; claws whitish with brown ends. Upper parts about the same shade of brown as in *P. gravis*; upper tail-coverts entirely dark. No white on inner webs of primaries. On sides of head and neck the color of the upper parts extends entirely around, without any distinct line of demarcation; chin and throat mottled with dark and white in about equal amounts. On sides of breast the color more restricted than on neck. Lower eyelid white. Sides of body and lining of wings mottled with dusky and white in about equal amounts; long axillars dark except just at base. Middle of belly and vent variegated with dusky and white. Under tail-coverts entirely fuliginous. "Length 19.00; extent 45.00;" wing 12.50; tail 5.00, graduated 1.00; tarsus 2.10; outer toe and claw 2.50; middle ditto 2.65; inner ditto 2.60; chord of culmen 1.60; gape 2.30; height or width of bill at base 0.60; nasal tubes 0.40. Eastern Pacific Ocean; coast of California, S. to Chile.

P. puffinus. MAX SHEARWATER. "Puffin of the Isle of Man." Smaller and otherwise very different from any of the foregoing. Adult: Upper parts uniform lustrous black, or blackish with slight brown or slaty shade, rather ashy across hind neck; the dark color extending on sides of head much below eyes, but there marbled with white; under eyelid white, set in black. On sides of neck the white reaches part way around; on sides of breast the dark extends some distance, dilute and marbled with white. Primaries black, with black shafts, their inner webs dull grayish-brown; tail-feathers like primaries. Entire under parts, from chin to anus, pure white, except a few feathers of the flanks, and outer webs of outer under tail-coverts, which are plumbeous-black. Lining of wings and axillars white, mottled with black along the edge. Length 13.50–15.00; extent 30.00–33.00; wing 8.75–9.25; tail 3.10, graduated 0.75 or less; tarsus 1.80; middle toe and claw 1.90; outer ditto 2.00; inner ditto 1.55; chord of culmen 1.40; gape 2.10; height or width of bill at base 0.45. Varies much, but the small size and blackishness are distinctive. Chiefly inhabits the Atlantic coast of Europe, and the Mediterranean; it is the most numerous British species of the genus, said to range the N. Atlantic at large, S. to Brazil; but those who suppose it to be a common North American species are mistaken. Nest in burrows in the ground dug by the birds, or in natural cavities; egg single, dead white, smooth, 2.35×1.60 . Nestlings in down sooty-gray above, whitish below. *Procellaria anglorum* RAY, 1713; *Proc. puffinus* BRÜNN. 1764. *Puffinus anglorum* of most authors, as of former editions of the Key; *Puffinus puffinus* LICHT. 1854; A. O. U. No. [90].

P. auduboni. (To J. J. Audubon.) AUDUBON'S SHEARWATER. SMITH'S CAHOW. Bill small and weak, about $\frac{2}{3}$ as long as head, $\frac{3}{4}$ as long as tarsus; stout only at base, where higher than wide; hook rising abruptly from line of culmen; commissure and lower outline of bill almost straight from feathers to hook. Wings folding to end of tail, which is comparatively

long, and much graduated. Tarsus as long as middle toe without claw; outer toe and claw equal to middle toe and claw; tip of inner claw reaching base of middle. Adult: Blackish of upper parts with much of a grayish or plumbeous cast, and lighter borders of the feathers, especially on scapulars and inner secondaries; darkest on rump and upper tail-coverts; on sides of head not extending below eyes, and even there marbled with whitish; both eyelids white, and indication of a light superciliary stripe. Quills and tail-feathers as in *P. puffinus*. Under parts white, including lining of wings and axillars; a few plumbeous-black feathers on flanks; longest and outermost under tail-coverts black, the rest white, pure or with a plumbeous shade. Bill dull leaden-blue, blackening at tip; outside of tarsus and outer toe bluish-black, inside and webs of all yellowish. Small: Length 11.00–12.00; extent 26.00; wing 7.50–8.00; tail 4.25, graduated nearly 1.00; tarsus 1.60; middle toe and claw 1.80; chord of culmen 1.25; gape 1.70; nasal case to tip 0.90; depth of bill at base 0.40; width 0.35. A small bicolor species, readily distinguished from any of the foregoing. S. Atlantic and Gulf coast, straying north to the Middle States. (*P. obscurus* Gm.? *P. obscurus* of former editions of the Key, doubtfully referred to the Dusky Petrel, described as a Pacific species; considered identical therewith by Salvin, but separated by the A. O. U. as *P. auduboni* FINSCH, P. Z. S. 1872, p. 111, and apparently to be recognized as distinct.) It is the Cahow of Smith, Virginia, ed. of 1632, p. 171, at which date it had already been almost exterminated in the Bermudas, where it formerly swarmed; but it is known to still breed there of late years. Egg single, white, 2.05 × 1.45.

***P. opisthomelas*.** (Gr. ὀπίσθε, *opisthe*, backward; μέλας, *melas*, black. Fig. 706.) BLACK-VENTED SHEARWATER. Resembling the last, and little larger. Bill about $\frac{4}{5}$ as long as tarsus. Tail relatively shorter, less graduated. Tarsus as long as middle toe and half its claw. Frontal feathers extending in a point on culmen. Adult: Dark color of upper parts extending

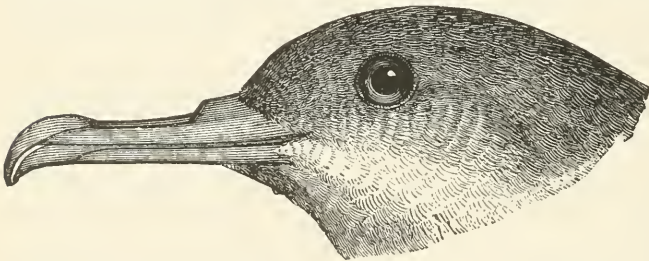


FIG. 706. — Black-vented Shearwater, nat. size. (From Elliot.)

farther on sides of head than in *auduboni*, leaving no white about eye. Under tail-coverts entirely sooty-blackish, except a few of the shortest just at the vent. More dark color on flanks, lining of wings, and axillars, than in *auduboni*. In the dry state, bill yellowish- or reddish-brown, nasal tubes and culmen blackish, hook mostly bluish-white; outside of tarsus for the most part, outer toe and edges of webs, blackish; rest of foot pale yellowish flesh-color; iris brown. Length 12.00 or more; wing 9.00; tail 3.75, graduated 0.60; tarsus 1.80; middle toe and claw 2.10; chord of culmen 1.40; gape 2.00; end of nasal tubes to tip 1.05; height at base 0.42, at hook 0.32. Egg 1.80 × 1.30. Decidedly different from *P. obscurus* of Pacific waters, as well as *P. auduboni* of the Atlantic. Pacific ocean; on American coast from Lower California to Vancouver Island; common in summer on central California coast; breeds on some islands of Pacific coast of Lower California. Described in Proc. Phila. Acad. 1864, p. 139, from Cape St. Lucas, and appearing correctly in all editions of the Key, 1872–90; miscarried as *Puffinus gavia* in A. O. U. Lists, 1886–95; *P. opisthomelas* A. O. U. Suppl. List, Auk, Jan. 1897, p. 124, after SALVIN, Cat. B. Brit. Mus. xxv, 1896, p. 380.

***P. auricularis*.** (Lat. *auricular*, relating to the ears.) EARED SHEARWATER. TOWNSEND'S SHEARWATER. Resembling *opisthomelas*; bill and feet smaller; darker above, where nearly black; color of side of head extending below eye in line with the mouth and on auriculars, without sharply defused edge; flanks and axillars white; under tail-coverts black. Length

about 12.50; wing 9.25; tail 3.15; bill 1.50 along gape; tarsus 1.80; middle and outer toe and claw 1.90; inner 1.60. Clarion Island of Revillagigedo Group, Mexico, to Cape San Lucas, Lower California. New to the Key. C. H. TOWNSEND, Pr. U. S. Nat. Mus. xiii, Sept. 9, 1890, p. 133; SALVIN, Cat. B. Brit. Mus. xxv, 1896, p. 380; ANTHONY, Auk, 1898, p. 38, p. 313, p. 317; A. O. U. Comm. Suppl. List, Auk, Jan. 1899, p. 101, No. 93.1.

P. assimilis. (Lat. *assimilis*, assimilated; *ad*, to, and *similis*, similar, like.) SIMILAR SHEARWATER. Resembling the last; upper parts rather less blackish, with more of a slaty-blue shade; line of demarcation between dark upper and white lower parts better defined along sides of neck; especially, primaries white underneath on most of the inner webs; under tail-coverts and lining of wings all white; white rising on sides of head to include most of auriculars and lores; obscurely whitish edgings of greater wing-coverts. Bill black; feet blackish, with yellow webs. Small: Length 10.50–11.00; wing 6.50–7.00; tail 2.75; bill 1.00 along culmen; 1.40 along gape, 0.70 from nostril to tip, scarcely 0.20 high or wide at nostril, hardly 0.50 in length of the hook at end; tarsus 1.35; middle toe and claw 1.65. A very small species of Australian and New Zealand seas, N. in the Atlantic to Madeira, accidental in North America on Sable Island, Nova Scotia, Sept. 1, 1896 (Pr. Biol. Soc. Washn. xi, April 21, 1897, p. 69). *P. assimilis* GOULD, P. S. Z. 1837, p. 156; B. Aust. vii, 1848, pl. 59. *P. nugar* and *P. bailtoni* BP. 1856. See COUES, Pr. Phila. Acad. 1864, p. 141 and p. 144. *P. assimilis*, A. O. U. Comm. Suppl. List, Auk, Jan. 1899, p. 100, No. [92.1.].

(** *Unicolor species, dark below as above.*)

P. fuliginosus. (Lat. *fuliginosus*, sooty. Fig. 707.) ATLANTIC SOOTY SHEARWATER. STRICKLAND'S SHEARWATER. BLACK HAG or HAGDON. Adult ♂ ♀: Nearly uniform dark sooty-brown, blackening on quills and tail-feathers, more sooty-gray below, paler still on throat; lining of wings mixed sooty and whitish. Bill drying an undefinable dark color, in life dusky bluish-horn color, the tube, ridge, and hook blackish; feet drying dark outside, pale inside; in life inside of tarsus and upper side of feet livid flesh-color, outside of outer toe and under side of feet blackish; eye blackish. Length 16.00–18.00; extent about 40.00; wing 11.50–12.00; tail 4.00; tarsus 2.25; middle toe and claw 2.50; chord of culmen

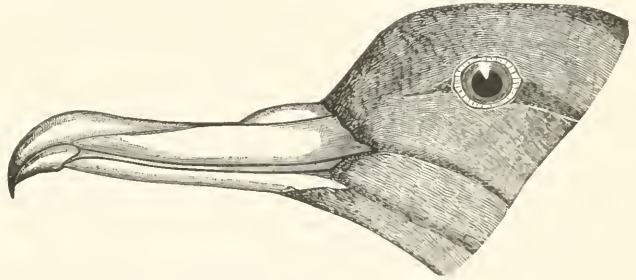


FIG. 707. — Sooty Shearwater, nat. size. (Ad. nat. del. E. C.)

1.75–2.00; gape 2.33; feathers on side of lower mandible to tip 1.67; depth of bill in front of nasal tube 0.40. A wide-ranging Atlantic species; common off North American coast, especially northerly, in summer, in flocks with *P. gravis*. It is perfectly distinct from any of the two-colored species, of several of which it has at times been considered to be the ♀ or a special state of plumage. Breeds in colonies, often of great extent, laying in holes burrowed several feet deep in the ground; egg single, white, 2.55 × 1.75. *P. stricklandi* RINGW. 1884; A. O. U. No. 94, 1886–95. But the species, supposing it to be distinct from the Pacific *P. griseus*, is correctly named as above in all editions of the Key, for *Puffinus fuliginosus* STRICKL. 1832, is not voided on account of any prior *Procellaria fuliginosa*, applied to several different species of other genera than *Puffinus*: see COUES, Auk, July, 1897, p. 315; whence the A. O. U. reverted to the original nomenclature of the Key: see Suppl. List, Auk, Jan. 1899, p. 101, No. 94.

P. griseus. (Lat. *griseus*, gray.) PACIFIC SOOTY SHEARWATER. DARK-BODIED SHEARWATER. Similar to the last, from which perhaps not specifically distinct. Under wing-coverts white, only interrupted by some dusky marbling; throat sometimes whitish. Bill

(dry) brownish-black, horn-colored at tip. Feet (dry) light yellowish flesh-color, tinged with brown on outside of tarsus, outer toe, and tips of claws. In life bill horn color, toes and tarsi bluish. Smaller: wing 11.00; tail 4.25, graduated 0.90; tarsus 2.00; middle toe and claw 2.40; outer ditto 2.30; chord of culmen 1.70. *Nectris anaurosoma* COUES, Pr. Phila. Acad. 1864, p. 124, p. 143 (Cape St. Lucas, L. Cala.), since found N. on the California coast, Queen Charlotte Islands, and at Sitka, and probably wide-ranging in Pacific waters; in which case its proper name is *P. griseus*, as A. O. U. No. 95. Supposedly breeds in Southern Hemisphere only. All the large Sooty Shearwaters are combined under the name *Griseus* by Salvin, and such is very probably their true status.

P. tenuirostris. (Lat. *tenuis*, slight, thin; *rostrum*, beak.) SLENDER-BILLED SHEARWATER. KURILE SHEARWATER. Distinct: a small, weak-billed, short-tailed, very dark-colored species, sooty-black above, quite black on quills and tail-feathers, beneath smoky-gray, palest on throat, the under tail-coverts nearly as blackish as upper parts. Groove of under side of primary-shafts yellow. Bill (dry) dusky greenish-yellow, brighter along edges and at tip; feet (dry) yellowish, the hinder edge of tarsus and under surface of webs blackish. Length about 14.00; wing 10.00; tail 3.50, graduated 0.75; chord of culmen 1.20; depth of bill at base 0.30; width 0.40; tarsus 1.90; middle or outer toe and claw 2.25. N. Pacific, Alaska to Japan; N. in summer to Kotzebue Sound; breeding in Southern Hemisphere and ranging at large southward; Australia; New Zealand.

ÆSTRELATA. (Gr. *οἰστρήλατος*, *oistrelatos*, goaded on by a gad-fly.) GADFLY PETRELS. DIABOLIC PETRELS. Bill about as long as tarsus, stout, compressed throughout, with nearly straight converging lateral outlines, the hook particularly large, high-arched, long-decurved, rising almost immediately from end of nasal tube, leaving but a short concave culmen proper; latericorn very large, turgid, rising high at root of nasal case, convex along under outline; commissure strongly sinuate throughout; outline of mandibular rami nearly straight, of gonyes concave; tip of under mandible decurved to fit the arch of the hook. Grooves of both mandibles distinct. Nasal tube of moderate length, high, not carinate, about straight, truncate at end, with thin partition between nostrils. Interramal space narrow, fully feathered. Wings pointed, very long, folding beyond end of tail. Tail long, graduated or much rounded; its length less than $\frac{1}{2}$ that of the wing, and its graduation less than $\frac{1}{3}$ its own length. Feet of moderate size; tarsus reticulate, about as long as, or little shorter than, middle toe without claw; outer toe alone rather longer than middle; with its claw, about as long as middle toe and claw; tip of inner claw reaching base of middle. Hallux a short sessile claw. The largest genus of *Procellariidae*, containing about 30 medium-sized and rather small species, chiefly inhabiting Southern seas; most of them bicolor, a few uniformly fuliginous. Our 3 are mere stragglers to North America, unless *Æ. fisheri* should prove native. (I cannot bring myself to misspell this word "*Æstrelata*," as a majority of my respected colleagues on the A. O. U. Committee insist upon doing, for no better reason than that Prince Charles Lucien Bonaparte did not know how *Æstrelata* ought to be spelled. Such deference to authority as this is in my judgment a blot on our "Canons of Nomenclature," which justly exposes us to rebuke from "mouths of wisest censure.")

Analysis of Species.

Large: wing 11.00 or more. No large white space on inner web of any primary.

A black cap. Under parts white *hesitata*

Small: wing under 11.00. Large white spaces on inner webs of primaries.

No cap. Back cinereous, the feathers tipped with whitish *scalaris*

Cap white, spotted with gray. Feathers of back not tipped with whitish *fisheri*

Obs. — A fourth species, *Æ. jamaicensis*, is likely to prove North American. This is nearly as large as *hesitata* (wing 11.00; tail 5.00), but much darker colored, without distinct black cap; general plumage sooty, paler below than above, the upper tail-coverts whitish; bill and feet black. It is the Blue Mountain Duck of Gosse, E. Jam. 1847, p. 437. *Proc. jamaicensis*, BANCROFT, Zool. Journ. v, 1826, p. 81. *Pterodroma caribbea* CARTE, P. Z. S. 1866, p. 93, pl. 10. *Æ. jamaicensis* A. and E. NEWTON, Handb. Jam. 1881, p. 117; SALVIN, Cat. B. Brit. Mus. xxv, 1896, p. 403.

Æ. hæsitata. (Lat. *hæsitata*, stuck; the describer was in doubt about it.) BLACK-CAPPED PETREL. DIABLOTIN. Adult: Forehead, sides of head, neck all round, upper tail-coverts, base of tail, and all under parts, white; back clear bistre-brown (nearly uniform, but the feathers often with paler or ashy edges), deepening on wings and terminal half of tail; crown with an isolated blackish cap, and sides of head with a black bar (younger birds with white of head and neck behind restricted, so that these dark areas run together). Bill black; tarsi and base of toes and webs, flesh-colored (drying yellowish); rest of toes and webs, black. Length 16.00; extent 39.50; wing 11.50–12.00; tail 5.25, its graduation 1.50; tarsus 1.40; middle toe and claw 2.12; bill 1.40, 0.66 deep at base, 0.40 wide; tube 0.33. A rare bird, native of some of the West India Islands, as Haiti, Guadeloupe, Martinique, and Dominica, of casual occurrence on the Atlantic coast, U. S. (*P. brevirostris* and *P. meridionalis* LAWR. Ann. Lye. Nat. Hist. N. Y. iv, 1848, p. 475; v, 1852, p. 220, pl. 15); and in Europe (Zool. 1852, p. 3691; Ibis, 1884, p. 202). A specimen was taken Aug. 30, 1893, at Blacksburg, Va., 200 miles inland (Auk, Oct. 1893, p. 361); and three others in October, 1898, on the Ohio River

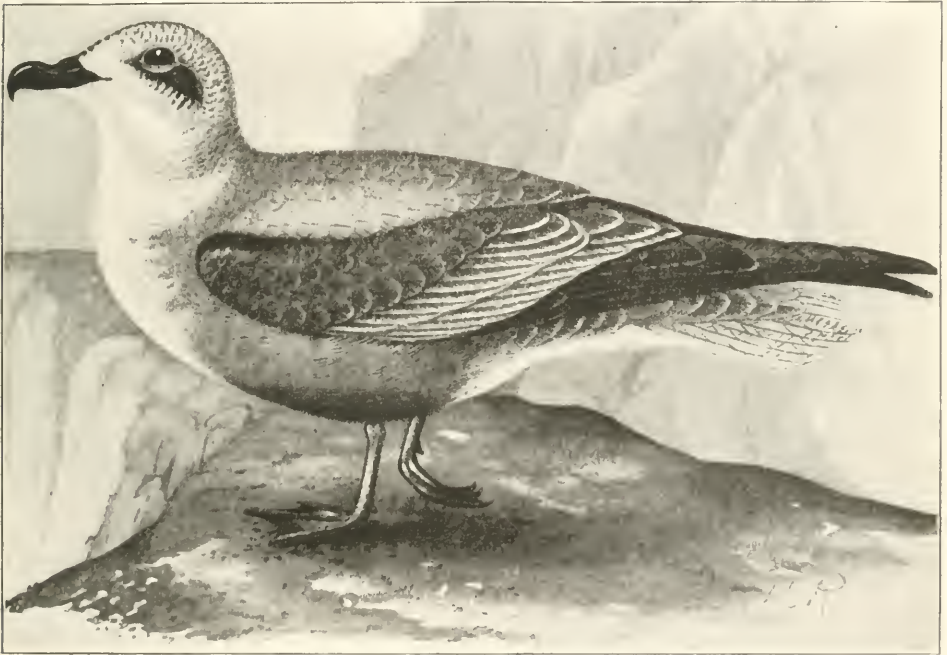


FIG. 708. — *Æstrelata Fisheriesi*. Ridgw.

at or near Cincinnati (Auk, Jan. 1899, p. 75). *Proc. hæsitata* KÜHL. *Æstrelata hæsitata* A. O. U. misspelling both words. *Proc. diabolica* LAFR. 1844.

Æ. scalaris. (Lat. *scalaris*, pertaining to a ladder or stairs; *scala*, a staircase; referring to the markings of the upper parts. Compare *scalaris* as a name of the ladder-backed Woodpeckers of the genus *Dryobates*.) SCALED PETREL. Form typical of *Æstrelata* as above; size small. Adult: Upper parts, including tail-coverts and exposed surfaces of tail-feathers, pure cinereous, deepening to plumbeous on hind head, rump, and lesser wing-coverts; feathers of back and greater and middle wing-coverts tipped with ashy-white. Under parts pure white; ash of upper parts coming down sides of neck and deepening as it extends more broadly along sides and quite across abdomen, which is plumbeous — this color with vague and nebu-

lous boundaries; under wing- and tail-coverts white. Sides of head white, with a distinct narrow dark bar through eye; a white superciliary line; forehead and crown mixed white and ashy. Primaries and secondaries with distinct pure white areas on inner webs; on the primaries these areas occupying the whole webs at base, sending a narrow wedge forward; primaries lightening from without inward, secondaries abruptly darkening again. Bill black; tarsus livid flesh-color; basal third of toes and contained portion of webs yellowish, the rest black. Chord of culmen 1.05; height of bill at base 0.45-0.50; width 0.40-0.45; tarsus 1.35; middle toe and claw 1.68; outer ditto 1.65; inner ditto 1.40. Wing 9.80; tail 3.90; graduated 0.75. Southern seas; a waif caught in New York State, Livingston Co., Apr. 1880. *Æstrelata gularis* BREWST. Bull. Nutt. Club, Apr. 1881, p. 94 (but not *Procellaria gularis* PEALE, 1848); A. O. U. List, 1st ed. 1886, No. [99]. *Æ. scalaris* BREWST. Auk, July, 1886, p. 390; RIDGW. Man. 1887, p. 68; A. O. U. List, 2d ed. 1895, No. [99]. *Æ. gularis* COUES, Key, 2d and 3d eds. 1884 and 1887, p. 780. *Æ. scalaris* COUES, Key, 4th ed. 1890, p. 906; SALVIN, Cat. B. Brit. Mus. xxv, 1896, p. 416.

Æ. fish'eri. (To Wm. J. Fisher, of Kadiak, Alaska. Fig. 708.) FISHER'S PETREL. Closely related to the last. Above plumbeous-gray, blackish on lesser wing-coverts; edges of secondaries hoary white; head and lower parts white; crown spotted with blackish, belly overlaid by a wash of smoky plumbeous; a dark spot below eye; tail largely white with irregular gray barring and vermiculation. Wing 10.15; tail 4.00, graduated 0.90; culmen 1.00; tarsus 1.35; middle toe 1.40. Off coast of Alaska (Kadiak). *Æ. fisheri* RIDGW. Pr. U. S. Nat. Mus. v, June, 1883, p. 656; viii, 1885, p. 18; Man. 1887, p. 68; Auk, Oct. 1895, p. 319, pl. 4; COUES, Key, 2d-4th eds. 1884-90, p. 780; BD. BREW. and RIDGW. N. A. Water Birds, ii, 1884, p. 396; A. O. U. Lists, 1st and 2d eds. 1886-95, No. 100; SALVIN, Cat. B. Brit. Mus. xxv, 1896, p. 415. The type specimen remains unique and is not referable to any other species, though near *Æ. gularis* and *Æ. defilippiana*.

BULWERIA. (To one Bulwer.) COLUMBINE PETRELS. General characters of *Æstrelata*; bill similar with smaller nail and straighter commissure. Tail longer, more than $\frac{1}{2}$ the wing, cuneate. Size small. Color fuliginous. Two species, one a waif in North America. The other is *B. macgillivrayi* of the Fiji Islands. (Given under *Æstrelata* in 2d-4th eds. of Key.)

B. bul'weri. BULWER'S PETREL. Adult: Plumage entirely fuliginous, almost black on wings and tail, lighter and more brownish below, somewhat ashy on head, gray on greater wing-coverts. Length about 10.00; wing 8.00; tail 4.50, graduated 1.75; chord of culmen 0.85; tarsus 0.90-1.00; middle or outer toe and claw 1.10; inner ditto 0.85. Temperate North Atlantic and North Pacific oceans; Canary Islands, etc.; accidental at Bermudas; has once occurred off Greenland. (Pr. Phila. Acad. 1866, p. 158; Zool. 1881, p. 378.) Egg white, 1.60-1.75 \times 1.20, laid in burrows or rocky crevices; young covered with sooty down. *Proc. bulweri* JARD. and SELBY, pl. 65, pub. Nov. 1828. *P. anjinho*, HEIN. 1829. *Puffinus columbinus* WEBB and BERTHELOT.

Subfamily PROCELLARIINÆ: Short-legged Stormy Petrels.

Nasal tubes prominent, truncate, with thin partition between the nostrils (much as in the *Æstrelata* group of the *Puffininae*). Bill of moderate size and not diagnostic shape; both mandibles well hooked at end, as in most Petrels (compare *Fulmarinae*). Tail 12-feathered, of variable shape — square, forked, or wedged. Wings not very long: 2d primary longer than 1st; secondaries more than 10 (as throughout the family excepting *Oceanitinae*). Feet not notably lengthened; leg-bones shorter than wing-bones. Tarsal bone not twice as long as femur; tarsus little if any longer than middle toe and claw; tarsal envelop reticulate in front, with no tendency to fuse in a booted podotheca; tibiæ feathered nearly to the joint. Hallux minute. Claws compressed, curved, acute (compare *Oceanitinae*). Size at a minimum in the

family. Length under 10.00; wing 7.00 or less. Plumage in most cases fuliginous, unicolor or relieved with white on the tail. A small group of 3 genera, all represented in North America. They share with the long-legged Stormy Petrels (*Oceanitinæ*) the anatomical characters of lack of basipterygoids, even hind border of sternum, long manubrium of furcula, and slender coracoids with little divergent axes, in these respects differing from *Fulmarinæ* and *Puffininæ*; they also agree with the *Oceanitinæ* in the small size and general outward aspect, but differ remarkably in the feet, as will be more particularly noted under head of the next subfamily. The species are not numerous, and most of them belong to the genus *Oceanodroma*.

Analysis of Genera.

Tail cuneate. Color entirely fuliginous. Length under 6.00	<i>Halocyptena</i>
Tail square or a little rounded. Color fuliginous, with white upper tail-coverts. Length under 6.00	<i>Procellaria</i>
Tail forked. Color variable. Length over 6.00	<i>Oceanodroma</i>

HALOCYPTENA. (Gr. ἅλς, *hals*, the sea; ὄκῦς, *okus*, swift; πτερός, *ptenos*, winged.) WEDGE-TAILED STORMY PETRELS. Like a miniature *Estrelata* or *Bulweria*; unicolor, fuliginous. Bill much shorter than head, about $\frac{1}{2}$ the tarsus, weak and slender, acutely hooked; nasal tubes as in *Procellaria* proper. Wings folding beyond tail, 2d primary longest, 3d nearly equal, 1st about equal to 4th. Tibia briefly bare below; tarsus little longer than middle toe and claw; outer toe without claw as long as middle; tip of inner claw reaching base of middle; hallux minute; webs moderately full; claws compressed, curved, acute. Tail rather long, wedge-shaped; central feathers projecting; lateral regularly graduated, narrowly rounded. One species.

H. microsoma. (Gr. μικρός, *mikros*, small; σῶμα, *soma*, body.) LEAST PETREL. Adult: Lustrous brownish-black, darker above, blackening on wings and tail, brownish on under parts, graying on greater wing-coverts and inner quills; bill and feet black; no white anywhere. Length 5.75; wing 4.75; tail 2.50, graduated 0.35; bill 0.50; gape 0.62; height at base 0.19, width 0.21; nasal tube 0.22; tibia bare 0.30; tarsus 0.90; middle toe and claw 0.82; outer ditto 0.80; inner ditto 0.68. A queer little bird, from the coast of Lower California to Panama. My type specimen, described in 1864, remained unique till 1888, when the second one was taken in the Bay of Panama (Pr. U. S. Nat. Mus. xiii, 1890, p. 141). Salvia catalogues one in the British Museum from Mazatlan, Mexico. In 1896 the bird was found breeding with *Oceanodroma melania* and *O. socorroensis* on San Benito Island off the Lower California coast. Egg laid in July in a hole or crevice of rocks, not in underground burrow, single, dead white, with the usual rosy blush when fresh and unblown, in many cases with a ring of black specks at one or both ends, which come off at a touch, leaving only faint stains; shape variable, elliptical varying to long or short ovate: 0.97–1.07 × 0.70–0.77 (ANTHONY, *Nidologist*, Oct. 1896, p. 16).

PROCELLARIA. (Lat. *procella*, a tempest.) SQUARE-TAILED STORMY PETRELS. "MOTHER CAREY'S CHICKENS." Diminutive, fuliginous, with white upper tail-coverts. Bill small, short, compressed, sides rapidly converging to narrow tip; less than half as long as head, about $\frac{1}{2}$ the tarsus. Wings folding beyond tail; 2d primary longest, 3d little shorter, 1st less than 4th. Tibia briefly bare below; claws compressed, curved, acute. Tail slightly rounded or nearly square, with broad feathers; under tail-coverts very ample. Two species, distinguished by shape of tail from those of the preceding or following genus. The extralimital one is *P. tetlys* of the *Galapagos*.

P. pelagica. (Gr. πελαγικός, *pelagikos*, oceanic.) COMMON STORMY PETREL. Above, glossy brownish-black, below more fuliginous; upper tail-coverts white, with black tips; white streaking on crissum, and usually white touches under the wings. Bill and feet black; no yellow on webs. Length 5.50–5.75; wing 4.50–4.75; tail 2.50; bill 0.45; gape 0.62; tarsus 0.90; middle toe and claw 0.82, outer 0.88, inner 0.65. Egg 1.09 × 0.85. Nestlings

in down sooty-gray. Atlantic and Mediterranean coasts; Europe, Africa, and North America; not known to breed on our side. This is the rarest of the three little black white-rumped "Mother Carey's chickens" of our Atlantic coast, easily distinguished by its short legs and square tail; Leach's, the most numerous, is also short-legged, but larger and fork-tailed; Wilson's is intermediate, with square tail, but very long stilt-like legs, flat claws, and a yellow spot on the webs.

OCEANODROMA. (Gr. Ὠκεανός, *Okeanos*, Lat. *Oceanus*, the divinity of the sea, hence the ocean; δρόμος, *dromos*, running.) **FORK-TAILED STORMY PETRELS.** Bill much shorter than head, more than $\frac{1}{2}$ as long as tarsus, rather stout, as high as or higher than wide at base, the hook strong and acute; nasal tube less than half as long as culmen. Wings moderately long, folding little beyond tail; 2d or 3d primary longest; 1st about equal to 3d or 4th. Tail long, more or less deeply forked, the feathers all broad, obtusely rounded. Legs short; tibia little bare below; tarsus about equal to middle toe and claw. Of rather large size (for this subfamily) and robust form. Color fuliginous, unicolor or with white upper tail-coverts; or variously ashy or gray, mostly white below. About 12-14 species are known. (*Cymochorea* and *Oceanodroma* of former editions of the Key.)

Analysis of Species.

General plumage dark (*Cymochorea*).

Upper tail-coverts more or less white.

Upper tail-coverts almost entirely white.

Larger; tail deeply forked, about 0.75. Atlantic and N. Pacific *leucorrhoa*

Smaller; tail lightly forked, about 0.33. S. and L. California *kaedingi*

Upper tail-coverts tipped with black.

Smaller; tail lightly forked; much white on tail-feathers. Washington, D. C. *cryptoleucura*

Larger; tail deeply forked, about 1.00. Guadalupe Isl. *macrodactyla*

Upper tail-coverts white only on each side. L. and S. California *socorroensis*

No white anywhere.

Sooty-brown; large; wing 6.75; tail 4.00, forked 1.00 or more. L. and S. California *melania*

Sooty-gray; small; wing 5.00; tail 3.25, forked 0.60-0.90. California *homochroa*

General plumage light; no white on upper tail-coverts. (*Oceanodroma*.)

Not white below. N. Pacific *furcata*

White below, with dark collar. N. Pacific *hornbyi*

O. leucor'rhoa. (Gr. λευκός, *leukos*, white; ὄρρος, *orrhos*, rump. Fig. 709.) **LEACH'S FORK-TAILED PETREL. WHITE-RUMPED PETREL.** Coloration as in the last species, with



FIG. 709. — Leach's Fork-tailed Petrel, much reduced. (From Temney, after Audubon.)

white of upper tail-coverts, forming a conspicuous mark; but apt to be lighter — rather of a grayish or even ashy hue on some parts; but easily recognized, whatever the shade of color. Bill and feet black; iris brown. Length about 8.00; extent 17.50; wing 6.00-6.50; tail 3.00-3.50, forked about 0.75; tarsus 1.00; middle toe and claw the same; bill 0.67. Seas of the Northern Hemisphere. North America, both coasts, and west coast of Europe. Abundant on our North Atlantic coast, breeding from Maine northward, and equally so at some points on the coast of Alaska. Nest in burrows in the ground; egg single, white, unmarked, or with a wreath of fine or obscure light-red spots around the larger end, 1.20 × 0.95, laid in June.

