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**A HISTORY OF NORTH
AMERICAN BIRDS,
LAND BIRDS. VOLUME
3**

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Robert Ridgway
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A History of North American
Birds, Land Birds. Volume 3

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A History of North American Birds; Land Birds; Vol. 3 of 3:*

Содержание

RAPTORES. 1 —The Birds of Prey	4
Family STRIGIDÆ.—The Owls	9
Genera and Subgenera	12
Genus STRIX, Savigny	23
Genus OTUS, Cuvier	39
Genus SYRNIUM, Savigny	67
Genus NYCTALE, Brehm	94
Genus SCOPS, Savigny	116
Genus BUBO, Dum	147
Genus SURNIA, Duméril	178
Genus GLAUCIDIUM, Boie	191
Genus MICRATHENE, Coues	207
Genus SPEOTYTO, Gloger	214
NOTE	231
Family FALCONIDÆ.—The Falcons	267
Genera	269
Subfamily FALCONINÆ	276
Genus FALCO, Auct	276
Конец ознакомительного фрагмента.	381

**Spencer Fullerton
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RAPTORES.¹ —The Birds of Prey

The group of birds usually known as the *Raptores*, or Rapacious Birds, embraces three well-marked divisions, namely, the Owls, the Hawks, and the Vultures. In former classifications they headed the Class of Birds, being honored with this position in consequence of their powerful organization, large size, and predatory habits. But it being now known that in structure they are less perfectly organized than the *Passeres* and *Strisores*, birds generally far more delicate in organization, as well as smaller in size, they occupy a place in the more recent arrangements nearly

¹ The whole of the systematic portion of the article on the *Raptores*, has been prepared by Mr. Ridgway; the biographies, however, are furnished by Dr. Brewer, as usual. The outlines of the skulls and sterna of the *Strigidae*, the skulls, sterna, and heads of the *Cathartidae*, and the generic outlines of the *Falconidae* and *Cathartidae*, were drawn by Mr. Ridgway.—S. F. Baird.

at the end of the Terrestrial forms.

The complete definition of the order *Raptores*, and of its subdivisions, requires the enumeration of a great many characters; and that their distinguishing features may be more easily recognized by the student, I give first a brief diagnosis, including their simplest characters, to be followed by a more detailed account hereafter.

Common Characters. Bill hooked, the upper mandible furnished at the base with a soft skin, or “cere,” in which the nostrils are situated. Toes, three before and one behind. *Raptores*.

Strigidæ. Eyes directed forwards, and surrounded by radiating feathers, which are bounded, except anteriorly, by a circle or rim of differently formed, stiffer feathers. Outer toe reversible. Claws much hooked and very sharp. Legs and toes usually feathered, or, at least, coated with bristles. *The Owls*.

Falconidæ. Eyes lateral, and not surrounded by radiating feathers. Outer toe not reversible (except in *Pandion*). Claws usually hooked and sharp, but variable. Head more or less completely feathered. *The Hawks*.

Cathartidæ. Eyes lateral; whole head naked. Outer toe not reversible; claws slightly curved, blunt. *The Vultures*.

The preceding characters, though purely artificial, may nevertheless serve to distinguish the three families of *Raptores* belonging to the North American *Ornis*; a more scientific diagnosis, embracing a sufficient number of osteological, and accompanying anatomical characters, will be found further on.

The birds of prey—named *Accipitres* by some authors, and *Raptores* or *Rapaces* by others, and very appropriately designated as the *Ætomorphæ* by Professor Huxley—form one of the most strongly characterized and sharply limited of the higher divisions of the Class of Birds. It is only recently, however, that their place in a systematic classification and the proper number and relation of their subdivisions have been properly understood. Professor Huxley's views will probably form the basis for a permanent classification, as they certainly point the way to one eminently natural. In his important paper entitled "On the Classification of Birds, and on the Taxonomic Value of the Modifications of certain Cranial Bones observable in that Class,"² this gentleman has dealt concisely upon the affinities of the order *Raptores*, and the distinguishing features of its subdivisions. In the following diagnoses the osteological characters are mainly borrowed from Professor Huxley's work referred to. Nitzsch's "Pterylography"³ supplies such characters as are afforded by the plumage, most of which confirm the arrangement based upon the osteological structure; while important suggestions have been derived from McGillivray's "History of British Birds."⁴ The Monographs of the *Strigidæ* and *Falconidæ*, by Dr. J. J. Kaup,⁵ contain much

² By Thomas H. Huxley, F. R. S., V. P. Z. S.; Proceedings of the Zoölogical Society of London, 1867, pp. 415–473.

³ By Charles Ludwig Nitzsch. English edition, translated from the German by Dr. Philip Lutley Sclater, and published by the Ray Society of London, 1867.

⁴ By William McGillivray, A. M.; London, 1840.

⁵ See Jardine's Contributions to Ornithology, London, 1849, p. 68; 1850, p. 51;

valuable information, and were they not disfigured by a very eccentric system of arrangement they would approach nearer to a natural classification of the subfamilies, genera, and subgenera, than any arrangement of the lesser groups which I have yet seen.

The species of this group are spread over the whole world, tropical regions having the greatest variety of forms and number of species. The *Strigidae* are cosmopolitan, most of the genera belonging to both continents. The *Falconidae* are also found the world over, but each continent has subfamilies peculiar to it. The *Cathartidae* are peculiar to America, having analogous representatives in the Old World in the subfamily *Vulturinae* belonging to the *Falconidae*. The *Gypogeranidae* are found only in South Africa, where a single species, *Gypogeranus serpentarius* (Gmel.), sole representative of the family, is found.

As regards the comparative number of species of this order in the two continents, the Old World is considerably ahead of the New World, which might be expected from its far greater land area. 581 species are given in Gray's Hand List,⁶ of which certainly not more than 500, probably not more than 450, are valid species, the others ranking as geographical races, or are synonymous with others; of this number about 350 nominal species are accredited to the Old World. America, however,

1851, p. 119; 1852, p. 103; and Transactions of the Zoölogical Society of London, 1862, p. 201.

⁶ Hand List of Genera and Species of Birds, distinguishing those contained in the British Museum. By George Robert Gray, F. R. S., etc. Part I. *Accipitres*, *Fisserostres*, *Tenuirostres*, and *Dentirostres*. London, 1869.

possesses the greatest variety of forms, and the great bulk of the Old World Raptorial fauna is made up chiefly by a large array of species of a few genera which are represented in America by but one or two, or at most half a dozen, species. The genera *Aquila*, *Spizætus*, *Accipiter*, *Haliaetus*, *Falco*, *Circus*, *Athene*, *Strix*, and *Buteo*, are striking examples. As regards the number of peculiar forms, America is considerably ahead.

Family STRIGIDÆ.—The Owls

Char. Eyes directed forward, and surrounded by a radiating system of feathers, which is bounded, except anteriorly, by a ruff of stiff, compactly webbed, differently formed, and somewhat recurved feathers; loral feathers antrorse, long, and dense. Plumage very soft and lax, of a fine downy texture, the feathers destitute of an after-shaft. Oil-gland without the usual circlet of feathers. Outer webs of the quills with the points of the fibres recurved. Feathers on the sides of the forehead frequently elongated into ear-like tufts; tarsus usually, and toes frequently, densely feathered. Ear-opening very large, sometimes covered by a lappet. Œsophagus destitute of a dilated crop; cœca large. Maxillo-palatines thick and spongy, and encroaching upon the intervening valley; basipterygoid processes always present. Outer toe reversible; posterior toe only about half as long as the outer. Posterior margin of the sternum doubly indented; clavicle weak and nearly cylindrical, about equal in length to the sternum. Anterior process of the coracoid projected forward so as to meet the clavicle, beneath the basal process of the scapula. Eggs variable in shape, usually nearly spherical, always immaculate, pure white.

The Owls constitute a very natural and sharply limited family, and though the species vary almost infinitely in the details of their structure, they all seem to fall within the limits of a single

subfamily.

They have never yet been satisfactorily classified, and all the arrangements which have been either proposed or adopted are refuted by the facts developed upon a close study into the true relationship of the many genera. The divisions of "Night Owls," "Day Owls," "Horned Owls," etc., are purely artificial. This family is much more homogeneous than that of the *Falconidæ*, since none of the many genera which I have examined seem to depart in their structure from the model of a single subfamily, though a few of them are somewhat aberrant as regards peculiarities in the detail of external form, or, less often, to a slight extent, in their osteological characters, though I have examined critically only the American and European species; and there may be some Asiatic, African, or Australian genera which depart so far from the normal standard of structure as to necessitate a modification of this view. In the structure of the sternum there is scarcely the least noticeable deviation in any genus⁷ from the typical form. The appreciable differences appear to be only of generic value, such as a different proportionate length of the coracoid bones and the sternum, and width of the sternum in proportion to its length, or the height of its keel. The crania present a greater range of variation, and, if closely studied, may afford a clew to a more natural arrangement than the one which is here presented. The chief differences in the

⁷ I have, however, examined the sterna only of *Nyctea*, *Bubo*, *Otus*, *Brachyotus*, *Syrnium*, *Nyctale*, and *Glaucidium*.

skulls of different genera consist in the degree of pneumaticity of the bones, in the form of the auricular bones, the comparative length and breadth of the palatines, and very great contrasts in the contour. As a rule, we find that those skulls which have the greatest pneumaticity (e.g. *Strix* and *Otus*) are most depressed anteriorly, have the orbital septum thicker, the palatines longer and narrower, and a deeper longitudinal median valley on the superior surface, and *vice versa*.

The following classification is based chiefly upon external characters; but these are in most instances known to be accompanied by osteological peculiarities, which point to nearly the same arrangement. It is intended merely as an artificial table of the North American genera, and may be subjected to considerable modification in its plan if exotic genera are introduced.⁸

⁸ My unpublished determinations of the North American species were furnished, by request, to Dr. Coues, for introduction into his "Key of North American Birds"; consequently the names used in these pages are essentially the same as those there employed.

Genera and Subgenera

A. Inner toe equal to the middle in length; inner edge of middle claw pectinated. First quill longer than the third; all the quills with their inner webs entire, or without emargination. Tail emarginated. Feathers of the posterior face of the tarsus recurved, or pointed upwards.

1. **Strix.** No ear-tufts; bill light-colored; eyes black; tarsus nearly twice as long as middle toe; toes scantily haired. Size medium. Ear-conch nearly as long as the height of the skull, with an anterior operculum for only a portion of its length; symmetrical.