Nestlings sooty. (*Cymochorea leucorrhoa* of former editions of the Key.)

O. kaed'ingi. (To — Kaeding.) **KAEDING'S FORK-TAILED PETREL.** Like *O. leucorrhoa*; smaller; tail less forked. Sooty black, more plumbeous on head, more brownish on wing-coverts; long upper tail-coverts white, black-shafted; lateral lower coverts edged with white; tail-feathers blackish to base. Wing about 5.00; middle tail-feathers 3.00; lateral 3.33; tarsus 0.80; middle toe and claw 0.80; culmen 0.60. Socorro and Clarion Islands of the

Revillagigedo Group, Mexico, to Guadalupe Island, Lower California, and to southern California; N. to Cape Flattery. New to the Key. ANTHONY, Auk, Jan. 1898, p. 37; A. O. U. Comm. Suppl. List, Auk, Jan. 1899, p. 101, No. 105.2.

O. cryptoleucura. (Gr. κρυπτός, *kryptos*, hidden; λευκός, *leukos*, white; οὐρά, *oura*, tail; referring to concealed white bases of tail-feathers.) HAWAIIAN PETREL. SANDWICH ISLAND PETREL. KNUDSEN'S PETREL. Similar to Leach's Petrel; longer upper tail-coverts broadly tipped with black, 0.25–0.50; tail-feathers, except middle pair, extensively white toward their bases for about 1.00, and with white shafts; tail lightly forked. Bill and feet entirely black, as in all the foregoing species of this genus; claws short and wide. Length about 7.75; extent 19.00; wing averaging 6.00, said to range from 5.80–6.30; tail 3.00–3.25, forked 0.15–0.25; tarsus 0.85–0.90; bill 0.80; middle toe 0.90; outer rather less; inner 0.70. Originally described from the Sandwich Islands; accredited to the Galapagos and Madeira. New to the Key; accidental at Washington, D. C., Aug. 28, 29, 1893; two specimens secured, harbingers of the annexation of the Hawaiian avifauna to that of the United States! Also, Kent, England, Dec. 5, 1895. (See Auk, July, 1897, pp. 297–299.) *Cymochorea cryptoleucura* RIDGW. Pr. U. S. Nat. Mus. iv, Mar. 1882, p. 337; *Oceanodroma cryptoleucura* RIDGW. Man. 1887, p. 71; Pr. U. S. Nat. Mus. xix, for 1896, p. 654; A. O. U. Suppl. List, Auk, Jan. 1899, p. 101, No. [106.2].

O. macrodactyla. (Gr. μακρός, *makros*, long; δάκτυλον, *daktulon*, a digit, whether finger or toe.) GUADALUPE PETREL. Similar to Leach's Petrel; larger and darker; white of upper tail-coverts restricted, these feathers being broadly tipped with black; crown darker than back, lightening somewhat on the forehead; bill stouter at base than that of *leucorroha*; tail longer and more deeply forked. Length about 8.50; wing 6.50; tail nearly 4.00, forked 1.00 or more; tarsus 0.85–1.00; middle toe and claw 1.10–1.20. Guadalupe Island, Lower California. An interesting Petrel, apparently a valid species, described as *O. leucorroha macrodactyla* by BRYANT, Bull. Cala. Acad. Sci. ii, No. 8, July, 1887, p. 450, though earlier noticed in the same publication (p. 276) as *O. leucorroha*; raised to specific rank by the A. O. U. Committee as *O. macrodactyla*, Suppl. List, 1889, p. 5; A. O. U. List, 2d ed. 1895, No. 106.1. SALVIN, Cat. B. Brit. Mus. xxv, 1896, p. 351, where in character of the upper tail-coverts the species is compared with *cryptoleucura* of the Sandwich Islands and Galapagos. *Cymochorea macrodactyla* COUES, Key, 4th ed. 1890, p. 906.

O. melan'ia. (Gr. μελάνια, *melania*, blackness. Fig 710.) BLACK FORK-TAILED PETREL. Form of *leucorroha* very nearly; bill more robust; tarsus a little longer than middle toe and claw. No white or whitish anywhere. Adult: Plumage sooty brownish-black, darkest above and on head, more smoky-brown on under parts, grayer on wing-coverts, quite black on wing- and tail-feathers; bill and feet black; iris brown. Length 9.00; extent 18.50; wing 6.75; tail 4.00, forked 1.20; tibia bare 0.50; tarsus 1.20; middle toe and claw 1.10; bill 0.65; gape 0.95; height or width at base 0.25; nasal tubes 0.30. Coast of Mexico N. to southern California: Cape St. Lucas, Lower California, and some of the islands off the coast. Breeds on San Benito and Los Coronados Islands—on San Benito Island more numerous than *O. socorroensis*, but in company with and in a similar manner (see beyond). Egg white, larger than that of the Socorro Petrel; average 1.35 × 1.00 (ANTHONY, Nidologist, Oct. 1896, p. 16). The species remained for long rare and little known. (*Cymochorea melena* of former editions of the Key. *O. townsendi* RIDGW.)

O. homoch'roa. (Gr. ὁμός, *omos*, like, equal; χροά, *chroa*, color.) ASHY FORK-TAILED PETREL. Adult: Somewhat like the last; smaller, with short, weak, compressed bill and tarsus no longer than middle toe and claw. No white anywhere; but under wing-coverts with

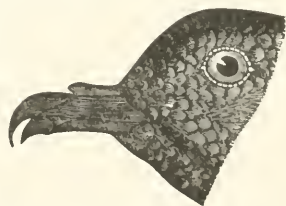


FIG. 710.—Black Fork-tailed Petrel, nat. size. (Ad. nat. del. E. C.)

some grayish-white. Plumage dull plumbeous or slaty-blackish, more smoky-brownish on lower parts, lighter grayish-brown on greater wing-coverts; wings and tail black. 2d primary longest, 3d nearly equal, 1st longer than 4th. The general plumbeous or bluish-ashy cast of the plumage is quite different from the sooty shade of *O. melania*, approaching the clearer ash of *O. furcata*. Length about 7.25; wing 5.25; tail 3.25, forked 0.60–0.90; tarsus 0.90; middle toe and claw the same; bill 0.50; gape 0.75; height or width at base 0.20; nasal tubes 0.24. Coast of California, breeding on Farallone and Santa Barbara Islands. Egg dull creamy white with fine reddish dots around great end.

***O. socorroensis*.** (Lat. of Socorro.) SOCORRO FORK-TAILED PETREL. Similar to *O. homochroa*; about same size; wings longer; tail shorter and less deeply forked; feet smaller. Lateral upper tail-coverts of the type specimen chiefly whitish, producing an evident spot on each side of the rump; no whitish under the wings, the under coverts being of the same color as the under surface of the body. The general coloration darker than in *O. homochroa* and more as in *O. melania*. Wing 5.55; tail 2.85, forked 0.40; culmen 0.55; nasal tube 0.27; tarsus 0.85; middle toe and claw the same. It is surmised that the lateral white spots on the upper tail-coverts of the type may in other cases be united in one. Socorro Island, off the W. coast of Mexico, and N. into our fauna; San Diego; breeds on Coronados Islands and San Benito Island, off the coast of Lower California, on the latter in June and July, with *O. melania* and *Halocyptena microsoma*; egg single, laid in a burrow underground or among rocks, often that deserted by Cassin's Auklet; shell smooth, not glossy, white, sometimes with pale or faint specks of lavender and cinnamon about the larger end; average size 1.15 × 0.90. C. H. TOWNSEND, Pr. U. S. Nat. Mus. xiii, 1890, p. 134; SALVIN, Cat. B. Brit. Mus. xxv, 1896, p. 352; A. O. U. Suppl. List, Auk, Jan. 1897, p. 117, No. 108.1.

***O. furcata*.** (Lat. *furcata*, forked.) GRAY FORK-TAILED PETREL. Adult: Bluish-ash, paler or whitish below and on greater wing-coverts, dusky about eyes; lesser wing-coverts sooty; quills and tail brownish; primaries pale or white on inner edges; outer web of outer tail-feather white; bill and feet black. Length 8.00–9.00; wing 6.00–6.40; tail 4.00, forked about 1.00; bill 0.60; tarsus 0.87; middle toe and claw the same. North Pacific coast, common, breeds on Aleutians and islands in the vicinity of Sitka; S. to Monterey. Young in down light gray. Egg averaging 1.30 × 1.00, white with a pink flush when fresh, usually found stained, or with fine spots about great end; laid in underground burrows or holes in rocks, chiefly in June.

***O. hornbyi*.** (To Admiral Hornby, R. N.) HORNBY'S FORK-TAILED PETREL. Very different from any of the foregoing; white below, with a distinct dark collar. Adult: Above sooty-brown, paler and grayer on the upper back; a whitish cervical collar across hind neck, connecting with white of the throat; hind head, nape, and about the eyes blackish; front, lores, and all under parts white, with the dark collar as said. Wings black, lightening to sooty-gray on most of the coverts above and below; tail dusky brown. Bill and feet black. Length 8.25; wing 6.75; tail 3.75; tarsus 1.00; middle toe and claw about the same; bill along culmen 0.60; along rictus 0.90. Northwest coast. I have never seen this rare species, of which there are no specimens in this country; type in British Museum, figured by SALVIN, Cat. B. Brit. Mus. xxv, 1896, pl. 3. A. O. U. Hypothetical List, No. 6.

Subfamily OCEANITINÆ: Long-legged Stormy Petrels.

Nasal tube and bill not peculiar, in comparison with *Procellariinae*. Wings remarkably distinguished in the whole family *Procellariidae* by fewness of the secondaries — only 10; 1st primary shorter than 2d, usually than 3d. Legs and feet very long, almost grallatorial; leg-bones longer than wing-bones; tarsal bone at least twice as long as femur; basal phalanx of middle toe at least as long as next two joints; outer and middle toes of approximately equal

lengths. Tarsal envelop tending to fuse in a booted podotheca (especially in *Oceanites* and *Pealea*; less so in *Garrodia* and *Pelagodroma*; variable in *Fregetta*). Tibiæ bare an inch or so. Hallux minute. Claws broad, flat, blunt (least so in *Oceanites*). This is in several respects the most remarkable subfamily of *Procellariidæ*, by some authors ranked as a family. In the small size and general outward appearance these Stormy Petrels resemble the foregoing *Procellariinæ*; but a glance at the feet suffices to distinguish them; in characters of the skull and sternal bones they agree with *Procellariinæ*, except that the sternal keel is fenestrate. The *Oceanitina* consist of the five genera mentioned in this paragraph, three of them represented in North America. Extralimital forms are *Oceanites gracilis*, *Garrodia nereis*, *Pealea lineata*, and several species of *Fregetta*.

Analysis of Genera.

- Tarsus moderately longer than middle toe and claw; basal phalanx of middle toe shorter than rest of toe and claw.
 - Tarsus booted; webs yellow. Plumage fuliginous, with white upper tail-coverts *Oceanites*
 - Tarsus somewhat scutellate; webs yellow. Plumage largely white *Pelagodroma*
- Tarsus much longer than middle toe and claw; basal phalanx of middle toe flattened, not shorter than rest of toe and claw.
 - Tarsus somewhat scutellate; webs black. Plumage largely white *Fregetta*

OCEANITÆS. (Gr. Ὠκεανίτης, *Oceanites*, son of the sea.) WILSONIAN STORMY PETRELS. Bill short, weak, compressed, not $\frac{1}{2}$ as long as head or middle toe and claw, about $\frac{2}{3}$ the tarsus; sides a little concave; hook small; nasal tubes perfectly horizontal. Wings very long, 2d primary much the longest; 1st and 3d about equal; 4th much shorter. Tail moderate, about square (as in *Procellaria*); ample, with feathers broad to their very tips. Tibia denuded 1.00 or more. Tarsi presenting the character, remarkable if not unique among water birds, of being covered in front and on sides by a continuous plate or "boot," as in a Thrush, the scutella being fused. Toes, though long, only about $\frac{2}{3}$ the greatly lengthened tarsi; basal phalanx of middle toe shorter than rest of toe and claw; hind toe so minute as to be liable to be overlooked. Claws broad, flat, obtuse. Two species of this notable genus: *O. gracilis* of the west coast of South America, and the following:

O. oceanicus. (Lat. *oceanicus*, oceanic.) WILSON'S STORMY PETREL. Coloration much as in *P. pelagica* or *O. leucorroha*. Adult: Dark sooty-brown, pale gray on wing-coverts, black on wings and tail; upper tail-coverts, and frequently crissum, sides of rump, and base of tail, white. Bill and feet black, but webs with a large yellow spot: iris brown. Length 7.00: extent about 16.00; wing about 6.00; tail 3.00, nearly even but slightly emarginate; tibia bare 1.00; tarsus 1.30; middle toe and claw 1.10; bill 0.50. One of the commonest and best known Stormy Petrels, widely dispersed over the waters of the globe; on the Atlantic N. to Labrador and Great Britain; Antarctic and Indian Oceans; Australia; New Zealand; breeds in southern seas; common in summer on our Atlantic coast. Nest in burrows or crevices; egg single, white.

FREGETTA. (Ital. *fragata*, a frigate.) STILT STORMY PETRELS. FRIGATE STORMY PETRELS. Resembling *Oceanites* in great length of leg, flat obtuse claws, and other characters. Bill stout, about as high as broad at base, $\frac{1}{2}$ as long as head, more than half as long as middle toe and claw, with long high nasal tube. Wings moderately long, folding just beyond tail; 2d primary longest; 3d nearly equal; 1st between 3d and 4th. Tail ample, square (in our species; forked in others), with broad feathers, square-tipped. Tibiæ bare 1.00 or more; tarsus nearly half as long again as middle toe, its scutella fused in a boot, or tending to become so. Toes short, with small narrow webs; basal phalanx of middle toe flattened, not shorter than rest of toe and claw; claws extremely flat, broad, rounded, somewhat like a Grebe's. Colors blackish and white. Several species of Southern seas, one straggling to our country. (*Cymodroma* RIDGW. 1881, of A. O. U. 1886-95, but *Fregetta* BP. 1855 is not voided by *Fregetta* BRISS. 1760. See COUES, Auk, July, 1897, p. 315; A. O. U. Suppl. List, Auk, Jan. 1899, p. 102.

F. gralla'ria. (Lat. for *grallatorius*, relating to stilt-walking; *grallator*, one who goes on stilts; *grallæ*, stilts, related to *gradus*, a step, stride, pace.) LAWRENCE'S STILT PETREL. WHITE-BELLIED PETREL. Adult: Blackish of variable intensity, blackening on quills and tail, lightening to grayish on back, where the feathers may be edged with whitish; abdomen, upper tail-coverts, most under wing-coverts, and bases of all tail-feathers except middle pair, white; bill and feet black. Length 7.50–8.00; wing 6.00–6.50; tail 3.00, about even, with very broad, square-tipped feathers; bill 0.50; tarsus 1.33; longest toe (outer) and claw 1.00 or less; tibiae bare 1.00 or more. Southern seas; Florida, accidental, one instance (LAWR. Ann. Lyc. Nat. Hist. N. Y. 1851, v, 117).

PELAGODRO'MA. (Gr. *πέλαγος*, *pelagos*, the sea; *δρόμος*, *dromos*, running.) CLIPPER STORMY PETRELS. Resembling *Fregatta* in great length of leg, flat, blunt claws, and other characters. Basal phalanx of middle toe not peculiar; tarsi appreciably scutellate. Bill remarkably long, slender, and compressed, with weak hook and short nasal tubes, less than half as long as culmen. Wings of moderate length, folding just beyond end of tail; 2d primary longest, 3d nearly as long, 1st about equal to 4th. Tail long, square, or but slightly emarginate, with broad feathers, truncate at the end. Tibiæ bare an inch or more; middle toe and claw nearly as long as tarsus; webs very full. One species.

P. mari'ua. (Lat. marine.) WHITE-FACED PETREL. Color ashy-gray, or slaty, of variable shade, blackening on wings and tail, lightening on back, rump, and upper tail-coverts, where the feathers may be edged with white; all the under parts, the forehead, and line over eye, white. Bill and feet black; webs mostly yellow. Length about 8.00; wing 5.80–6.20; tail about 3.00, emarginated about 0.30; bill 0.90; tarsus 1.60; middle toe and claw 1.40. A large, handsome species, the original "Frigate Petrel" of Latham, related to *Fregatta grallaria*, but readily distinguished. Southern seas, N. to the Canary Islands; accidental in Great Britain (Walney Island in Morecambe Bay, Nov. 1890, and Colonsay Island, W. coast of Scotland, Jan. 1, 1897); once taken off the coast of Massachusetts, lat. 40° 34' 18" N., long. 66° 09' W. Auk, Oct. 1885, p. 386; RIDGW. Man. N. A. Birds, 1887, p. 72; COUES, Key, 3d ed. 1887, p. 893; A. O. U. List, 2d ed. 1895, p. 38, No. [111.]

Order PYGOPODES: Diving Birds.

In birds of this order the natatorial plan reaches its highest development. All the species swim and dive with perfect ease; many are capable of remaining long submerged, and of traversing great distances under water, progress being effected by the wings as well as by the feet. Few other birds, as Cormorants, Aningas, Penguins, and the passerine Dippers, resemble *Pygopodes* in this respect. The legs are so completely posterior, that in standing the horizontal position of the axis of the body is impossible; the birds rest upright or nearly so, the whole tarsus being often applied to the ground, while the tail affords additional support; progression on land is awkward and constrained, only accomplished, in most cases, with a shuffling motion, when the belly partly trails on the ground. One species of Auk could not fly at all, because the wings, although perfectly formed, were too small to support the body. The rest of the order fly swiftly and vigorously, with continuous wing-beats. The rostrum varies in shape with the genera; but it is never extensively membranous, nor lamellate (as in *Anseres* and some *Tubinares*), nor furnished with a pouch (as in most *Steganopodes*); nor are the tomia ever serrate. The nostrils vary, but are neither tubular nor abortive. The wings are short, never reaching when folded to end of tail, which is short, never of peculiar shape, generally of many feathers (there are, however, no perfect rectrices in Grebes). The crura are almost completely buried, and feathered nearly or quite to the heel. The tarsus is usually compressed; sometimes, as in Loons, extremely so. The front toes are completely palmate

in Loons and Auks; lobate, with basal webbing, in Grebes; hallux present and well formed, with a membranous expansion, in Loons and Grebes, but wanting in Auks. The plumage is thick and completely waterproof; once observing some Loons under peculiarly favorable circumstances in the limpid water of the Pacific, I saw that bubbles of air clung to the plumage whilst the birds were under water, giving them a beautiful spangled appearance. The pterylosis shows contour- and down-feathers, both aftershafted; there are definite apteria; Auks have free outer branches of the inferior pteryke, wanting in Loons and Grebes. The oil-gland is large, with several orifices. Among osteological characters should be particularly mentioned the long apophysis of the tibia in Loons and Grebes, but not in Auks. The thoracic walls are very extensive; long jointed ribs grow all along the backbone from neck to pelvis, and form with the long broad sternum a bony box enclosing much of the abdominal viscera as well as those of the thorax, perhaps to prevent their undue compression under water. In Auks and Loons, the top of the skull has a pair of crescentic depressions for lodgment of large glands; the palate is schizognathous, and the nasals are schizorhinal in Auks, but horizontal in Loons and Grebes. Basipterygoids are lacking or rudimentary; lacrymals small, not reaching zygoma; the vomer is cleft behind, and maxillopalatines laminate. The sternum has a different shape in each of the families. There are two carotids, except among Grebes, and in the genus *Alle*. The digestive system shows minor modifications, but accords in general with the piscivorous regimen of the whole order. Sexes are alike; young mostly different; seasonal changes often great. Auks are altricial or nidicolous; Loons and Grebes præcocial or nidifugous. There are three families of *Pygopodes*, sharply distinguished by external characters; all of them are fully represented in this country, where all the known species of Loons and Auks occur. (The Penguins, *Impennes*, *Squamipennes*, *Ptilopteri*, or *Spheniscomorpha*, formerly included in this order, are better left to stand by themselves. They are confined to the Southern Hemisphere, where they are represented by 6 genera, *Aptenodytes*, *Pygoscelis*, *Catarrhactes*, *Megadyptes*, *Eudyptula*, and *Spheniscus*, and about 17 species of one family, *Spheniscida*. The wings are reduced to mere flippers, with very numerous undeveloped remiges, unfit for flight, but very efficient as fins in swimming under water; there are no apteria; much of the plumage is harsh and scaly. There are numerous strong osteological characters, among them flatness and solidity of wing-bones, and incomplete fusion of metatarsals. The elbow has a pair of sesamoids, and the knee a large irregularly-shaped patella. The feet are 4-toed and palmate.)

Analysis of Suborders and Families.

<i>Loons.</i> Feet 4-toed, palmate	GAVLE OF GAVIIDÆ
<i>Grebes.</i> Feet 4-toed, lobate	PODICIPEDES OF PODICIPEDIDÆ
<i>Auks.</i> Feet 3-toed, palmate	ALCÆ OR ALCIDÆ

SUBORDER GAVLÆ: LOONS.

The characters of the suborder are the same as those of its single family, as follows:—

Family GAVIIDÆ: Loons, or Divers.

(COLYMBIDÆ of KEY, 1872-90. URINATORIDÆ of A. O. U. 1886-95.)

Bill stout, straight, compressed, tapering, acute, paragnathous, entirely horny. Nostrils narrowly linear, their upper edge lobed. Head completely feathered; antie prominent, acute, reaching nostrils; no crests nor ruffs. Wings strong, with 10 stiff developed primaries (11 in all) and many short secondaries; aquintocubital. Legs completely posterior, buried, feathered to the heel; tarsi entirely reticulate, extremely compressed, the back edge smooth; toes 4, the anterior palmate, the posterior semilateral, not elevated, and having a lobe connecting it with

the base of the inner. Tail short, but well formed, of 18–20 stiff feathers. Tibia with a very long apophysis; patella rudimentary. Sternum with long, broad, median projection backward (metasternum), and shorter lateral processes. Skull with deep temporal fosse and supraorbital depressions, separated by a well-marked sagittal crest, and small lacrymal bones in close connection with nasals. Spinal column with free vertebrae. Carotids double. Cæca and ambiens present, accessory semitendinosus absent; sternotracheal muscles symmetrical. Back spotted. Head of adults never crested or ruffed, of young not striped. Loons are large heavy birds with broad flattened body and rather long sinuous neck, abundant on the coasts and large inland waters of the Northern Hemisphere. They are noted for their powers of diving, being able to evade the shot from a gun by disappearing at the flash, and to swim many fathoms under water. Loons also share with Grebes the curious faculty of altering their specific gravity at will, by inhaling or exhaling air, so that they can sink quietly down in the water without diving, and swim with the body more or less submerged, but with head and part of the neck out of water. They are migratory, breeding mostly in high latitudes, generally dispersed S. in winter. They are præcocial, and generally lay 2 dark-colored spotted eggs in a rude nest or none by the water's edge. The voice is extremely loud, harsh, and resonant. Sexes alike; ♀ smaller than ♂; young and winter adults different from summer adults. There is but one genus, with 5 species, all North American.

GA'VIA. (Ital. name of a Gull. As Lat. used by Moehring, 1752, for Gulls; by Brisson, 1760, for Gulls and the Noddy Tern; by Forster, Eucheridion, 1788, p. 38, for the Loons, as here applied; by Boie, 1822, for certain Gulls; by Gloger, 1842, and Naumann, 1834, for certain Plovers; by the A. O. U. 1886–95, for the Ivory Gull: see Allen, Auk, xiv, July, 1897, p. 312, and COUES, *ibid.* p. 313. In the plural, *Gavia* was used by Bonaparte, 1850–53, for an order of birds equivalent to *Longipennis* and *Tubinæres*, or Gulls and Petrels (including the genus *Chionis*!), to which were added the *Urinatores*, or Loons, Grebes, and Auks. I now restrict *Gavia* to the latter. See NEWTON, Dict. 1893, p. 310.) **LOONS or DIVERS.** Characters as above given for the family *Gaviidæ*. (*Colymbus* of all former editions of the Key. *Urinator* of A. O. U. 1886–95.)

Analysis of Species and Varieties (Adults in summer).

- Head and neck black, with green, blue, and purple reflection, and patches of white streaks.
- Bill mostly or wholly black; culmen, commissure, and gonyes gently curved with slight gonydeal angle; feathers falling short of middle of nostrils; culmen 3.00 or less; gape 4.00 or more; height of bill at nostrils usually under 1.00. Gloss of head and neck mostly green; white spots of back nearly square *imber*
- Bill mostly yellow; culmen nearly straight; commissure and gonyes straight with sharp gonydeal angle; feathers reaching middle of nostrils; culmen about 3.75; gape about 5.00; height of bill at nostrils usually over 1.00. Gloss of head and neck mostly blue; white spots of back longer than broad *adamsi*
- Top of head bluish-ash; front of neck blue-black; neck with white stripes.
- Larger: wing about 12.00; bill about 2.50, stout, with convex culmen *arcticus*
- Smaller: wing about 11.00; bill about 2.00, slender, with straight culmen *pacificus*
- Throat and sides of head bluish-ash; front of neck with red patch *lumme*

Analysis of Species (Adults in winter and Young).

- Back with paler gray margins of the feathers and no spots. Wing 12.50 or more.
- Bill as above said for summer *imber*
- Bill as above said for summer *adamsi*
- Back uniformly dark or with gray margins (young); some spots on wing-coverts. Wing 11.50–13.00.
- Larger, as above said *arcticus*
- Smaller, as above said *pacificus*
- Back profusely spotted with white. Wing 11.50 or less *lumme*

G. im'ber. (Danish *imber*; Swedish *immer, emmer*; Færoic *imbrim*; Icelandic *himbrim*; English *ember, imber, immer*, etc. in composition with *goose*. Fig. 711.) **COMMON LOON.** **GREAT NORTHERN DIVER.** **EMBER-GOOSE.** Adult ♂ ♀, in summer: Bill black, the tip and cutting edges sometimes yellowish. Feet black. Iris red. Head and neck

glossy greenish-black, with lustrous purplish reflections on the front and sides of the head. A patch of sharp white streaks on throat; a larger triangular patch of the same on each side of neck lower down, nearly or quite meeting behind, separate in front. Sides of breast striped with black and white. Entire upper parts, wing-coverts, inner secondaries, and sides under the wings, glossy black; all except the sides thickly marked with white spots; those of scapulars, inner secondaries, and middle back, large, square, and regular; those of other parts oval, smallest on rump, most numerous on wing-coverts. Upper tail-coverts greenish-black, immaculate. Primaries brownish-black, lighter on inner webs. Under surface of wings, axillars, and under parts generally from the neck, pure white; lower belly with a dusky band. The white throat-patch consists usually of five or six streaks; in this, as in the lateral neck-stripes, the individual feathers are broadly black, with sharp white edges toward their ends. The texture of these feathers is peculiar; the outer surface is hollowed, with raised edges of specially firm, smooth, polished character, so that these patches may be *felt* as well as seen.



FIG. 711. - Loon. (L. A. Fuertes.)

The white spots on the back occur in a pair on each feather near its end, their aggregation in any region being therefore determined by the size of the feathers. The frontal antize extend half-way or more from base of culmen to fore end of nostrils. Adults in winter have a plumage indistinguishable from that of the young, as follows: Young: Bill smaller than in the adult, bluish-white, with dusky ridge; feet not black. Iris brown. Crown and hind neck dull brownish-black; other upper parts dark brown, but the feathers, especially of fore back, with light gray edgings. Primaries black, with brown inner webs; tail-feathers with gray tips. Traces of lighter and darker lineation on sides of breast. Sides of head mottled with ashy and whitish; chin, throat, neck in front, and under parts, white, with some dark feathers on sides, flanks, and crissum. Length 31.00-36.00; extent about 52.00; wing 12.50-14.25; culmen 2.75-3.00; gape 4.00-4.25; height of bill at nostrils about 0.80; width there about 0.40; tarsus 3.00-3.50, thus longer than culmen; middle toe and claw 4.25-5.00; ♀ and young at or near the smaller figures given; young with bill much smaller than that of adults. Downy young sooty-brown, paler on neck, the breast and belly pure white. Inhabits the northern portion of the Northern Hemisphere; in winter, generally dispersed in the U. S.; breeds in northerly portions of the U. S. and northward. Eggs usually 2, 3.50 × 2.25, elongate and

pointed, dull greenish-drab, with dark brown and blackish spots. (*Colymbus torquatus* of most authors, as of former editions of the Key; *Urinator imber* of A. O. U. Lists, 1886-95.)

G. adamsi. (To Dr. C. B. Adams.) YELLOW-BILLED LOON. ADAMS' DIVER. Larger than *G. imber*; bill rather larger, somewhat differently shaped and colored. Bill about equalling head, longer than tarsus, much compressed, tip very acute, not at all decurved; culmen and commissure almost perfectly straight; gonys straight or nearly so to the prominent angle. Frontal antiæ reaching beyond middle of nostrils. Bill light yellowish horn-color, only dusky at base. Head and neck deep steel-blue, with purplish and violet reflections, glossed only on cervix with green. Throat-patch of white streaks smaller than in *imber*, but the individual streaks larger, as are those of the neck-patches. White spots of upper parts larger than in *imber*, longer than broad instead of square on the scapulars. Length 35.00-38.00; wing averaging 15.00; culmen 3.50-3.75; gape 5.00-5.25; height of bill at nostrils 0.95-1.10; width 0.40-0.50; tarsus 3.50, thus rather shorter than culmen; outer toe 4.65-5.10. Average dimensions thus somewhat exceeding those of *imber*; extension of loreal feathers and proportions of tarsi and toes the same. Arctic America, Hudson's Bay to Bering Sea, common; Siberia to Japan; also occasional in Europe. *Colymbus adamsi* of former editions of Key; *Urinator adamsii*, A. O. U. Lists, 1886-95.)

G. arcticus. (Lat. *arcticus*, arctic.) ARCTIC LOON. BLACK-THROATED DIVER. Adult ♂ ♀, in summer: Bill black, shaped as in *imber*, but smaller; feet blackish; eyes red. Chin, throat, and neck in front black, with purplish and violet reflections on sides of head, gradually fading into clear bluish-gray of crown, nape, and hind neck, deepest on forehead, lightest behind, separated from black of throat by a series of white streaks; a crescent of short, white streaks across upper throat; sides of breast and neck striped with pure white and glossy black, these stripes nearly meeting in front. Upper parts glossy greenish-black, each feather of scapulars and interscapulars with a white spot near end of each web, the scapular spots largest, forming four patches in transverse rows; wing-coverts thickly speckled with small ovate white spots. Inner webs of quills, and tail-feathers below, light grayish-brown. Sides under wings like back. Lining of wings and under parts from neck, pure white, with a narrow dusky band across lower belly; under tail-coverts dusky, tipped with white. Young: Bill light bluish-gray, dusky along ridge; eyes brown; feet dusky. Upper part of head and neck dark grayish-brown; sides of head grayish-white, minutely streaked with brown. Upper parts with a reticulated or scaly appearance, the feathers being brownish-black with broad bluish-gray margins; rump brownish-gray. Primaries and their coverts brownish-black; secondaries and tail-feathers dusky, margined with gray. Fore part of neck grayish-white, minutely and faintly dotted with brown, its sides below streaked with the same. Lower parts, including under surface of wings, pure white, the sides of body and rump, with part of lower tail-coverts, dusky, edged with bluish-gray. Adults in winter resemble the young; they are distinguished from those of the foregoing by smaller size, and from *lumme* by not being spotted on the back; the frontal antiæ are shorter than in *imber* and *adamsi*, hardly extending half way from base of culmen to end of nostrils. Downy young sooty, paler below. Length 27.00-30.00; extent 40.00 or more; wing 12.00-13.00; culmen 2.45; gape 3.40; height of bill at nostrils 0.65; width there 0.35; tarsus 2.90; outer toe and claw 3.80. Northern part of Northern Hemisphere; common in Arctic America, where it breeds in June and July; rare or casual in winter in northerly portions of the U. S., chiefly E. of the Rocky Mts. Eggs indistinguishable from those of the foregoing, but averaging smaller, about 3.10×2.00 .

G. pacificus. (Lat. *pacificus*, pacific.) PACIFIC LOON. LAWRENCE'S BLACK-THROATED DIVER. Like the last; colors the same, only paler gray on hind head and neck. Bill shorter, slenderer, somewhat differently shaped, with straight culmen. Size small: Length about 24.00; extent 40.00 or less; wing 11.25-12.25, averaging under 12.00; culmen 1.90-2.20; gape 3.00; depth of bill at nostrils 0.50 or less; tarsus about 2.50. N.W. America, breeding only far

north; abundant on Pacific coast of U. S. in winter to Lower California. Eggs as before, averaging smaller still, about 3.00×1.90 . (*Colymbus pacificus* LAWR. 1858; COUES, Pr. Phila. Acad. 1862, p. 228. *C. arcticus pacificus* of all former editions of Key, and perhaps correctly; but I now revert to my original position of 1862, since the A. O. U. have adopted it. *Urinator pacificus* of A. O. U. Lists, 1886-95.)

G. lumme. (Same word as English *loon* or *loom*, also dialectically *lom*, *lomm*, *lome*, *lomme*, etc., Danish and Swedish *lom*, German *lohme*, *lomme*, Icelandic *lomr*; applied indiscriminately to loons, grebes, murre, guillemots; the breeding resorts of the latter are called *loomeries*, and the word reappears in the New Latin form *lomvia*, now the specific name of the Thick-billed Guillemot or Brünnich's Murre.) **SPRAT LOON. RED-THROATED DIVER.** Bill slender; culmen slightly concave at nostrils, gently convex to tip; outline of rami nearly straight; gonys slightly convex. Frontal antia scarcely extending beyond base of nostrils. Tarsus relatively longer than in any of the foregoing, about $\frac{4}{5}$ the middle toe. Adult ♂ ♀, in summer: Bill black, rather lighter at tip; feet blackish. Crown and broad cervical stripe glossy greenish-black, the latter with white streaks, which spread on sides of breast so as to nearly meet in front. Throat and sides of head clear bluish-gray; a large, well-defined, triangular chestnut throat-patch. Upper parts and sides under wings brownish-black, with greenish gloss, profusely spotted with white; the spots small, oval. Primaries blackish, paler on inner webs; tail narrowly tipped with white. Under parts and lining of wings white; axillars with narrow dusky shaft-streaks; lower belly, with some of the under tail-coverts, dusky. Young: Bill mostly bluish-white, with dusky ridge. Crown of head and hind neck bluish-gray, the feathers of the former bordered with whitish. Upper parts profusely marked with small oval and linear spots of white, as in the adult (as is not the case with any of the foregoing species). Throat without red patch, its sides and those of the head chiefly white, more or less mottled with dusky. Length 25.00; extent 44.00; wing 11.50 or less; culmen 2.00; gape 3.00; height of bill at nostril 0.50; width there 0.35; tarsus 2.75; outer toe 3.50. Varies greatly in size, and in size and shape of bill; recognized by profuse spotting of upper parts, as well as, when adult, by the red throat-patch. The spots are smallest and most numerous on wing-coverts and upper back, where they grade into streaks on hind neck; largest on inner secondaries, scapulars, and sides under the wings, where they are rather lines than spots; fewest, or almost wanting, on middle of back. The marking results from a small spot or stripe near end of each feather, on edge of each web; there is occasionally a second pair nearer base of the feather. The amount of spotting is very variable with individuals; some old summer birds are nearly plain on the back; in young the spots are larger and more numerous than in adults, and usually lengthened into oblique lines, producing a regular diamond-shaped reticulation. The difference depends mainly on the moult, which is complete in autumn, and extensive in spring. Northern portion of Northern Hemisphere at large; breeds from New Brunswick and Manitoba to high latitudes in North America, and ranges over most of the U. S. in winter. Eggs 2-3, 3.00×1.75 . (*Colymbus septentrionalis* of authors, as of all former editions of the Key. *Urinator lumme* of A. O. U. Lists, 1886-95.)

SUBORDER PODICIPEDES: GREBES.

The characters of the suborder are the same as those of its single family, as follows:

Family PODICIPEDIDÆ: * Grebes.

Bill of variable length, much longer or shorter than head; culmen usually about straight, sometimes a little concave, or quite convex, especially at end; commissure nearly straight, but

* Since the name *Colymbus* has been transferred from Loons to Grebes, under exigency of the A. O. U. Code, and is the prior generic designation of any Grebes, the present family should in strictness be called COLYMBIDÆ. We may

more or less corresponding with curve of culmen, usually sinuate at base; under outline in general convex, with slight gonydeal angle or none; sides more or less striate. Nasal fossæ well marked; nostrils near their end, linear and pervious (broader in *Podilymbus*), upper edge straight, not lobed. Frontal extension of feathers considerable, and usually antiæ run still further into the nasal fossæ. A groove along symphysis of mandible extends often nearly to tip. Eyes far forward, with a loreal strip of bare skin thence to base of upper mandible, very narrow in typical forms, broader in *Podilymbus*. Head usually adorned in breeding season with variously lengthened colored crests or ruffs; when these are wanting the frontal feathers may be bristly. Neck usually long, slender, and sinuous. Plumage thick and compact, smoothly imbricated above, below of a peculiar smooth, satiny texture, which brings it into great repute for trimming the hats of women whose primitive tastes betray their savagery. Wings short but ample, very concavo-convex; developed primaries eleven (altogether twelve), narrow, somewhat falcate, graduated, the outer three or four attenuate on one or both webs; most secondaries short and broad, but inner ones lengthened to hide the rest of the remiges when the wing is closed; bastard quills unusually long, reaching over half-way to ends of primaries; greater coverts also very long. Tail rudimentary, represented by a tuft of downy feathers. Characters of the feet peculiar — for in other lobe-footed birds, as Phalaropes and Coots, the lobation is of a different character. Tarsus extremely compressed, with only a slightly

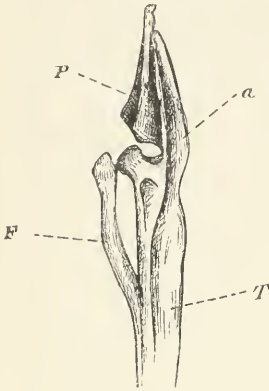


FIG. 712. — *F*, fibula; *T*, tibia, with *a*, its cnemial process, and *P*, large patella, of a Grebe, nat. size.

thickened tract within which the tendous pass, its front edge a single smooth row of overlapping, the hinder serrate with a double row of pointed, scales; sides regularly, transversely scutellate, as are upper surfaces of toes; latter inferiorly reticulate, with an edging of pectinated scales. Toes flattened out and further widened with broad lobes, especially wide toward end, and at base connected for a varying distance by interdigital webs. Hind toe highly elevated, broadly lobate, free. Claws short, broad, flat, obtuse, of squarish shape something like human finger-nails; that of the hallux minute.

Grebes are so strongly marked by the foregoing characters, especially of feet and tail, that some authors, including the A. O. U. Committee, rank them as a suborder *Podicipedes* of the order *Pygopodes* to be alone contrasted with the Loons and Auks together. There is something to be said in favor of this view, but it is better to have three suborders, if any, and rank them as equidistant from one another. Principal internal characters are absence of right carotid, and of ambiens, femoro-caudal, and accessory semitendinosus muscles (leg formula BX minus ambiens, as against ABX plus ambiens in Loons); sternotracheal muscles asymmetrical; greater number of cervical vertebræ (15-19); fusion of one or more thoracic vertebræ; shortness of sternum, whose lateral processes reach beyond the transverse median

waive that point, as there is actually a genus "*Podiceps*" or *Podicipes* in this family, to furnish a corresponding title. But I cannot follow those who write the family name "*Podicipidae*." By no rule of faith or morals can such a bogus word be justified. The A. O. U. uses the generic word "*Podiceps*," copying the original misprint or other blunder of Latham, 1790. Very well: then the proper form of the family name would be *Podicipitidae*. For if "*Podiceps*" is mistaken to end in *-ceps*, a term meaning "head," its genitive is *-cipitis*, and the same is its combining form (like *anceps*, gen. *ancipitis*, etc.). But in fact the formation of the word is *podex*, gen. *podicis*, the rump, and *pes*, gen. *pedis*, the foot, giving *Podicipes*, the correct literal translation into Latin of the English name which was formerly in good literary use for Grebes. And consequently the proper form of the family name is *PODICI-PED-IDÆ*, as above. This term is precisely equivalent to the name of the order *Pygopodes*, which is derived from the Greek *πυγή*, *pyge*, the rump, buttocks, nates, and *πούς*, *pous*, gen. *πόδος*, *podos*, the foot. So "*Podicipidae*" is literally as well as figuratively a "head over heels" affair, which requires to be set on its stern, or stood on its feet — not on its head.

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part (reverse of the case in Loons); absence from top of skull of pits for supraorbital glands; and freedom of lacrymal bone. There is a long enomial apophysis of the tibia, reaching high above knee-joint, as in Loons, but this is backed by a patella of about equal altitude (fig. 712). The gizzard has a special pyloric sac; there are cœca and a tufted oil-gland. Grebes are among the most thoroughly or exclusively aquatic of all birds, preferring always to swim unless forced to fly; they are extremely expert divers, and have the curious habit of sinking back quietly into the water when alarmed, like Anhingas and Loons, their ability to alter the specific gravity of their bodies being unsurpassed if not unequalled. The mechanism of the feet is such, that Grebes "feather their oars" automatically in bringing them forward; and how fast they can row under water with these admirable implements will be appreciated by one who tries to shoot a bird of this kind, and observes how quickly, after diving like a flash, it reappears afar. A Grebe held in the hand, moreover, can work its flippers so fast that the eye cannot follow the movement, and only perceives a film like that of a humming-bird's wings. The wings sometimes serve as fore legs to assist a Grebe's awkward scrambling on land. Owing to the apparent absence of any tail, the general aspect is singular, rendered still more so by the grotesque parti-colored ruffs and crests that most members of the *Podicipedidæ* possess. These ornaments are very transient; old birds in winter, and young, are very different from adults in breeding attire, and young birds frequently have the head curiously striped. The eggs are more numerous than in other pygopodous birds, frequently numbering 6-8; elliptical, of a pale or whitish unvariegated color, and commonly covered with chalky substance. The nest is formed of matted vegetation, close to the water, or floating among aquatic plants; it is a wet bed in which the eggs are laid, and from which the young swim directly. Grebes are the only cosmopolitan birds of the order *Pygopodes*, being abundantly distributed over lakes and rivers of all parts of the world; but they are less maritime than the species of either of the other families, and only found on salt water when away from their native water-soaked vegetation. There are not over 25 well-determined species, of few genera, the best-marked of which are the four following:

Analysis of Genera.

- Bill slender or only moderately stout, paragnathous, acute. Nostrils narrow or linear. Loral bare strip narrow. Frontal feathers normal. Tarsus little if any shorter than middle toe — at least $\frac{2}{3}$ as long. Semipalmation of toes moderate. Lobe of hallux broad. Usually with conspicuous crests or ruffs during the breeding season.
- Bill longer than head, extremely slender and acute. Tarsus equal to middle toe and claw. Crests and ruffs slight. Secondaries short. Large: Length over 20.00 *Echmophorus*
- Bill not longer than head, moderately stout. Tarsus shorter than middle toe and claw. Crests and ruffs decided. Medium: Length under 20.00, over 10.00 *Colymbus*
- Bill much shorter than head, not $\frac{2}{3}$ the tarsus, quite stout. Tarsus about $\frac{3}{4}$ the middle toe. Outer and middle toes equal. No decided crests or ruffs. Small: Length 10.00 or less (Subgenus) *Podicipes*
- Bill stout, epignathous, obtuse. Nostrils broadly oval. Loral bare strip broad. Frontal feathers bristly. Tarsus not $\frac{2}{3}$ the middle toe. Semipalmation of toes extensive. Lobe of hallux moderate. No decided crests or ruffs
Podilymbus

ÆCHMOPHORUS. (Gr. *αἰχμή*, *aichmē*, a spear; *φορός*, *phoros*, bearing.) SPEAR-BILL GREBES. Bill very long, exceeding head, straight or slightly recurved, very slender and acute; culmen straight or slightly concave; commissure about straight, or slightly sinuate at base; under outline concave at base, without protuberance at symphysis. Bare loral space extremely narrow. Wings comparatively long, with much attenuated outer primaries, and scanty secondaries. Legs long; tarsus not shorter than bill, as long as middle toe and claw; basal webbing of toes slight. Size large; neck very long; body slender. Crest and ruffs inconspicuous, not specially colored in our species (gray and chestnut in the South American *A. major*); no great difference between summer and winter plumages. One species, western: from which the hypothetical "*clarki*" may be recognized by the following characters, perhaps only distinctive of sex:

Large: Length (extreme) 29.00; wing 8.00; bill and tarsus each 3.00. Bill equal to tarsus, straight, dark olivaceous brighter yellowish at tip and along cutting edges. Under outline of bill straight from base to the slight angle, gonyes thence straight to tip. Lores ashy-gray *occidentalis* ♂
 Small: Length 22.00; wing 7.00; bill 2.25; tarsus 2.75. Bill shorter than tarsus, slightly recurved, under outline curved from base to tip, with barely appreciable angle. Lores pure white *clarki* ♀

Æ. occidentalis. (Lat. *occidentalis*, western.) WESTERN GREBE. Adult ♂: Bill obscurely olivaceous, brighter along edges and at tip. Iris orange-red, pink or carmine, with a white ring. Hard parts of palate like bill; soft parts purplish or lavender. Outer side and sole of foot blackish, rest dull olivaceous, more yellowish on webs. Forehead and lores dark silvery-ash. A short occipital crest and puffy cheeks, but neither bright-colored, agreeing with white and dark colors of the respective parts. Top of head and line down back of neck sooty-blackish, changing on upper parts into a lighter, more brownish-black; feathers of back with grayish margins. Primaries mostly dark chocolate-brown, with white bases, their shafts white at base. Secondaries mostly white, but more or fewer of them dark on most or all of the outer webs. Sides under wings washed with a pale shade of color of back. Lining of wings and whole under parts from bill pure white, with satiny gloss. Length 24.00–29.00; extent 40.00 or thereabouts: wing about 8.00; bill, tarsus, middle toe and claw, each, about 3.00; gape 3.60; height of bill at base 0.50. Eggs usually 3–5 in number, measuring 2.40 × 1.55; nestlings in down are grayish-brown above, white below, without special markings on the head. As here described, the bird is given in its purest character; but it grades in size directly into the next, and some of the larger individuals have a mostly yellow, somewhat recurved bill, with white lores. Western U. S. and adjoining British Provinces; common, especially in the interior, E. to Manitoba, S. to Mexico and Lower California.

Æ. clarkii? (To John H. Clark.) CLARK'S GREBE. Adult ♀, in breeding plumage: Bill about as long as head, shorter than tarsus, slightly recurved, extremely slender and acute; culmen a little concave; under outline almost one unbroken curve from base to tip. Under mandible, and tip and cutting edges of upper, chrome-yellow, in marked contrast to black of culmen. Loral bare strip leaden-blue. Crown, occiput, and hind neck grayish-black, almost pure black on hind head, fading gradually along neck into the lighter blackish-gray of the upper parts generally. Lores broadly pure white, as are the entire under parts, with a sharp line of demarcation along sides of head and neck. A decided occipital crest, the feathers about an inch long and quite filiform—but not colored apart from the general pattern; no decided ruffs—no colored ruffs at all; but the white feathers of sides of head behind and across throat longer and fuller than elsewhere—about as in *griseigena* or *holballi*. Wings and general coloration (except white lores) exactly as in *occidentalis*. Winter dress not materially different. Length 22.00; extent 28.50; wing 7.00; culmen 2.30; gape 2.75; height of bill at nostrils 0.40; tarsus and middle toe with claw, each, about 2.75; thence grading up to *occidentalis*. With only extremes before us, we might well consider them distinct species; but other specimens show intergradation; we frequently find specimens as small as typical *clarkii*, with equally slender bill, yet with bill wholly olivaceous and lores ashy, as in typical *occidentalis*. Individuals said to be more frequently observed on the Pacific coast of the U. S. *Podiceps clarkii* LAWR. 1858. *Æchmophorus clarkii* COUES, 1862; A. O. U. Hypothetical List, 1886–95, No. 1, as probably ♀ of *occidentalis*. *Podiceps* (*Æchmophorus*) *occidentalis* var. *clarkii*, of the Key, 1st ed. 1872, p. 336; *Æ. o. clarki* of later editions, 1881–90, p. 794. See especially COUES, Pr. Phila. Acad. Sept. 1862, p. 404; HENSHAW, Bull. Nutt. Club, 1881, pp. 214–218; BRYANT, Auk, 1885, p. 313.

COLYMBUS. (Gr. κολυμβος, *kolumbos*, Lat. *colymbus*, a diving-bird, perhaps a Grebe; also κολυμβάς, *kolumbas*, κολυμβίς, *kolumbis*, and κολυμβητής, *kolumbetes*, of same meaning and application, like Lat. *urnator*. The name *colymbus* has usually been given to the genus of Loons; but the A. O. U. code requires its application to a genus of Grebes.) GREBES. Bill

moderately stout, usually more or less compressed, equalling or shorter than head or tarsus. Tarsus obviously shorter than middle toe and claw; outer lateral toe a little longer than middle. Size medium. Head in breeding season with colored crests or ruffs, or both. The leading genus: *Podiceps* or *Podicipes* of authors, as of former editions of Key. *Colymbus*, A. O. U.

NOTE. — Believing *C. cristatus* may have been hastily eliminated from our fauna, I analyze and describe it with the rest.

Analysis of Subgenera and Species (adults).

Large: Length over 15.00; wing over 6.00. Bill more or less nearly equalling head or tarsus in length. (COLYMBUS *proper.*)

Crests, and especially ruffs, long and conspicuous. Neck without red or gray in front; under parts pure silky-white. Tarsus averaging equal to middle toe without claw *cristatus*

Crests moderate; ruffs inconspicuous. Neck with red or gray in front; under parts watered with dusky (sometimes but slightly). Tarsus averaging less than middle toe and claw *holbœlli*

Medium: Length under 15.00, over 11.00; wing 5.00-6.00. Bill much shorter than head; little over half the tarsus. (DYTES.)

Bill compressed, higher than broad at nostrils. Crests and ruffs very conspicuous; neck red in front . . . *auritus*

Bill depressed, broader than high at nostrils. Crests in form of auricular tufts; neck black in front *nigricollis californicus*

Small: Length under 11.00; wing under 5.00. Bill as before. (PODICIPES.)

No crests or ruffs *dominicus*

P. crista'tus. (Lat. *cristatus*, crested.) CRESTED GREBE. TIPPET GREBE. GAUNT. Adult ♂ ♀, breeding plumage: Crown and long occipital crests glossy black; end of ruff the same, the rest reddish-brown, fading into silky-white of throat and sides of head. Neck behind and upper parts dark brown, the feathers with gray margins. Primaries chocolate-brown, with black shafts; tips of inner ones white, as are all the secondaries, excepting a little of the outer webs; greater wing-coverts white on inner webs. Under parts pure silky-white, without a trace of dusky mottling; sides of neck and body tinged with reddish, and on flanks mixed with dusky, where the feathers have dark shaft-lines. Length about 24.00; extent 33.00; wing 7.00; bill 2.00, the gape 2.70; tarsus 2.50. Europe, Asia, etc. North America? (Not authentic; not recognized by A. O. U.)

(*Subgenus COLYMBUS.*)

C. hol'bœlli. (To C. Holbœll.) AMERICAN RED-NECKED GREBE. HOLBÆLL'S GREBE. Adult ♂ ♀, breeding plumage: Crests short, and ruffs scarcely apparent. Iris carmine. Bill black; tomia of upper mandible at base and most of lower mandible yellowish. Crown and occiput glossy greenish-black; back of neck the same, less intense, and upper parts generally the same, with grayish edgings of the feathers. Wing-coverts and primaries uniform chocolate-brown; shafts of the latter black. Secondaries white, mostly with black shafts and brownish tips. Lining of wings and axillars white. A broad patch of silvery-ash on throat, extending on sides of head, whitening along line of juncture with the black of the crown. Neck, except the dorsal line, deep-brownish-red, which extends diluted some distance on breast. Under parts silky-white, with a shade of silvery-ash, each feather having a dark shaft-line and terminal spot, producing a peculiar dappled appearance. Winter adults, and young: Crests scarcely appreciable. Bill mostly yellowish, the ridge more or less dusky. Red of neck replaced by brownish-ash of variable shade, from quite dark to whitish. Ash of throat and sides of head replaced by pure white. Under parts ashy-white, the mottling not so conspicuous as in summer. Length about 19.00; extent 32.00; wing 7.60; culmen 1.90-2.40; gape 2.40-3.10; height of bill at nostrils 0.55; tarsus 2.50; middle toe and claw 2.85. This bird could only be confounded with *cristatus* in immature dress: it is smaller, more thick-set, with stouter bill, nebulated under plumage, less white on the wing, and usually has rather shorter tarsi—only about ⁴/₅ the middle toe and claw, instead of about equal to middle toe alone, as in *cristatus*. The American *holbœlli* is larger than the European *griseigena*: bill, especially, disproportionately longer, differently shaped and colored; tarsus longer, both absolutely and relatively to length of toes. North America at large and Greenland; portions of Siberia and Japan; common in U. S. in winter; breeds in Washington, Montana, N. Idaho, North Dakota, northern

Minnesota, etc., but chiefly N. of the U. S. Specimens more like typical *griseigena* from the Northwest coast. Eggs 2-5, sometimes more, oftener 3 or 4, 2.10-2.35 × 1.25-1.45, rough, whitish, either inclining to pale greenish or with buffy discoloration, of the narrow-elongate shape usual in this family. *Podiceps rubricollis* and *P. griseigena* of American authors. *P. cooperi* LAWR. 1858; COUES, 1862. *P. holballii* REINH. 1853, Greenland. *P. (Pedetaithya) holböllii* COUES, 1862, N. Am. generally. *P. affinis* SALVAD. 1866. *P. griseigena* var. *holböllii* of Key, 1st ed. 1872, p. 337. *Podicipes griseigena holballii* of Key, 2d-4th eds. 1884-90, p. 794. *Colymbus holballii* A. O. U. Lists, 1886-95, No. 2.

(Subgenus DYTES.)

C. (D.) auritus. (Lat. *auritus*, eared. Figs. 713, 714.) HORNED GREBE. SCLAVONIAN GREBE. Adult ♂ ♀, breeding plumage: Bill black, tipped with yellow; feet dusky externally, internally yellowish; iris carmine, with a fine white ring. A brownish-yellow stripe over eye, widening behind, deepening in color at the ends of long crests, dark chestnut between eye and bill. Crown, chin, and very full ruff glossy greenish-black. Upper parts brownish-black, with paler edges of the feathers. Primaries light chocolate-brown, with black shafts, except at base; secondaries white. Neck all round except stripe down behind, and



FIG. 713. — Horned Grebe, Left Foot. (L. A. Fuertes.)

sides of the body, rich dark brownish-red or purplish wine-red, mixed with dusky on flanks; other under parts pure silky-white. Winter adults, and young: Bill dusky, much of under mandible bluish- or yellowish-white. Indications of crests and ruff in length and fulness of feathers of the parts. Crown and neck behind, and sides of body, sooty-blackish; other upper parts, and wings, as in the adult in summer. Chin, throat, and sides of head pure white, this color nearly encircling nape; neck in front and lower belly lightly washed with ash-gray; other under parts as before. Newly-fledged young curiously striped on the head with rufous, dusky, and white; downy young gray above, darker on crown, streaked and spotted with dusky on sides of head and throat. Length about 14.00; extent 24.00; wing 5.75; tarsus 1.75; middle toe and claw 2.10; culmen 0.90; gape 1.30; height of bill at nostrils 0.30, width there 0.25. Bill thus compressed

higher than wide at base, tapering, with considerably curved culmen — quite different from the depressed bill wider than high at base with straight tip and ascending gonyes, of *nigricollis* or *californicus*: it varies much in size, even among equally adult examples; in young it is always smaller and weaker than in old birds. Black, yellow-tipped in the old, we find it variously lighter in the young — usually dusky on ridge, elsewhere tinged with olivaceous, yellowish, or even orange, or extensively bluish-white. In breeding plumage this Grebe is conspicuously different from any other, "the head being surrounded, as it were, by a nimbus or aureole, such as that with which painters adorn saintly characters," as Newton says; but the young are much like those of the next species, requiring careful discrimination. Europe; Asia; North America at large, abundant, and generally diffused in migration; breeds in portions of the northern U. S. but mainly farther north. Eggs laid on soaking or floating beds of decayed reeds, to the number of about 5 usually, sometimes more, white or slightly shaded, elliptical, 1.70 × 1.20. *Colymbus auritus* LINN. 1758, in part; A. O. U. Lists, 1886-95, No. 3 — a name which has oftenest been applied to the Black-necked Grebe, but is now restricted to the present species. *C. cornutus* GM. 1788. *Podiceps cornutus* LATH. 1790, and of most authors, as of the Key, original edition, 1872, p. 337; *Podicipes*

cornutus of later editions, 1884-90, p. 795. It is unfortunate that the name *auritus*, which means "eared," must be taken away from the species called Eared Grebe in English, and given to another called Horned Grebe in English, instead of using *cornutus* for the latter; but this is one of the many awkwardnesses of nomenclature from which there is no escape under the A. O. U. Code.

C. (D.) nigricollis californicus. (Lat. *nigricollis*, black-necked; *niger*, black, *collum*, neck. Lat. *californicus*, Californian.) AMERICAN EARED GREBE. CALIFORNIAN BLACK-NECKED GREBE. Adult ♂ ♀, breeding plumage: Bill shorter than head, much depressed at base, broader than high at nostrils; tip acute, not decurved; gonys straight, ascending; culmen nearly straight. Tarsus about equal to middle toe without claw. Bill entirely black; feet dull olivaceous, blackish outside and on soles; eyes scarlet; eyelids orange. Conspicuous long auricular tufts, golden-brown or tawny, finely displayed fan-shaped upon a black ground. Crown, chin, and neck all round, black. Primaries entirely chocolate-brown, with usually a wash of dull reddish-brown externally; secondaries white, but bases of all, and a considerable

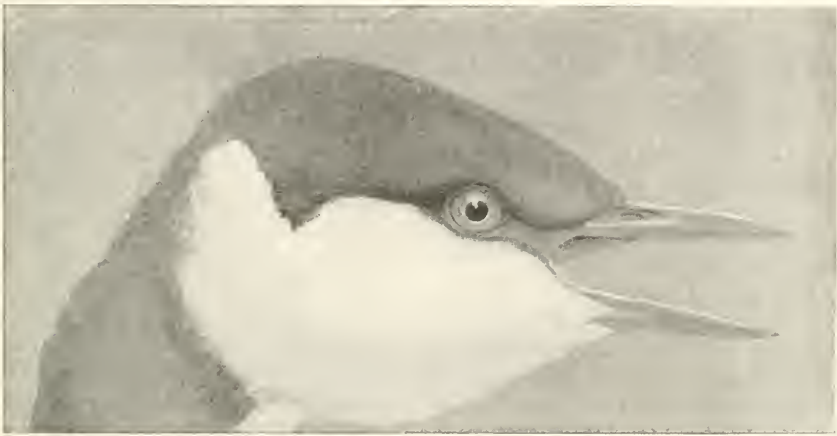


FIG. 714. — Horned Grebe, Winter Plumage. (L. A. Fuertes.)

part of two outer ones, dusky; their shafts mostly all dusky. Sides deep purplish-brown or wine-red; this color washed across breast, behind black of neck, and across anal region. Under parts silky-white, the abdomen grayish. Adults in winter lack the ear-tufts and black neck, but are otherwise not very different: Crown, neck narrowly behind, and upper parts, blackish, or grayish-black: chin, throat, and sides of nape, white; place of the ear-coverts and fore neck dull whitish; sides and flanks more or less overlaid with slate-color. Young: Bill shaped generally as in the adult, but smaller, with less firm outlines, so that its distinctive shape is somewhat obscured; but notice the wide base, straight culmen, and ascending gonys of the present species. Little or no trace of auricular tufts. Crown, sides of head, and neck all around, sooty-grayish, paler and more ashy on fore neck. Upper parts rather lighter and duller colored than in adults. Primaries as in adults, but without reddish tinge: a few of the innermost sometimes white-tipped. Sides under wings washed with a lighter shade of color of back; lower belly grayish. Length 12.00-14.00, usually 13.00 or less: extent 21.50-24.00; wing 4.75-5.25; culmen 1.00 or less; gape 1.25; height of bill at nostril 0.22, width there 0.26; tarsus 1.60; middle toe and claw 1.95. While the breeding plumages of the Horned and Eared Grebes are widely different, there is much similarity between the young and winter dress of the two species. As a rule, this one is *smaller*; wing under 5.30, that of the other

species over 5.60; traces of ruffs are less appreciable; the fore neck is scarcely lighter than hind neck; back rather deeper colored and more uniform. The shape of the bill, however, furnishes the most reliable character. Western North America, the commonest Grebe breeding in pools west of the Mississippi; N. to Great Slave Lake; E. to Illinois; S. to Guatemala in winter. Eggs not distinguishable from those of *C. auritus*. As I first pointed out in 1862, Proc. Phila. p. 231, *californicus* is simply the American form of the European Eared Grebe, differing in much less extent of white on the wings. In the European, all the primaries have some white, and the 4 inner ones are all white, like the secondaries: compare above. In the 2d-4th eds. of the Key, I presented both forms, on the strength of a queried Greenland reference for the European one; but this does not seem to be confirmed, and I now drop *nigricollis* proper, as the A. O. U. has also done. Our bird is *P. auritus* of some American writers; *P. californicus* HEERM, 1854, LAW. 1858; *P. (Proctopus) californicus* COUES, 1862; *P. auritus californicus* of the Key, orig. ed. 1872, p. 337, later eds. p. 796; *Colymbus (Dytes) nigricollis californicus*, A. O. U. Lists, 1886-95, No. 4.

(Subgenus PODICIPES.)

C. (P.) dominicus. (Of St. Domingo.) ST. DOMINGO GREBE. WHITE-WINGED GREBE. (Representing a subgenus apart from the foregoing, commonly called *Tachybates* or *Sylboecycylus*, but most closely related to the European Dabchick, *C. fluviatilis*, which is type of *Podicipes* as now restricted by elimination.) Bill very short, much less than head, scarcely over half the tarsus, stout, little compressed, rather obtuse; lateral outlines nearly straight; culmen slightly concave at nostrils, elsewhere convex; commissure almost straight; under outline straight to angle, gonyes thence straight to tip, angle well defined. Wings short, with abrupt attenuation of outer primaries. Tarsus stout, about $\frac{3}{4}$ middle toe and claw; outer lateral about equal to middle toe. Size very small; body full; neck short; no decided crests or ruffs. Adult ♂ ♀, in breeding plumage: Iris orange; bill mostly black; feet blackish. Crown and occiput deep glossy steel-blue; sides of head and neck all around dark ashy-gray, darkest behind, where tinged with bluish; chin and throat blackish. Upper parts brownish-black, with glossy-greenish reflections. Primaries chocolate-brown, the greater portion of inner vanes of all, and nearly all of the inner 4 or 5, together with all secondaries, pure white. Under parts silky-white, thickly mottled with dusky. Adults in winter, and young: Upper mandible dusky, the lower mostly yellowish. Plumage less pure and glossy; top of head like other upper parts; chin and throat ashy, varied with white or quite white. Downy young have the head and neck spotted and striped with black, white, and rufous. Length 9.50-10.00; extent about 16.00; wing 3.60-4.00; culmen 0.70; gape 1.00; tarsus 1.25; middle toe and claw 1.75. Warmer parts of America, N. to the Lower Rio Grande of Texas and to Lower California. Eggs usually 7, 1.35 × 0.95.

PODILYMBUS. (*Podi(cipes) + Co)lymbus.*) THICK-BILLED GREBES. AMERICAN DABCHICKS. Bill shorter than head, stoutest in the family, compressed, with obtuse epignathous tip; culmen about straight to nostrils, thence declinato-convex; gonyes regularly convex without decided angle; commissure slightly sinuate at base, then straight, then much deflected. Upper mandible covered with soft skin to nostrils, between which are two fossæ, the anterior shallow, oblong, the other deep, triangular, separated from bare loreal space by an intervening ridge. Nostrils broadly oval, far anterior. No crests or ruffs, but shafts of frontal feathers prolonged into bristles. Eyelids peculiarly thickened. Outer 3 or 4 primaries abruptly sinuate near the end. Tarsus stout, about $\frac{3}{4}$ as long as middle toe and claw. Middle and outer toes nearly equal. Basal semipalmation of toes extensive. Lobe of hind toe moderate.

P. podicipes. (For *podicipes*, see note under *Podicipedidæ*, p. 1051. A. O. U. uses *podiceps*.) PIED-BILLED GREBE. AMERICAN DABCHICK or DORCHICK. DIPPER. DIDAPPER or

DIVEDAPPER. WATER-WITCH. HELL-DIVER. Adult ♂ ♀, breeding plumage: Bill light dull bluish, or bluish-white, dusky on ridge or at tip, encircled with a broad black band. Iris brown and white; eyelids white. Feet greenish-black outside, leaden-gray inside. Frontal and coronal bristles black. Crown, occiput, and neck behind, grayish-black, the feathers with slightly lighter edges; sides of head and neck brownish-gray; a broad black throat-patch, extending on sides of lower mandible. Upper parts brownish-black, the feathers with scarcely lighter edges. Primaries and secondaries chocolate-brown, the latter frequently with a white area on inner webs. Under parts ashy, washed with silvery, thickly mottled with dusky; these dark spots most numerous and evident on the sides; lower belly nearly uniformly dusky. Winter adults: Bill light dull yellowish, without a dark band, more or less dusky on the ridge. No gular patch; throat whitish. Crown and occiput dusky brown; upper parts with more evident pale edgings of the feathers than in summer. Neck, breast, and sides light brown, darker behind, where more or less conspicuously mottled with dusky; lower belly grayish; under parts otherwise pure silky-white, immaculate. Young: White of throat invaded by brownish streaks; head streaked with white. Downy young: Blackish above, with 4 whitish stripes; head and neck streaked with black and white, and spotted with rufous. Length about 13.00; extent 24.00; wing 4.50-5.00; culmen 0.85; gape 1.20; height of bill at nostrils 0.40; width 0.25; tarsus 1.50; middle toe and claw 2.15. Varies greatly in size: Length 12.00-15.00, etc. Inhabits the greater part of South and Central America and all temperate North America; the most abundant Grebe in the eastern U. S. at any season, breeding nearly throughout its range. Eggs 4-6 or more, 1.70×0.95 .

SUBORDER ALCÆ: AUKS.