B. Inner toe decidedly or much shorter than the middle; inner edge of middle claw not pectinated. First quill shorter than the third; one to six outer quills with their inner webs emarginated. Tail rounded. Feathers of the posterior face of the tarsus not recurved but pointed downwards.

I. Nostril open, oval, situated in the anterior edge of the cere, which is not inflated.

a. Cere, on top, equal to, or exceeding, the chord of the culmen; much arched. Ear-conch nearly as long as the height of the skull, with the operculum extending its full length; asymmetrical.

2. **Otus.** One or two outer quills with their inner webs emarginated. With or without ear-tufts. Bill blackish; iris

yellow. Size medium.

Ear-tufts well developed; only one quill emarginated ... *Otus*.

Ear-tufts rudimentary; two quills emarginated ... *Brachyotus*.

b. Cere, on top, less than the chord of the culmen; gradually ascending basally, or level (not arched). Ear-conch nearly the height of the skull, with the operculum extending only a part of its full length, or wanting entirely.

† Anterior edge of the ear-conch with an operculum; the two ears asymmetrical.

3. **Syrnium.** Five to six outer quills with their inner webs emarginated. Top of cere more than half the culmen. Without ear-tufts. Bill yellow; iris yellow or black. Size medium or large.

Six quills emarginated; toes densely feathered, the terminal scutellæ concealed; iris yellow. Size very large ... *Scotiaptex*.

Five quills emarginated; toes scanty feathered, the terminal scutellæ exposed; iris black. Size medium ... *Syrnium*.

4. **Nyctale.** Two outer quills with inner webs emarginated. Top of cere less than half the culmen, level. Without ear-tufts. Bill yellow or blackish; iris yellow. Size small.

†† Anterior edge of the ear-conch without an operculum. The two ears symmetrical. Tail slightly rounded, only about half as long as the wing.

5. **Scops.** Two to five quills with inner webs

emarginated; second to fifth longest. Bill weak, light-colored. Ear-conch elliptical, about one-third the height of the head, with a slightly elevated fringed anterior margin. Size small; ear-tufts usually well developed, sometimes rudimentary.

6. **Bubo.** Two to four outer quills with inner webs emarginated; third to fourth longest. Bill robust, black. Ear-conch elliptical, simple, from one third to one half the height of the skull. Size large. Ear-tufts well developed or rudimentary.

Ear-tufts well developed. Two to three outer quills with inner webs emarginated; lower tail-coverts not reaching end of the tail. Toes covered with short feathers, the claws exposed, and bill not concealed by the loral feathers ... *Bubo*.

Ear-tufts rudimentary. Four outer quills with their inner webs emarginated; lower tail-coverts reaching end of the tail. Toes covered with long feathers, which hide the claws, and bill nearly concealed by the loral feathers ... *Nyctea*.

††† Similar to the last, but the tail graduated, nearly equal to the wing.

7. **Surnia.** Four outer quills with inner webs emarginated. Third quill longest. Bill strong, yellow; ear-conch simple, oval, less than the diameter of the eye. Size medium; no ear-tufts.

II. Nostril, a small circular opening into the surrounding inflated membrane of the cere. Ear-conch small, simple, oval, or nearly round, without an operculum.

First quill shorter than the tenth.

8. **Glaucidium.** Third to fourth quills longest; four emarginated on inner webs. Tarsus about equal to the middle toe, densely feathered. Tail much more than half the wing, rounded. Bill and iris yellow. Size very small.

9. **Micrathene.** Fourth quill longest; four emarginated on inner webs. Tarsus a little longer than middle toe, scantily haired. Tail less than half the wing, even. Bill light (greenish ?); iris yellow. Size very small.

First quill longer than sixth.

10. **Speotyto.** Second to fourth quills longest; three emarginated on inner webs. Tarsus more than twice as long as middle toe, closely feathered in front to the toes, naked behind. Tail less than half the wing, slightly rounded. Bill yellowish; iris yellow. Size small.

In their distribution, the Owls, as a family, are cosmopolitan, and most of the genera are found on both hemispheres. All the northern genera (*Nyctea*, *Surnia*, *Nyctale*, and *Scotiaptex*), and the majority of their species, are circumpolar. The genus *Glaucidium* is most largely developed within the tropics, and has numerous species in both hemispheres. *Otus brachyotus* and *Strix flammea* are the only two species which are found all over the world,—the former, however, being apparently absent in Australia. *Gymnoglaux*, *Speotyto*, *Micrathene*, and *Lophostrix* are about the only well-characterized genera peculiar to America. *Athene*, *Ketupa*, and *Phodilus* are peculiar to the Old World. The approximate number of known species (see Gray's Hand List of Birds, I, 1869) is about two hundred, of which two, as stated,

are cosmopolitan; six others (*Surnia ulula*, *Nyctea scandiaca*, *Glaucidium passerinum*, *Syrnium cinereum*, *Otus vulgaris*, and *Nyctale tengmalmi*) are found in both halves of the Northern Hemisphere; of the remainder there are about an equal number peculiar to America and the Old World.

As regards the distribution of the Owls in the Nearctic Realm, a prominent feature is the number of the species (eighteen, not including races) belonging to it, of which six (*Micrathene whitneyi*, *Nyctale acadica*, *Syrnium nebulosum*, *S. occidentale*, *Scops asio*, and *S. flammeola*) are found nowhere else. *Speotyto cunicularia* and *Bubo virginianus* are peculiarly American species found both north and south of the equator, but in the two regions represented by different geographical races. *Glaucidium ferrugineum* and *G. infuscatum* (var. *gnoma*) are tropical species which overreach the bounds of the Neotropical Realm,—the former extending into the United States, the latter reaching to, and probably also within, our borders. Of the eighteen North American species, about nine, or one half (*Strix flammea* var. *pratincta*, *Otus brachyotus*, *O. vulgaris* var. *wilsonianus*, *Syrnium cinereum*, *Nyctale acadica*, *Bubo virginianus*, and *Scops asio*, with certainty, and *Nyctea scandiaca* var. *arctica*, and *Surnia ulula* var. *hudsonia*, in all probability), are found entirely across the continent. *Nyctale tengmalmi*, var. *richardsoni*, and *Syrnium nebulosum*, appear to be peculiar to the eastern portion,—the former to the northern regions, the latter to the southern. *Athene cunicularia* var. *hypugaea*, *Micrathene*

whitneyi, *Glaucidium passerinum* var. *californicum*, *Syrnium occidentale*, and *Scops flammeola*, are exclusively western, all belonging to the southern portion of the Middle Province and Rocky Mountain region, and the adjacent parts of Mexico, excepting the more generally distributed *Speotyto cunicularia*, var. *hypogæa*, before mentioned. Anomalies in regard to the distribution of some of the species common to both continents, are the restriction of the American representative of *Glaucidium passerinum* to the western regions,⁹ and of *Strix flammea* to the very southern and maritime portions of the United States, the European representatives of both species being generally distributed throughout that continent. On the other hand, the northwest-coast race of our *Scops asio* (*S. kennicotti*) seems to

⁹ This case of the restriction of the American representative of a European or Western Palæarctic species to the western half of the continent has parallel instances among other birds. The American form of *Falcolanarius* (var. *polyagrus*), of *Corvus corax* (var. *carnivorus*), *Pica caudata* (var. *hudsonica* and var. *nuttalli*) and of *Ægialitis cantianus* (var. *nivosus*), are either entirely restricted to the western portion, or else are much more abundant there than in the east. The European genera *Cinclus*, *Coccothraustes*, *Nucifraga*, and *Columba* have representatives only in the western portion of North America. Instances of a similar relation between the plants of the Western Province of North America and those of Europe, and more striking likeness between the flora of the Eastern Region and that of Eastern Asia, are beautifully explained in Professor Gray's interesting and instructive paper entitled "Sequoia, and its History," an address delivered at the meeting of the American Association for the Advancement of Science, at Dubuque, Iowa, August, 1872. The poverty in the species of tortoises, and richness in lizards, and the peculiarities of the ichthyological fauna, as well as absence of forms of Western North America and Europe, compared with Eastern North America and Eastern Asia, afford other examples of parallelism in other classes of the Animal Kingdom.

be nearly identical with the Japanese *S. semitorques* (Schlegel), which is undoubtedly referrible to the same species.

As regards their plumage, the Owls differ most remarkably from the Hawks in the fact that the sexes are invariably colored alike, while from the nest to perfect maturity there are no well-marked progressive stages distinguishing the different ages of a species. The nestling, or downy, plumage, however, of many species, has the intricate pencilling of the adult dress replaced by a simple transverse barring upon the imperfect downy covering. The downy young of *Nyctea scandiaca* is plain sooty-brown, and that of *Strix flammea* immaculate white.

In many species the adult dress is characterized by a mottling of various shades of grayish mixed with ochraceous or fulvous, this ornamented by a variable, often very intricate, pencilling of dusky, and more or less mixed with white. As a consequence of the mixed or mottled character of the markings, the plumage of the Owls is, as a rule, difficult to describe.

In the variations of plumage, size, etc., with differences of habitat, there is a wide range, the usually recognized laws¹⁰ applying to most of those species which are generally distributed and resident where breeding. Of the eight species common to the Palæarctic and Nearctic Realms, all but one (*Otus brachyotus*) are modified so as to form representative geographical races on

¹⁰ See Baird, Am. Journ. Arts and Sciences, Vol. XLI, Jan. and March, 1866; Allen, Bull. Mus. Comp. Zoöl. Cambridge, Vol. II, No. 3; and Ridgway, Am. Journ. Arts and Sciences, Vols. IV and V, Dec., 1872, and Jan., 1873.

the two continents. In each of these cases the American bird is much darker than the European, the brown areas and markings being not only more extended, but deeper in tint. The difference in this respect is so tangible that an experienced ornithologist can instantly decide to which continent any specimen belongs. Of the two cosmopolitan species one, *Otus brachyotus*, is identical throughout; the other is modified into geographical races in nearly every well-marked province of its habitat. Thus in the Palæarctic Realm it is typical *Strix flammea*; in the Nearctic Realm it is var. *pratincola*; while Tropical America has at least three well-marked geographical races, the species being represented in Middle America by the var. *guatemalæ*, in South America by var. *perlata*, and in the West Indies by the var. *furcata*. The Old World has also numerous representative races, of which we have, however, seen only two, namely, var. *javanica* (Gm.), of Java, India, and Eastern Africa, and var. *delicatula* (Gould) of Australia, both of which we unhesitatingly refer to *S. flammea*.¹¹

On the North American continent the only widely distributed species which do not vary perceptibly with the region are *Otus brachyotus* and *O. vulgaris* (var. *wilsonianus*). *Bubo virginianus*, *Scops asio*, and *Syrnium nebulosum* all bear the impress of special laws in the several regions of their habitat. Starting with the Eastern Province, and tracing either of these three species

¹¹ For diagnoses of these geographical races of *Strix flammea*, see pp. 1339 and 1340.

southward, we find it becoming gradually smaller, the colors deeper and more rufous, and the toes more scantily feathered. *Scops asio* reaches its minimum of size and maximum depth of color in Florida (var. *floridana*) and in Mexico (var. *enano*).