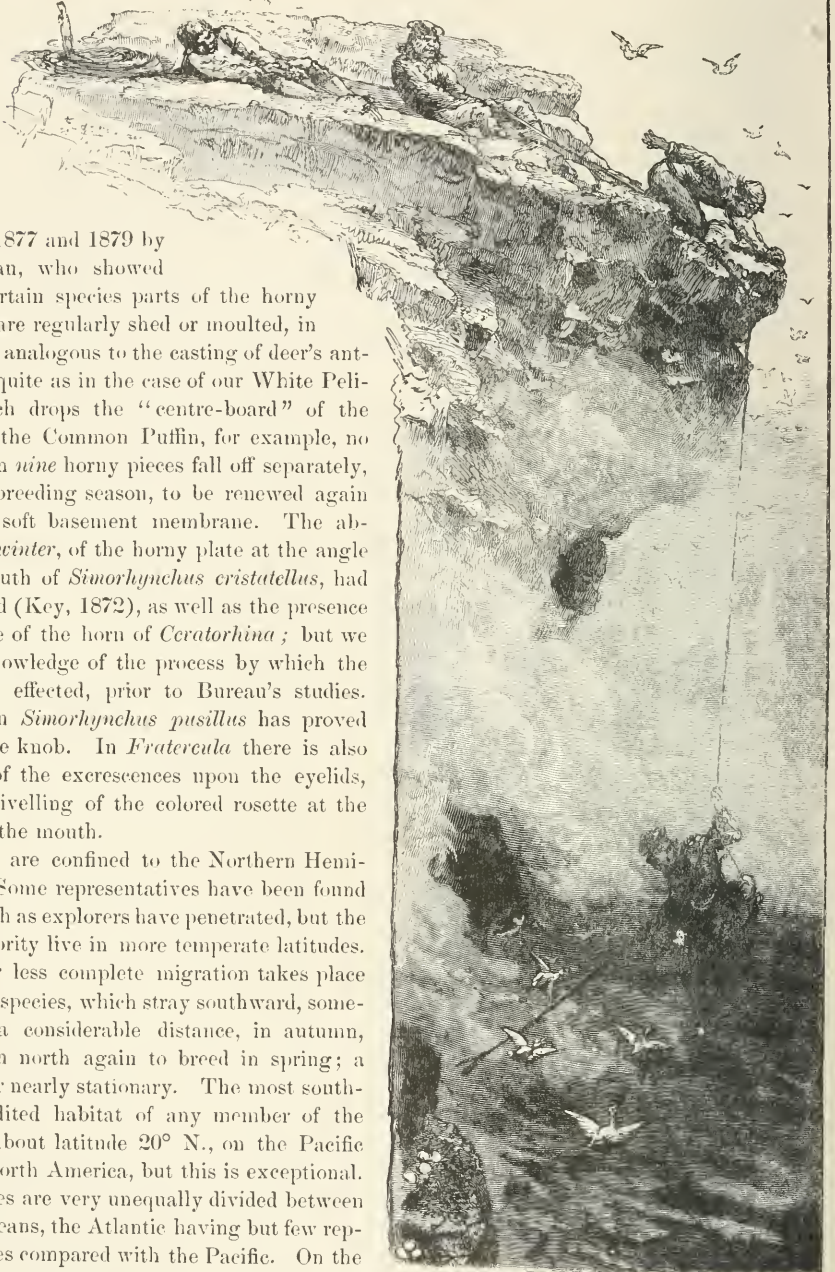
The characters of this suborder are the same as those of its single family, as follows:

Family ALCIDÆ: Auks, Murres, etc.

Feet palmate, three-toed (hallux wanting). Tarsi reticulate or partly scutellate. Tibio-tarsal joint naked. Claws ordinary. Bill of wholly indeterminate shape, often much as in *Gaviidæ* or *Podicipedidæ*, often curiously shaped, with various ridges, furrows, or horny protuberances, which latter are deciduous. Tail perfect, though short, of 12-16 feathers (rarely 18 in one species). Lores completely feathered. Nostrils wholly variable in shape and position, naked or feathered. Coloration variable; head often with long curly crests. No tibial apophysis. Carotids double (single in *Alle*). Cæca present; accessory semitendinosus absent; oil-gland tufted. Palatal structure schizognathous; nasal schizorbinal. Skull with marked supraorbital and temporal fossæ; lacrymals fused; vomer bifid behind; basipterygoids undeveloped; maxillopalatines laminate; sternum very long, with its median backward projection beyond the lateral processes. Nature altricial and ptilopædic, the young being nidicolous, not nidifugous like those of Loons and Grebes. Eggs few or single, plain or variegated. The numerous species confined to the Northern Hemisphere.

Birds of this family will be immediately recognized by the foregoing, in connection with general pygopodous characters. Agreeing closely in essential respects, they differ among themselves to a remarkable degree in the form of the bill, with every genus and almost every species: this organ frequently assuming an odd shape, developing horny processes, showing various ridges and furrows, or being brilliantly colored. It is the rule that any *soft* part that may be observed on the bill will finally become hard, or form an outgrowth, or both; and such processes, in some cases at least, are temporary, appearing only during the breeding season.

The last sentence, reprinted as it stands in the original edition of the Key (1872), hints at the extraordinary changes undergone by the bill in several genera of *Alcidæ*, so ably eluci-



dated in 1877 and 1879 by L. Bureau, who showed that in certain species parts of the horny covering are regularly shed or moulted, in a manner analogous to the casting of deer's antlers, and quite as in the case of our White Pelican, which drops the "centre-board" of the bill. In the Common Puffin, for example, no fewer than *nine* horny pieces fall off separately, after the breeding season, to be renewed again from the soft basement membrane. The absence, *in winter*, of the horny plate at the angle of the mouth of *Simorhynchus cristatellus*, had been noted (Key, 1872), as well as the presence or absence of the horn of *Ceratorhina*; but we had no knowledge of the process by which the change is effected, prior to Bureau's studies. Since then *Simorhynchus pusillus* has proved to shed the knob. In *Fratercula* there is also a moult of the excrescences upon the eyelids, and a shrivelling of the colored rosette at the corner of the mouth.

Auks are confined to the Northern Hemisphere. Some representatives have been found as far north as explorers have penetrated, but the great majority live in more temperate latitudes. A more or less complete migration takes place with most species, which stray southward, sometimes to a considerable distance, in autumn, and return north again to breed in spring; a few appear nearly stationary. The most southern accredited habitat of any member of the family is about latitude 20° N., on the Pacific coast of North America, but this is exceptional. The species are very unequally divided between the two oceans, the Atlantic having but few representatives compared with the Pacific. On the northern coasts of the latter the family reaches its highest development; the greatest number of species and genera are found there, though the number of individuals of no species surpasses that of several Atlantic representatives.

FIG. 715.—Egging in Alaska on cliffs inhabited by Kittiwakes (p. 993), Auks, etc. (Designed by H. W. Elliott. (From Harper Brothers.)

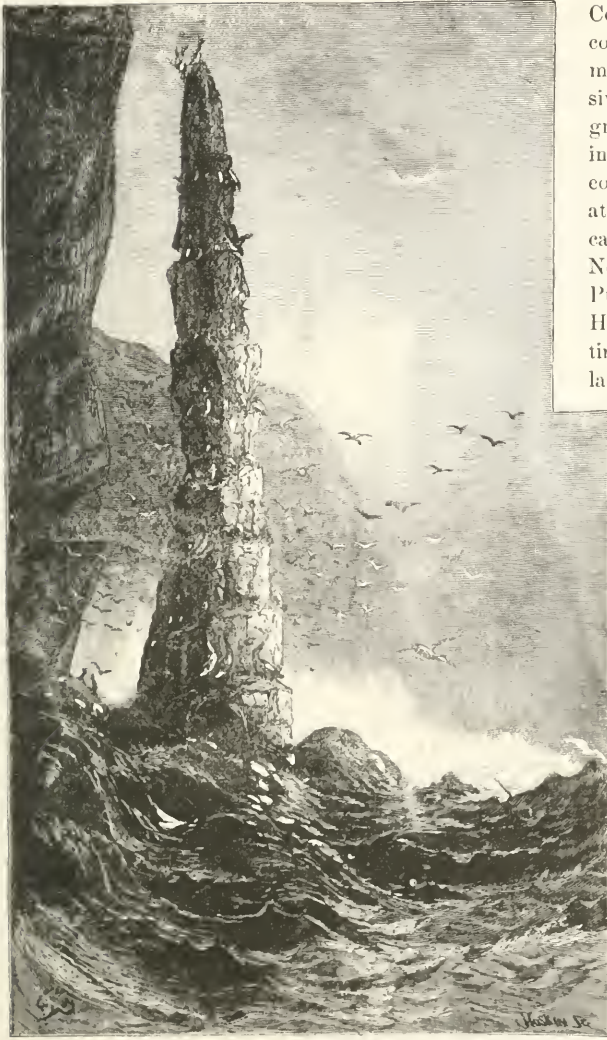


FIG 716. — A Needle Rock tenanted by Cormorants (*P. bicristatus*), Auks, etc. (Designed by H. W. Elliott. From Harper Brothers.)

Comparatively few species are common to both oceans. All the members of the family are exclusively marine. They are decidedly gregarious, at least in the breeding season, when some of them congregate in countless numbers at places called "loomeries." A calculation worked out by Professor Newton in 1893 gave 3,000,000 Puffins for one locality among the Hebrides. Usually one, sometimes two, rarely three eggs are laid, either upon bare rock or ground, in crevices among rocks, or in burrows excavated for the purpose. Auks are all altricial, and believed to be chiefly monogamous. The young are at first covered with fluffy down; rarely stiffish hairs appear on some parts. The moult is double; young of the year usually differ from adults, and the latter are usually unlike in their summer and winter plumages. A prevalent feature is the possession of crests or plumes, or of elongated feathers of peculiar shape on the sides of the head. All the species walk badly; some scarcely walk at all. The position of the legs with reference to the axis of the body necessitates an upright position when standing. The birds

appear to rest on their rumps, with the feet extended horizontally before them, most of the tarsus touching the ground. The Puffins, however, and a few others, stand well on their feet. All the species but one fly well, with rapid vigorous motion of the wings, in a straight, firm, well-sustained course, and progress on or under water with the utmost facility. They are very silent birds; the voice is rough and harsh; the notes are monotoned. They feed exclusively upon animal substances procured from the water.

The family is divisible into four subfamilies according to feathering of nostrils and other characters, especially those derived from shape and structure of the bill.

Analysis of Subfamilies and Genera.

- FRATERCULINÆ.** Nostrils naked, remote from feathers. Bill of variable shape, extremely compressed, much higher than wide, appendaged with deciduous elements. A rosette at angle of mouth. Inner claw enlarged and much curved. Tarsi scutellate in front. No great seasonal changes of plumage. Tail of 16 feathers.
 Eyelids with deciduous appendages. No crests. Culmen with one curve; both mandibles grooved. Covering of bill moulted in 7-9 pieces. N. Atlantic and N. Pacific *Fratercula*
 Eyelids simple. Long lateral crests. Culmen with two curves; upper mandible grooved, under smooth. Covering of bill moulted in 7 pieces. N. Pacific *Lunda*
- PHALERIDINÆ.** Nostrils naked or only incompletely feathered, in most forms exposed and overhung with a nasal scale. Bill of variable shape in different genera and species, appendaged with deciduous elements or not. Various crests, or none. Inner claw not peculiar. Eyelids not appendaged. No rosette at angle of mouth. Tarsi scutellate or reticulate. Average size small.
 Nostrils remote from feathers. Bill usually appendaged. Head usually crested or plumed. All N. Pacific.
 Bill appendaged with a large upright horn. Tarsi scutellate in front. Tail of 16-18 feathers . *Ceratorhina*
 Bill variously appendaged with one or more deciduous pieces. Tarsi reticulate.
 Upper mandible oval in profile, lower falcate, rictus ascending. Tail of 14 feathers . *Cyclorhynchus*
 Upper mandible not oval in profile, lower not falcate, rictus not ascending. Tail of 14 feathers
Simorhynchus
 Bill not known to be appendaged, acute at tip, upper mandible wrinkled. Tarsi reticulate. Tail of 14 feathers *Ptycorhamphus*
 Nostrils not remote from feathers. Bill not appendaged with deciduous elements. Head never crested exc. *S. umizusume*.
 Tarsi scutellate in front and internally, much compressed. Bill short, much compressed. Tail of 14 feathers. N. Pacific *Synthliborhamphus*
 Tarsi reticulate, not much compressed. Bill elongate, more or less acute.
 Bill slender, straight, acute, with comparatively long gonys. Small; wing under 6 inches. Tail of 12-14 feathers. N. Pacific *Brachyrhamphus*
 Bill similar, with comparatively short gonys. Large: wing over 6 inches. Tail of 12-14 feathers. Circumpolar *Cepphus*
- ALLINÆ.** Nostrils subcircular, incompletely feathered. Bill unappendaged, short, stout, obtuse, with very short gonys. No crests. One genus, Arctic and N. Atlantic. Tarsi scutellate. Size small; wing about 5 inches. Tail of 12 feathers *Alle*
- ALCINÆ.** Nostrils linear, densely feathered, being quite covered by the plumage. Bill unappendaged, lengthened. No crests. Tarsi scutellate. Size largest in the family; length over 15 inches.
 Bill simply elongate, not cultrate nor sulcate, culmen gently curved. Tail of 12 feathers. Circumpolar . *Uria*
 Bill elongate, extremely compressed, cultrate, sulcate, culmen strongly decurved.
 Wings fully developed, fit for flight. Tail of 12 feathers. N. Atlantic *Alca*
 Wings reduced in size, unfit for flight. Tail of 14 feathers. Extinct *Plautus*
- Obs. — Many additional characters of these remarkable genera are given under their respective heads.

Subfamily FRATERCULINÆ: Sea Parrots, or Puffins.

Characters as above sufficiently indicated. This subfamily contains a number of the most curious birds of the Auk family. With one exception (that of the Common Puffin or Sea Parrot of the Atlantic), all are confined to North Pacific and Polar waters, and all have the bill appendaged with 7 to 9 deciduous elements, which are regularly moulted. The shape and coloration of the bill are peculiar, giving the birds a grotesque appearance. Both genera have a singular fleshy rosette at the angle of the mouth; *Fratercula* has peculiarly appendaged eyelids; *Lunda* has extravagant corn-colored crests on each side of the head; and both have a special development of the inner claw.

FRATER/CULA. (Lat. *fraterculare*, to swell up, used comically by Plautus like *sororiare*, to swell up as twin breasts; from *fraterculus*, little brother, dimin. of *frater*, brother: what application?) **SEA PARROTS. MASKING PUFFINS** (the grotesque bill being likened to the comic mask of revellers at a carnival, and being as it were put on for the nuptial festivities, and afterward removed). Bill about as long as head, about as high as long, extremely compressed, with nearly vertical sides; lateral profile somewhat triangular; depth at base equal to that of head; culmen beginning level with forehead, thence curving downward with regular convexity to the overhanging tip, its ridge sharp and unbroken throughout; commissure straight and horizontal to the decurved tip; gonys sharp, ascending, gently sinuous. Terminal

portions of both mandibles hard, horny, and persistent, depressed with several oblique curved grooves, convex forward. Basal portion of upper mandible forming a narrow obtuse-angled triangular space, or nasal fossa, its short base horizontal, its long sides rising and sloping backward to meet at an acute angle at base of culmen; nostrils linear, horizontal, close to commissure at base of this space, which in winter is naked and membranous, in summer covered with a symmetrical horny "saddle" sheathing nasal fossa; with a raised "collar" surrounding base of upper mandible, through numerous perforations of which protrude rudimentary feathers; with a small narrow horizontal horny strip on each side below nostrils; usually, also, with a long, narrow, obliquely vertical strip bounding the triangular space anteriorly. Basal portion of under mandible contracted and membranous in winter, in summer with a symmetrical horny "shoe" which carries the line of the gonys downward and backward to a point, and a narrow horny strip along base. These deciduous elements form 3 symmetrical pieces, surrounding the bill, and 3 or 2 pairs of lateral pieces; in all, 9 or 7 pieces (9 in *arctica* and *glacialis*, 7 in *corniculata*) which are regularly moulted. Angle of mouth with a rosette of naked skin, festooned in summer, shrunken in winter. Eyelids surmounted above by a triangular, obtuse or acute, below by a horizontal, lengthened callosity. No crests on head, but a furrow in plumage behind eye. Wings not peculiar. Tail rounded, but central feathers shorter than the next, contained about $2\frac{1}{2}$ times in length of wing, 16-feathered. Tarsus very short, only equal to inner toe without claw, stout, little compressed, reticulate except for a small scutellate space in front. Outer toe about equal to middle; its claw shorter than middle claw, both slightly curved, not very acute, upright; middle claw dilated on inner edge; inner claw enlarged, curved to a semicircle, very acute, usually lying horizontal. Sexes alike; seasonal changes of plumage slight, those connected with moult of bill very great. Egg single, white or scarcely marked, laid in rocky crevices or burrows in ground. Young in down sooty, with white belly.

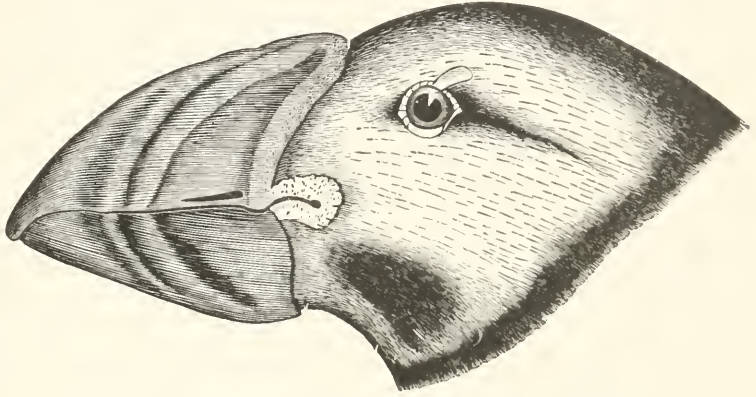


FIG. 717. — Head of Sea Parrot (*F. arctica*), nat. size. (Ad. nat. del. E. C.)

Analysis of Species and Subspecies.

Excrescence of upper eyelid forming a slender acute horn. Height of bill much greater than length of commissure.	
Black of throat reaching bill. N. Pacific	<i>corniculata</i>
Excrescence of upper eyelid forming an obtuse process. Black of throat not reaching bill.	
Culmen moderately convex, its chord about 2.00; its arc 2.10; bill under 1.50 deep at base. Wing under 7.00.	
N. Atlantic	<i>arctica</i>
Culmen very convex, its chord about 2.40; its arc 2.60; bill over 1.50 deep at base. Wing 7.00 or more. Arctic	
	<i>arctica glacialis</i>

F. corniculata. (Lat. *corniculata*, having a little horn (over the eye); *corniculum*, a cornicle. small horn; dimin. of *cornu*, a horn. Figs. 718, 719.) **HORNED MASKING PUFFIN.** Adult ♂ ♀, in summer: Appendage of upper eyelid produced into a long, slender, acute, upright horn; that of lower eyelid linear, obtuse, horizontal. Bill very large, especially high for its length, its height about equal to chord of culmen exclusive of the basal collar, much greater

than length of gape; base of culmen and point of gonys both produced far backward, giving a very convex outline of feathers alongside the bill; sides of bill not distinctly divided into nasal



FIG. 718. — Horned Puffin. (L. A. Fuertes.)

compartment and grooved portion, nearly smooth, with only 3 short shallow grooves; culmen very convex, almost the sextant of a circle; tip of upper mandible much hooked; rictus short, that portion in advance of the basal rim of upper mandible only about as long as upper mandible is deep; outline of gonys sinuate, at first convex, then more ascending, with slight concavity; chord of gonys nearly as long as that of upper mandible, exclusive of the basal rim or collar. Crown grayish-black, narrowing to a point at base of culmen; sides of head white; post-ocular furrow and sides of lower jaw ashy. A distinct narrow line of white along edge of fore-arm. Upper parts glossy blue-black; a sootier shade of black encircling fore-neck, running forward on throat to bill; other under parts white, except a few elongated blackish feathers on flanks; lining of wings pearly-ash. Bill entirely vermilion, even the basal collar; edges of eyelids red; ex-

creescences of eyelids bluish-gray; iris brown; feet orange, the webs tinged with vermilion; claws brownish-black; rosette of mouth bright orange. Length 14.50; extent 24.50; wing 7.25; tail 2.75; tarsus 1.10; middle toe and claw 2.00; outer 1.90; inner 1.35; chord of culmen 2.00; curve 2.25; gape, from basal collar to tip, 1.20; chord of gonys 1.75; depth of bill at base 1.80; greatest width 0.60; nostril 0.40; horn over eye 0.35. In winter: Bill supposed with good reason to shed 3 symmetrical pieces and 2 pairs of pieces, in all 7, namely, collar at base of upper mandible; saddle of nasal fossa; shoe of under mandible; pair of sub-nasal strips; pair of mandibular strips—if so, all the same as in *F. arctica*, excepting the prenasal strips. Processes of eyelids fall; colored ring round eye pales; rosette of mouth shrivels and pales; denuded membranous part of bill doubtless blackish; feet yellow. In any state, the species is easily recognized by extension of black collar to bill. North Pacific, both coasts, and adjoining Polar seas; S. on the Asiatic side to the Kurile Islands, on the American to British Columbia; not known on North Atlantic. Economy in all respects that of the better known species. The single egg seen is dead white, rough, 2.75×1.75 .

F. arctica. (Lat. *arctica*, arctic. Fig. 717.) COMMON PUFFIN. PUFFIN AUK. LABRADOR AUK. SEA PARROT. TAMMY NORIE. COULTERNEB. BOTTLENOSE. POPE. Adult ♂ ♀, in summer: Appendage of upper eyelid upright, obtusely triangular; of lower eyelid linear, obtuse, horizontal. Bill with moderate convexity of culmen, its height less than chord of culmen, little more than from posterior border of nostril to tip; base of culmen and point of gonys not produced far backward, leaving but little convex outline of feathers along side of bill; sides of bill distinctly divided, the anterior, hard, horny, deeply grooved portion differently colored from the smooth basal portion; rictus long, that portion in advance of basal rim of upper mandible longer than upper mandible is deep; outline of under mandible regularly curved from base to tip; chord of gonys shorter than that of culmen. Crown grayish-black, sharply defined against color of sides of head, separated by a slight ashy cervical collar from the dark color of other upper parts; sides of head, with chin and throat, ashy, nearly white between eyes and

bill, with a dark ashy patch on side of throat. Upper parts glossy blue-black, continuous with a broad collar around neck in front, not extending to bill; a narrow line of white along border of fore-arm. Under parts from the neck pure white, the long feathers of flanks blackish. Under surface of wings pearly-gray; inner webs of primaries and secondaries grayish-brown, the shafts brown, with black ends and whitish bases. Iris brown. Eyelids vermilion, the excrescences grayish-blue. Basal collar of bill and first ridge dull yellowish; nasal saddle and corresponding shoe of lower mandible grayish-blue; rest of bill vermilion, the tip of lower mandible and two terminal grooves often yellowish; rosette of mouth orange; feet coral or vermilion; claws black. Length 13.50; extent 24.00; wing 6.50; tail 2.25; tarsus 1.00; middle toe alone 1.40, its claw 0.40; outer 1.40, its claw 0.30; inner 1.00, its claw 0.40; chord of culmen 2.00, its are 2.10, the ordinate 0.30; depth of bill 1.40; gape 1.25; gonys 1.45; greatest width of bill (at base of nostrils) 0.60; nostrils 0.35. ♀ averaging less than ♂. Adults in winter: Face blackish. No colored eye-ring nor appendages of eyelids. Rosette of mouth shrunken and pale. Feet orange, not red. Basal parts of bill membranous and blackish, and whole base contracted; point of gonys cut off. The following pieces have been shed: 1, basal rim or collar; 2, nasal case or saddle; 3, mandibular case or shoe; 4, 5, strips at base of mandible, one on each side; 6, 7, subnasal strips, one on each side; 8, 9, prenasal strips, one on each side (3 symmetrical pieces, 3 paired pieces, 9 in all). Young, first fall and winter: Resemble winter adults, plumage the same, with blackish face, but bill weaker and less developed. This long kept us in ignorance of the moult of the bill, adults in winter being mistaken for young birds till Bureau explained the case. Both coasts and islands of the North

Atlantic; in North America breeding in southern Greenland, Labrador, Newfoundland, and S. to Bay of Fundy and Maine coast (Matineus Rock most southern point); not known in the North Pacific, where replaced by *F. corniculata*; replaced in Polar seas by the larger, stouter-billed *F. glacialis*. In winter, ranging or driven S. along the coast of the U. S.; not regular beyond New England. The moult of the bill as well as of the plumage occurs in August and September, when the birds are unable to fly for a period, and many perish if caught at sea in storms at this time. Nest by thousands or millions on coasts and islands, burrowing in the ground like rabbits, to arm's length or more. The single egg is laid late in June and in July, on a slight grassy nest at the end of the burrow, or sometimes in a rocky crevice; in shape rounded ovate, with greatest diameter nearly at the middle; average size 2.50×1.75 ; shell granular, white or brownish-white, colorless or marked with obsolete spots, dots, and

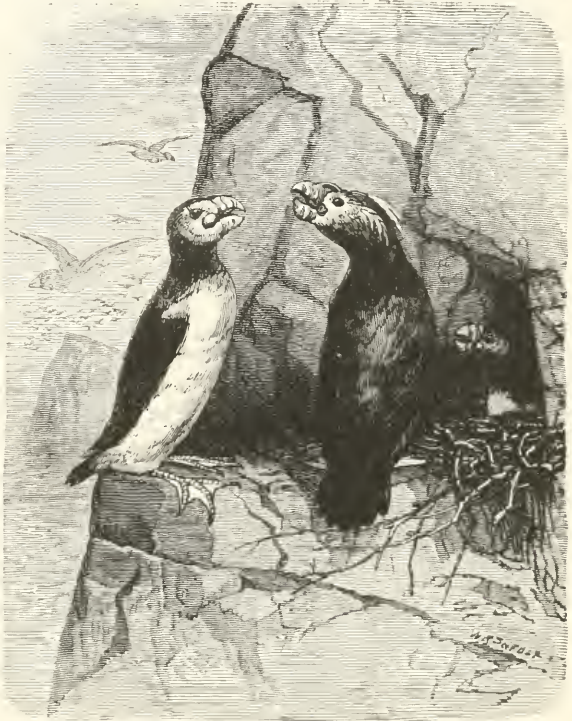


FIG. 719.—Left, Horned Puffin; right, Tufted Puffin. (Drawn by H. W. Elliott. From Harper Brothers.)

scratches of pale purplish, sometimes with a few splashes of pale yellowish-brown. Nestlings are covered with blackish down, whitish below from the breast.

F. a. glacialis. (Lat. *glacialis*, icy.) LARGE-BILLED PUFFIN. GLACIAL PUFFIN. Specific character of *F. arctica*; size greater; bill especially larger, and differently shaped. Protruberance of upper eyelid higher and sharper. Bill very deep, rising high on forehead, with very convex culmen, dropping nearly perpendicularly at end. Four distinct grooves of upper and three of lower mandible; gonys quite convex. Length 14.50; extent 26.00; wing 7.25; tail 2.25; tarsus 1.20; middle toe and claw 1.90, outer 1.90, inner 1.45; chord of culmen 2.40, its arc 2.60, the ordinate 0.45; depth of bill at base 1.70; gape 1.50; gonys 1.60; greatest width of bill 0.65; nasal slit 0.45. Polar seas; Novaya Zemlya; Spitzbergen; northern Greenland. Not authentic as occurring in the U. S. The seasonal changes are the same as those of *F. arctica*. This subspecies was originally described by TEMMINCK, Man. Orn. 2d ed. ii, 1820, p. 933, and figured by NAUMANN in Oken's Isis, 1821, p. 782, pl. 7, fig. 2, as *Mormon glacialis* LEACH; it was afterward taken up in STEPHENS' Gen. Zool. xiii, 1825, p. 40, pl. 4, fig. 2, as *Fratercula glacialis*.

LUNDA. (Skandinavian *lunde*; "one of the many local names of the Puffin, and doubtless that from which Lundy, the island in the Bristol Channel, is called," Newton.) TUFTED MASKING PUFFIN. Generic character of *Fratercula*, excepting crest, eyelids, and details of bill. A long tuft of feathers on each side of head. Eyelids not appendaged. Nostrils very small, linear, marginal. Upper mandible divided into distinct but not differently colored compartments; its base with a deciduous raised rim or collar, perforated for passage of feathers as in *Fratercula*, but not so prominent, and deciduous smooth basal saddle not so distinctly separated from ridged part of bill beyond, where are 3 well marked, widely separated, curved grooves, concave forward (the reverse of *Fratercula*). Culmen arched in two separate curves; basal one surmounted by a prominent widened ridge-pole, ending abruptly; terminal one sharp, strongly convex to hooked tip of bill. Lower mandible with sides perfectly smooth throughout; gonys at first descending, then rounding upward, thence about straight to tip; base with a narrow deciduous border; ordinarily no evidence of existence of a deciduous shoe. The parts of the bill moulted are: basal collar; nasal saddle; pair of subnasal strips; mandibular shoe; basal strip — 3 large symmetrical pieces and 2 pairs of small lateral pieces, in all 7. (Thus as in *F. arctica*, lacking only the pair of prenasal strips; thus exactly as supposed to be

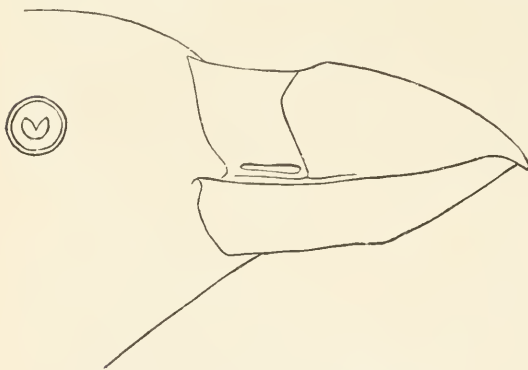


FIG. 720. — Bill of young Tufted Puffin, nat. size.

the case in *F. corniculata*. The loss of the pieces of the upper mandible makes the same difference in the bill as occurs in *F. arctica*; but the moult of the mandibular shoe effects less change in the appearance of the bill.) One species, Pacific.

L. cirrata. (Lat. *cirrata*, having curly locks. Figs. 719, 720, 721.) TUFTED PUFFIN. Adult ♂ ♀, in summer: Crests about 4 inches long, straw-yellow, some of the posterior feathers black at base; these bundles of silky, glossy plumes with very delicate shafts and loosened webs;

they chiefly sprout from what corresponds to the furrow in the plumage of *F. arctica*. Face white, broadly of this color on sides of head to beyond eyes (as far as the crests), narrowly across forehead and chin; bill thus entirely surrounded by white. Crown between the crests, and entire upper parts, excepting extreme forehead and a line along forearm, glossy blue-

black. Entire under parts, excepting extreme chin, and including sides of hind head and sides of neck, sooty brownish-black, more grayish on belly; lining of wings smoky-gray; under tail-coverts quite black. Wings and tail black, their inner webs brownish-black; shaft of 1st primary whitish underneath near base. Bill, feet, and eye-ring vermilion; basal parts of bill when about to desquamate more yellowish horn color, or even showing the livid color of the subjacent membrane. Rosette of mouth yellow. Iris white. Claws black. Length 15.00–16.00; extent 27.00; wing 7.75; tail 2.75; tarsus 1.30; middle toe 2.00, its claw 0.50; outer 1.80, its claw 0.40; inner 1.25, its claw 0.50; greatest depth of bill 1.90; greatest width 0.90; chord of culmen 2.40, of which the terminal part is 1.40; gape about 1.90; gonys 1.60; greatest depth of upper mandible 1.15; nostrils 0.25. Adults in winter: Plumage as in summer, but crests shed, and white of face replaced by dusky; feet pale salmon flesh-color; iris "pale blue." Basal part of bill dark, without the above-named deciduous pieces. In birds of the first spring the terminal portion of the bill may be smooth, like the under mandible, and the bill and feet rather orange than vermilion; at this time the face whitens and the crests sprout. Young: No crests, and no white face. Bill like that of adults in winter after the moult, saddled with soft dark skin at base, but smaller, weaker, quite smooth ("*Sagmatorhina lathamii*," fig. 720), and, like the feet, rather yellow or orange than red. Plumage entirely blackish

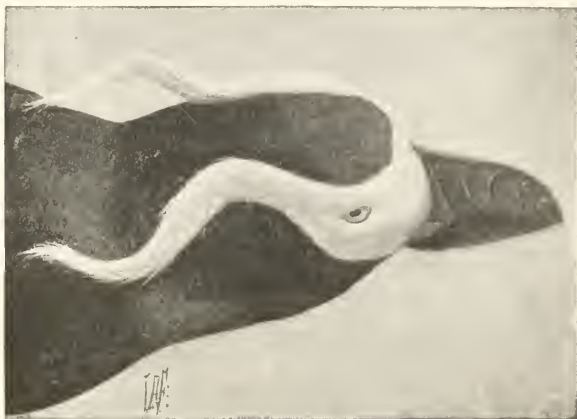


FIG. 721. — Tufted Puffin. (L. A. Fuertes.)

above, sooty-brown below, the feathers of belly and flanks whitish at base; iris brown. Nestlings in down uniformly sooty, only paler below; but the first feathers of the belly come out white. Coasts and islands of North Pacific, S. in winter on the American side to Santa Barbara Islands, southern California, and on the Asiatic side to Japan; accidental on Atlantic coast to Maine. General habits and economy of other Puffins; nesting similar. Egg single, rough, dead-white, but showing, besides frequent discolorations, obsolete shell-markings of

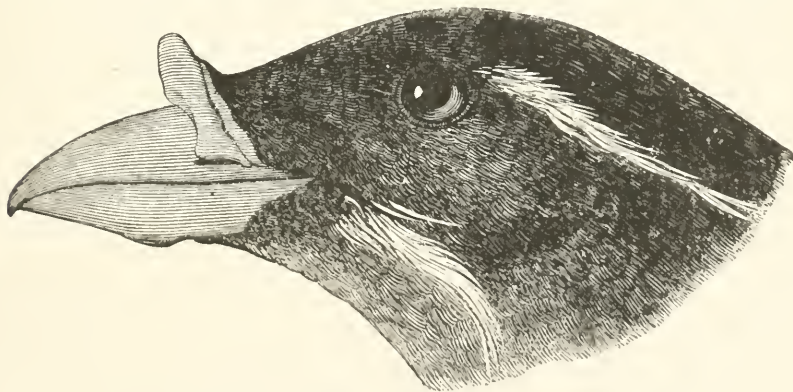


FIG. 722. — Horn-billed Auklet, adult in summer, nat. size. (From Elliott.)

above, sooty-brown below, the feathers of belly and flanks whitish at base; iris brown. Nestlings in down uniformly sooty, only paler below; but the first feathers of the belly come out white. Coasts and islands of North Pacific, S. in winter on the American side to Santa Barbara Islands, southern California, and on the Asiatic side to Japan; accidental on Atlantic coast to Maine. General habits and economy of other Puffins; nesting similar. Egg single, rough, dead-white, but showing, besides frequent discolorations, obsolete shell-markings of

pale purplish-gray or brownish, or both; size 2.65–2.85 × 1.92–2.00; broader and more capacious than that of *F. corniculata*, though no longer. There is a loomery of this species as far south as the Farallones, off San Francisco, Cal. Skins both of the Tufted and of the Horned Puffin are much used by the Aleuts of Alaska for clothing, about 45 being sewn together to make a garment called the parka.