Of the other two I have not seen Florida specimens, but examples of both from other Southern States and the Lower Mississippi Valley region are much more rufous, and—the *S. nebulosum* especially—smaller, with more naked toes. The latter species is darkest in Eastern Mexico (var. *sartori*), and most rufescent, and smallest, in Guatemala (var. *fulvescens*). In the middle region of the United States, *Scops asio* (var. *maccalli*) and *Bubo virginianus* (var. *arcticus*) are more grayish and more delicately pencilled than from other portions. In the northwest coast region they become larger and much more darkly colored, assuming the clove-brown or sooty tints peculiar to the region. The var. *kennicotti* represents *S. asio* in this region, and var. *pacificus* the *B. virginianus*. The latter species also extends its range around the Arctic Coast to Labrador, and forms a northern *littoral* race, the very opposite extreme in color from the nearly albinoscent examples of var. *arcticus* found in the interior of Arctic America.

A very remarkable characteristic of the Owls is the fact that many of the species exist in a sort of *dimorphic* condition, or that two plumages sufficiently unlike to be of specific importance in other cases belong to one species. It was long thought that these two phases represented two distinct species; afterwards

it was maintained that they depended on age, sex, or season, different authors or observers entertaining various opinions on the subject; but it is now generally believed that every individual retains through life the plumage which it first acquires, and that young birds of both forms are often found in the same nest, their parents being either both of one form, or both of the other, or the two styles paired together.¹² The normal plumage, in these instances, appears to be grayish, the pattern distinct, the markings sharply defined, and the general appearance much like that of species which do not have the other plumage. The other plumage is a replacing of the grayish tints by a bright lateritious-rufous, the pencillings being at the same time less well defined, and the pattern of the smaller markings often changed. This condition seems to be somewhat analogous to *melanism* in certain *Falconidæ*, and appears to be more common in the genera *Scops* and *Glaucidium* (in which it affects mainly the tropical species), and occurs also in the European *Syrnium aluco*. As studied with relation to our North American species, we find it only in *Scops asio* and *Glaucidium ferrugineum*. The latter, being strictly tropical in its habitat, is similarly affected throughout its range; but in the former we find that this condition depends much upon the region. Thus neither Dr. Cooper nor I have ever seen a red specimen from the Pacific coast, nor do I find any record of such an occurrence. The normal gray plumage, however, is

¹² See Allen, Bull. Mus. Comp. Zoöl., Cambridge, Vol. II, No. 3, pp. 338, 339, where these plumages are discussed at length.

as common throughout that region as in the Atlantic States. In the New England and Middle States the red plumage seems to be more rare in most places than the gray one, while toward the south the red predominates greatly. Of over twenty specimens obtained in Southern Illinois (Mt. Carmel) in the course of one winter, only one was of the gray plumage; and of the total number of specimens seen and secured at other times during a series of years, we can remember but one other gray one. As a parallel example among mammals, Professor Baird suggests the case of the Red-bellied Squirrels and Foxes of the Southern States, whose relationships to the more grayish northern and western forms appear to be about the same as in the present instance.

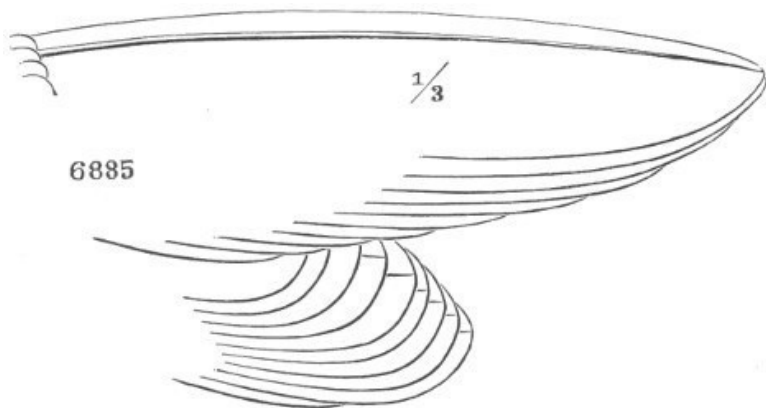
Genus **STRIX**, Savigny

Strix, Savigny, 1809 (*nec* Linn. 1735). (Type, *Strix flammea*, Linn.)

Stridula, Sellys-Longch, 1842.

Eustrinx, Webb & Berth. 1844.

Hybris, Nitzsch.



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Strix pratincola.

Gen. Char. Size medium. No ear-tufts; facial ruff entirely continuous, very conspicuous. Wing very long, the first or second quill longest, and all without emargination. Tail short,

emarginated. Bill elongated, compressed, regularly curved; top of the cere nearly equal to the culmen, straight, and somewhat depressed. Nostril open, oval, nearly horizontal. Eyes very small. Tarsus nearly twice as long as the middle toe, densely clothed with soft short feathers, those on the posterior face inclined upwards; toes scantily bristled; claws extremely sharp and long, the middle one with its inner edge pectinated. Ear-conch nearly as long as the height of the head, with an anterior operculum, which does not extend its full length; the two ears symmetrical?

The species of *Strix* are distributed over the whole world, though only one of them is cosmopolitan. This is the common Barn Owl (*S. flammea*), the type of the genus, which is found in nearly every portion of the world, though in different regions it has experienced modifications which constitute geographical races. The other species, of more restricted distribution, are peculiar to the tropical portions of the Old World, chiefly Australia and South Africa.

Synopsis of the Races of *S. flammea*

S. flammea. Face varying from pure white to delicate claret-brown; facial circle varying from pure white, through ochraceous and rufous, to deep black. Upper parts with the feathers ochraceous-yellow basally; this overlaid, more or less continuously, by a grayish wash, usually finely mottled and speckled, with dusky and white. Primaries and tail barred

transversely, more or less distinctly, with distant dusky bands, of variable number. Beneath, varying from pure snowy white to tawny rufous, immaculate or speckled. Wing, 10.70–13.50.

Wing, 10.70–12.00; tail, 4.80–5.50; culmen, .75–.80; tarsus, 2.05–2.15; middle toe, 1.25–1.30. Tail with four dark bands, and sometimes a trace of a fifth. *Hab.* Europe and Mediterranean region of Africa ... var. *flammea*.¹³

Wing, 12.50–14.00; tail, 5.70–7.50; culmen, .90–1.00; tarsus, 2.55–3.00. Tail with four dark bands, and sometimes a trace of a fifth. Colors lighter than in var. *flammea*. *Hab.* Southern North America and Mexico ... var. *pratincta*.

Wing, 11.30–13.00; tail, 5.30–5.90; tarsus, 2.55–2.95. Colors of var. *flammea*, but more uniform above and more coarsely speckled below. *Hab.* Central America, from Panama to Guatemala ... var. *guatemalæ*.¹⁴

¹³ *Strix flammea*, var. *flammea*. *Strix flammea*, Linn. S. N. I, 133, 1766, et Auct.-Strickl. Orn. Syn. I, 1855, 178. *Strix alba*, Scop. Ann. 1st, p. 21, 1768.—Gmel. S. N. 293.—Lath.—Daud.—Lep. and Shaw. *Strix guttata*, Brehm, Vög. Deutschl. p. 106, 1831. *Hab.* Europe and Africa.

¹⁴ *Strix flammea*, var. *guatemalæ*, Ridgway. Central American specimens differ very appreciably from Mexican and North American examples, in being considerably darker-colored in the extreme phases of plumage. Eight of eleven specimens convey an impression of decided difference in this respect at a mere casual glance. The extremes of plumage in this series are as follows:—Darkest (No. 40,961, Chimandega, Nicaragua; F. Hicks): The dusky mottling of the upper parts is altogether darker than in any example from Mexico or northward, and prevails, with great uniformity, over the entire surface; the white specks are linear, instead of roundish. On the primaries and tail, the blackish and ochraceous are about equal in extent, the latter color forming five bands on the quills, and four on the tail. The facial circle is bright dark orange above the ears, and the portion below the ears continuous black; the face is reddish-

Wing, 11.70–12.00; tail, 4.80–5.20; tarsus, 2.40–2.75. Tail more even, and lighter colored; the dark bars narrower, and more sharply defined. Colors generally paler, and more

white, strongly tinged with wine-brown, while the spot in front of the eye is deep black. The whole lower parts are deep orange-ochraceous, with numerous irregular specks of dusky, which posteriorly become broken or confused into ragged zigzag transverse mottlings, while on the lower tail-coverts they form irregular transverse bars. Wing-formula, 2, 1–3. Wing, 13.00; tail, 5.90; culmen, .85; tarsus, 2.90; middle toe, 1.50. Lightest (No. 41,252, ♂, San José, Costa Rica, Aug. 23, 1865; José C. Zeledon): The dark tint above, though prevalent, is a continuous wash of grayish, instead of a fine mottling of blackish and white; the white specks are nearly obsolete. The wings are superficially plain grayish, this overlaying the ground-color of ochraceous-orange; and have visible spots only on the primaries, near their shafts. The tail has four rather distinct grayish bands. The facial circle is ochraceous, somewhat darker across the foreneck; the face white, with the ante-orbital spot claret-brown. Entire lower parts immaculate pure white. Wing-formula, 2, 1=3. Wing, 12.30; tail, 5.30; culmen, .70; tarsus, 2.75; middle toe, 1.45. No. 24,283, Nicaragua, (Captain J. M. Dow,) is like the specimen just described, in the uniform dark wash of the upper parts, but this is deeper; the lower parts, however, are quite different, being ochraceous-orange, instead of pure white. The remaining five specimens (from San Salvador, Costa Rica, and Nicaragua) are alike, and differ from northern birds in the deeper dark mottling of the upper parts; the white specks very conspicuous, and usually sagittate. The facial circle deep black where it crosses the foreneck. The lower parts vary in color from nearly pure white to deep orange-rufous; the dark markings of the lower surface are larger, more angular, and more transverse than in true *pratincola*. The wing measures 11.30–13.00; tarsus, 2.55–2.95. The northern form varies from 12.50–13.00 (wing) and 2.50–2.85 (tarsus). It is thus seen that while these southern birds average smaller in general dimensions, they have actually larger feet, the average length of the tarsus being 2.80 in the Central American series, and only 2.60 in the northern series. This exactly coincides with the case of *Sturnella*, the *S. magna* var. *mexicana* of the same region being smaller bodied and shorter winged than var. *magna* of the United States, but with much larger feet, see p.

grayish. *Hab.* South America (Brazil, etc.) ... var. *perlata*.¹⁵

Wing, 12.00–13.50; tail, 5.60–6.00; culmen, .85–.95; tarsus, 2.70–2.85; middle toe, 1.45–1.60. Colors as in var. *perlata*, but secondaries and tail nearly white, in abrupt contrast to the adjacent parts; tail usually without bars. *Hab.* West Indies (Cuba and Jamaica, Mus. S. I.) ... var. *furcata*.¹⁶

¹⁵ *Strix flammea*, var. *perlata*. *Strix perlata*, Licht. Verz. Doubl. 59, 1823.—Tschudi, Av. Consp. Wieg. Archiv. 267, 1844.—Hartt. Syst. Ind. Azara. p. 3.—Max. Beitr. III, 263 (excl. syn.).—Strickl. Orn. Syn. I, 1855, 180 (excl. syn.). *Strix flammea*, Darwin, Zool. Beag. 34.—Schomb. Verz. Faun. Brit. Guian. p. 732.—Spix, Av. Bras. I, 21. This is a still further differentiated or more appreciably modified race. It differs in smaller size (wing, 11.70–12.50; tail, 4.80–5.20; tarsus, 2.40–2.75) and more square tail, while the colors also present constant differences. The tail is much lighter compared with the wings, the bands narrower and more sharply defined, though the same in number.

¹⁶ *Strix flammea*, var. *furcata*. *Strix furcata*, Temm. Pl. Col. 432, 1838.—D'Orb. Hist. Nat. Cuba Ois. p. 34. *Hab.* West Indies (Cuba and Jamaica). This form is the most distinctly characterized of all the races of *S. flammea* which we have examined. It has the general plumage decidedly lighter and less rufous, while the secondaries and tail are abruptly lighter than the adjacent parts, and usually free from bands, though there are sometimes traces of them. All the American races of *Strix flammea* differ very decidedly from the European form (var. *flammea*) in much larger size. The differences in color are not so appreciable, and there is hardly any certain difference in this respect. The extreme phases, however, appear to be darker in the var. *flammea* than in the var. *pratincola*. The supposed differences in the character of the feathers fringing the operculum, insisted on by MacGillivray (History of British Birds, III, 1840, p. 473), I am unable to appreciate, for I cannot find that they differ in the least in the two races. That excellent ornithologist states that in the American "species" the feathers of the operculum are reduced to a simple tube, having neither filaments nor shaft, while in the European bird they are perfect feathers, with all their parts complete. Though this may have been the case with the one or more specimens of *pratincola* examined by Mr. MacGillivray, I have yet to see an American specimen which has not the feathers

Wing, 11.00; tail, 5.00; culmen, about .85; tarsus, 2.05–2.45; middle toe, 1.30–1.40. Colors of var. *pratincola*, but less of the ochraceous, with a greater prevalence of the gray mottling. Tail with four dark bands *Hab.* Australia ... var. *delicatula*.¹⁷

Wing, 11.00–11.70; tail, 5.10–5.40; culmen, .85–.90; tarsus, 2.30–2.45; middle toe, 1.35–1.45. Same colors as var. *delicatula*. Tail with four dark bands (sometimes a trace of a fifth). *Hab.* India and Eastern Africa ... var. *javanica*.¹⁸

***Strix flammea*, var. *pratincola*, Bonap**

AMERICAN BARN OWL

Strix pratincola, Bonap. List, 1838, p. 7.—De Kay, Zoöl.

of the operculum just as perfectly developed as in European examples.

¹⁷ *Strix flammea*, var. *delicatula*. *Strix delicatula*, Gould, P. Z. S. 1836, 140.—Ib. B. Australia, I, pl. xxxi.—Strickl. Orn. Syn. 1855, 180. *Hab.* Australia.

¹⁸ *Strix flammea*, var. *javanica*. *Strix javanica*, Gmel. S. N. I, 295, 1789.—Lath. Ind. Orn. p. 64, and Gen. Hist. I, 357.—Horsf. L. Trans. XIII, 139.—Gray, Gen. B. fol. sp. 5, pl. xv.—Sykes, P. Comm. Zoöl. Soc. pl. ii, 81.—Strickl. Orn. Syn. I, 1855, 180. *Phodilus javanicus*, Blyth, Journ. As. Soc. Beng. XIX, 513. *Strix flammea*, Pears. & Blyth. *Hab.* Java and Southern India, and Eastern Africa. I have been unable to find any description of this form, and believe it to be unnamed. It is certainly not the *S. dominicensis*, Gmel. (S. N. 296, *S. domingensis*, Müll. Gray's Hand List, 43, No. 438), not *S. fusca*, Vieill. (Gray's Hand List, No. 439). The type is in the collection of the Boston Society of Natural History, and belongs to the Lafresnaye collection (No. 787).

N. Y. II, 1844, 31, pl. xiii. f. 28.—Gray, Gen. B., fol. sp. 2.
 —Cassin, B. Cal. & Tex. 1854, p. 176.—Newb. P. R. Rep.
 VI, iv, 1857, 76.—Heerm. do. VII, 1857, 34.—Cass. Birds
 N. Am. 1858, 47.—Coues, Prod. Orn. Ariz. (P. A. N. S.
 Philad. 1866), 13.—Scl. P. Z. S. 1859, 390 (Oaxaca).—
 Dresser, Ibis, 1865, 330 (Texas).—? Bryant, Pr. Bost. Soc.
 1867, 65 (Bahamas). *Strix perlata*, Gray, List Birds Brit.
 Mus. 1848, 109 (not *S. perlata* of Licht. !).—Ib. Hand List,
 I, 1869, 52.—Kaup, Monog. Strig. Pr. Zoöl. Soc. Lond.
 IV, 1859, 247. *Strix americana*, Aud. Synop. 1839, 24.
 —Brewer, Wilson's Am. Orn. 1852, 687. *Strix flammea*,
 Max. Reise Bras. II, 1820, 265.—Wils. Am. Orn. 1808,
 pl. 1, f. 2.—James, ed. Wilson's Am. Orn. I, 1831, 111.
 —Aud. B. Am. 1831, pl. clxxi.—Ib. Orn. Biog. II, 1831,
 403.—Spix, Av. Bras. I, 21.—Vig. Zoöl. Jour. III, 438.—
 Ib. Zoöl. Beech. Voy. p. 16.—Bonap. Ann. N. Y. Lyc. II,
 38.—Ib. Isis, 1832, 1140; Consp. Av. p. 55.—Gray, List
 Birds Brit. Mus. 1844, 54.—Nutt. Man. 1833, 139. *Ulula*
flammea, Jardine, ed. Wilson's Am. Orn. II, 1832, 264.
Strix flammea, var. *americana*, Coues, Key, 1872, 201.

Char. *Average plumage.* Ground-color of the upper parts
 bright orange-ochraceous; this overlaid in cloudings, on nearly
 the whole of the surface, with a delicate mottling of blackish
 and white; the mottling continuous on the back and inner
 scapulars, and on the ends of the primaries more faint, while
 along their edges it is more in the form of fine dusky dots, thickly
 sprinkled. Each feather of the mottled surface (excepting the
 secondaries and primaries) has a medial dash of black, enclosing

a roundish or cordate spot of white near the end of the feather; on the secondaries and primaries, the mottling is condensed into obsolete transverse bands, which are about four in number on the former and five on the latter; primary coverts deeper orange-rufous than the other portions, the mottling principally at their ends. Tail orange-ochraceous, finely mottled—most densely terminally—with dusky, fading into whitish at the tip, and crossed by about five distinct bands of mottled dusky. Face white, tinged with wine-red; an ante-orbital spot of dark claret-brown, this narrowly surrounding the eye; facial circle, from forehead down to the ears (behind which it is white for an inch or so) soft orange-ochraceous, similar to the ground-color of the upper parts; the lower half (from ears across the throat) deeper ochraceous, the tips of the feathers blackish, the latter sometimes predominating. Lower parts snowy-white, but this more or less overlaid with a tinge of fine orange-ochraceous, lighter than the tint of the upper parts; and, excepting on the jugulum, anal region, and crissum, with numerous minute but distinct specks of black; under surface of wings delicate yellowish-white, the lining sparsely sprinkled with black dots; inner webs of primaries with transverse bars of mottled dusky near their ends.

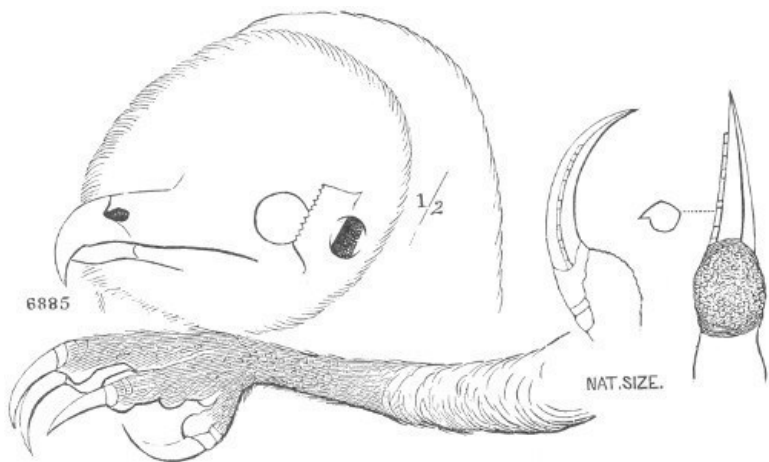
Extreme plumages. Darkest (No. 6,884, ♂, Tejon Valley, Cal.; "R. S. W." Dr. Heermann): There is no white whatever on the plumage, the lower parts being continuous light ochraceous; the tibiæ have numerous round spots of blackish. Lightest (No. 6,885, same locality): Face and entire lower parts immaculate

snowy-white; facial circle white, with the tips of the feathers orange; the secondaries, primaries, and tail show no bars, their surface being uniformly and finely mottled.