Subfamily PHALERIDINÆ: Auklets, Murrelets, and Black Guillemots.

See p. 1062 for essential characters of this subfamily, and analysis of its several genera. The rather numerous species differ so much that the subfamily is best defined by exclusion of the marked characters which distinguish the *Fraterculinæ*, *Allinæ*, and *Alecinæ*. It becomes susceptible of much better definition than it used to have, by disengaging the group from

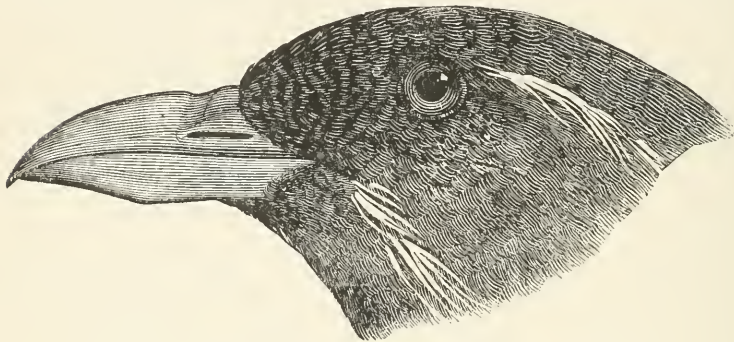


FIG. 723. — Horn-billed Auklet, adult in winter, nat. size. (From Elliott.)

association with *Fraterculinæ* and *Allinæ*, and by including in it the genus *Cephus*, which has usually been placed with *Uria* in the *Alecinæ*. The *Phaleridinæ* all belong to Pacific and Polar waters, excepting some species of *Cephus*. The average size is small, only the Black Guillemots and the Rhinoceros Auklet being about as large as a Puffin, and some being among the smallest of all sea birds. These birds are noted for the wide range of shapes of bill, and most of them have this organ variously appendaged with deciduous elements, which are shed like the crests or plumes with which the head of several species is adorned, and which, as in the case of the Puffins, are nuptial ornaments. All the genera of this subfamily are well marked, and there is no difficulty in determining the species, except in the genus *Cephus*.

The name of this subfamily is correctly formed as above. The etymology of the word is the Greek *φαλαρίς*, *phalaris*, in Ionic dialect *φαληρίς*, *phalēris*, which was a native name of the European Coot, *Fulica atra*, so called because the bare frontal shield suggested a bald head. The noun is of the third declension and feminine gender in grammar, and makes its genitive case in *-idos*; whence the stem of the word is seen to be *phalerid-* (not *phaler-*), to which, adding *-inæ* as the suffix denoting subfamily rank of the group, we arrive at the correct name *Phaleridinæ*.

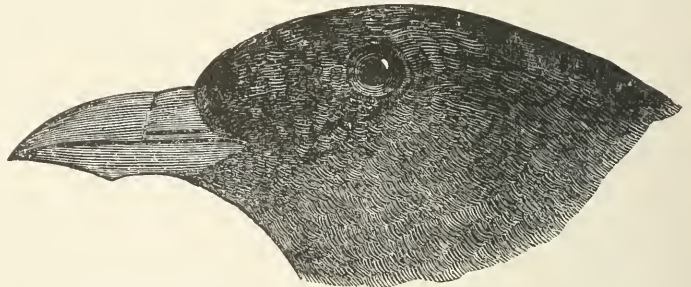


FIG. 724. — Horn-billed Auklet, young, nat. size. (From Elliott.)

CERATORHINA. (Gr. *κέρας, κέρατος, keras, keratos*, a horn; *ῥίς, ῥινός, hris, hrinos*, the nose. The name of this genus was first *Cerorhinca* Bp. 1828, thus mangled beyond certain recognition, for the second element in its malformation might have been *ῥύγχος, hrugchos*, beak. But the author next wrote *Ceratorhinna*, in 1830 and 1831, showing that he intended the etymology I have given. This became *Cerorhinna* BRANDT, 1837. Then came *Ceratorhynchia* and *Cerorhynca* Bp. 1838. Later forms are *Ceratorhynchia*, *Ceratorhina*, *Cerorhynchia*, *Cerorhincha*, *Cerorhynna*, etc. I hold to the form given in the Key, 1884, and later. A. O. U. uses the original abortion.) **RHINOCEROS AUKLET.** Related to *Lunda* and *Fratercula*; no peculiarity of eyelids or inner claw; bill smooth; base of upper mandible with a large upright horn, and under mandible with an accessory horny piece lying between its rami; this piece and the horn deciduous, when base of upper mandible covered with a soft cere. Bill shorter than head, stout, deep at base, much compressed and rapidly tapering to acute decurved tip; sides smooth; culmen very convex; gape gently curved; gonys nearly straight, with angle at symphysis. Nostrils short, linear, subbasal, marginal, impervious, at base of the horn or cere. Two series, postocular and maxillary, of lengthened, straight, stiffish, lance-acute, white feathers on each side of head. Tail of 16 (rarely 18) feathers. General form of *Fratercula* and *Lunda*. Size large for this subfamily. One species.

C. monocerata. (Gr. *μόνος, monos*, only, single; *κέρας, keras*, horn. Figs. 722, 723, 724.) **UNICORN AUKLET. HORN-BILL AUKLET.** Adult ♂ ♀, in summer: Bill orange; culmen and base of upper mandible dusky; feet some yellowish color, tarsi behind and soles blackish; claws black. Iris amber. Sharp plumes of head white, about 1.00 long. Entire upper parts dusky; a line of white along edge of forearm. Sides of head and neck, of body under wings, with chin, throat, and fore-breast, clear grayish-ash, or bluish-gray; under parts from breast pure white, shading insensibly into color of sides and flanks. Inner webs of wing- and tail-feathers grayish-brown, paler toward base; shafts of primaries dull whitish at base. Length 14.00–15.50; extent 26.00; wing 7.25; tail 2.50; tarsus 1.20; middle toe and claw 1.85; outer 1.70; inner 1.40; chord of culmen without horn 1.00, with horn 1.40; gape 2.00; nostril to tip of horn 0.75; total depth of bill, including horn, 1.25. In winter: Plumage similar; iris white; no horn nor accessory piece under bill, these being shed; place of horn occupied by a soft dark-colored basement membrane or cere (“*Sagmatorhina suckleyi*,” fig. 723). Young: Bill like that of adults in winter, lacking horn, but hardly more than half as large. Plumage mostly dark; no white plumes on side of head; white of under parts overlaid and marbled with dark-gray ends of the feathers; black of upper parts brownish. The first spring the horn grows, the accessory piece develops, and the plumage clears up. Nestlings are covered with smoky-brown down resembling those of *Lunda cirrata* both in size and color. Egg single, colorless or nearly so, but more or less obscurely marked, as in *Lunda* and *Fratercula*: size 2.70 × 1.80. Both coasts and islands of North Pacific to Lower California and Japan; not specially Arctic; has bred as far S. as the Farallone Islands.

CYCLORRHYNCHUS. (Gr. *κύκλος, kuklos*, circle, and *ῥύγχος, hrugchos*, beak. **PUG-NOSED AUKLET.** Bill moderately large, much compressed, densely feathered at base, but not to nostrils, which are narrowly oval, overlung by a deciduous scale or shield. Profile of bill oval; of upper mandible narrowly oval; culmen gently convex, declinate, tomial edge more convex, acclinate, meeting at an obtuse tip; lower mandible extremely slender, falcate, recurved, with concave tomia, very convex gonys, and acute point. Frontal feathers embracing culmen with a re-entrance, thence dropping perpendicularly to commissure; those on lower mandible not reaching quite so far; interramal space fully feathered. Wings and tail as in *Simorhynchus*; tail 14-feathered; tarsus shorter than middle toe, reticulate. As subgenus of *Simorhynchus*, in previous editions of the Key, but I said, p. 806, that it “might stand apart as a genus,” and as the A. O. U. committee has acted on this suggestion, I willingly accord it full generic rank.

C. psittac'ulus. (Lat. *psittaculus*, a little parrot. Fig. 725.) PAROQUET AUKLET. Adult ♂ ♀: In summer with a nasal saddle, moulted in one piece or several pieces in winter;

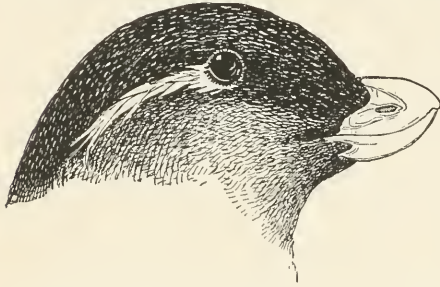


FIG. 725.—Paroquet Auklet, nat. size. (Ad. nat. del. H. W. Elliott.)

shape of bill not materially altered, however, the piece or pieces being small and flattish. Bill vermilion or coral, usually horn-yellow at tip and along edges, nasal scale darker. Iris white. Mouth and soft base of tomia whitish. Feet mostly black, but in part pale bluish or yellowish. No curly crest on forehead, but a series of long white filamentous plumes from eye downward and backward. Entire upper parts, with chin, throat, and flanks, sooty brownish-black, grayer below than above; other under parts white; lining of wings dark.

When out of season, the white invades the throat and chin, the sides of the former being mottled with dusky and white. Length 9.00 or more; wing 5.40-5.75; tail 1.55; tarsus 1.00; middle toe alone 1.10; chord of culmen or gonyx 0.60; gape 1.00; depth of bill 0.45; width 0.30. Young: No white filaments on head; a white spot on lower eyelid; upper parts as before; under parts white, marbled and mottled with dusky ends of the feathers. North Pacific, ranging S. to Sitka and the Kurile Islands; S. in winter to San Francisco Bay; common along the Aleutian chain, where it resorts to cliffs and crags to breed, laying its single egg usually deep in cavities of the most inaccessible rocks overhanging the sea; it resembles a small narrow hen's egg, being white, variously soiled and discolored, minutely granular and rough to the touch, 2.25-2.35 × 1.45-1.50.

SIMORHYNCHUS. (Gr. *σιμός*, *simos*, snub-nosed; *ῥύγχος*, *hrugchos*, beak.) SNUB-NOSED AUKLETS. STARIKIS. Of moderate and very small size, and stocky shape. Head crested or with peculiar feathers. Bill of indeterminate shape, differing with each species, furnished with a varying number of deciduous horny elements. Nostrils entirely unfeathered. Wings and tail ordinary; tail 14-feathered. Feet small; tarsus shorter than middle toe, entirely reticulate; toes long, middle and outer of about equal lengths, claw of former longest; inner claw reaching base of middle; all curved and compressed. Three very distinct species—the queerest little Auks in the world. Each has been made type of a genus; and their respective peculiarities are now considered to represent three subgenera—*Simorhynchus* proper, *Phaleris*, and *Ciceronia*.

Analysis of Species.

A long frontal crest, curling over forward.

- One series of white feathers on each side of head (*Simorhynchus* proper) *cristatellus*
- More than one series of white feathers on each side of head (*Phaleris*) *pygmaeus*
- Short white hair-like feathers over forehead; no crest (*Ciceronia*) *pusillus*

(*Subgenus* SIMORHYNCHUS.)

S. cristatellus. (Lat. *cristatellus*, dimin. of *cristatus*, crested. Figs. 726, 727, 728.) CRESTED AUKLET. CRESTED STARIKI. SNUB-NOSED AUKLET. DUSKY AUKLET. Bill fundamentally small and simple, compressed-conic, with convex culmen and little sinuate horizontal commissure; but in breeding season developing several corneous appendages, which make it singularly irregular, and modify even outline of feathers at base. These deciduous accessory pieces are: a nasal plate, filling nasal fossa, separate from its fellow of opposite side; a subnasal strip prolonged on cutting edge of upper mandible backward from nostrils; a semicircular plate at base of upper mandible over angle of mouth; a large shoe

encompassing posterior part of under mandible—the latter single, the other 3 pieces in pairs, making 7 in all which are moulted; when dry, all these elements vermilion or coral-red, and end of bill yellowish. (Before acquiring these outgrowths the young bird is *tetraculus* of authors; the adult in winter, after shedding them, is *dubius*.) Adult ♂ ♀, in summer: Bill as said in form, etc., in life crimson, with bluish tip. A beautiful crest of 12–20 slender blackish plumes springing from forehead, curling over forward in arc of a circle to fall gracefully upon bill; at full length the plumes are about 2.00 long, not filamentous, but with well-formed webs, and bundled or impacted together, owing to oblique divergence of webs from shaft (as in *Lophortyx*). One slender series of white filaments behind each eye, drooping downward and backward. Plumage otherwise sooty—more brownish-black above, more brownish-gray below, but belly not whitish, and no white on scapulars. Feet bluish, with dark webs. Bill coral or orange, with horn-colored tip; inside of mouth flesh-color. Aside from transformation of bill, the young only differ in lacking crest and white filaments, but both are early acquired; a white spot below eye. Summer and winter plumages are alike. Iris white, or with blackish outer and bluish inner ring; in the young, brown. Length 8.50–9.00; wing 5.25–5.50; tail 1.55; tarsus 0.90–1.00; middle toe and claw 1.35; chord of culmen 0.45. North Pacific, both coasts and islands, on Asiatic side to Japan, and in Alaska to Kadiak. Nesting in every respect like *C. psittaculus*; single egg similar, smaller, 2.10 × 1.40.



FIG. 726. — Crested Auklet, reduced. (Ad. nat. del. H. W. Elliott)

(Subgenus PHALERIS.)

S. (P.) *pygmaeus*. (Lat. *pygmaeus*, dwarf. Figs. 729, 730.) PYGMY AUKLET. WHISKERED AUKLET. FLAT-BILLED AUKLET. Bill small and simply conic-compressed, little



FIG. 727. — Crested Auklet, in summer, nat. size.

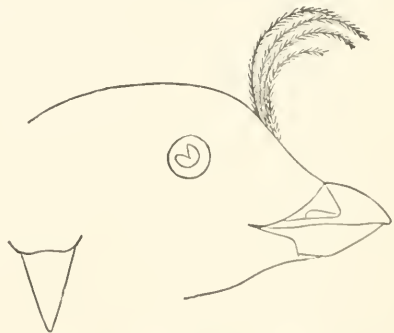


FIG. 728. — Crested Auklet, in winter, nat. size.

longer than high, resembling the young or winter bill of the preceding, having but one pair of small accessory pieces, which fill nasal fossæ and are doubtless shed in winter. Adult ♂ ♀,

in summer: A very long curly crest of slender plumes curving over forward in arc of a circle to droop upon the bill, dark-colored and of same general character as that of *crisatellus*, but of fewer and more thready feathers. A maxillary series of slender filaments from commissure

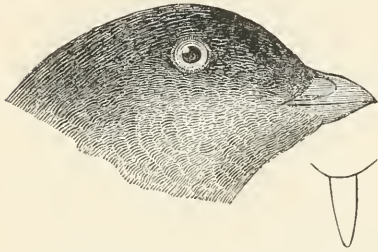


FIG. 729. — Whiskered Auklet, young, nat. size. (From Elliott.)

of bill along side of jaw; another series from base of culmen to eye; a very long postocular series adown side of neck; all these white or yellowish-white. General plumage as in the last, but belly whitish. Bill (dry) orange-red, more salmon color or yellowish at end, in life vermilion with horn-blue tip. Feet dark. Length about 8.00; wing 4.50; tail 1.25; tarsus 1.00; middle toe and claw 1.55; outer 1.60; inner 1.10; chord of culmen 0.45; depth of bill at base 0.30; gape 0.90; crest outstretched 1.50; longest white filaments on head 1.00. Young (*S. cassini* COUES): Bill very small and weak, much compressed. No crest nor white plumes on head. Above blackish-cinereous, quite black on head, wings, and tail; under parts lighter and more grayish-plumbeous, bleaching on belly and crissum. Bill reddish-dusky; tarsi behind and soles black; eye black and white. Nestlings in down sooty, nearly uniform, but paler below. North Pacific coasts and islands, from Kamtschatka through the Aleutians to Unalashka. Figured in breeding plumage in Turner's Cont. Alaska, 1886, p. 120, pl. 1.

(Subgenus CICERONIA.)

S. (C.) pusillus. (Lat. *pusillus*, puerile. Figs. 731, 732, 733.) LEAST AUKLET. MINUTE AUKLET. KNOB-NOSED AUKLET. Adult ♂ ♀, in summer: Bill small and simple, but stout for its length, scarcely higher than wide at base, rather obtuse at tip. A small deciduous knob or tubercle at base of culmen. No crest; but front, top, and sides of head more or less thickly lined with delicate white thready feathers; a similar series, exceedingly fine, from eye along side of hind head and nape. Excepting these filaments and more or less white on scapulars and tips of some secondaries, entire upper parts glossy black; region about under mandible, and a few feathers along sides of body and flanks, blackish; throat white; under parts white, more or less extensively mottled or clouded with blackish, often uninterrupted on fore breast. Lining of wings white, with dark feathers along the edge. Iris white. Bill red; knob and base of upper mandible dark. Legs (dry) dark; front of tarsus and tops of toes lighter. Length 6.50; wing 3.75; tail 1.25; tarsus 0.70; middle toe and claw 1.00; chord of culmen, including the node, 0.40; gape 0.60; height of bill at base 0.30, width scarcely less. In winter: No knob; bill brownish; little white bristles of head retained but less developed; white of under parts extensive, reaching far around sides of neck. Young: Like winter adults, but with smaller bill and lacking white bristles of head and with more white on scapulars. (Figured in Nelson's Cruise Corwin, 1883, colored plate of breeding plumage.) Young in down like that of *S. pygmaeus*. This curious little bird, the smallest of Auks, and one of the least of all water birds, inhabits the coasts and islands of the North Pacific, resorting to favorite breeding places by millions, with *C. psittaculus* and *S. cristatellus*. The nesting is

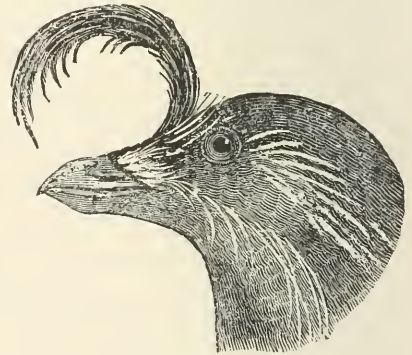


FIG. 730. — Whiskered Auklet, adult, nat. size. (From Elliott.)

similar, the single egg being laid in recesses of rocks over the water; size 1.55×1.12 ; color white or whitish, unmarked, as in other species of this genus. The bird occurs S. to Japan and Sitka, and has been recorded from Puget Sound.

PTYCHORHAMPHUS. (Gr. πτύξ, πτυχος, *ptux, ptuchos*, a fold; ῥάμφος, *hramphos*, beak.)
WRINKLE-NOSED AUKLET. Size moderate; form stout; no crests nor any peculiar feathers about head. Bill about $\frac{2}{3}$ as long as head, stout, straight, little compressed, conic-acute;

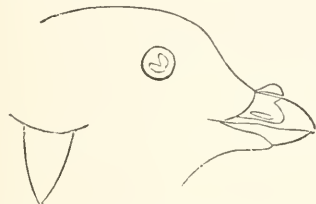


FIG. 731. — Least Auklet, adult, nat. size.

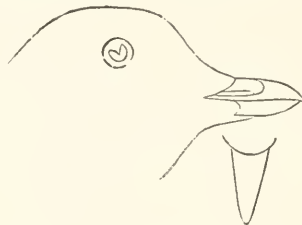


FIG. 732. — Least Auklet, young, nat. size.

culmen little convex, broad at base, where in the dried state transversely corrugated; sides of upper mandible turgid, with inflected tomtia; of under, upright, grooved lengthwise; gonys straight or nearly so, very long. Nasal fossæ large, shallow, covered with soft skin which flares over the rather long, narrowly oval, sub-basal nostrils. Outline of frontal feathers nearly transverse across culmen, thence retreating obliquely to commissure. Tarsus reticulate,

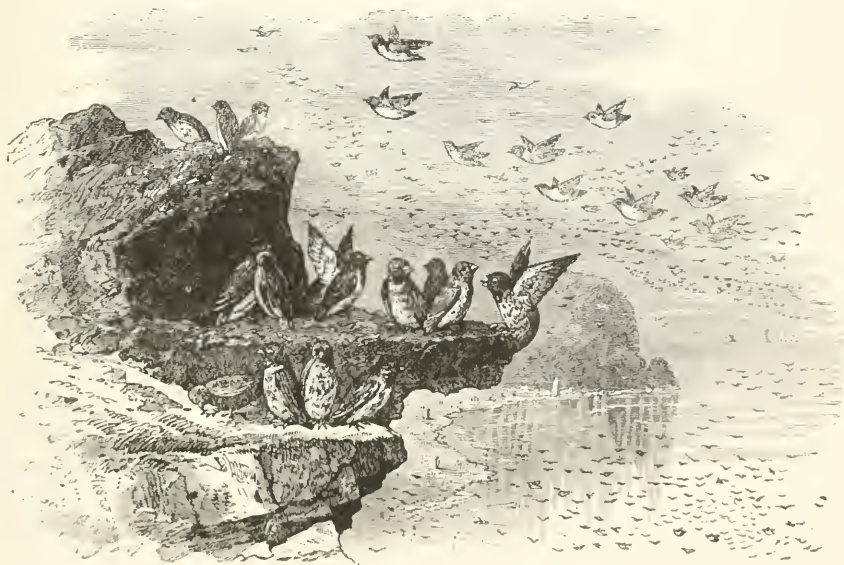


FIG. 733. — Group of Least Auklets. (Designed by H. W. Elliott.)

much shorter than middle toe without claw. Tail of 14 feathers. This genus has much the aspect of *Brachyrhamphus*, with sui generis shape of bill.

P. aleu'ticus. (Of the Aleutian Islands.) ALEUTIAN AUKLET. CASSIN'S AUKLET. Bill black, the skinny part pale or yellowish; feet blackish behind and below, bluish in front of tarsus and on tops of toes. Iris white. A touch of white on lower eyelid. Upper parts blackish-plumbeous; head, wings, and tail nearly black, this dark color, diluted to grayish-

plumbeous, extending around head, neck, and fore-breast, along sides of body, and on lining of wings, fading to white on belly and crissum. No special states of bill or plumage known. Length 8.00–9.50; extent 16.00–18.50; wing 4.75–5.25; tail 1.50–1.75; tarsus about 1.00; middle toe and claw 1.40; outer 1.30; inner 1.10; culmen 0.75; gape 0.90; gonys 0.60; depth of bill at base 0.40, width 0.30. Pacific coast of North America, Aleutians to Lower California, breeding S. to the Farallones, and San Geronimo Island, lat. 30°; egg white, 1.80 × 1.35.

SYNTHLIBORHAMPHUS. (Gr. *συνθλιβω*, *sunthlibo*, I compress; *ράμφος*, *ramphos*, beak.) **NIPPER-NOSED MURRELETS.** Of moderate size and stout form; with or without a crest. Bill somewhat as in *Brachyrhamphus*, but stouter and deeper for its length; greatly compressed throughout, its depth at base about half the length of culmen; culmen moderately convex; gonys ascending. Nostrils sub-basal, broadly oval or nearly circular; nasal fossæ small and shallow, feathered to nostrils. Feathers extending to about opposite points on culmen and keel, thence retreating rapidly. Secondaries very short, as in *Brachyrhamphus*, the longest not reaching much more than half-way from carpal joint to point of closed wing. (This style of wing is characteristic of the Murrelets, which "paddle" the air in a peculiar way.) Tail short, nearly square, of 14 broadly rounded feathers. Tarsi much compressed, like bill; transversely scutellate in front and on sides, reticulate behind; about as long as middle toe without claw. With the general character of *Brachyrhamphus*, this genus differs in the deeper, stouter bill, and much compressed scutellate tarsi; it includes two very stylish species of the North Pacific, subgenerically different from each other. Egg whitish or buffy, heavily marked with brown and gray, 2.40 × 1.55.

Analysis of Species.

Head closely feathered; depth of bill more than half its length; white of sides of crown not advancing before eyes; black of throat extensive. (*Synthliborhamphus*) *antiquus*
 Head crested; depth of bill about half its length; white of sides of crown advancing nearly to bill; dark of throat restricted. (*Rhamphosynthlipsis*) *umizusume*

(*Subgenus* SYNTHLIBORHAMPHUS.)

S. anti'quus. (Lat. *antiquus*, ancient; *i. e.* gray-headed. Fig. 734.) **ANCIENT MURRELET. GRAY-HEADED MURRELET. BLACK-THROATED MURRELET.** Adult ♂ ♀, in breeding dress: Bill whitish or yellowish, its base and ridge black. Iris dark brown. Feet whitish or yellowish, the tarsus behind and both surfaces of webs black. Head black, pure above, sooty on chin and throat; a conspicuous white stripe from over each eye to side of nape, where sometimes connected by some white feathers with its fellow, and spreading on sides and back of neck into a set of sharp white streaks; trace of white on each eyelid. Upper parts dark plumbeous, blackening on tail; upper surface of wing the same, the edging all along from elbow, and exposed parts of primaries, blackish; secondaries like coverts, or rather darker; basal portion of inner webs and shafts of primaries whitish; under surface of wing white, mottled with dusky along



Fig. 734. — Black-throated Murrelet, nat. size.

the edge. Sides of body under wings velvety-black; these black feathers lengthening behind, and overlying the white flanks. Anteriorly this black extends in front of wings and continues on to nape of neck, where it mixes with the white streaks above said. Sooty-black of throat continuous with that of sides of head as far as auriculars, beyond which it narrows to a point on throat, being separated from black of nape by a large white area — an extension to auriculars of the white which is the color of the whole under parts, except as said. Length 9.50–10.50; extent 16.75–18.25; wing 5.50; tail 1.60; tarsus 1.00; middle toe and claw 1.25; outer 1.15; inner 1.00; culmen 0.60; gape 1.20; gonys 0.40; depth of bill at base 0.30, width

0.20. Winter: Upper parts darker, the plumbeous obscured by dusky, especially on wing- and tail-coverts and rump. Forehead, crown, and nape sooty-black, not relieved by white streaks, or only with traces of the latter; eyelids sometimes largely white. No black on throat, only some dusky mottling about base of bill; white of under parts extending on head nearly to eyes, and far around on sides of nape, so that only a narrow median line is left dark. Sides of body under wings merely dusky, not continuous over the flanks, where the feathers are partly white, and scarcely advancing in front of wings. The seasonal plumages, or those dependent upon age, not fully traced; but clarity of the ash, intensity of the black, and distinctness of the white striping, indicate the more perfect feathering, and conversely. North Pacific, both Asiatic and American, S. in winter to Japan and the U. S. (Monterey Bay), breeding from Sitka northward. Accidental once in Wisconsin. Eggs buffy with small markings of brown and lavender-gray, 2.40×1.50 . (*Alca antiqua* GM. 1788. *Uria senicula* PALL. 1811. *Mergulus cirrocephalus* VIG. 1839. *Uria antiqua* AUD. 1839, folio pl. 402, fig. 1; 1844, 8vo pl. 470, fig. 1 (not fig. 2 of these plates, which is *Brachyrhamphus brevirostris*). *Brachyrhamphus* (*Synthliboramphus*) *antiquus* BRANDT, 1837. *B. brachypterus* BRANDT, 1837, as correctly given in original edition of Key, 1872, p. 344; but queried as distinct in 2d-4th eds. p. 814. *Uria cana* KITTLITZ. 1858.

(Subgenus RHAMPHIOSYNTHILIPSIS.)

S. (R.) umizu'sume. (Japanese name, of uncertain orthography and pronunciation, also written *wumizusume*, *wurmizusume*, etc. Fig. 735.) JAPANESE MURRELET. TEMMINCK'S MURRELET. Bill more elongate and acute than in the type of genus, less compressed, not so deep for its length; yellow, with black ridge; feet livid-bluish, with dusky webs; iris dark brown. A large crest, of a dozen (more or fewer) feathers springing from extreme forehead, not recurved, but drooping backward over occiput. A conspicuous series of white feathers on each side of head, from origin of crest over eye to nape, where more or less confluent with those of opposite side, and then dispersed in streaks over sides of neck to shoulders. Rest of head, including throat, sooty or ashy-blackish, this color extending as far as interscapulars, whence upper parts more plumbeous, only darker on wings and tail. Sides under wings plumbeous-black to flanks, this color advancing in front of wings and continuous with that on sides of neck and head. Lining

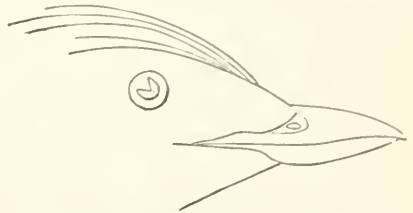


FIG. 735. — Japanese Murrelet, nat. size.

of wings white, except some dark mottling along edge; bases of primaries and most of inner webs white, shading through gray to dusky tips. Whole under parts white, except as said. Length 10.50-11.00; extent 18.00-18.50; wing 5.50; tail 1.75; tarsus 1.00; middle toe and claw 1.25; outer 1.20; inner 1.00; bill along culmen 1.00; gape 1.10; gonys 0.40; height or width at base 0.25-0.30. Younger: No crest; bill obscured; little or no trace of white about head, which is dusky-plumbeous; other upper parts similar, the back lighter; white of under parts extending to bill and far around on sides of neck. There is much variation in different specimens, the full significance of which remains to be determined; but the species is unmistakable. Japan. Questionably American; excluded from A. O. U. Check-List, 1895, though given in 1886. (On this question, still open, see Pr. U. S. Nat. Mus. 1885, p. 521.) **BRACHYRHAMPHUS.** (Gr. *βραχύς*, *brachus*, short; *ῥάμφος*, *rhamphos*, beak.) PEAKED-NOSED MURRELETS. Approaching *Cephus* in generic character. Bill small, slender, much shorter than head, not longer than tarsus, compressed, very acute; culmen gently curved, rictus and gonys straight, tomia of upper mandible inflected toward base, notched near tip. Nasal

fossæ small and shallow, nearly filled with feathers reaching to the broadly oval nostrils. Wings very narrow, falcate, pointed, with extremely short secondaries. Tail nearly square, of 12-14 obtuse feathers. Feet very small and short; tarsus of variable length relatively to toes in the two subgenæ, entirely reticulate. Outer and middle toes of equal lengths; claw of former smaller; inner toe short, its claw not reaching base of middle claw. Claws small, compressed, acute. Containing several species of diminutive Murrelets, of plain coloration, none with plumes on the head, all confined to the Pacific.

Analysis of Species.

Tarsus shorter than middle toe without claw. (*Brachyrhamphus*.)

Bill about as long as inner toe without claw. Upper parts blackish and chestnut, lower blackish and white (summer), or upper parts cinereous and white, lower white (winter); no white on secondaries or tail-feathers *marmoratus*

Bill about $\frac{3}{4}$ as long as inner toe without claw. Upper parts ashy, barred and spotted with dull yellowish; under parts whitish barred with dusky; some white on secondaries and tail-feathers. *brevirostris*

Tarsus as long as middle toe without claw. (*Micruria* or *Eudomychura*.)

Lining of wings white *hypoleucus*

Lining of wings dark *craverii*

(*Subgenus BRACHYRAMPHUS*.)

B. marmoratus. (Lat. *marmoratus*, marbled.) MARBLED MURRELET. WRANGEL'S MURRELET. TOWNSEND'S MURRELET. Adult ♂ ♀, in summer: Bill black; tarsi behind and both surfaces of webs blackish; tarsi in front and top of toes livid flesh-color, or dull bluish-gray; iris brown. Above, brownish-black, barred crosswise with chestnut-brown, or bright rust-color, except on wings, which are uniform brownish-black; primaries darker, their inner webs gray toward the base. Lining of wings brownish-black. A few whitish feathers, varied with chestnut and dusky, on scapulars, but no white tips of secondaries, and none on tail-feathers. Entire under parts, including sides of head and neck, marbled with sooty brownish-black and white, the feathers being white with dark ends. Adults in winter (*B. wrangeli*): No chestnut; under parts immaculate white, excepting some dusky streaks on the long feathers of sides and flanks. Upper parts dark cinereous; centres of feathers, especially of back and rump, blackish; crown, wings, and tail almost black; no white on any tail-feathers; greater wing-coverts narrowly edged with white; scapulars almost entirely white, forming two conspicuous patches. On lores, the white invades to level of eyes, and extends into nasal fossæ; it then dips, leaving the eyes in dark color; on nape it reaches nearly across middle line; on sides of rump it leaves a band of dark color about 1.00 wide. Specimens are found in every stage intermediate between the two here described. Young, first plumage, with bill only $\frac{1}{2}$ as long as head: Resembling winter adults in absence of chestnut. Upper parts blackish, with only a shade of cinereous, therefore darker than in winter adults; white on scapulars present, but restricted, and interrupted with dusky. Under parts white, but thickly marked with fine wavy dusky lines, most numerous across throat, largest on sides and flanks, finest on lower breast; chin, middle of belly and crissum unmarked. Lining of wings as before. Length 10.00; extent 18.00; wing 5.00; tail 1.50; tarsus 0.70; middle toe alone 1.00, its claw 0.20; outer toe and claw 1.15; inner 0.90; culmen 0.60-0.70; gape 1.25-1.35; gonys 0.45-0.55; height of bill at base 0.24, width 0.20. Coasts and islands of North Pacific, on the American side; S. in winter to southern California; breeds S. at least to Vancouver, and apparently does not penetrate far north. Egg buffy, ovate, variously marked with brown, 2.14×1.42 . (*Uria townsendii* AUD. 1839, folio pl. 430; 1844, 8vo pl. 475.)

NOTE. — B. PERDIX. PALLAS' MURRELET. PARTRIDGE MURRELET. This is the closely related species of the Asiatic side of the North Pacific. It differs from *marmoratus* in having the markings of the upper parts tawny or buff instead of chestnut, and the bill longer, over 0.75. *Cephus perdix* PALL. Zoogr. R. A. ii, 1811, p. 351, pl. 80. *Brachyrhamphus perdix* STJN. Zeit. Ges. Orn. iii, 1886, p. 213, pl. 7; RIDGW. MAN. 1887, p. 15. Not separated from the foregoing in former editions of the Key. Not in A. O. U. Lists.

B. brevirostris. (Lat. short-billed; *brevis*, short; *rostrum*, beak.) SHORT-BILLED MURRELET. VIGORS' MURRELET. KITTLITZ'S MURRELET. Closely related to *marmoratus*: belonging to same subgenus, having tarsus shorter than middle toe without claw. Bill hardly $\frac{1}{3}$ as long as head. Adult ♂ ♀, in summer: Above, cinereous of lighter and darker shades, fully spotted and barred with dull yellowish, except on wings, which are plain dusky, with whitish tips of median and greater coverts and inner secondaries; no white on scapulars; lateral tail-feathers largely white. Below, white, extensively mottled and barred with dusky and the buff or tawny yellowish of the upper parts, especially along sides and across breast. Bill black; feet light; eyes brown. Adults in winter: Differing precisely as *B. marmoratus* does from summer plumage. Above, cinereous or plumbeous, nearly uniform, without any buff markings, but darker on head, much white on scapulars and ends of inner secondaries, forming conspicuous patches, and whitish tips of feathers of back, rump, and tail. Below, pure white, with dark touches on sides and flanks, and a dark band extending on sides of fore breast nearly to median line; the white invading side of head to include eye, but leaving an isolated dark spot about eye, and almost forming a collar around back of neck. Bill, eyes, and claws black; feet pale bluish, darker behind. Length 9.00 or more; wing averaging 5.40; culmen 0.45 or less; depth of bill at base 0.25 or less; tarsus 0.60–0.65; middle toe alone 0.85–0.95. North Pacific, both sides, from Japan and Kamtschatka through the Aleutians to Unalashka: apparently not common, on North American side at any rate, and only lately become well known: best figures, from originals of present description, in Nelson's Rep. Alaska, 1887, p. 44, pl. 1 (summer plumage, late in May), and Turner's Cont. Alaska, 1886, p. 120, pl. 2 (winter plumage, Apr. 24). The bird is found with Ancient and Marbled Murrelets; it lays a single white egg in the herbage on ledges and cliffs. *Uria brevirostris* VIG. Zoöl. Journ. iv, 1828, p. 357, ascribed to Mexico! *Brachyramphus brevirostris* STEJ. Zeit. Ges. Orn. iii, 1886, p. 211; RIDGW. Man. 1887, p. 15. *Uria antiqua* AUD. 1839, folio pl. 402, fig. 2: 1844, 8vo pl. 470, fig. 2 (not fig. 1 of these plates, which is *Synthliborhamphus antiquus*). *Brachyramphus kittlitzii* BRANDT, 1837; A. O. U. Lists, 1886–95, No. 24; RIDGW. Man. 1887, p. 15. *Brachyrhamphus kittlitzii* of the Key, 2d–4th eds. p. 813.

(Subgenus MICRURIA.)

B. hypoleucis. (Gr. ἵψο, *hupo*, below; λευκός, *leukos*, white.) WHITE-BELLIED MURRELET. XANTUS' MURRELET. Adult ♂ ♀: Bill $\frac{1}{2}$ the head, $\frac{3}{4}$ the tarsus, very slender; tarsus equal to middle toe without claw. Entire upper parts unvaried dark cinereous, slightly darker on head, extending to include eyelids, and a little farther down on nape; thence in a straight line along middle of side of neck to shoulders, and along sides of body in a strip nearly an inch broad; elongated flank-feathers also of this color; other under parts pure white, including lining of wings. Primaries black, the greater part of their shafts and inner webs whitish. Bill black, base of lower mandible pale; feet whitish-blue, black below. Length 10.00–10.50; extent 16.00–17.50; wing 4.75; tail 1.75; tarsus 0.95; middle toe without claw 0.95, its claw 0.20; outer toe and claw 1.10; inner 0.90; bill 0.80; gape 1.30; gonys 0.45; depth of bill at base 0.22; width 0.19. Southern and Lower California, resident.

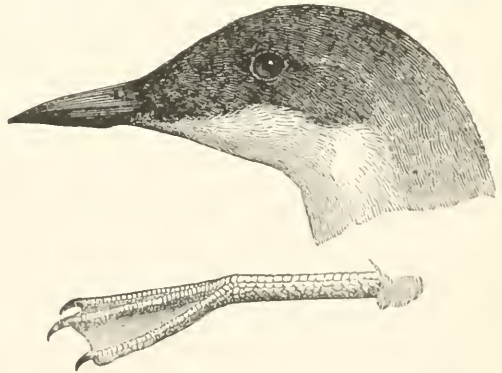


FIG. 736. — Craveri's Murrelet, nat. size. (From Elliott.)

B. craverii. (To F. Craveri. Fig. 736.) CRAVERI'S MURRELET. Resembles the last; differs markedly in having under surface of wings dark. Lower California, both sides, from Cape St. Lucas, N. to Espiritu Santo and Natividad islands, resident; breeding confined apparently to the Gulf. Egg 2.00×1.40 , buff, heavily marked with dark brown.

CEPPHUS. (Gr. κέπφος, *kepphos*, a kind of sea-bird.) BLACK GUILLEMOTS. Bill much shorter than head, about equal to tarsus, straight, rather stout, moderately compressed; culmen at first straight, then decurved; gape straight to near tip; gonys short, straight, ascending, about $\frac{1}{2}$ as long as culmen. No nick or groove near tip of upper mandible; its tomial edge scarcely inflected. Nasal fossæ large and deep, partially filled with feathers which do not entirely cover nostrils. Feathers salient in rounded outline on side of lower mandible. Tail of 12–14 feathers, little rounded. Tarsus entirely reticulate, slightly shorter than middle toe without claw. Claws compressed, arched, acute, the outer grooved on outer side, the middle dilated on inner edge. No postocular furrow in plumage. Color black, usually with white on head or wing; bill black; feet red; in winter, plumage largely white. Eggs plural, colored. *Uria* of former editions of the Key.

Analysis of Species (Adults in Summer).

Tail of 12 feathers. (*Cephus* proper.)

A large white mirror on wing above and below, entire; no white about head. Circumpolar *mandti*

A large white mirror on wing above and below, former partly divided; no white about head. Atlantic *grylle*

Tail of 14 feathers. (*Pseuduria*.)

A large white mirror on wing above, partly divided; none below; no white about head. Pacific . . . *columba*

No white mirror on wing; parts about eye and bill white. Pacific *carbo*

C. mandt'i. (To Martin Win. Mandt, in whose Inaugural Dissertation of 1822, p. 30, it was dedicated to him by Lichtenstein.) MANDT'S GUILLEMOT. GLACIAL GUILLEMOT. Similar to the common Black Guillemot; but white mirror on upper side of wing entire, the greater coverts being white to the very base or nearly so, and therefore not even making a concealed black bar or wedge in the white field; bill rather smaller. A circumpolar species, S. on the Atlantic coast of North America in winter to Massachusetts, and on the Alaskan coast to Norton Sound; breeding range from Labrador and Hudson's Bay northward. *Uria mandtii* LICHT. as just said. *Cephus mandtii* Bp. 1856; A. O. U. 1886–95, No. 28. *Uria grylle*, in part, of all former editions of the Key, and perhaps only a subspecies of this.

C. grylle. (Swedish name of the bird in Gothland. Fig. 737.) BLACK GUILLEMOT. WHITE GUILLEMOT. WHITE-WINGED GUILLEMOT. SCAPULAR GUILLEMOT. SPOTTED GREENLAND DOVE. SEA-PIGEON. TYSTY. GEYLLÉ.

Adult ♂ ♀, in full dress: Plumage sooty-black with a tint of "invisible" green; wings and tail pure black; former with a large white mirror on both surfaces. Bill and claws black; mouth and feet carmine, vermilion or coral red; eyes brown. This faultless dress-suit is worn only about two months. In August, the wings and tail fade to gray; the body-color loses the green gloss; the white mirror is soiled with brown. When the quills and tail-feathers have fallen, and new ones partly grown, progress of the moult gives a



FIG. 737. — Black Guillemot, nat. size.

new clean white mirror, smaller than in midsummer; head and neck all around, rump and under parts, marbled with black and white, the bird looking as if dusted over with flour; back black, the feathers mostly edged with white. Completion of the moult gives the following winter plumage: Wings and tail black, the white mirror faultless; head and neck all around,

rump and under parts, white; back and more or less of hind neck and head black, variegated with white. Young in first plumage: Bill black; feet dusky reddish. Upper parts plumbeous or sooty, little varied with white; under parts white, marbled, rayed, and waved with dusky; incipient mirror spotty. Nestlings are covered with sooty brownish-black down; bill and feet brownish-black. Perfectly white (*lacteolus*, *niveus*) and entirely black (*motzfeldi*, *unicolor*) birds are rarely seen. In some cases, very old birds remain black in winter. The mirror on the upper surface of the wings is composed of the terminal half (more or less) of the greater coverts, the rest dark; of the several next rows excepting their dark bases, the white of these coverts normally overlying and concealing the dark basal portions of the greater coverts, so that the oval mirror is usually unbroken; the anterior border of the mirror is the line through the union of white tips with dark bases of the row of lesser coverts about $\frac{1}{2}$ an inch from the fore-arm edge of the wing. When, as not seldom happens, the row of greatest coverts are dark beyond the extent of the next row, this dark uncovered portion shows as a wedge partly splitting the mirror, as normally occurs in *U. columba*. Or, the greater row of coverts may be entirely dark, when the mirror is unbroken, as before, but much smaller; or, again, the middle row of coverts may be tipped with dark, making a break across the mirror, but in a different method from that first described. Finally, the mirror may be only indicated by isolated white feathers, or wholly wanting. Length, average, 13.00; extent, average, 22.50; wing 6.00–6.25; tail about 2.00; tarsus 1.25; middle toe and claw 1.75; bill 1.30; gape 1.75; gonys 0.65; depth of bill at base 0.45, width 0.35. Europe and North American

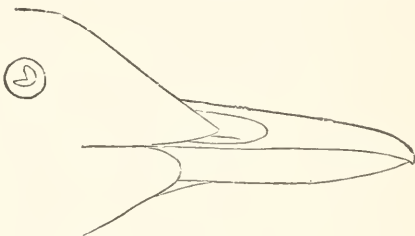


FIG. 738. — Pigeon Guillemot, nat. size.

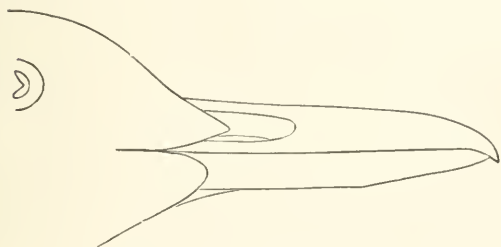


FIG. 739. — Sooty Guillemot, nat. size.

coasts and islands of the North Atlantic, very abundant; not authentic in the North Pacific, where replaced by *columba*; not occurring in the Arctic Ocean, where replaced by *mandti*; in North America breeding in southern Greenland, Labrador, Magdalen islands, and Newfoundland, and S. to islands of Maine coast; S. in winter to the Middle States. Gregarious; flying in close flocks low over the water; nesting scattering in rifts of rock near the water; eggs 2–3, sea-green, greenish-white or white, spotted and blotched most irregularly with blackish-brown, and with purplish shell-markings; size 2.25–2.50 × 1.50–1.60; shape nearly elliptical, not pyriform like those of Guillemots; laid in June, July. *Uria grylle*, in part, of former editions of the Key, including *C. mandti*. *Cephus grylle* BREHM. 1831. *Cephus grylle* NAUM. 1844; A. O. U. Lists, 1886–95, No. 27. *Uria unicolor* FABER, and *U. motzfeldi* BENICKEN, 1824, are believed to be a melanism of *grylle*: but *Cephus motzfeldi* STEL. Pr. U. S. Nat. Mus. vii, Aug. 5, 1884, p. 210; B. B. & R. Water B. N. A. ii, Sept. 1884, p. 497; A. O. U. Hypothetical List, 1886–95, No. 2, is compared with *C. carbo*.

C. colum'ba. (Lat. *columba*, a pigeon. Fig. 738.) PIGEON GUILLEMOT. Bill stouter than that of *grylle*, and more obtuse. No white on under surface of wing. White mirror of upper surface nearly split in two by an oblique dark line, caused by extension of dark bases of greater coverts in increasing amount from within outward, till the outermost are scarcely tipped with white; consequently there is a dark wedge between the white ends of greater and middle rows

of coverts. Plumage and its changes otherwise as in *grylle*; general habits and nesting the same; eggs indistinguishable. Asiatic and American coasts and islands of the North Pacific, S. to Japan and southern California.

OS. — **C. snow'i.** (To Capt. H. J. Snow of Yokohama.) SNOW'S GUILLEMOT. Described as like *C. columba*, with black wings, only relieved by white tips of the larger coverts; lining of wings smoky-gray; no white about eyes; tail-feathers 14. Kurile Islands. *St. Auk*, April, 1897, p. 201.

C. car'bo. (Lat. *carbo*, a coal; *i. e.* black. Fig. 739.) SOOTY GUILLEMOT. SPECTACLED GUILLEMOT. Like *columba*; larger, especially the bill. No white on either surface of wing. A pair of white spectacles on eyes, and whitish about base of bill. General plumage and its changes as in others of the genus; bill and feet the same; tail of 14 feathers. Length 14.00–15.00; wing 7.75; tail 2.50; tarsus 1.50; middle toe and claw 2.10; bill 1.55–1.70 along culmen, along gape 2.20, from feathers on side of lower mandible 1.50; depth at base 0.50; width 0.38. North Pacific in higher latitudes; Sea of Okhotsk; Bering Island; Japan; breeds on the Kurile Islands, but is only hypothetically North American. *Cephus carbo* PALL. 1811; A. O. U. Hypothetical List, No. 3. *Uria carbo* of former editions of the Key.

Subfamily ALLINÆ: Sea Doves.

The characters of this subfamily are coincident with those of its single genus *Alle*.

AL/LE. (Swedish name of the bird.) SEA DOVES. Size small; form squat and bunched. Bill very short, stout, and obtuse, as wide as high at base; sides of both mandibles turgid, edge of upper much inflected; culmen very convex; rictus ample, decurved at end; gonys straight, very short; mandibular rami correspondingly long, widely divaricated, the space between them extensively feathered; nasal fossæ short, wide, deep, partly feathered. Nostrils sub-basal, sub-circular. Wings rather long for this family; tail much rounded, of 12 narrow pointed feathers. Feet small and weak; tarsus shorter than middle toe and claw, scarcely compressed, broadly scutellate in front, finely reticulate behind.

A. al'te. (The specific name duplicates the generic. Fig. 740.) LITTLE AUK. SEA-DOVE. DOVEKEY, DOVEKEE or DOVEKIE. ROTCH, ROTCHE or ROTGES. ALLE. Adult ♂ ♀, in summer: Head, neck, and upper parts, glossy blue-black; sides of head and neck with throat and jugulum sooty brown; scapulars edged and secondaries tipped with white, forming conspicuous patches; touches of white about eyes. Under parts from the chest pure white, some long feathers of flanks rayed with black; lining of wings dusky. Bill black; mouth yellow; feet black behind and below, in front and above flesh-colored; eyes brown. In winter: White of under parts extending to bill, and nearly around sides of neck. Young in winter: Like winter adults, but upper parts duller; bill smaller; feet dusky greenish, the scales obscured. Downy young: Smoky gray, paler below. Length 8.50; extent 15.50; wing 4.75–5.25; tail 1.50; tarsus 0.80; middle toe and claw 1.20; outer 1.15; inner 0.85; chord of culmen 0.50; gape 1.00; gonys 0.20; height or width of bill at base 0.35. North Atlantic, both coasts, and Polar seas; in North America S. in winter to the Middle States or beyond. Overtaken by storms at this season, this little bird is not seldom blown inland—to Michigan, for instance. It is very abundant at its breeding grounds in the far North, being one of the most boreal of birds. Egg single, 1.60–1.85 × 1.10–1.25, pale greenish-blue, unmarked. (*Mergulus alle* of 1st and *Alle nigricans* of 2d–4th eds. of Key.)

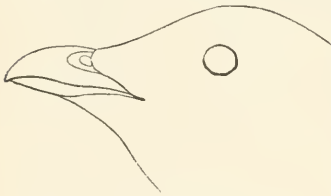


FIG. 740. — Sea-dove, nat. size.

below. Length 8.50; extent 15.50; wing 4.75–5.25; tail 1.50; tarsus 0.80; middle toe and claw 1.20; outer 1.15; inner 0.85; chord of culmen 0.50; gape 1.00; gonys 0.20; height or width of bill at base 0.35. North Atlantic, both coasts, and Polar seas; in North America S. in winter to the Middle States or beyond. Overtaken by storms at this season, this little bird is not seldom blown inland—to Michigan, for instance. It is very abundant at its breeding grounds in the far North, being one of the most boreal of birds. Egg single, 1.60–1.85 × 1.10–1.25, pale greenish-blue, unmarked. (*Mergulus alle* of 1st and *Alle nigricans* of 2d–4th eds. of Key.)

Subfamily ALCINÆ: Murres or Guillemots, and Auks.

See p. 1062 for characters of this subfamily, which is now restricted to the several species of Murres of the genus *Uria*, and two species of Auks proper, representing the two genera *Alca* and *Plautus*. All these birds are of the largest size in the family, readily recognized among other *Alcidæ*, and the three genera are strongly marked. The bill has no deciduous elements, and the head no crests of any sort. The bill in *Uria* is simply elongate, but is peculiarly sulcate and cultrate in *Alca* and *Plautus*. Murres and Auks abound in North Atlantic waters, in the same situations as the Puffins, and the two species of Murres are also numerously represented by two subspecies in the North Pacific, where, however, *Alca* does not occur. The student will observe that the name "guillemot" is common to the species of *Uria*, of the present subfamily, and to those of *Cephus*, of the subfamily *Phaleridina*. This is unfortunate, but cannot be helped, and need occasion no confusion, if it be noted that the species of *Cephus* are qualified as *black* Guillemots.

URIA. (Lat. from Gr. *οὔρια*, *ouria*, a kind of diving bird.) **MURRES.** **GUILLEMOTS.** **EGG-BIRDS.** Bill shorter than head, longer than tarsus, straight or slightly decurved, much



FIG. 741. — Gathering Murre's eggs in Alaska. (Designed by H. W. Elliott.)

compressed; culmen regularly curved throughout; rictus curved in most of its length; gonys straight, or little curved, nearly as long as culmen; upper mandible grooved near tip, its commissural edge greatly inflected. Nasal fossæ fully feathered; nostrils covered. Feathers on lower mandible retreating in straight oblique line from interramal space to rictus. Tail short, rounded, with 12 broad (not pointed) feathers, contained over 3 times in length of wing. Tarsus compressed, much shorter than middle toe and claw; outer claw not grooved on outer face. A furrow in plumage behind eye. Colors dark above, white below. Egg single, pictured, pyriform. *Lomria* of all former editions of the Key.

Analysis of Species and Subspecies.

Depth of bill opposite nostrils not one-third the length of culmen.

Bill comparatively slender, not dilated along edge of upper mandible at base; culmen, commissure, and gonyes curved. Atlantic *troile*

Bill stouter, somewhat dilated along edges of upper mandible at base; culmen, rictus, and gonyes nearly straight. Pacific *troile californica*

Depth of bill opposite nostrils more than one-third the length of culmen.

Bill very stout, thick, deep, much dilated along edges of upper mandible at base; culmen, commissure, and gonyes curved. Atlantic *lomvia*

Bill less stout. Pacific *lomvia arra*

U. troile. (Nom. propr. of uncertain reference. "Possibly a compliment to Troil, the Ice-lander." NEWTON. Figs. 742, 743, 746.) COMMON or FOOLISH GUILLEMOT, GUILLEM or GWILYM. COMMON MURRE. TINKER or TINKERSHIRE. KIDDAW or SKIDDAW. MARROCK. WILLOCK. SCUTTOCK. SCOUT. STRANY. LAVY. FROWL. (Several of these

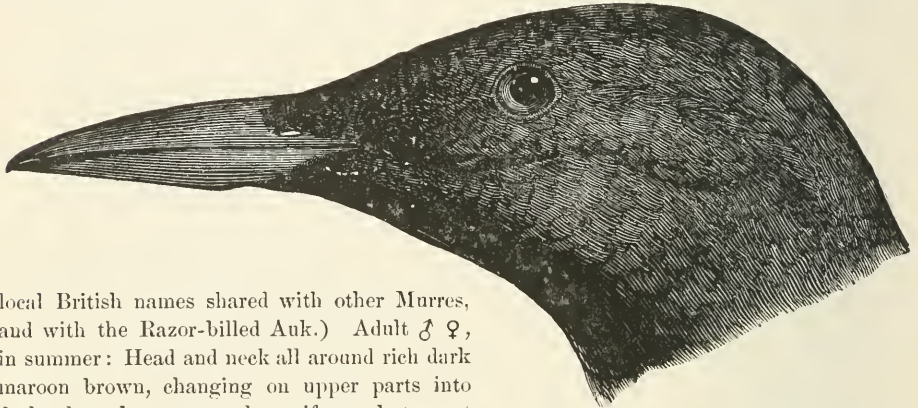


FIG. 742. — Common Guillemot, or Murre, nearly nat. size. (From Elliott.)

local British names shared with other Murres, and with the Razor-billed Auk.) Adult ♂ ♀, in summer: Head and neck all around rich dark maroon brown, changing on upper parts into dark slaty-brown, nearly uniform, but most feathers of back and rump with slightly lighter, more grayish-brown, edges. Secondaries narrowly but distinctly tipped with white. Under parts from throat pure white; sides and flanks marked with dusky or slaty; lining of wings varied with white and dusky. Bill black; mouth yellow; eyes brown; feet blackish. In some cases, not in most, a white "eye-glass," consisting of a rim around eye and handle back of eye in the furrow of the plumage (such birds, which are of either sex, being the so-called Ringed or Bridled Guillemot, *U. ringvia*). In winter: White of under parts reaching bill, on sides of head to level of commissure, farther around on sides of neck, leaving only a narrow isthmus of dark color; the two colors shading without distinct line of demarcation; usually a spur of

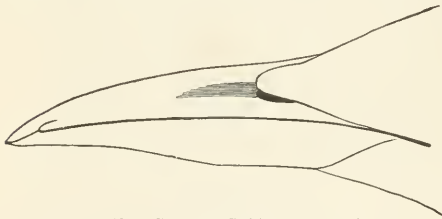


FIG. 743. — Common Guillemot, nat. size.

dark color in the furrow behind eye. Young, first winter: Similar to adults at that season but with less white on sides of head and slight dusky mottling on jugulum; bill shorter and weaker, and, like the feet, in part light-colored. Fledglings dusky brownish, with white breast and belly, and whitish about head and neck. Length 17.00; extent 30.00; wing 8.00; tail 2.25; tarsus 1.40; middle toe and claw 2.10; outer 2.00; inner 1.70; culmen 1.75; gape 2.50; gonyes 1.15; depth of bill at base 0.55; width 0.30. (The figures are averages of adults; total range of variation 15.00–18.00 in length, and other measurements to

correspond.) European and American coasts and islands of the North Atlantic, to or beyond lat. 80° N.; on the American side breeding from Gulf of St. Lawrence northward; in winter S. to New England. Myriads of Murres congregate to breed on rocky islands, incubating their single eggs as closely together as they can find standing-room on the shelves of the cliffs; their ranks serried on ledge after ledge, and clouds of birds whirling through the air. The eggs, so numerous as to have commercial value, are notorious for their variability in coloration. The size is great for that of the bird, averaging 3.25×2.00 , running unusually from 3.00 to 3.50, with half as much variation in breadth. The ground color ranges from creamy to pure white, then through earthy, grayish, bluish, or greenish-white to sea-green and every darker shade of green. The

markings of the creamy and white varieties are generally spots and blotches of different shades of brown, pretty uniformly dispersed, and eggs of this type resemble those of the Razor-billed Auk, but may usually be distinguished by larger size (in length) and more pyriform shape. The green eggs are endlessly varied, in pattern of the markings, but are normally more streaked in sharp angular zigzag lines, inextricably confused, reminding one of Chinese literature. *Lomvia troile* of former editions of the Key.

U. t. californica. (Fig. 744.) CALIFORNIAN MURRE or GUILLEMOT. FARALLONE BIRD. Like the last. Bill somewhat longer, about 1.90; culmen, commissure, and gony usually less curved; upper mandible somewhat dilated toward base along cutting edges, and less feathered; gonydeal angle prominent. The bill consequently approaches that of *lomvia* in width and depth, but exaggerates the length and straightness of that of *troile*. Pacific coast of North America, breeding from islands in Bering's Sea to southern California. *Lomvia troile californica* of former editions of the Key.

U. lomvia. (Faroese name; Icelandic *langvia*. Fig. 745.) BRÜNNICH'S MURRE. FRANKS' GUILLEMOT. THICK-BILLED GUILLEMOT. Similar to *troile* in plumage and its changes,

but pileum and nape darker and contrasting with brown of throat and sides of head and neck. Form very robust. Bill short, stout, wide, deep; culmen curved throughout; commissure decurved at end; gony if anything concave in outline, the angle very protuberant; cutting edges of upper mandible dilated and denuded toward base, this bare turgid space flesh-colored in life, drying pale yellowish. Length 18.00; extent 32.00; wing 8.50; tarsus 1.35; culmen 1.40, gape 2.20; gony 0.90; depth of bill at angle 0.55, width at base of

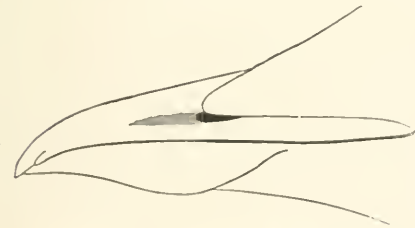


FIG. 745.—Thick-billed Guillemot, nat. size.

nostrils 0.30, at angle of mouth 0.80. Young: Plumage resembling that of winter adults; smaller, with especially smaller and thinner bill. Length hardly 16.00; extent about 29.00; wing 7.75; tail 2.00; culmen 1.20; gony 0.63; depth of bill 0.42, width 0.27. North Atlantic and Polar seas, on the shores and islands, in myriads; on the American side of the Atlantic

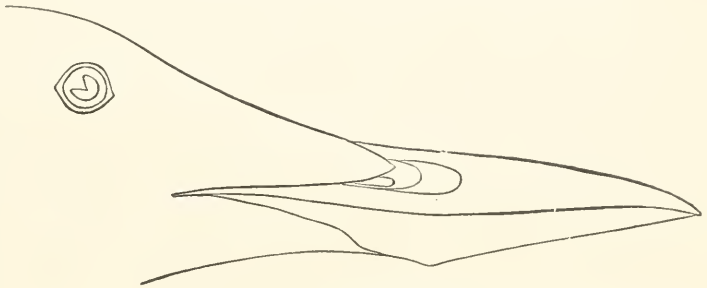


FIG. 744.—Californian Guillemot, nat. size.

breeding from the Gulf of St. Lawrence northward, S. in winter to the Middle States regularly, and casually farther. Egg indistinguishable from that of *troile*. The numbers of Murres, either of this or other species, observed anywhere in winter, bear no estimable proportion to the millions that congregate in the breeding resorts, and their winter whereabouts is something of a mystery. Individuals of any species are liable to be blown inland or otherwise beyond their range. Thus, a storm of Dec. 16, 1896, scattered a flight of Brünnich's Murres over the U. S. from Michigan and Indiana to South Carolina; a few of these were captured and recorded. (Auk, Apr. 1897, pp. 197-199, 202, 203, 226, 228.) *Lomvia arva svarbag* of 2d-4th editions of the Key.

U. l. ar'ra. (Russian name.) PALLAS' MURRE. PACIFIC THICK-BILLED GUILLEMOT. The North Pacific form, unquestionably of the "thick-billed" species, does not exhibit the extreme of shortness and stoutness of bill described for Brünnich's Murre of the Atlantic; culmen about 1.67, depth opposite nostrils hardly 0.67, thus less than half length of culmen, instead of about half; gape nearly 3.00. Tomia of upper mandible dilated and denuded, of a glaucous bluish color; tip of bill less deflexed, though more so than in the Common Guillemot. This is the great "egg-bird" of the North Pacific; on St. George's, one of the Pribilof group, for example, the birds "go flying around the island in great files and platoons, always circling against or quartering, on the wing, at regular hours in the morning and the evening, making a dark girde of birds more than a quarter of a mile broad and thirty miles long,



FIG. 746. — Murres.

whirling round and round the island, and forcing upon the most casual observer a lasting impression." *Lomvia arva* of former editions of the Key.

AL/CA. (Lat. from Icelandic *alka*, Teutonic *alk*; an Auk.) RAZOR-BILLED AUK. Size, form, and general aspect of the last genus. Bill shorter than head, densely feathered for half its length, the feathers extending on upper mandible beyond middle of commissure, those on lower somewhat farther. Bill greatly compressed, cultrate, sulcate, hooked; culmen ridged, regularly convex; commissure straight to the hook; gonys about straight. Nostrils linear, marginal, densely feathered. Tarsi scutellate in front. Tail short, pointed, of 12 stiffish, acute

feathers. Wings normal, effective for flight. Bicolor. Egg single, colored. One species. *Utamania* of former editions of the Key.

A. tor'da. (Name of the bird *tord* or *tordmule*.) RAZOR-BILLED AUK. TINKER. Adult ♂ ♀, in summer: Bill and feet black, former with a white line occupying the length of middle sulcus on both mandibles; mouth yellow; eye hazel-brown or bluish. A strict, sunken line



FIG. 747. — Great Auk. (From "Sport with Gun and Rod." The Century Co., N. Y.)

of white from eye to base of culmen. Head and neck all around and upper parts black, glossy and intense on latter, lustreless opaque brownish-black on sides and front of former. Tips of secondaries and entire under parts from neck, including lining of wings, white. In winter: White reaching bill, and invading sides of head and neck; the sharp white line so conspicuous in summer obliterated; dark parts duller. Young: Similar to adults in winter; smaller:

duller; bill smaller, unformed, ungrooved, and lacking any white line. Nestlings clothed with sooty down overlaid with rufous, paler or whitish on head, neck, and below. Length of adults about 18.00; extent 27.00; wing 7.75; tail 3.50, graduated 1.25; tarsus 1.25; middle or outer toe and claw 2.00, inner 1.40; chord of culmen 1.30, arc 1.50; gape 2.25; gonys 0.75; greatest depth of bill 0.90. This Auk abounds on the North Atlantic, both coasts, and parts of the Polar seas. On our coast, it breeds in great numbers in the Gulf of St. Lawrence, about Newfoundland and Labrador, and strays S. in winter to the Middle States, like other *Alcide*, and casually to North Carolina. A very few still occur in summer at Grand Manan. Eggs usually laid in caverns and fissures of rocks along precipitous shore-lines, often with those of Murres, Sea-pigeons, and Puffins; about $3.00 \times$ scant 2.00, white with creamy or milky-bluish tint, never green like those of Murres, spotted and blotched, but not fantastically traced over, with different shades of umber-brown; less pointed; laid in June and July. *Utamunia torda* of former editions of the Key.

PLAUTUS. (Lat. flat-footed.) HIS GRACE, THE AUK, who lost the use of his wings, and perished off the face of the earth in consequence.