Measurements (♂, 6,884, Tejon Valley, Cal.; Dr. Heermann). Wing, 13.00; tail, 5.70; culmen, .90; tarsus, 2.50; middle toe, 1.25. Wing-formula, 2, 1–3. Among the very numerous specimens in the collection, there is not one marked ♀. The extremes of a large series are as follows: Wing, 12.50–14.00; tail, 5.70–7.50; culmen, .90–1.10; tarsus, 2.55–3.00.

Hab. More southern portions of North America, especially near the sea-coast, from the Middle States southward, and along the southern border to California; whole of Mexico. In Central America appreciably modified into var. *guatemalæ*. In South America replaced by var. *perlata*, and in the West Indies by the quite different var. *furcata*.

Localities: Oaxaca (Scl. P. Z. S. 1859, 390); Texas (Dresser, Ibis, 1865, 330); Arizona (Coues, P. A. N. S. 1866, 49); ? Bahamas (Bryant, Pr. Bost. Soc. 1867, 65). Kansas (Snow, List of B. Kansas); Iowa (Allen, Iowa Geol. Report, II, 424).



6885 $\frac{1}{2}$ nat. size.

Strix pratincola.

The variations of plumage noted above appear to be of a purely individual nature, since they do not depend upon the locality; nor, as far as we can learn, to any considerable extent, upon age or sex.

Habits. On the Atlantic coast this bird very rarely occurs north of Pennsylvania. It is given by Mr. Lawrence as very rare in the vicinity of New York, and in three instances, at least, it has been detected in New England. An individual is said, by Rev. J. H. Linsley, to have been taken in 1843, in Stratford, Conn.; another was shot at Sachem's Head in the same State, October 28, 1865; and a third was killed in May, 1868, near Springfield, Mass.

In the vicinity of Philadelphia the Barn Owl is not very rare, but is more common in spring and autumn than in the summer. Its nests have been found in hollow trees near marshy meadows. Southward it is more or less common as far as South Carolina, where it becomes more abundant, and its range then extends south and west as far as the Pacific. It is quite plentiful in Texas and New Mexico, and is one of the most abundant birds of California. It was not met with by Dr. Woodhouse in the expedition to the Zuñi River, but this may be attributed to the desolate character of the country through which he passed, as it is chiefly found about habitations, and is never met with in wooded or wild regions.



Strix flammea.

Dr. Heermann and Dr. Gambel, who visited California before the present increase in population, speak of its favorite resort as being in the neighborhood of the Missions, and of its nesting under the tiled roofs of the houses. The latter also refers to his

finding numbers under one roof, and states that they showed no fear when approached. The propensity of the California bird to drink the sacred oil from the consecrated lamps about the altars of the Missions was frequently referred to by the priests, whenever any allusion was made to this Owl. Dr. Gambel also found it about farm-houses, and occasionally in the prairie valleys, where it obtains an abundance of food, such as mice and other small animals.

Dr. Heermann, in a subsequent visit to the State, mentions it as being a very common bird in all parts of California. They were once quite numerous among the hollow trees in the vicinity of Sacramento, but have gradually disappeared, as their old haunts were one by one destroyed to make way for the gradual development and growth of that city. Dr. Heermann found a large number in the winter, sheltered during the day among the reeds of Suisun Valley. They were still abundant in the old Catholic Missions, where they frequented the ruined walls and towers, and constructed their nests in the crevices and nooks of those once stately buildings, now falling to decay. These ruins were also a shelter for innumerable bats, reptiles, and vermin, which formed an additional attraction to the Owls.

Dr. Cooper speaks of finding this Owl abundant throughout Southern California, especially near the coast, and Dr. Newberry frequently met with it about San Francisco, San Diego, and Monterey, where it was more common than any other species. He met with it on San Pablo Bay, inhabiting holes in the

perpendicular cliffs bordering the south shore. It was also found in the Klamath Basin, but not in great numbers.

Mr. J. H. Clark found the Barn Owl nesting, in May, in holes burrowed into the bluff banks of the Rio Frio, in Texas. These burrows were nearly horizontal, with a considerable excavation near the back end, where the eggs were deposited. These were three or four in number, and of a dirty white. The parent bird allowed the eggs to be handled without manifesting any concern. There was no lining or nest whatever. Lieutenant Couch found them common on the Lower Rio Grande, but rare near Monterey, Mexico. They were frequently met with living in the sides of large deep wells.

Dr. Coues speaks of it as a common resident species in Arizona. It was one of the most abundant Owls of the Territory, and was not unfrequently to be observed at midday. On one occasion he found it preying upon Blackbirds, in the middle of a small open reed swamp.

It is not uncommon in the vicinity of Washington, and after the partial destruction of the Smithsonian Building by fire, for one or two years a pair nested in the top of the tower. It is quite probable that the comparative rarity of the species in the Eastern States is owing to their thoughtless destruction, the result of a short-sighted and mistaken prejudice that drives away one of our most useful birds, and one which rarely does any mischief among domesticated birds, but is, on the contrary, most destructive to rats, mice, and other mischievous and injurious vermin.

Mr. Audubon mentions two of these birds which had been kept in confinement in Charleston, S. C., where their cries in the night never failed to attract others of the species. He regards them as altogether crepuscular in habits, and states that when disturbed in broad daylight they always fly in an irregular and bewildered manner. Mr. Audubon also states that so far as his observations go, they feed entirely on small quadrupeds, as he has never found the remains of any feathers or portions of birds in their stomachs or about their nests. In confinement it partakes freely of any kind of flesh.

The Cuban race (var. *furcata*), also found in other West India islands, is hardly distinguishable from our own bird, and its habits may be presumed to be essentially the same. Mr. Gosse found the breeding-place of the Jamaica Owl at the bottom of a deep limestone pit, in the middle of October; there was one young bird with several eggs. There was not the least vestige of a nest; the bird reposed on a mass of half-digested hair mingled with bones. At a little distance were three eggs, at least six inches apart. On the 12th of the next month he found in the same place the old bird sitting on four eggs, this time placed close together. There was still no nest. The eggs were advanced towards hatching, but in very different degrees, and an egg ready for deposition was found in the oviduct of the old bird.

An egg of this Owl, taken in Louisiana by Dr. Trudeau, measured 1.69 inches in length by 1.38 in breadth. Another, obtained in New Mexico, measures 1.69 by 1.25. Its color is

a dirty yellowish-white, its shape an oblong oval, hardly more pointed at the smaller than at the larger end.

An egg from Monterey, California, collected by Dr. Canfield, measures 1.70 inches in length by 1.25 in breadth, of an oblong-oval shape, and nearly equally obtuse at either end. It is of a uniform bluish-white. Another from the Rio Grande is of a soiled or yellowish white, and of the same size and shape.

Genus OTUS, Cuvier

Otus, Cuv. Reg. An. 1799. (Type, *Strix otus*, Linn.)

Asio, Swains. 1831 (*nec* Brisson, 1760).

Brachyotus, Gould, P. Z. S. 1837, 10. (Type, *Stryx brachyotus*.)

Ægolius, Keys. & Bl. 1840 (*nec* Kaup, 1829).

Char. Size medium. Ear-tufts well developed or rudimentary; head small; eyes small. Cere much arched, its length more than the chord of the culmen. Bill weak, compressed. Only the first, or first and second, outer primary with its inner web emarginated. Tail about half the wing, rounded. Ear-conch very large, gill-like, about as long as the height of the skull, with an anterior operculum, which extends its full length, and bordered posteriorly by a raised membrane; the two ears asymmetrical.

Species and Varieties

A. *Otus*, Cuvier. Ear-tufts well developed; outer quill only with inner web emarginated.

Colors blackish-brown and buffy-ochraceous,—the former predominating above, where mottled with whitish; the latter prevailing beneath, and variegated with stripes or bars of dusky. Tail, primaries, and secondaries, transversely barred (obsoletely in *O. stygius*).

1. **O. vulgaris.** Ends of primaries normal, broad; toes feathered; face ochraceous.

Dusky of the upper parts in form of longitudinal stripes, contrasting conspicuously with the paler ground-color. Beneath with ochraceous prevalent; the markings in form of longitudinal stripes, with scarcely any transverse bars. *Hab.* Europe and considerable part of the Old World ... var. *vulgaris*.¹⁹

Dusky of the upper parts in form of confused mottling, not contrasting conspicuously with the paler ground-color. Beneath with the ochraceous overlaid by the whitish tips to the feathers; the markings in form of transverse bars, which are broader than the narrow medial streak. Wing, 11.50–12.00; tail, 6.00–6.20; culmen, .65; tarsus, 1.20–1.25; middle toe, 1.15. Wing-formula, 2, 3–4–1. *Hab.* North America ... var. *wilsonianus*.

2. **O. stygius.**²⁰ Ends of primaries narrow, that of the first almost falcate; toes entirely naked; face dusky, or with dusky prevailing.

Above blackish-brown, thinly relieved by an irregular

¹⁹ *Otus vulgaris*. *Strix otus*, Linn. S. N. p. 132, 1766.—*Asio otus*, Less. Strickl.—*Bubo otus*, Savign. *Uhula otus*, Macgill. *Otus vulgaris*, Flem. Brit. An. p. 56, 1828, et Auct. *O. europæus*, Steph. 1. *O. albicollis*, Daud. *O. italicus*, Daud. *O. communis*, Less. *O. aurita*, Mont. *O. asio*, Leach. *O. sylvestris*, *O. arboreus*, and *O. gracilis*, Brehm.

²⁰ *Otus stygius*. *Nyctalops stygius*, Wagl. Isis, 1832, p. 1221.—Gray, Gen. B. p. 6, ed. 2, p. 8.—Bonap. Consp. Av. p. 50. *Otus stygius*, Puch. Rev. Zoöl. 1849, 29.—Gray, Gen. B. fol. sp. 12.—Kaup, Monog. Strig. Cont. Orn. 1852, p. 113. *Asio styg.* ? *Otus siguapa*, D'Orb. Hist. Nat. Cuba Ois. p. 31, Tab. 2, 1840.—Gray, Gen. fol. sp. 9.—Bonap. Consp. 50 (Cuba). *Otus communis*, var., Less. Tr. Orn. p. 110. *Hab.* South America (Brazil, ? Cuba, St. Paulo, Kaup).

sparse spotting of yellowish-white. Beneath with the markings in form of longitudinal stripes, which throw off occasional transverse arms toward the edge of the feathers. Wing, 13.00; tail, 6.80; culmen, .90; tarsus, 1.55; middle toe, 1.50. Wing-formula, 2, 3-4, 1. *Hab.* South America.

B. Brachyotus, Gould (1837). Similar to *Otus*, but ear-tufts rudimentary, and the second quill as well as the first with the inner web emarginated.

Colors ochraceous, or white, and clear dark brown, without shadings or middle tints. Beneath with narrow longitudinal dark stripes upon the whitish or ochraceous ground-color; crown and neck longitudinally striped with dark brown and ochraceous.

3. O. brachyotus. Wings and tail nearly equally spotted and banded with ochraceous and dark brown. Tail with about six bands, the ochraceous terminal. Face dingy ochraceous, blackish around the eyes. Wing, about 11.00-13.00; tail, 5.75-6.10; culmen, .60-.65; tarsus, 1.75-1.80; middle toe, 1.20. *Hab.* Whole world (except Australia?).

Though this genus is cosmopolitan, the species are few in number; two of them (*O. vulgaris* and *O. brachyotus*) are common to both North America and Europe, one of them (the latter) found also in nearly every country in the world. Besides these, South Africa has a peculiar species (*O. capensis*) while Tropical America alone possesses the *O. stygius*.

Otus vulgaris, var. wilsonianus, Less

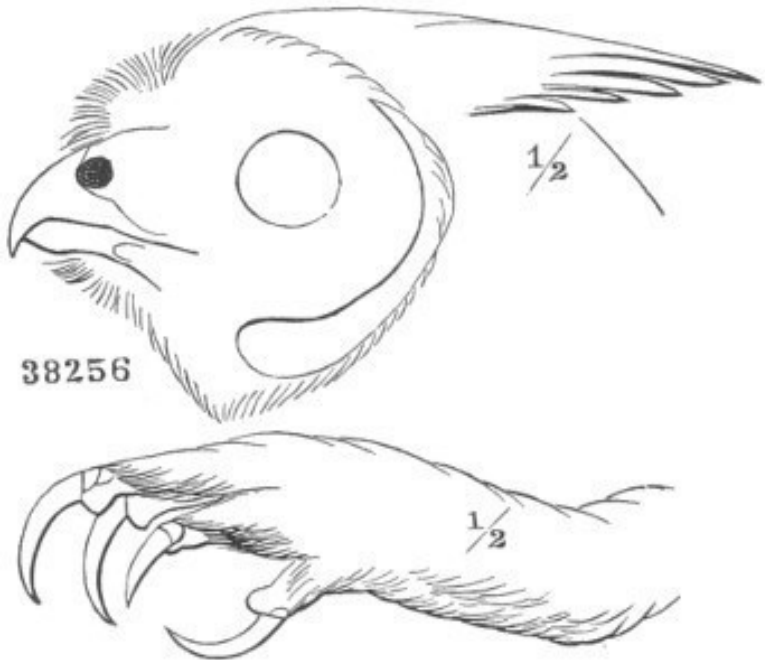
LONG-EARED OWL; LESSER-HORNED OWL

? *Strix peregrinator* (?), Bart. Trav. 1792, p. 285.—Cass. B. Cal. & Tex. 1854, 196. *Asio peregrinator*, Strickl. Orn. Syn. I, 1855, 207. *Otus wilsonianus*, Less. Tr. Orn. 1831, 110.—Gray, Gen. fol. sp. 2, 1844.—Ib. List Birds Brit. Mus. p. 105.—Cass. Birds Cal. & Tex. 1854, 81.—Ib. Birds N. Am. 1858, 53.—Coop. & Suck. 1860, 155.—Coues, Prod. 1866, 14. *Otus americanus*, Bonap. List, 1838, p. 7.—Ib. Consp. p. 50.—Wederb. & Tristr. Cont. Orn. 1849, p. 81.—Kaup, Monog. Strig. Cont. Orn. 1852, 113.—Ib. Trans. Zoöl. Soc. IV, 1859, 233.—Max. Cab. Jour. VI, 1858, 25.—Gray, Hand List, I, 1869, No. 540, p. 50. *Strix otus*, Wils. Am. Orn. 1808, pl. li, f. 1.—Rich. & Sw. F. B. A. II, 72.—Bonap. Ann. N. Y. Lyc. II, 37.—Ib. Isis, 1832, 1140.—Aud. Orn. Biog. IV, 572.—Ib. Birds Am. pl. ccclxxxiii.—Peab. Birds, Mass. 88. *Uhula otus*, Jard. ed. Wils. Am. Orn. I, 1831, 104.—Brewer, ed. Wils. Am. Orn. Synop. p. 687.—Nutt. Man. 130. *Otus vulgaris* (not of Fleming!), Jardine, ed. Wils. Am. Orn. 1832, II, 278.—Aud. Synop. 1831, 28.—Giraud, Birds Long Island, p. 25. *Otus vulgaris*, var. *wilsonianus* (Ridgway), Coues, Key, 1872, 204. *Bubo asio*, De Kay, Zoöl. N. Y. II, 25, pl. xii,

Sp. Char. *Adult*. Upper surface transversely mottled with blackish-brown and grayish-white, the former predominating, especially on the dorsal region; feathers of the nape and wings (only), ochraceous beneath the surface, lower scapulars with a few obsolete spots of white on lower webs. Primary coverts dusky, with transverse series of dark mottled grayish spots, these becoming somewhat ochraceous basally; ground-color of the primaries grayish, this especially prevalent on the inner quills; the basal third (or less) of all are ochraceous, this decreasing in extent on inner feathers; the grayish tint is everywhere finely mottled transversely with dusky, but the ochraceous is plain; primaries crossed by a series of about seven quadrate blackish-brown spots, these anteriorly about as wide as the intervening yellowish or mottled grayish; the interval between the primary coverts to the first of these spots is about .80 to 1.00 inch on the fourth quill,—the spots on the inner and outer feathers approaching the coverts, or even underlying them; the inner primaries—or, in fact, the general exposed grayish surface—has much narrower bars of dusky. Ground-color of the wings like the back, this growing paler on the outer feathers, and becoming ochraceous basally; the tip approaching whitish; secondaries crossed by nine or ten narrow bands of dusky.

Ear-tufts, with the lateral portion of each web, ochraceous; this becoming white, somewhat variegated with black, toward the end of the inner webs, on which the ochraceous is broadest;

medial portion clear, unvariegated black. Forehead and post-auricular disk minutely speckled with blackish and white; facial circle continuous brownish-black, becoming broken into a variegated collar across the throat. "Eyebrows" and lores grayish-white; eye surrounded with blackish, this broadest anteriorly above and below, the posterior half being like the ear-coverts. Face plain ochraceous; chin and upper part of the throat immaculate white. Ground-color below pale ochraceous, the exposed surface of the feathers, however, white; breast with broad longitudinal blotches of clear dark brown, these medial, on the feathers; sides and flanks, each feather with a medial stripe, crossed by as broad, or broader, transverse bars, of blackish-brown; abdomen, tibial plumes, and legs plain ochraceous, becoming nearly white on the lower part of tarsus and on the toes; tibial plumes with a few sagittate marks of brownish; lower tail-coverts each having a medial sagittate mark of dusky, this continuing along the shaft, forking toward the base. Lining of the wing plain pale ochraceous; inner primary coverts blackish-brown, forming a conspicuous spot.



38256 $\frac{1}{2}$ $\frac{1}{2}$

Otus wilsonianus.

♂ (51,227, Carlisle, Penn.; S. F. Baird). Wing formula, 2, 3-1, 4, etc. Wing, 11.50; tail, 6.20; culmen, .65; tarsus, 1.20; middle toe, 1.15.

♀ (2,362, Professor Baird's collection, Carlisle, Penn.). Wing formula, 2, 3-4-1. Wing, 12.00; tail, 6.00; culmen, .65; tarsus, 1.25; middle toe, 1.15.

Young (49,568, Sacramento, Cal., June 21, 1867; Clarence King, Robert Ridgway). Wings and tail as in the adult; other portions transversely banded with blackish-brown and grayish-white, the latter prevailing anteriorly; eyebrows and loreal bristles entirely black; legs white.

Hab. Whole of temperate North America? Tobago? (Jardine).

Localities: Tobago (Jardine, Ann. Mag. 18, 116); Arizona (Coues, P. A. N. S. 1866, 50).

The American Long-eared Owl is quite different in coloration from the *Otus vulgaris* of Europe. In the latter, ochraceous prevails over the whole surface, even above, where the transverse dusky mottling does not approach the uniformity that it does in the American bird; in the European bird, each feather above has a conspicuous medial longitudinal stripe of dark brownish: these markings are found everywhere except on the rump and upper tail-coverts, where the ochraceous is deepest, and transversely clouded with dusky mottling; in the American bird, no longitudinal stripes are visible on the upper surface. The ochraceous of the lower surface is, in the *vulgaris*, varied only (to any considerable degree) by the sharply defined medial longitudinal stripes to the feathers, the transverse bars being few and inconspicuous; in *wilsonianus*, white overlies the ochraceous below, and the longitudinal are less conspicuous than the transverse markings; the former on the breast are broader than in *vulgaris*, in which, also, the ochraceous at the bases of the primaries occupies a greater extent. Comparing these very

appreciable differences with the close resemblance of other representative styles of the two continents (differences founded on shade or depth of tints alone), we were almost inclined to recognize in the American Long-eared Owl a specific value to these discrepancies.



Otus vulgaris.

The *Otus stygius*, Wagl., of South America and Mexico, is entirely distinct, as will be seen from the foregoing synoptical table.