P. impennis. (Lat. *impennis*, wingless. Fig. 747.) THE GREAT AUK, or GAREFOWL. Largest of the family: length about 30.00; wing 6.00; tail 3.00, of 14 feathers; bill along gape 4.25; chord of culmen 3.15; greatest depth of upper mandible 1.00, of lower 0.67; greatest width of bill 0.67; tarsus 1.67; middle toe and claw 3.25; outer 3.00; inner 2.25. A great white oval spot between eye and bill. Hood and mantle dark; under parts white, extending in a point on the throat; ends of secondaries white. Bill black, with white grooves; feet black; iris hazel-brown. Special interest attaches to this bird, which is now extinct, largely through human agency. It formerly inhabited the North American coast from Massachusetts northward, as attested by earlier observers, and by the plentiful occurrence of its bones in shell-heaps; also Greenland, Iceland, and the northwest shores of Europe from the British islands nearly to the Arctic Circle. On our shores it was apparently last alive at Funk Island off the south coast of Newfoundland; in Iceland, its living history has been brought down to 1844. For some years it was currently, but prematurely, reported extinct. Mr. R. Deane has recorded (Am. Nat. vi, 1872, 368) that a specimen was "found dead in the vicinity of St. Augustine, Labrador, in November, 1870;" this one, though in poor condition, being sold for \$200, and sent to Europe. But there appears to be some question respecting the character, date, and disposition of this alleged individual; and it seems very improbable that the species lived down to 1870. I know of only four specimens in this country, — in the Smithsonian Institution, in the Philadelphia Academy, the Cambridge Museum, and Vassar College, Poughkeepsie (the latter the original of Audubon's figures). There is an egg in each of the first two mentioned collections. In pattern of coloration the egg is like that of the Razor-billed Auk, though it is of course much larger, measuring about 5.00×3.00 . About 70 skins appear to be preserved in various museums, with as many eggs, some 6 more or less complete skeletons, and other bones representing perhaps 100 individuals.

PART IV.

SYSTEMATIC SYNOPSIS

OF THE

FOSSIL BIRDS OF NORTH AMERICA.

There is at present no satisfactory evidence that Birds existed in North America before the Jurassic period; the footprints in the sandstone of the Connecticut Valley attributed to Birds having probably all been made by Dinosaurian Reptiles (p. 62). A number of Cretaceous Birds have been known for some years, as given in the original edition of this work (1872); but it is only since 1881 that this class of vertebrates has been traced back to the Jurassic by the discovery of *Laopteryx priscus* on a geologic horizon nearly that of the famous *Archaeopteryx*.

The Tertiary Birds of North America belong to genera identical with, or nearly related to, those now living. The case is otherwise with the earlier forms from the Cretaceous and the Jurassic. Most of these are "*Odontornithes*," or Birds with teeth; having the teeth implanted either in grooves (*Odontolæ*), or in sockets (*Odontotormæ*), as illustrated by the genera *Hesperornis* and *Ichthyornis* respectively.

In the original edition of the Key these Cretaceous types were ranged with those from the Tertiary, their characters not having been fully worked out at that time. They have since become well known, through Professor Marsh's restorations and illustrations (*Odontornithes*, 4to, Washington and New Haven, 1880).

It is deemed advisable to present the Fossil Birds of North America under the three categories of Tertiary, Cretaceous, and Jurassic forms; the first-named being ranged under the several orders to which they are supposed to belong, as described in this work; the remainder, with few exceptions, being *Odontornithes*, which are most conveniently catalogued alphabetically.

A. — Tertiary Birds.

CARINATÆ (p. 244).

PASSERES (p. 244).

PALÆOSPIZA BELLA.

Palæospiza bella ALLEN, Bull. U. S. Geol. Surv. Terr. iv, No. 2, May 3, 1878, pp. 443-445, pl. 1, figs. 1, 2. — Am. Journ. Sci. xv, May, 1878, p. 381. — Amer. Nat. xv, Mar. 1881, p. 253. — COUES, Key, 2d ed. 1884, p. 822. — A. O. U. Check-List, 2d ed. 1895, p. 345.

Based upon some beautifully preserved remains, from the insect-bearing shales of Florissant, Colorado, now deposited in the Museum of the Boston Society of Natural History. They consist of the greater part of the skeleton, including all the bones of the wings and legs excepting the femurs, but unfortunately lacking the bill. The impression of the feathers of the wings and tail are remarkably distinct, showing not only the general shape of these parts, but the shafts and barbs of the feathers themselves. The bones are all *in situ*, "and indicate beyond question a high ornithic type, probably referable to the oscine division of the *Passeres*. The lack of the bill renders it impossible to assign the species to any particular family, but the fossil on the whole gives the impression of Fringilline affinities." The approximate length of the specimen is seven inches.

SCOLECOPHAGUS AFFINIS.

Scolecophagus affinis SHU. Journ. Acad. Nat. Sci. Phila. xi, 1892, p. 418. pl. xv, fig. 10. — A. O. U. Check-List, 2d ed. 1895, p. 345.

A Grackle from the Pliocene of Oregon.

CORVUS ANNECTENS.

Corvus annectens SHU. Journ. Acad. Nat. Sci. Phila. xi, 1892, p. 419, pl. xv, figs. 14, 15, 16. — A. O. U. Check-List, 2d ed. 1895, p. 345.

A Crow from the Pliocene of Oregon.

PICARIÆ (p. 537).

UINORNIS LUCARIS.

Uinornis lucaris MARSH, Am. Journ. Sci. iv, Oct. 1872, p. 259. — COUES, Key, 1872, p. 347. — COUES, Key, 2d ed. 1884, p. 822. — A. O. U. Check-List, 2d ed. 1895, p. 345.

This bird was about as large as a Robin, and apparently related to the Woodpeckers. The only known remains are from the Lower Tertiary formation of Wyoming Territory. They are preserved in the Museum of Yale College.

RAPTORES (p. 617).

AQUILA PLIOGRYPUS.

Aquila pliogryps SHU. Journ. Acad. Nat. Sci. Phila. xi, 1892, p. 416, pl. xvii, fig. 33. — A. O. U. Check-List, 2d ed. 1895, p. 344.

An Eagle from the Pliocene of Oregon.

AQUILA SODALIS.

Aquila sodalis SHU. Journ. Acad. Nat. Sci. Phila. xi, 1892, p. 417. — A. O. U. Check-List, 2d ed. 1895, p. 344.

Another Eagle from the same formation, supposed to be distinct from the foregoing.

AQUILA DANANA.

Aquila danana MARSH, Am. Journ. Sci. ii, Aug. 1871, p. 125. — COUES, Key, 1872, p. 347. — COUES, Key, 2d ed. 1884, p. 822. — A. O. U. Check-List, 2d ed. 1895, p. 344.

This species was nearly as large as the Golden Eagle (*A. chrysaëtus*). The only known remains were found in the Pliocene of Nebraska, and are preserved in the Yale Museum.

BUBO LEPTOSTEUS.

Bubo leptosteus MARSH, Am. Journ. Sci. ii, Aug. 1871, p. 126. — COUES, Key, 1872, p. 347. — COUES, Key, 2d ed. 1884, p. 822. — A. O. U. Check-List, 2d ed. 1895, p. 344.

A species about two-thirds as large as the Great Horned Owl (*B. virginianus*). The remains were discovered in the Lower Tertiary beds of Wyoming, and are now in the Yale Museum.

PALÆOBORUS UMBROSUS.

Cathartes umbrosus COPE, Proc. Phila. Acad. xxvi, 1874, p. 151. — Ann. Rep. Chief of Engrs. U. S. A. 1874, p. 606.

Vultur umbrosus COPE, Proc. Phila. Acad. xxvii, 1875, p. 271. — Ann. Rep. Chief of Engrs. U. S. A. 1875, p. 993. — Rep. Surv. W. 100th Merid. iv, pt. ii, p. 287, pl. lxvii, figs. 10-18, pl. lxxviii, figs. 1-19.

Palæoborus umbrosus COUES, Key, 2d ed. 1884, p. 822. — A. O. U. Check-List, 2d ed. 1895, p. 344.

From the Pliocene of New Mexico; remains found in the sands north of Pojuaque, representing a rapacious bird in size intermediate between the Golden Eagle and the Turkey Vulture; referred at first to the genus *Cathartes*, afterward provisionally to the genus *Vultur*. As the description and figures clearly indicate a bird generically distinct from *Cathartes*, and as the improbability of the occurrence of a true *Vultur* in North America is extreme, this species was made the type of a new genus, *Palæoborus*, in the second edition of the Key.

PALÆOTETRIX GILLI.

Palæotetrix gilli SHU. Journ. Acad. Nat. Sci. Phila. xi, 1892, p. 415, pl. xvii, fig. 37. — A. O. U. Check-List, 2d ed. 1895, p. 343.

From the Pliocene of Oregon.

PEDIOCÆTES LUCASI.

Pediocætes lucasi SHU. Journ. Acad. Nat. Sci. Phila. xi, 1892, p. 414, pl. xvii, fig. 30. — A. O. U. Check-List, 2d ed. 1895, p. 343.

A Grouse from the Pliocene of Oregon, supposed to be closely related to the common Sharp-tailed Grouse.

PEDIOCÆTES NANUS.

Pediocætes nanus SHU. Journ. Acad. Nat. Sci. Phila. xi, 1892, p. 414, pl. xvii, figs. 36, 37. — A. O. U. Check-List, 2d ed. 1895, p. 343.

From the same geographical locality and geological horizon as the last.

GALLINÆ (p. 719).**MELEAGRIS ANTIQUUS.**

Meleagris antiquus MARSH, Am. Journ. Sci. ii, Aug. 1871, p. 126. — COUES, Key, 1872, p. 347. — COUES, Key, 2d ed. 1884, p. 823. — A. O. U. Check-List, 2d ed. 1895, p. 343.

This species was nearly as large as the Wild Turkey (*M. gallopavo*). The remains representing it were found in the Miocene of Colorado, and are preserved in the Yale Museum.

MELEAGRIS ALTUS.

Meleagris altus MARSH, Proc. Phila. Acad. Mar. 1870, p. 11. — Amer. Nat. iv, July, 1870, p. 317. — Am. Journ. Sci. iv, Oct. 1872, p. 260. — COUES, Key, 1872, p. 348. — COUES, Key, 2d ed. 1884, p. 823. — A. O. U. Check-List, 2d ed. 1895, p. 344.

Meleagris superbus COPE, Syn. Ext. Batrach. etc. p. 239.

“Represented by portions of three skeletons, of different ages, which belonged to birds about the size of the Wild Turkey, although proportionally much taller. The tibiæ and tarso-metatarsal bones were, in fact, so elongated as to resemble those of wading birds.” From the Post-pliocene of New Jersey. The remains are mostly in the Museum of Yale College.

MELEAGRIS CELER.

Meleagris celer MARSH, Am. Journ. Sci. Oct. 1872, p. 261. — COUES, Key, 1872, p. 348. — COUES, Key, 2d ed. 1884, p. 823. — A. O. U. Check-List, 2d ed. 1895, p. 344.

A species much smaller than the foregoing, but with legs of slender proportions. Also from the Post-pliocene of New Jersey, and preserved in the Yale Museum.

LIMICOLÆ (p. 762).**CHARADRIUS SHEPPARDIANUS.**

Charadrius sheppardianus COPE, Bull. U. S. Geol. Surv. Terr. vi, No. 1, Feb. 11, 1881, pp. 83-85. — Amer. Nat. xv, Mar. 1881, p. 253. — COUES, Key, 2d ed. 1884, p. 823. — A. O. U. Check-List, 2d ed. 1895, p. 343.

HERODIONES (p. 863).**ARDEA PALOCCIDENTALIS.**

Ardea paloccidentalis SHU. Journ. Acad. Nat. Sci. Phila. xi, 1892, p. 411, pl. xvii, fig. 31. — A. O. U. Check-List, 2d ed. 1895, p. 341.

A Heron from the Pliocene of Oregon.

PALUDICOLÆ (p. 844).**GRUS HAYDENI.**

Grus haydeni MARSH, Am. Journ. Sci. xlix, March, 1870, p. 214. — COUES, Key, 1872, p. 348. — COUES, Key, 2d ed. 1884, p. 823. — A. O. U. Check-List, 2d ed. 1895, p. 342.

A species about as large as the Sandhill Crane (*G. canadensis*). From the Pliocene of Nebraska. Remains preserved in the Museum of the Philadelphia Academy.

GRUS PROAVUS.

Grus proavus MARSH, Am. Journ. Sci. iv, Oct. 1872, p. 261. — COUES, Key, 1872, p. 348. — COUES, Key, 2d ed. 1884, p. 823. — A. O. U. Check-List, 2d ed. 1895, p. 342.

This species was nearly as large as a Sandhill Crane. The remains representing it were found in the Post-pliocene of New Jersey, and are now in the Yale Museum.

ALETORNIS NOBILIS.

Aletornis nobilis MARSH, Am. Journ. Sci. iv, Oct. 1872, p. 256. — COUES, Key, 1872, p. 348. — COUES, Key, 2d ed. 1884, p. 823. — A. O. U. Check-List, 2d ed. 1895, p. 342.

Nearly as large as the preceding species. Found in the Eocene deposits of Wyoming, and now in the Museum of Yale College.

ALETORNIS PERNIX.

Aletornis pernix MARSH, Am. Journ. Sci., iv, Oct. 1872, p. 256. — COUES, Key, 1872, p. 348. — COUES, Key, 2d ed. 1884, p. 824. — A. O. U. Check-List, 2d ed. 1895, p. 342.

About half the size of the above, and from the same locality. Also in the Yale Museum.

ALETORNIS VENUSTUS.

Aletornis venustus MARSH, Am. Journ. Sci. iv, Oct. 1872, p. 257. — COUES, Key, 1872, p. 348. — COUES, Key, 2d ed. 1884, p. 824. — A. O. U. Check-List, 2d ed. 1895, p. 342.

A smaller species, about as large as a Curlew (*Numenius*). From the same locality, and likewise in the Yale Museum.

ALETORNIS GRACILIS.

Aletornis gracilis MARSH, Am. Journ. Sci. iv, Oct. 1872, p. 258. — COUES, Key, 1872, p. 348. — COUES, Key, 2d ed. 1884, p. 824. — A. O. U. Check-List, 2d ed. 1895, p. 342.

A bird about the size of a Woodcock (*Philohela minor*). From the same formation and locality, and now preserved in the Museum of Yale College.

ALETORNIS BELLUS.

Aletornis bellus MARSH, Am. Journ. Sci. iv, Oct. 1872, p. 258. — COUES, Key, 1872, p. 349. — COUES, Key, 2d ed. 1884, p. 824. — A. O. U. Check-List, 2d ed. 1895, p. 343.

A still smaller species, probably belonging to a different genus. From the same locality, and also in the Yale Museum.

FULICA MINOR.

Fulica minor SHU. Journ. Acad. Nat. Sci. Phila. xi, 1892, p. 412, pl. xvii, fig. 32. — A. O. U. Check-List, 2d ed. 1895, p. 342.

A Coot from the Pliocene of Oregon.

ODONTOGLOSSÆ (p. 887).

PHŒNICOPTERUS COPEI.

Phœnicopterus copei SHU. Journ. Acad. Nat. Sci. Phila. xi, 1892, p. 410, pl. xv, figs. 41-43, pl. xvii, figs. 23, 29, 38. — A. O. U. Check-List, 2d ed. 1895, p. 341.

A Flamingo from the Pliocene of Oregon.

ANSERES (p. 890).

CYGNUS PALOREGONUS.

Cygnus paloregonus COPE, Bull. U. S. Geol. Surv. Terr. iv, No. 2, May 3, 1878, p. 388.

Represented by numerous bones, especially by four metatarsals, two of which are nearly perfect, indicating a species very near those now existing, but apparently distinct. From the Pliocene of Oregon. Remains in Professor Cope's Collection.

BRANTA HYSIBATUS.

Anser hysibatus COPE, Bull. U. S. Geol. Surv. Terr. iv, No. 2, May 3, 1878, p. 387.

Bernicla hysibates COUES, Key, 2d ed. 1884, p. 824.

Branta hysibates COUES, A. O. U. Check-List, 1st ed. 1885, p. 364.

Branta hysibatus A. O. U. Check-List, 2d ed. 1895, p. 341.

Based upon a metatarsal bone lacking the hypotarsus, indicating a Goose nearly related to *Branta canadensis*, but probably larger or with longer legs. From the Pliocene of Oregon. Remains in Professor Cope's Collection.

BRANTA PROPINQUA.

Branta propinqua SHU. Journ. Acad. Nat. Sci. Phila. xi, 1892, p. 407, pl. xv, fig. 17. — A. O. U. Check-List, 2d ed. 1895, p. 341.

From the Pliocene of Oregon.

ANSER CONDONI.

Anser condoni SHU. Journ. Acad. Nat. Sci. Phila. xi, 1892, p. 406. — A. O. U. Check-List, 2d ed. 1895, p. 341.

From the Pliocene of Oregon.

STEGANOPODES (p. 951).

SULA LOXOSTYLA.

Sula loxostyla COPE, Trans. Amer. Philos. Soc. xiv, Dec. 1870, p. 236. — COUES, Key, 1872, p. 349. — COUES, Key, 2d ed. 1884, p. 824. — COUES, A. O. U. Check-List, 1st ed. 1886, p. 363.

A Gannet, not so large as the common living species (*S. bassana*), from the Miocene of North Carolina. The remains are preserved in Professor Cope's Collection.

PHALACROCORAX IDAHENSIS.

Graculus idahensis MARSH, Am. Journ. Sci. xlix, March, 1870, p. 216. — COUES, Key, 1872, p. 349.

Phalacrocorax idahensis COUES, Key, 2d ed. 1884, p. 824. — COUES, A. O. U. Check-List, 1st ed. 1886, p. 363.

A typical Cormorant, rather smaller than *P. carbo*. From the Pliocene of Idaho. Most of the known remains are deposited in the Yale Museum.

PHALACROCORAX MACROPUS.

Graculus macropus COPE, Bull. U. S. Geol. Surv. Terr. iv, No. 2, May 3, 1878, p. 386.

Phalacrocorax macropus COUES, Key, 2d ed. 1884, p. 824.

Phalacrocorax micropus, by error. COUES, A. O. U. Check-List, 1st ed. 1886, p. 364.

From the Pliocene of Oregon, in which it appears to have been numerous; represented by various bones, those upon which the species is based being three nearly perfect metatarsals in the collection of Professor Cope, indicating a bird somewhat larger than the living *Phalacrocorax dilophus*, and agreeing closely in size with *Ph. idahensis*.

TUBINARES (p. 1021).

PUFFINUS CONRADI.

Puffinus conradii MARSH, Am. Journ. Sci. xlix, Mar. 1872, p. 212. — COUES, Key, 1872, p. 350. — COUES, Key, 2d ed. 1884, p. 825. — COUES, A. O. U. Check-List, 1st ed. 1886, p. 363.

A Shearwater about the size of *P. cinereus*. From the Miocene of Maryland, and now preserved in the Museum of the Philadelphia Academy.

PYGOPODES (p. 1046).

URIA ANTIQUA.

Catarractes antiquus MARSH, Am. Journ. Sci. xlix, Mar. 1870, p. 213. — COUES, Key, 1872, p. 350.

Lomvia antiqua COUES, Key, 2d ed. 1884, p. 825.

Uria antiqua COUES, A. O. U. Check-List, 1st ed. 1886, p. 363.

A Guillemot rather larger than the Common Murre (*U. troile*). From the Miocene of North Carolina. Deposited in the Philadelphia Academy.

URIA AFFINIS.

Catarractes affinis MARSH, Am. Journ. Sci. iv, Oct. 1872, p. 259. — COUES, Key, 1872, p. 350.

Lomvia affinis COUES, Key, 2d ed. 1884, p. 825.

Uria affinis COUES, A. O. U. Check-List, 1st ed. 1886, p. 363.

A species about as large as the preceding, and nearly related. From the Post-pliocene of Maine. The original specimen is in the Philadelphia Academy.

RATITÆ (p. 244).

GASTORNIS GIGANTEUS.

Diatryma gigantea COPE, Proc. Phila. Acad. 1876, p. 11. — Rep. Surv. W. 100th Merid. iv, pt. ii, 1877, pp. 69-71, pl. xxxii, figs. 23-25.

Gastornis giganteus COUES, Key, 2d ed. 1884, p. 825.

From the Eocene of New Mexico, of the Wahsatch epoch; based upon a tarso-metatarsal bone lacking a part of the shaft and the external condyle. The species was of great size, the proximal end of the bone being nearly twice the diameter of that of the Ostrich. "Its discovery introduced this group of Birds [*Ratitæ*] to the known faunæ of North America, and demonstrates that this continent has not been destitute of the gigantic forms of birds now confined to the southern hemisphere faunæ" (Cope). The proximal end of the bone is described as re-

sembling the same part in the Ostriches (*Struthionidæ*) and Moas (*Dinornithidæ*); while the distal end, as far as that is preserved, is similar to that of *Gastornis* of the corresponding horizon in France.

BARORNIS REGENS.

Barornis regens MARSH, Am. Journ. Sci. xlviii, 1894, p. 344.

From the Eocene of the vicinity of Squantum, New Jersey.

B. — Cretaceous Birds.

The following synopsis is based upon that given in the appendix of Marsh's great work already cited ("Odontornithes"). The ten genera and twenty-three species presented are supposed to be referable to one or the other of the two types exemplified by *Ichthyornis* and *Hesperornis* respectively; but, as many of them are still known only by remains so fragmentary that it is impossible to say whether they are *Odontotormæ* or *Odontoleæ*, an alphabetical arrangement of the genera is followed.

Most of the known remains of Cretaceous birds of North America have been discovered on the eastern slopes of the Rocky Mountains, in beds of middle Cretaceous age which have been termed by Marsh "Pteranodon beds," from the genus of toothless Pterodactyles found in them. These *Western* Cretaceous birds were all found in Kansas, excepting some from corresponding strata in Texas. The *Eastern* Cretaceous forms from the green-sand of New Jersey, all of which are distinct from the western ones, are from a higher horizon, representing a division of the upper Cretaceous. No jaws or teeth of these birds having been found, it is impossible to say as yet whether or not they are odontornithic. All the deposits of Cretaceous age in North America, in which birds have been found, are marine, and the species appear to have all been aquatic.

APATORNIS CELER.

Ichthyornis celer MARSH, Am. Journ. Sci. v, Jan. 1873, p. 74.

Apatornis celer MARSH, Am. Journ. Sci. v, Feb. 1873, p. 162. — *Id. ibid.* v, Mar. 1873, p. 230. — *Id. ibid.* x, Nov. 1875, p. 404. — *Id.* Am. Nat. ix, Dec. 1875, p. 626. — *Id.* Geol. Mag. iii, Feb. 1876, p. 50. — *Woodw.* Pop. Sci. Rev. Oct. 1875, p. 349. — *MARSH.* Odont. 1880, p. 192, pls. xxviii-xxxiii.

A bird about the size of a Pigeon, from the middle Cretaceous of western Kansas: related to *Ichthyornis*. The two known specimens are preserved in the Yale Museum.

BAPTORNIS ADVENUS.

Baptornis advenus MARSH, Am. Journ. Sci. xiv, July, 1877, p. 86. — *Id.* Journ. de Zool. vi, 1877, p. 387. — *Id.* Odont. 1880, p. 192, figs. 37-39.

Based upon a nearly perfect tarso-metatarsal, closely resembling the same part of *Hesperornis*, and indicating an aquatic bird about as large as a Loon. From western Kansas, in the same Cretaceous beds with *Odontornithes* and *Pteranodontia*. The type, and a second specimen referred to the same species, are preserved in the Museum at Yale College.

CIMOLOPTERYX RARUS.

Cimolopteryx rarus MARSH, Am. Journ. Sci. xlv, 1892, p. 175, pl. iii, fig. 2.

From the Laramie beds of Wyoming.

CIMOLOPTERYX RETUSUS.

Cimolopteryx retusus MARSH, Am. Journ. Sci. xlv, 1892, p. 175.

From the Laramie beds of Wyoming.

CONIORNIS ALTUS.

Coniornis altus MARSH, Am. Journ. Sci. xlv, 1893, p. 82.

From the Cretaceous of the Judith River basin, in Montana.

GRACULAVUS VELOX.

Graculavus velox MARSH, Am. Journ. Sci. iii, May, 1872, p. 363. — ID. *ibid.* v, Mar. 1873, p. 229. — ID. Odont. 1880, p. 194. — COUES, Key, 1872, p. 349.

A bird about two-thirds as large as a Cormorant. The remains were found in the green-sand of the middle marl bed, or upper Cretaceous, near Hornerstown, New Jersey, and are all preserved in the Museum of Yale College.

GRACULAVUS PUMILUS.

Graculavus pumilus MARSH, Am. Journ. Sci. iii, May, 1872, p. 364. — ID. *ibid.* v, Mar. 1873, p. 229. — ID. Odont. 1880, p. 195. — COUES, Key, 1872, p. 350.

A smaller species than the foregoing, from the same formation and locality. Remains also in the Yale Museum.

NOTE. Several western species, provisionally referred to the genus *Graculavus*, have since been identified with *Ichthyornis*, which see.

HESPERORNIS REGALIS. (See p. 63, fig. 15.)

Hesperornis regalis MARSH, Am. Journ. Sci. iii, Jan. 1872, p. 56. — ID. *ibid.* iii, May, 1872, p. 360. — ID. *ibid.* x, Nov. 1875, p. 403. — ID. *ibid.* xiv, July, 1877, p. 85, pl. v. — ID. Am. Nat. ix, Dec. 1875, p. 625. — ID. Geol. Mag. iii, Feb. 1876, p. 49, pl. ii. — ID. Odont. 1880, pp. 1-117, p. 195, pls. i-xx. — COUES, Key, 1872, p. 195. — WOODW. Pop. Sci. Rev. Oct. 1875, p. 337. — SEELEY, Journ. Geol. Soc. xxxii, 1876, p. 510. — HUXL. Pop. Sci. Monthly, x, 1876, pp. 215-218. — VOGT, Revue Scient. xvii, 1879, p. 247. — DANA, Man. Geol. 1880, pl. iv.

Reference to p. 244, *antea*, will show the essential characters of *Odontolæa*, of which the present species is a type. *Hesperornis* may be tersely characterized as a gigantic diver, some six feet in length from the point of the bill to the end of the toes, standing over three feet high in the position represented in the above-cited figure. While the general configuration of the skeleton may be likened to that of a Loon, the conformation of the sternum is ratite, and the wings are rudimentary or abortive, only a remnant of a humerus being left; other struthious characters are noted in various parts of the skeleton; the jaws are long and furnished with sharp recurved teeth implanted in grooves, but the vertebræ are heterocœlous, or saddle-shaped, and the coccyx is short, as in ordinary birds; most of these characters separating this odontolæous type sharply from both *Odontotormæ* and *Saururæ*. Comparison of the three Mesozoic genera, *Hesperornis*, *Ichthyornis*, and *Archæopteryx*, shows greater diversity from one another than that existing among all known birds of later geologic and of the present epoch.

The first remains of this now famous species were found by Professor Marsh in November, 1870, in the yellow chalk of the Pteranodon beds, near the Smoky Hill River in Kansas. The type specimen was found in July, 1871, on the south bank of the same river, about twenty miles east of Fort Wallace, imbedded in gray calcareous shale. Many other remains have also been collected, representing in all some 40 different individuals, all from the same geologic horizon in western Kansas, and most of them near the locality of the original ones. They are all preserved in the Museum of Yale College.

HESPERORNIS CRASSIPES.

Lestornis crassipes MARSH, Am. Journ. Sci. xi, June, 1876, p. 509.

Hesperornis crassipes MARSH, Odont. 1880, p. 196, figs. 40 *a-d*, pls. vii, xvii.

Based upon a nearly complete skeleton from the yellow chalk of western Kansas, indicating a bird considerably larger than *H. regalis*, and one that may prove to be generically distinct. Deposited in the Yale Museum.

HESPERORNIS GRACILIS.

Hesperornis gracilis MARSH, Am. Journ. Sci. xi, June, 1876, p. 510. — ID. Odont. 1880, pp. 99, 197.

A third species, from the same horizon and locality, represented by two specimens, one of them a nearly complete skeleton. Deposited in the Yale Museum.

ICHTHYORNIS DISPAR.

Ichthyornis dispar MARSH, Am. Journ. Sci. iv, Oct. 1872, p. 344. — ID. *ibid.* v, Feb. 1873, p. 161. — ID. *ibid.* Mar. 1873, p. 230. — COUES, Key, 1872, p. 350. — OWEN, Journ. Geol. Soc. Lond. xxxix, 1873, p. 520. — WOODW. Pop. Sci. Rev. Oct. 1875, p. 348. — MARSH, Am. Nat. ix, Dec. 1875, p. 625. — ID. Geol. Mag. iii, 1876, p. 49. — HUXL. Pop. Sci. Monthly, x, 1876, pp. 215-218. — MARSH, Journ. de Zoöl. iv, 1875, p. 494, pl. xv; vi, 1877, p. 385. — ID. Odont. 1880, pp. 119-183, 197, pls. xxi-xxvi.

This remarkable bird, forming a type of the group *Odontotormæ* (p. 243), with general characters of the skeleton like those of ordinary birds, yet with socketed teeth and biconcave vertebrae, was discovered in 1872 near the Solomon River in northwestern Kansas, in the Pteranodon beds of the middle Cretaceous. It was about as large as a Pigeon. The remains of about nine individuals, all from the same region, are preserved in the Museum at Yale College.

ICHTHYORNIS AGILIS.

Gracularus agilis MARSH, Am. Journ. Sci. v, Mar. 1873, p. 230.

Ichthyornis agilis MARSH, Odont. 1880, p. 197.

From the same horizon in western Kansas, on Butte Creek, a tributary of the Smoky Hill River, where discovered in October, 1872. The remains are preserved in the Yale College Museum.

ICHTHYORNIS ANCEPS.

Gracularus anceps MARSH, Am. Journ. Sci. iii, May, 1872, p. 364. — COUES, Key, 1872, p. 350. — MARSH, Am. Journ. Sci. v, Mar. 1873, p. 229. — ID. Odont. 1880, pp. 124, 198.

Resembling *I. dispar*, but with slenderer jaws and more teeth. The right lower jaw of the type specimen of *I. dispar* shows twenty-one distinct sockets. Discovered in November, 1870, in the gray shale of the middle Cretaceous, on the north fork of the Smoky Hill River in western Kansas, where other specimens have since been found. All are preserved at Yale.

ICHTHYORNIS LENTUS.

Gracularus lentus MARSH, Am. Journ. Sci. xiv, Sept. 1877, p. 253.

Ichthyornis lentus MARSH, Odont. 1880, p. 198.

Based upon part of a tarso-metatarsus from near Fort McKinney, Texas, in beds of middle Cretaceous age. Deposited in the Yale Museum.

ICHTHYORNIS TENER.

Ichthyornis tener MARSH, Odont. 1880, p. 198, pl. xxx, fig. 8.

From the Pteranodon beds of the middle Cretaceous, Wallace County, Kansas; two specimens, secured in 1876, and now preserved at the Yale College Museum.

ICHTHYORNIS VALIDUS.

Ichthyornis validus MARSH, Odont. 1880, p. 198, pl. xxx, figs. 11-14.

Discovered in 1877, in the yellow chalk of the middle Cretaceous, near Solomon River, in northwestern Kansas. The known specimens are deposited in the Museum of Yale College.

ICHTHYORNIS VICTOR. (See p. 64, fig. 16.)

Ichthyornis victor MARSH, Am. Journ. Sci. xi, June, 1876, p. 511. — ID. Odont. 1880, p. 199, pls. xxvii-xxxiv. — DANA, Man. Geol. 1880, pp. 466-468, pl. v.

A species of the genus rather larger than a Pigeon, of which more than forty specimens have been found in various localities in Kansas, all apparently from the same geological horizon in the middle Cretaceous. These are preserved in the Museum of Yale College.

LAORNIS EDWARDSIANUS.

Laornis edwardsianus MARSH, Proc. Phila. Acad. Jan. 1870, p. 5. — ID. Am. Journ. Sci. xlix, Mar. 1870, p. 206. — ID. *ibid.* v, Mar. 1873, p. 230. — A. MILNE-EDW. Rech. Ossem. Foss. ii, 1871, p. 540. — COUES, Key, 1872, p. 350. — MARSH, Odont. 1880, p. 199.

This species was nearly as large as a Swan. The remains by which it is represented were found in the middle marl bed, of upper Cretaceous age, at Birmingham, New Jersey, and are now in the Museum of Yale College.

PALÆOTRINGA LITORALIS.

Palæotringa littoralis MARSH, Proc. Phila. Acad. Jan. 1870, p. 5. — ID. Am. Journ. Sci. xlix, Mar. 1870, p. 208. — A. MILNE-EDW. Rech. Ossem. Foss. ii, 1871, p. 540. — COUES, Key, 1872, p. 349. — MARSH, Am. Journ. Sci. v, Mar. 1873, p. 229. — ID. Odont. 1880, p. 199.

A bird about as large as a Curlew. The remains representing it were discovered in the green-sand of the upper Cretaceous, near Hornerstown, New Jersey, and are preserved in the collection at Yale College.

PALÆOTRINGA VAGANS.

Palæotringa vagans MARSH, Am. Journ. Sci. iii, May, 1872, p. 365. — COUES, Key, 1872, p. 349. — MARSH, Am. Journ. Sci. v, Mar. 1873, p. 229.

From the same formation and locality as the last; of smaller size, being intermediate between the other two species of the genus. The specimens upon which this species is based are preserved in the Yale College Museum.

PALÆOTRINGA VETUS.

Scolopax MORTON, Syn. Organic Remains of the Cret. U. S. 1834, p. 32. — HARLAN, Med. and Phys. Res. 1835, p. 280.