Habits. This species appears to be one of the most numerous of the Owls of North America, and to be pretty generally distributed. Its strictly nocturnal habits have caused it to be temporarily overlooked in localities where it is now known to be present and not rare. Dr. William Gambel and Dr. Heermann both omit it from their lists of the birds of California, though Dr. J. G. Cooper has since found it quite common. It was once supposed not to breed farther south than New Jersey, but it is now known to be resident in South Carolina and in Arizona, and is probably distributed through all the intervening country. Donald Gunn writes that to his knowledge this solitary bird hunts in the night, both summer and winter, in the Red River region. It there takes possession of the deserted nests of crows, and lays four white eggs. He found it as far as the shores of Hudson's Bay. Richardson states it to be plentiful in the woods skirting the plains of the Saskatchewan, frequenting the coast of the bay in the summer, and retiring into the interior in the winter. He met with it as high as the 16th parallel of latitude, and believed it to occur as far as the forests extend.

Dr. Cooper met with this species on the banks of the Columbia, east of the Dalles. The region was desolate and barren, and several species of Owls appeared to have been drawn there

by the abundance of hares and mice. Dr. Suckley also met with it on a branch of Milk River, in Nebraska. It has likewise been taken in different parts of California, in New Mexico, among the Rocky Mountains, in the valley of the Rio Grande, at Fort Benton, and at Cape Florida, in the last-named place by Mr. Würdemann.

Dr. Cooper found this Owl quite common near San Diego, and in March observed them sitting in pairs in the evergreen oaks, apparently not much troubled by the light. On the 27th of March he found a nest, probably that of a Crow, built in a low evergreen oak, in which a female Owl was sitting on five eggs, then partly hatched. The bird was quite bold, flew round him, snapping her bill at him, and tried to draw him away from the nest; the female imitating the cries of wounded birds with remarkable accuracy, showing a power of voice not supposed to exist in Owls, but more in the manner of a Parrot. He took one of the eggs, and on the 23d of April, on revisiting the nest, he found that the others had hatched. The egg measured 1.60 by 1.36 inches. Dr. Cooper also states that he has found this Owl wandering into the barren treeless deserts east of the Sierra Nevada, where it was frequently to be met with in the autumn, hiding in the thickets along the streams. It also resorts to caves, where any are to be found.

Dr. Kennerly met with this bird in the cañons west of the Aztec Mountains, where they find good places for their nests, which they build, in common with Crows and Hawks, among the precipitous cliffs,—places unapproachable by the wolf and lynx.

On the Atlantic coast the Long-eared Owl occurs in more or less abundance from Nova Scotia to Florida. It is found in the vicinity of Halifax, according to Mr. Downes, and about Calais according to Mr. Boardman, though not abundantly in either region. In Western Maine, and in the rest of New England, it is more common. It has been known to breed at least as far south as Maryland, Mr. W. M. McLean finding it in Rockville. Mr. C. N. Holden, Jr., during his residence at Sherman, in Wyoming Territory, met with a single specimen of this bird. A number of Magpies were in the same bush, but did not seem either to molest or to be afraid of it.

The food of this bird consists chiefly of small quadrupeds, insects, and, to some extent, of small birds of various kinds. Audubon mentions finding the stomach of one stuffed with feathers, hair, and bones.

The Long-eared Owl appears to nest for the most part in trees, and also frequently to make use of the nests of other birds, such as Crows, Hawks, or Herons. Occasionally, however, they construct nests for themselves. Audubon speaks of finding such a one near the Juniata River, in Pennsylvania. This was composed of green twigs with the leaflets adhering, and lined with fresh grass and sheep's wool, but without feathers. Mr. Kennicott sent me from Illinois an egg of this bird, that had been taken from a nest on the ground; and, according to Richardson, in the fur regions it sometimes lays its eggs in that manner, at other times in the deserted nests of other birds, on low bushes. Mr. Hutchins speaks

of its depositing them as early as April. Richardson received one found in May; and another nest was observed, in the same neighborhood, which contained three eggs on the 5th of July. Wilson speaks of this Owl as having been abundant in his day in the vicinity of Philadelphia, and of six or seven having been found in a single tree. He also mentions it as there breeding among the branches of tall trees, and in one particular instance as having taken possession of the nest of a Qua Bird (*Nyctiardea gardeni*), where Wilson found it sitting on four eggs, while one of the Herons had her own nest on the same tree. Audubon states that it usually accommodates itself by making use of the abandoned nests of other birds, whether these are built high or low. It also makes use of the fissures of rocks, or builds on the ground.

As this Owl is known to breed early in April, and as numerous instances are given of their eggs being taken in July, it is probable they have two broods in a season. Mr. J. S. Brandigee, of Berlin, Conn., found a nest early in April, in a hemlock-tree, situated in a thick dark evergreen woods. The nest was flat, made of coarse sticks, and contained four fresh eggs when the parent was shot.

Mr. Ridgway found this Owl to be very abundant in the Sacramento Valley, as well as throughout the Great Basin, in both regions inhabiting dense willow copses near the streams. In the interior it generally lays its eggs in the deserted nests of the Magpie.

The eggs of this Owl, when fresh, are of a brilliant white color,

with a slight pinkish tinge, which they preserve even after having been blown, if kept from the light. They are of a rounded-oval shape, and obtuse at either end. They vary considerably in size, measuring from 1.65 to 1.50 inches in length, and from 1.30 to 1.35 inches in breadth. Two eggs, taken from the same nest by Rev. C. M. Jones, have the following measurements: one 1.60 by 1.34 inches, the other 1.50 by 1.30 inches.

Otus (Brachyotus) brachyotus, Steph

SHORT-EARED OWL; MARSH OWL

Strix brachyotus, Gmel. Syst. Nat. 289, 1789.—Forst. Phil. Trans. LXII, 384.—Wils. Am. Orn. pl. xxxiii, f. 3.—Aud. Birds Am. pl. ccccxxxii, 1831.—Ib. Orn. Biog. V, 273.—Rich. & Swains. F. B. A. II, 75.—Bonap. Ann. Lyc. N. Y. II, 37.—Thomps. N. H. Vermont, p. 66.—Peab. Birds Mass. p. 89. *Ulula brachyotus*, James. (Wils.), Am. Orn. I, 106, 1831.—Nutt. Man. 132. *Otus brachyotus*, (Steph.) Jard. (Wils.), Am. Orn. II, 63, 1832.—Peale, U. S. Expl. Exp. VIII, 75.—Kaup, Monog. Strig. Cont. Orn. 1852, 114.—Ib. Tr. Zoöl. Soc. IV, 1859, 236.—Hudson, P. Z. S. 1870, 799 (habits). *Asio brachyotus*, Strickl. Orn. Syn. I, 259, 1855. *Otus brachyotus americanus*, Max. Cab. Jour. II, 1858, 27. *Brachyotus palustris*, Bonap. List. 1838, p. 7.—Ridgw. in Coues, Key, 1872, 204. *Otus palustris*,

(Darw.) De Kay, Zoöl. N. Y. II, 28, pl. xii, f. 27, 1844. *Brachyotus palustris americanus*, Bonap. Consp. Av. p. 51, 1849. *Brachyotus cassini*, Brewer, Pr. Boston Soc. N. H.—Newb. P. R. Rep't, VI, iv, 76.—Heerm. do. VII, 34, 1857.—Cassin (in Baird) Birds N. Am. 1858, 54.—Coop. & Suckl. P. R. Rep't, XII, ii, 155, 1860.—Coues, P. A. N. S. (Prod. Orn. Ariz.) 1866, 14.—Gray, Hand List, I, 51, 1869. *Brachyotus galapagoensis*, Gould, P. Z. S. 1837, 10. *Otus galapagoensis*, Darw. Zool. Beag. pt. iii, p. 32, pl. iii.—Gray, Gen. fol. sp. 3; List Birds Brit. Mus. 108.—Bonap. Consp. 51. *Asio galapagoensis*, Strickl. Orn. Syn. I, 1855, 211.

Sp. Char. *Adult*. Ground-color of the head, neck, back, scapulars, rump, and lower parts, pale ochraceous; each feather (except on the rump) with a medial longitudinal stripe of blackish-brown,—these broadest on the scapulars; on the back, nape, occiput, and jugulum, the two colors about equal; on the lower parts, the stripes grow narrower posteriorly, those on the abdomen and sides being in the form of narrow lines. The flanks, legs, anal region, and lower tail-coverts are always perfectly immaculate; the legs most deeply ochraceous, the lower tail-coverts nearly pure white. The rump has obsolete crescentic marks of brownish. The wings are variegated with the general dusky and ochraceous tints, but the markings are more irregular; the yellowish in form of indentations or confluent spots, approaching the shafts from the edge,—broadest on the outer webs. Secondaries crossed by about five bands of

ochraceous, the last terminal; primary coverts plain blackish-brown, with one or two poorly defined transverse series of ochraceous spots on the basal portion. Primaries ochraceous on the basal two-thirds, the terminal portion clear dark brown, the tips (broadly) pale brownish-yellowish, this becoming obsolete on the longest; the dusky extends toward the bases, in three to five irregularly transverse series of quadrate spots on the outer webs, leaving, however, a large basal area of plain ochraceous,—this somewhat more whitish anteriorly. The ground-color of the tail is ochraceous,—this becoming whitish exteriorly and terminally,—crossed by five broad bands (about equalling the ochraceous, but becoming narrower toward outer feathers) of blackish-brown; on the middle feathers, the ochraceous spots enclose smaller, central transverse spots of blackish; the terminal ochraceous band is broadest.

Eyebrows, lores, chin, and throat soiled white, the loral bristles with black shafts; face dingy ochraceous-white, feathers with darker shafts; eye broadly encircled with black. Post-orbital circle minutely speckled with pale ochraceous and blackish, except immediately behind the ear, where for about an inch it is uniform dusky.

Lining of the wing immaculate delicate yellowish-white; terminal half of under primary coverts clear blackish-brown; under surface of primaries plain delicate ochraceous-white; ends, and one or two very broad anterior bands, dusky.

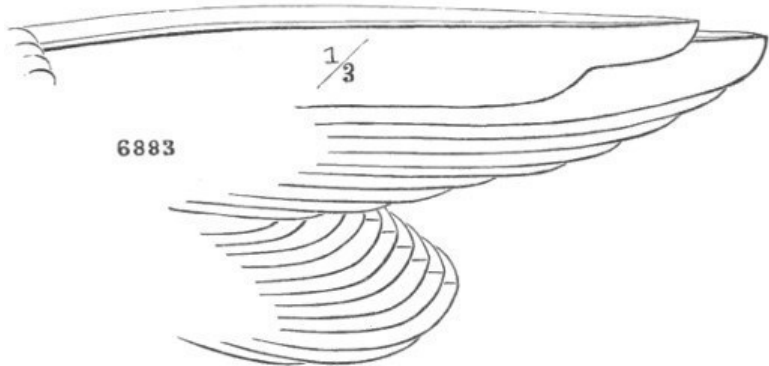
♂ (906, Carlisle, Penn.). Wing-formula, 2–1, 3. Wing, 11.80;

tail, 5.80; culmen, .60; tarsus, 1.75; middle toe, 1.20.