Palæotringa vetus MARSH, Proc. Phila. Acad. Jan. 1870, p. 5. — ID. Am. Journ. Sci. xlix, Mar. 1870, p. 209. — A. MILNE-EDW. Rech. Ossem. Foss. ii, 1871, p. 540. — COUES, Key, 1872, p. 349. — MARSH, Am. Journ. Sci. v, Mar. 1873, p. 229. — ID. Odont. 1880, p. 200.

The first fossil bird of North America appears to have been noted by Dr. Morton in 1834, as that of a Snipe-like species. The specimen, consisting of a femur imperfect at the upper extremity, was presented by S. W. Conrad to Dr. Harlan, who remarks that "the bone appears to be perfectly mineralized." It was found near Arneytown, New Jersey, in the lower marl bed of the Cretaceous formation. This same specimen (which meanwhile had been generally regarded as of a recent species, notwithstanding its condition and the position in which it had been found) furnished Professor Marsh the basis of his *Palæotringa vetus*, a smaller species than either of the others of this genus. The known remains are in the Philadelphia Academy.

TELMATORNIS PRISCUS.

Telmatornis priscus MARSH, Proc. Phila. Acad. Jan. 1870, p. 5. — ID. Am. Journ. Sci. xlix, Mar. 1870, p. 210. — A. MILNE-EDW. Rech. Ossem. Foss. ii, 1871, p. 541. — COUES, Key, 1872, p. 349. — MARSH, Am. Journ. Sci. v, Mar. 1873, p. 229. — ID. Odont. 1880, p. 200.

A species about as large as the King Rail (*Rallus elegans*); from the middle marl bed of the upper Cretaceous formation. The remains were found near Hornerstown, New Jersey, and are preserved in the Museum of Yale College.

TELMATORNIS AFFINIS.

Telmatornis affinis MARSH, Proc. Phila. Acad. Jan. 1870, p. 5. — ID. Am. Journ. Sci. xlix, Mar. 1870, p. 211. — A. MILNE-EDW. Rech. Ossem. Foss. ii, 1871, p. 541. — COUES, Key, 1872, p. 349. — MARSH, Am. Journ. Sci. v, Mar. 1873, p. 229. — ID. Odont. 1880, p. 201.

The known remains are in the Yale Museum.

C. — Jurassic Birds.

The single representative of birds at present known from this formation is odontornithic.

LAOPTERYX PRISCUS.

Laopteryx priscus MARSH, Am. Journ. Sci. xxi, Apr. 1881, p. 341.

From the upper Jurassic beds of Wyoming. The known remains are deposited in the Museum of Yale College.

The interest attaching to this fossil induces me to transcribe the original description:—

“The type specimen of the present species is the posterior portion of the skull, which indicates a bird rather larger than a Blue Heron (*Ardea Herodias*). The braincase is so broken that its inner surface is disclosed, and in other respects the skull is distorted, but it shows characteristic features. The bones of the skull are pneumatic. The occipital condyle is sessile, hemispherical in form, flattened and slightly grooved above. There is no trace of a posterior groove. The foramen magnum is nearly circular, and small in proportion to the condyle. Its plane coincides with that of the occiput, which is slightly inclined forward. The bones around the foramen are firmly co-ossified, but the supra-occipital has separated somewhat from the squamosals and parietals. Other sutures are more or less open. On each side of the condyle, and somewhat below its lower margin, there is a deep, rounded cavity, perforated by a pneumatic foramen.

“The cavity for the reception of the head of the quadrate is oval in outline, and its longer axis, if continued backward, would touch the outer margin of the occipital condyle. This cavity indicates that the quadrate had an undivided head. The braincase was comparatively small, but the hemispheres were well developed. They were separated above by a sharp mesial crest of bone. A low ridge divided the hemispheres from the optic lobes, which were prominent.

“The following measurements indicate the size of the specimen:—

Width of skull across occiput (approximate)	24 mm.
Transverse diameter of occipital condyle	5 "
Vertical diameter	4 "
Width of foramen magnum	5 "
Height	6 "
Distance from occipital condyle to top of supra-occipital	11 "

“In its main features, the present specimen resembles the skull of the *Ratita*, more than that of any existing birds. Other parts of the skeleton will doubtless show still stronger reptilian characters.

“In the matrix attached to this skull, a single tooth was found, which most resembles the teeth of birds, especially those of *Ichthyornis*. It is probable that *Laopteryx* possessed teeth, and also biconcave vertebræ.

“The specimen here described, and others apparently of the same species, were found in the upper Jurassic of Wyoming Territory, in the horizon of the *Atlantosaurus* beds.”

INDEX.

NOTE.—(1) Scientific names of birds consisting of two or three terms are entered but once, under the genus; as, *Turdus mustelinus*. (2) But vernacular names of two terms are entered twice; as, *Wood thrush*, and *Thrush, wood*. (3) Anatomical and other technical terms are fully indexed as occurring in Part II., where they are defined and explained; but not as occurring in Parts III. and IV., where they are simply used in describing birds. (4) Names of birds, both scientific and vernacular, are fully indexed as occurring in Parts III. and IV., but *usually* not as incidentally occurring in Parts I. and II. in illustration of the zoological and anatomical characters there noted. (5) Names merely appearing in the text, not as headings, are *usually* not indexed; many such, however, will be found, especially such as are not elsewhere formally treated. (6) Synonyms, both scientific and vernacular, are indexed. (7) Matters of field-work and taxidermy treated in Part I. are fully indexed by one or more leading words; as, *Insect pests*, and *Pests, insect*. (8) Names of persons mentioned or of authors quoted are not indexed. (9) The whole work is so fully indexed that the Index will serve as a glossary of the terminology of ornithology. (10) All the figures refer to pages.

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APPENDIX

EXHIBITING THE NUMERATION AND NOMENCLATURE OF THE AMERICAN ORNITHOLOGISTS' UNION CHECK-LIST OF NORTH AMERICAN BIRDS, SO FAR AS AFFECTED BY ELIMINATIONS AND CHANGES MADE IN THE TENTH, ELEVENTH, AND TWELFTH SUPPLEMENTS TO THE CHECK-LIST, IN COMPARISON WITH THE CORRESPONDING NOMENCLATURE OF THE KEY; AND INCLUDING ADDITIONS TO THE CHECK-LIST.¹

NOTE.—The daggers (†) indicate the numbers of the “Hypothetical List” of the Check-List.

761 *b.* ***Merula migratoria achrustera*** BATCHELDER. SOUTHERN ROBIN. *Merula migratoria achrustera* BATCHELDER, Proc. N. Engl. Zool. Club, i, 1900, 104. The Carolinas and Georgia.

COUES KEY.

UNION LIST.

Hesperocichla nœvia.

| 763. *Ixoreus nœvius*.

763 *a.* ***Ixoreus nœvius meruloides*** (SWAINS.). NORTHERN VARIED THRUSH. *Ixoreus nœvius meruloides* RICHMOND, Proc. Biol. Soc. Wash. xv, 85, April 25, 1902. Interior of northern Alaska and eastward, wintering in southern California. (Cf. GRINNELL, Auk, xviii, April, 1901, 112.)

Hylocichla aonalaschkæ.

aonalaschkæ auduboni.

aonalaschkæ pallasii.

| 759. *Hylocichla guttata*.

759*a.* guttata auduboni.

759*b.* guttata pallasii.

759 *c.* ***Hylocichla guttata nana*** (AUD.). DWARF HERMIT THRUSH. *Hylocichla guttata nana* BREWSTER, Bull. Mus. Comp. Zool. xli, 1902. Pacific coast region, from Washington southward, breeding south to Sierra Nevada region, east in migrations to Nevada and Arizona and south to Lower California and western Mexico.

Hylocichla ustulata almæ.

| 75*Sc.* *Hylocichla ustulata almæ*.

765 *a.* ***Saxicola œnanthe leucorhoa*** (GMEL.). GREENLAND WHEATEAR. *Saxicola œnanthe leucorhoa* STEJNEGER, Proc. U. S. Nat. Mus. xxiii, No. 1220, 1901, 476. Greenland, adjacent portions of North America, and Iceland, migrating by way of the British Islands and France to western Africa. The North American range of *S. œnanthe* is thus restricted to Alaska.

Regulus calendula grinnelli.

| 749*a.* *Regulus calendula grinnelli*.

742 *b.* ***Chamæa fasciata phæa*** OSGOOD. COAST WREN-TIT. *Chamæa fasciata phæa* OSGOOD, Proc. Biol. Soc. Wash. xiii, 1899, 41. Coast region of Oregon and California from Astoria, Oregon, to Marin Co., California.

¹ See Tenth Supplement, Auk, xviii, July, 1901; Eleventh Supplement, Auk, xix, July, 1902; Twelfth Supplement, Auk, xx, July, 1903.

741 b. **Parus rufescens barlowi** J. GRINNELL. BARLOW'S CHICKADEE. *Parus rufescens barlowi* J. GRINNELL, Condor, ii, 1900, 127. Coast range of California, from Monterey Co. to San Francisco Bay.

COUES KEY.

Lophophanes bicolor.
 bicolor texensis.
 atricristatus.
 inornatus.
 inornatus griseus.
 inornatus cineraceus.
 wollweberi.

UNION LIST.

731. *Baeolophus bicolor*.
 731a. bicolor texensis.
 732. atricristatus.
 733. inornatus.
 733a. inornatus griseus.
 733b. inornatus cineraceus.
 734. wollweberi.

727 c. **Sitta carolinensis nelsoni** MEARNS. ROCKY MOUNTAIN NUTHATCH. *Sitta carolinensis nelsoni* MEARNS, Proc. U. S. Nat. Mus. xxiv, 1902, 923. Rocky Mountain region of the U. S., south into Mexico (Chihuahua and Sonora).

727 d. **Sitta carolinensis lagunæ** BREWSTER. SAINT LUCAS NUTHATCH. *Sitta carolinensis lagunæ* BREWSTER, Auk, viii, 1891, 149. Cape region of Lower California. (Cf. BREWSTER, Bull. Mus. Comp. Zool. xli, 1902, 203.) The range of *Sitta c. aculeata* thus becomes restricted to the Pacific coast region of the U. S.

Certhia familiaris americana.

| 726. *Certhia familiaris americanus*.

726 d. **Certhia familiaris zelotes** OSGOOD. SIERRA CREEPER. *Certhia familiaris zelotes*, OSGOOD, Auk, xviii, April, 1901, 182. Cascade Mountains of Oregon and the Sierra Nevada of California. *Certhia f. occidentalis* thus becomes restricted to the Pacific coast region, from Sitka, Alaska, to Marin Co., California.

703 a. **Mimus polyglottos leucopterus** (VIGORS). WESTERN MOCKINGBIRD. *Mimus polyglottos leucopterus* MEARNS, Auk, xix, Jan. 1902, 70. Southwestern U. S., from Texas to the Pacific, southward into Mexico and Lower California.

Harporynchus rufus.
 longirostris sennetti.
 curvirostris.
 curvirostris palmeri.
 bendirei.
 cinereus.
 cinereus mearnsi.
 redivivus.
 lecontei.
 crissalis.

705. *Toxostoma rufum*.
 706. longirostre sennetti.
 707. curvirostre.
 707a. curvirostre palmeri.
 708. bendirei.
 709. cinereum.
 709a. cinereum mearnsi.
 710. redivivum.
 711. lecontei.
 712. crissalis.

719 c. **Thryomanes bewickii cryptus** OBERHOLSER. *Thryomanes bewickii cryptus* OBERHOLSER, Proc. U. S. Nat. Mus. xxi, 1898, 425. Texas except the extreme western part and probably north to Kansas, and south to Tamaulipas and Nuevo Leon, Mexico.

719 d. **Thryomanes bewickii charienturus** OBERHOLSER. *Thryomanes bewickii charienturus* OBERHOLSER, Proc. U. S. Nat. Mus. xxi, 1898, 435. Coast region of southern California, north to about Pasadena; south to about lat. 28°, Lower California; Santa Catalina Island, Cal.

719 e. **Thryomanes bewickii calophonus** OBERHOLSER. *Thryomanes bewickii calophonus* OBERHOLSER, Proc. U. S. Nat. Mus. xxi, 1898, 440. Pacific slope, from Oregon to southern Vancouver Island and valley of Fraser River, British Columbia.

COUES KEY.

Anorthura hiemalis.
 hiemalis pacificus.
 alascensis.

UNION LIST.

722. *Olbiorchilus hiemalis*.
 722 a. *hiemalis pacificus*.
 723. *alascensis*.

722 b. *Olbiorchilus hiemalis helleri* OSGOOD. KADIAK WINTER WREN. *Anorthura hiemalis helleri* OSGOOD, Auk, xviii, April, 1901, 181. *Olbiorchilus hiemalis helleri* OBERHOLSER, Auk, xix, April, 1902, 179. Kadiak Island, Alaska.

723.1. *Olbiorchilus meligerus* OBERHOLSER. ALEUTIAN WREN. *Anorthura meligera* OBERHOLSER, Auk, xvii, Jan. 1900, 25. *Olbiorchilus meligerus* OBERHOLSER, Auk, xix, April, 1902, 178. The westernmost islands of the Aleutian group, Alaska.

Telmatodytes palustris.
 palustris paludicola.
 palustris griseus.
 [Not admitted to the Key.]
 marianæ.

725. *Telmatodytes palustris*.
 725 a. *palustris paludicola*.
 725 b. *palustris griseus*.
 725 c. *palustris plesius*.
 725.1. *marianæ*.

656 a. *Dendroica auduboni nigrifrons* (BREWSTER). *Dendroica auduboni nigrifrons* RIDGWAY, Bull. U. S. Nat. Mus. No. 50, Pt. II, 1902, 555. "Mountains of southern Arizona (Huachuca and Chiricahua ranges) and southward through mountains of Chihuahua to Durango."

681 c. *Geothlypis trichas arizela* OBERHOLSER. *Geothlypis trichas arizela* OBERHOLSER, Auk, xvi, July, 1899, 257. Pacific coast region, from southern British Columbia to northern Lower California, west of the Cascades and Sierra Nevada; in winter south to Cape St. Lucas and Tepic.

681 d. *Geothlypis trichas brachidactyla* (SWAINS.). NORTHERN YELLOW-THROAT. *Geothlypis trichas brachidactyla* W. PALMER, Auk, xvii, July, 1900, 221.

681 e. *Geothlypis trichas sinuosa* J. GRINNELL. SALT MARSH YELLOW-THROAT. *Geothlypis trichas sinuosa* GRINNELL, Condor, iii, May, 1901, 65. Salt marshes of San Francisco Bay, California. (Cf. RIDGWAY, Bull. U. S. Nat. Mus. No. 50, Pt. II, 1902, 672.)

Geothlypis poliocephala ralphii.

| 682.1. *Geothlypis poliocephala*.

685 b. *Wilsonia pusilla chryseola* RIDGWAY. GOLDEN PILEOLATED WARBLER. *Wilsonia pusilla chryseola* RIDGWAY, Bull. U. S. Nat. Mus. No. 50, Pt. II, 1902, 711. Pacific coast district, from southern California to British Columbia, southward during migration to Arizona, Lower California, and western Mexico.

Piranga rubriceps.

| †18.1. *Piranga rubriceps*.

Tachycineta bicolor.

| 614. *Iridoprocne bicolor*.

thalassina.

| 615. *Tachycineta thalassina lepida*.

615 a. *Tachycineta thalassina brachyptera* BREWSTER. SAINT LUCAS SWALLOW. *Tachycineta thalassina brachyptera* BREWSTER, Bull. Mus. Comp. Zool. xli, 1902, 167. Cape region of Lower California.

612.2. *Petrochelidon melanogastra* (SWAINS.). MEXICAN CLIFF SWALLOW. Mexico, south to Guatemala, north into Arizona, along the San Bernardino and Santa Cruz rivers. (Cf. MEARNS, Proc. Biol. Soc. Wash. xiv, 178, Sept. 25, 1901.)

Clivicola riparia.

| 616. *Riparia riparia*.

Vireo gilvus swainsoni?

| 627 a. *Vireo gilvus swainsonii*.

631 b. *Vireo noveboracensis bermudianus* (BANGS and BRADLEY). BERMUDA VIREO. *Vireo bermudianus* BANGS and BRADLEY, Auk, xviii, July, 1901, 252. Bermuda Islands.

631 c. **Vireo noveboracensis micrus** NELSON. SMALL WHITE-EYED VIREO. *Vireo noveboracensis micrus* NELSON, Auk, xvi, Jan. 1899, 30. Northeastern Mexico, northward to Rio Grande Valley, Texas. (Cf. MEARNS, Auk, xix, Jan. 1902, 87.)

COUES KEY.

Vireo belli pusillus.
Hesperiphona vespertina.
 vespertina montana.
Pinicola enucleator canadensis.
Astragalinus psaltria arizonæ.
Passerculus bairdi.
 princeps.
 sandwichensis.
 sandwichensis savanna.
 sandwichensis alaudinus.
 sandwichensis bryanti.
 beldingi.
 rostratus.
 rostratus guttatus.
 sanctorum.

UNION LIST.

633.1. *Vireo pusillus*.
 514. *Hesperiphona vespertina*.
 514a. *vespertina montana*.
 515. *Pinicola enucleator leucura*.
 [Eliminated.]
 545. *Coturniculus bairdii*.
 541. *Passerculus princeps*.
 542. *sandwichensis*.
 542a. *sandwichensis savanna*.
 542b. *sandwichensis alaudinus*.
 542c. *sandwichensis bryanti*.
 543. *beldingi*.
 544. *rostratus*.
 544a. *rostratus guttatus*.
 544c. *rostratus sanctorum*.

544 b. **Passerculus rostratus halophilus** (MCGREGOR). LAGOON SPARROW. *Ammodramus halophilus* MCGREGOR, Auk, xv, July, 1898, 265. Salt marshes in the vicinity of Abrejos point, Lower California.

Ammodramus savannarum passerinus.
 savannarum perpallidus

546. *Coturniculus savannarum passerinus*.
 546a. *savannarum bimaculatus*.

546 b. **Coturniculus savannarum floridanus** MEARNS. FLORIDA GRASSHOPPER SPARROW. *Coturniculus savannarum floridanus* MEARNS, Proc. U. S. Nat. Mus. xxiv, 1902, 915. Central Florida (Kissimmee prairie region).

Melospiza melodia.
 melodia juddi.
 melodia fallax.
 melodia montana.
 melodia heermanni.
 melodia samuelis.
 melodia cooperi.
 melodia pusillula.
 melodia rivularis.
 melodia graminea.
 melodia clementæ.
 melodia morphna.
 melodia merrilli.
 melodia rufina.
 melodia caurinas.
 insignis.

581. *Melospiza cinerea melodia*.
 581j. *cinerea juddi*.
 581a. *cinerea fallax*.
 581b. *cinerea montana*.
 581c. *cinerea heermanni*.
 581d. *cinerea samuelis*.
 581m. *cinerea cooperi*.
 581l. *cinerea pusillula*.
 581g. *cinerea rivularis*.
 581h. *cinerea graminea*.
 581i. *cinerea clementæ*.
 581e. *cinerea morphna*.
 581k. *cinerea merrilli*.
 581f. *cinerea rufina*.
 581n. *cinerea caurina*.
 581.1. *cinerea insignis*.

581 o. **Melospiza cinerea kenaiensis** (RIDGWAY). KENAI SONG SPARROW. *Melospiza cinerea kenaiensis* RIDGWAY. Bull. U. S. Nat. Mus. No. 50, Pt. I, 1901, 375. Coast of Kenai Peninsula, Alaska, from east side of Cook Inlet to Prince William Sound.

COUES KEY.

Peuceea arizonæ. }
 mexicana. }
 Zonotrichia leucophrys intermedia.
 leucophrys gambeli.
 Pipilo maculatus atratus.

588 e. *Pipilo maculatus magnirostris* BREWSTER. LARGE-BILLED TOWHEE. *Pipilo maculatus magnirostris* BREWSTER, Auk, viii, April, 1891, 146. Mountain districts of southern Lower California.

Pipilo fuscus carolæ.
 Sporophila moreleti sharpei.
 Euetheia bicolor.
 canora.

Agelaius phœniceus sonoriensis.

498 d. *Agelaius phœniceus fortis* RIDGWAY. THICK-BILLED REDWING. *Agelaius phœniceus fortis* RIDGWAY. Proc. Wash. Acad. Sci. iii, April, 1901, 153. Central North America, breeding northward; in migrations from Manitoba south to Illinois, Indian Territory, and western Texas, westward to and including the Rocky Mountains, and south to Arizona and Chihuahua.

498 e. *Agelaius phœniceus neutralis* RIDGWAY. SAN DIEGO REDWING. *Agelaius phœniceus neutralis* RIDGWAY. Proc. Wash. Acad. Sci. iii, April, 1901, 153. Great Basin district of United States, southwestward to southern California and northern Lower California.

498 f. *Agelaius phœniceus caurinus* RIDGWAY. NORTHWESTERN REDWING. *Agelaius phœniceus caurinus* RIDGWAY. Proc. Wash. Acad. Sci. iii, April, 1901, 153. Northwest coast, in Washington and British Columbia; northern California in winter.

Sturnella magna argutula.

Icterus cucullatus.

Quiscalus macrurus.
 major.

Cyanocitta stelleri maculosa.

501c. Sturnella magna argutula.

505. Icterus cucullatus sennetti.

513a. Megaquiscalus major macrourus.

513. Megaquiscalus major.

478b. Cyanocitta stelleri diademata.

478 d. *Cyanocitta stelleri carlottæ* OSGOOD. QUEEN CHARLOTTE JAY. *Cyanocitta stelleri carlottæ* OSGOOD, N. Am. Fauna, No. 21, 1901, 46. Queen Charlotte Islands, British Columbia.

480.2. *Aphelocoma texana* RIDGWAY. TEXAN JAY. *Aphelocoma texana* RIDGWAY, Auk, xix, Jan. 1902, 70. Southwestern Texas, from Concho and Kerr counties west to the Davis mountains.

482 a. *Aphelocoma sieberii couchii* (BAIRD). COUCH'S JAY. *Aphelocoma sieberii couchii* OBERHOLSER, Auk, xix, 1902, 300. Northeastern Mexico to southwestern Texas (Chisos Mountains)

Xanthura luxuosa.

Perisoreus obscurus griseus.

Otocorys alpestris leucolama.
 alpestris arenicola.
 alpestris chrysolama

483. Xanthura luxuosa glaucescens.

485a. Perisoreus obscurus griseus.

474a. Otocorys alpestris arcticola.

474c. alpestris leucolama.

474e. alpestris actia.

474 k. *Otocorys alpestris hoyti* BISHOP. HOYT'S HORNED LARK. *Otocorys alpestris hoyti* BISHOP, Auk, xiii, 1896, 130. In summer British America from the west shore of

Hudson Bay to the valley of the Mackenzie River, north to the Arctic coast, south to Lake Athabasca; in winter southward to Nevada, Utah, Kansas, and Michigan, casually to Ohio and New York (Long Island)." (Cf. OBERHOLSER, Proc. U. S. Nat. Mus. xxiv, 1902, 812.)

474 l. **Otocoris alpestris occidentalis** (McCALL). MONTEZUMA HORNED LARK. *Otocoris alpestris occidentalis* STONE, Proc. Acad. Nat. Sci. Phila. 1899, 21. "In summer central New Mexico, west to central Arizona; in winter south to northern Sonora and Chihuahua, Mexico, and southeast to Texas." (Cf. OBERHOLSER, Proc. U. S. Nat. Mus. xxiv, 1902, 856.)

474 m. **Otocoris alpestris insularis** TOWNSEND. ISLAND HORNED LARK. *Otocoris alpestris insularis* TOWNSEND, Proc. U. S. Nat. Mus. xiii, 1890, 140. Santa Barbara Islands, California.

COUES KEY.

Milvulus tyrannus.
forficatus.
Myiozetetes texensis.

UNION LIST.

[442.] *Muscivora tyrannus*.
443. forficata.
[450.] *Myiozetetes similis superciliosus*.

454 b. **Myiarchus cinerascens pertinax** (BAIRD). LOWER CALIFORNIA FLY-CATCHER. *Myiarchus cinerascens pertinax* BREWSTER, Bull. Mus. Comp. Zool. xli, 1902, 117. Southern Lower California.

458 a. **Sayornis nigricans semiatra** (VIGORS). WESTERN BLACK PHOEBE. *Sayornis nigricans semiatra* NELSON, Auk. xvii, April, 1900, 125. Pacific coast of the United States and Mexico, from Oregon to Colima, eastward to Arizona. *S. nigricans* thus becomes restricted in the United States to Texas, New Mexico, and southeastern Arizona.

Contopus borealis.
Empidonax insulicola.
Trochilus violijugularis.
Amizilis tzacatl.
cerviniventris chalconota.

459. *Nuttallornis borealis*.
464.2. *Empidonax insulicola*.
†16.2. *Trochilus violajugulum*.
438. *Amizilis tzacatl*.
439. *cerviniventris chalconota*.

393 f. **Dryobates villosus picoideus** (OSGOOD). QUEEN CHARLOTTE WOODPECKER. Queen Charlotte Islands, British Columbia. *Dryobates picoideus* OSGOOD, N. Am. Fauna, No. 21, 1901, 44.

394 e. **Dryobates pubescens turati** (MALHERBE). WILLOW WOODPECKER. *Dryobates pubescens turati* W. K. FISHER, Condor, iv, 1902, 68. "California, except desert ranges and eastern slope of Sierra Nevada, coast region north of Marion Co., and region north of upper end of Sacramento Valley." (Cf. FISHER, Condor, iv, 1902, 70.)

Picoides americanus alascensis.

| 401 a. *Picoides americanus fasciatus*.

403 a. **Sphyrapicus ruber notkensis** (SUCKOW). NORTHERN RED-BREASTED SAP-SUCKER. *Sphyrapicus ruber notkensis* RICHMOND, Proc. Biol. Soc. Wash. xv, 89, April 25, 1902. Western British Columbia, south to the coast region of Washington and Oregon.

Asyndesmus torquatus
Centurus carolinus.
aurifrons.
uropygialis.
Colaptes mexicanus.

408. *Asyndesmus torquatus*.
409. *Centurus carolinus*.
410. *aurifrons*.
411. *uropygialis*.
413. *Colaptes cafer collaris*.

382.1. **Rynchopsitta pachyrhyncha** (SWAINS.). THICK-BILLED PARROT. Central Mexico, northward, casually, to the Chiricahua Mts. (Lusk, Condor, ii, 1900, 129.)

COUES KEY.	UNION LIST.
<i>Strix nebulosa</i> .	368. <i>Syrnium varium</i> .
<i>nebulosa alleni</i> .	368 <i>a</i> . <i>varium alleni</i> .
<i>nebulosa helveolum</i> .	368 <i>b</i> . <i>varium helveolum</i> .
[Not admitted to the Key.]	375 <i>a</i> . <i>Bubo virginianus pallescens</i> .
375 <i>e</i> . Bubo virginianus elachistus BREWSTER. DWARF HORNED OWL. <i>Bubo virginianus elachistus</i> BREWSTER, Bull. Mus. Comp. Zool., xli, 1902, 96. Lower California.	
373.2. Megascops xantusi BREWSTER. XANTUS'S SCREECH OWL. <i>Megascops xantusi</i> BREWSTER, Bull. Mus. Comp. Zool., xli, 1902, 93. Cape region of Lower California.	
<i>Scotiaptex cinerea</i> .	370. <i>Scotiaptex nebulosa</i> .
<i>cinerea lapponica</i> .	[370 <i>a</i> .] <i>nebulosa lapponica</i> .
372 <i>a</i> . Nyctala acadica scotæa OSGOOD. NORTHWEST SAW-WHET OWL. <i>Nyctala acadica scotæa</i> OSGOOD, N. Am. Fauna, No. 21, 1901, 43. Puget Sound region, north to Queen Charlotte Islands, British Columbia.	
<i>Falco sparverius deserticolus</i> .	360 <i>a</i> . <i>Falco sparverius phalæna</i> .
<i>Buteo borealis lucasanus</i> .	[Eliminated.]
<i>latissimus</i> .	343. <i>Buteo platypterus</i> .
<i>Pseudogryphus californianus</i> .	324. <i>Gymnogyps californianus</i> .
<i>Columba squamosa</i> .	[314.1.] <i>Columba squamosa</i> .
320 <i>b</i> . Columbigallina passerina bermudiana (BANGS and BRADLEE). BERMUDA GROUND DOVE. <i>Columbigallina bermudiana</i> BANGS and BRADLEE, Auk, xviii, July, 1901, 250. Bermuda Islands.	
<i>Meleagris gallopavo</i> .	310. <i>Meleagris gallopavo merriami</i> .
<i>gallopavo fera</i> .	310 <i>a</i> . <i>gallopavo silvestris</i> .
<i>Canachites canadensis labradorius</i> .	[Cancelled.]
298 <i>b</i> . Canachites canadensis osgoodi BISHOP. ALASKA SPRUCE GROUSE. <i>Canachites canadensis osgoodi</i> BISHOP, Auk, xvii, April, 1900, 114. Upper Yukon region and thence northwest to Prince William Sound and Cook Inlet.	
298 <i>c</i> . Canachites canadensis canace (LINN.). CANADIAN SPRUCE GROUSE. <i>Canachites canadensis canace</i> NORTON, Proc. Portland Soc. Nat. Hist. ii, Art. viii, May, 1901, 151. Northern Minnesota, northern New York, northern New England, New Brunswick, and the Canadian zone of southern and eastern Canada.	
304 <i>a</i> . Lagopus leucurus altipetens OSGOOD. SOUTHERN WHITE-TAILED PTARMIGAN. <i>Lagopus leucurus altipetens</i> OSGOOD, Auk, xviii, April, 1901, 180. Southern Rocky Mts. (Colorado, New Mexico, etc.).	
<i>Cyrtonyx montezumæ</i> .	296. <i>Cyrtonyx montezumæ nearsi</i> .
[269.1.] Eudromias morinellus (LINN.). DOTTEREL. Northern Europe and northern Asia, south in winter to the Mediterranean and northern Africa. Accidental at King Island, Alaska (Stone, Proc. Acad. Nat. Sci. Phila. 1900, 22).	
<i>Ægialitis vocifera</i> .	273. <i>Oxyechus vociferus</i> .
<i>wilsonia</i> .	280. <i>Oelthodromus wilsonius</i> .
<i>Podasocys montanus</i> .	281. <i>Podasocys montanus</i> .
283.1. Arenaria morinella (LINN.). RUDDY TURNSTONE. <i>Arenaria morinella</i> W. PALMER, Fur Seals and Fur Seal Isl. N. Pac. Oc. iii, 1899, 408, 412. Arctic America from the Mackenzie River eastward, southward in migration, chiefly coastwise, to Patagonia and	

the Falkland Islands. The range of *A. interpres* thus becomes restricted to the Old World, Greenland, and western Alaska.

COUES KEY.

Actodromas minutilla.
 damascensis.
 bairdi.
 maculata.
 fuscicollis.
 acuminata.
Arquatella maritima.
 couesi.
 ptilocnemis.
Pelidna alpina.
 alpina pacifica.
Ancylochilus ferrugineus.
Rallus crepitans waynei.
 scotti.

UNION LIST.

242. *Actodromas minutilla*.
 [242.1.] *damacensis*.
 241. *bairdii*.
 239. *maculata*.
 240. *fuscicollis*.
 238. *acuminata*.
 235. *Arquatella maritima*.
 236. *couesi*.
 237. *ptilocnemis*.
 [243.] *Pelidna alpina*.
 243*a*. *alpina pacifica*.
 244. *Erolia ferruginea*.
 211*c*. *Rallus crepitans waynei*.
 211*b*. *crepitans scottii*.

194*a*. *Ardea herodias fannini* CHAPMAN. NORTHWEST COAST HERON. *Ardea herodias fannini* CHAPMAN. Bull. Am. Mus. Nat. Hist. xiii, 1901, 87. Queen Charlotte Islands and coast region of British Columbia.

Ardea wardi.
Herodias egretta.
Garzetta candidissima.
Hydranassa tricolor ruficollis.
Dichromanassa rufa.
Florida cœrulea.
Butorides virescens.
 virescens frazari.
 virescens anthonyi.
Nyctanassa violacea.

194*b*. *Ardea herodias wardi*.
 196. *Herodias egretta*.
 197. *Egretta candidissima*.
 199. *Hydranassa tricolor ruficollis*.
 198. *Dichromanassa rufescens*.
 200. *Florida cœrulea*.
 201. *Butorides virescens*.
 201*a*. *virescens frazari*.
 201*b*. *virescens anthonyi*.
 203. *Nyctanassa violacea*.

133*a*. *Anas obscura rubripes* BREWSTER. RED-LEGGED BLACK DUCK. *Anas obscura rubripes* BREWSTER, Auk, xix, April, 1902, 184. Atlantic coast, during migration, from Newfoundland to Virginia, and west to Arkansas; breeding range not definitely known, but includes northern Labrador and Hudson Bay region.

Pelecanus fuscus.
Larus argentatus smithsonianus.
Fulmarus glacialis minor.
 glacialis rodgersi.
Puffinus cuneatus.

126. *Pelecanus occidentalis*.
 [Eliminated.]
 [Eliminated.]
 86.1. *Fulmarus rodgersi*.
 96.1. *Puffinus cuneatus*.

96.2. *Puffinus bulleri* SALVIN. NEW ZEALAND SHEARWATER. New Zealand; north casually to California. (LOOMIS, Proc. Cal. Acad. Sci., ser. 3 (zool.), 1900, 319.)

Puffinus auduboni.
Colymbus dominicus.
Fratercula arctica glacialis.

92. *Puffinus lherminieri*.
 5. *Colymbus dominicus brachypterus*.
 13*a*. *Fratercula arctica naumanni*.

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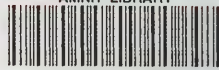
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