6888 $\frac{1}{2}$ $\frac{1}{2}$

Otus brachyotus.



6883 $\frac{1}{3}$

Otus brachyotus.

♀ (1,059, Dr. Elliot Coues's collection, Washington, D. C.).
Wing-formula, 2-3-1-4. Wing, 13.00; tail, 6.10; culmen, .65;
tarsus, 1.80; middle toe, 1.20.

Hab. Entire continent and adjacent islands of America; also
Europe, Asia, Africa, Polynesia, and Sandwich Islands.

Localities: Oaxaca (Scl. P. Z. S. 1859, 390); Cuba (Cab.
Journ. III, 465; Gundl. Rept. 1865, 225, west end); Arizona
(Coues, P. A. N. S. 1866, 50); Brazil (Pelz. Orn. Bras. I, 10);
Buenos Ayres (Scl. & Salv. P. Z. S. 1868, 143); Chile (Philippi,
Mus. S. I.).

In view of the untangible nature of the differences between
the American and European Short-eared Owls (seldom at all
appreciable, and when appreciable not constant), we cannot

admit a difference even of race between them. In fact, this species seems to be the only one of the Owls common to the two continents in which an American specimen cannot be distinguished from the European. The average plumage of the American representative is a shade or two darker than that of European examples; but the lightest specimens I have seen are several from the Yukon region in Alaska, and one from California (No. 6,888, Suisun Valley).

Not only am I unable to appreciate any tangible differences between European and North American examples, but I fail to detect characters of the least importance whereby these may be distinguished from South American and Sandwich Island specimens ("*galapagoensis*, Gould," and "*sandwichensis*, Blox."). Only two specimens, among a great many from South America (Paraguay, Buenos Ayres, Brazil, etc.), are at all distinguishable from Northern American. These two (Nos. 13,887 and 13,883, Chile) are somewhat darker than others, but not so dark as No. 16,029, ♀, from Fort Crook, California. A specimen from the Sandwich Islands (No. 13,890) is nearly identical with these Chilean birds, the only observable difference consisting in a more blackish forehead, and in having just noticeable dark shaft-lines on the lower tail-coverts.



Otus brachyotus.

In the geographical variations of this species it is seen that the average plumage of North American specimens is

just appreciably darker than that of European, while tropical specimens have a tendency to be still darker. I know of no bird so widely distributed which varies so little in the different parts of its habitat, unless it be the *Cotyle riparia*, which, however, is not found so far to the south. The difference, in this case, between the American and European birds, does not correspond at all to that between the two easily distinguished races of *Otus vulgaris*, *Nyctale tengmalmi*, *Surnia ulula*, and *Syrnium cinereum*.

A specimen from Porto Rico (No. 39,643) is somewhat remarkable on account of the prevalence of the dusky of the upper parts, the unusually few and narrow stripes of the same on the lower parts, the roundish ochraceous spots on the wings, and in having the primaries barred to the base. Should all other specimens from the same region agree in these characters, they might form a diagnosable race. The plumage has an abnormal appearance, however, and I much doubt whether others like it will ever be taken.

Habits. The Short-eared Owl appears to be distributed, in varying frequency, throughout North America, more abundant in the Arctic regions during the summer, and more frequently met with in the United States during the winter months. Richardson met with it throughout the fur countries as far to the north as the 67th parallel. Professor Holböll gives it as a bird of Greenland, and it was met with in considerable abundance by MacFarlane in the Anderson River district. Mr. Murray mentions a specimen received from the wooded district between Hudson's Bay and

Lake Winnipeg. Captain Blakiston met with it on the coast of Hudson's Bay, and Mr. Bernard Ross on the Mackenzie River.

Mr. Dresser speaks of it as common at times near San Antonio during the winter months, keeping itself in the tall weeds and grass. It is given by Dr. Gundlach as an occasional visitant of Cuba.

Dr. Newberry met with it throughout Oregon and California, and found it especially common in the Klamath Basin. On the level meadow-like prairies of the Upper Pitt River it was seen associating with the Marsh Hawk in considerable numbers. It was generally concealed in the grass, and rose as the party approached. He afterwards met with this bird on the shores of Klamath Lake, and in the Des Chutes Basin, among grass and sage-bushes, in those localities associated with the Burrowing Owl (*A. hypogæa*). In Washington Territory it was found by Dr. Cooper on the great Spokane Plain, where, as elsewhere, it was commonly found in the long grass during the day. In fall and winter it appeared in large numbers on the low prairies of the coast, but was not gregarious. Though properly nocturnal, it was met with, hunting on cloudy days, flying low over the meadows, in the manner of the Marsh Hawk. He did not meet with it in summer in the Territory.

Dr. Heermann found it abundant in the Suisun and Napa valleys of California, in equal numbers with the *Strix pratincola*. It sought shelter during the day on the ground among the reeds, and, when startled from its hiding-place, would fly but a few

yards and alight again upon the ground. It did not seem wild or shy. He afterwards met with the same species on the desert between the Tejon Pass and the Mohave River, and again saw it on the banks of the latter. Richardson gives it as a summer visitant only in the fur countries, where it arrives as soon as the snow disappears, and departs again in September. A female was killed May 20 with eggs nearly ready for exclusion. The bird was by no means rare, and, as it frequently hunted for its prey in the daytime, was often seen. Its principal haunts appeared to be dense thickets of young pines, or dark and entangled willow-clumps, where it would sit on a low branch, watching assiduously for mice. When disturbed, it would fly low for a short distance, and then hide itself in a bush, from whence it was not easily driven. Its nest was said to be on the ground, in a dry place, and formed of withered grass. Hutchins is quoted as giving the number of its eggs as ten or twelve, and describing them as round. The latter is not correct, and seven appears to be their maximum number.

Mr. Downes speaks of it as very rare in Nova Scotia, but Elliott Cabot gives it as breeding among the islands in the Bay of Fundy, off the coast, where he found several nests. It was not met with by Professor Verrill in Western Maine, but is found in other parts of the State. It is not uncommon in Eastern Massachusetts, where specimens are frequently killed and brought to market for sale, and where it also breeds in favorable localities on the coast. Mr. William Brewster met with it on Muskeget, near Nantucket,

where it had been breeding, and where it was evidently a resident, its plumage having become bleached by exposure to the sun, and the reflected light of the white sand of that treeless island. It is not so common in the interior, though Mr. Allen gives it as resident, and rather common, near Springfield. Dr. Wood found it breeding in Connecticut, within a few miles of Hartford.

Dr. Coues gives it as a resident species in South Carolina, and Mr. Allen also mentions it, on the authority of Mr. Boardman, as quite common among the marshes of Florida. Mr. Audubon also speaks of finding it so plentiful in Florida that on one occasion he shot seven in a single morning. They were to be found in the open prairies of that country, rising from the tall grass in a hurried manner, and moving in a zigzag manner, as if suddenly awakened from a sound sleep, and then sailing to some distance in a direct course, and dropping among the thickest herbage. Occasionally the Owl would enter a thicket of tangled palmettoes, where with a cautious approach it could be taken alive. He never found two of these birds close together, but always singly, at distances of from twenty to a hundred yards; and when two or more were started at once, they never flew towards each other.

Mr. Audubon met with a nest of this Owl on one of the mountain ridges in the great pine forest of Pennsylvania, containing four eggs nearly ready to be hatched. They were bluish-white, of an elongated form, and measured 1.50 inches in length and 1.12 in breadth. The nest, made in a slovenly manner with dry grasses, was under a low bush, and covered over with tall

grass, through which the bird had made a path. The parent bird betrayed her presence by making a clicking noise with her bill as he passed by; and he nearly put his hand on her before she would move, and then she hopped away, and would not fly, returning to her nest as soon as he left the spot. The pellets disgorged by the Owl, and found near her nest, were found to consist of the bones of small quadrupeds mixed with hair, and the wings of several kinds of coleopterous insects.

This bird was found breeding near the coast of New Jersey by Mr. Krider; and at Hamilton, Canada, on the western shore of Lake Ontario; Mr. McIlwraith speaks of its being more common than any other Owl.

A nest found by Mr. Cabot was in the midst of a dry peaty bog. It was built on the ground, in a very slovenly manner, of small sticks and a few feathers, and presented hardly any excavation. It contained four eggs on the point of being hatched. A young bird the size of a Robin was also found lying dead on a tussock of grass in another similar locality.

The notes of Mr. MacFarlane supply memoranda of twelve nests found by him in the Anderson River country. They were all placed on the ground, in various situations. One was in a small clump of dwarf willows, on the ground, and composed of a few decayed leaves. Another nest was in a very small hole, lined with a little hay and some decayed leaves. This was on a barren plain of some extent, fifty miles east of Fort Anderson, and on the edge of the wooded country. A third was in a clump of

Labrador Tea, and was similar to the preceding, except that the nest contained a few feathers. This nest contained seven eggs,—the largest number found, and only in this case. A fourth was in an artificial depression, evidently scratched out by the parent bird. Feathers seem to have been noticed in about half the nests, and in all cases to have been taken by the parent from her own breast. Nearly all the nests were in depressions made for the purpose.

Mr. Dall noticed the Short-eared Owl on the Yukon and at Nulato, and Mr. Bannister observed it at St. Michael's, where it was a not unfrequent visitor. In his recent Notes on the Avi-fauna of the Aleutian Islands, (Pr. Cal. Academy, 1873,) Dall informs us that it is resident on Unalashka, and that it excavates a hole horizontally for its nesting-place,—usually to a distance of about two feet, the farther end a little the higher. The extremity is lined with dry grass and feathers. As there are no trees in the island, the bird was often seen sitting on the ground, near the mouth of its burrow, even in the daytime. Mr. Ridgway found this bird in winter in California, but never met with it at any season in the interior, where the *O. wilsonianus* was so abundant.

The eggs of this Owl are of a uniform dull white color, which in the unblown egg is said to have a bluish tinge; they are in form an elliptical ovoid. The eggs obtained by Mr. Cabot measured 1.56 inches in length and 1.25 in breadth. The smallest egg collected by Mr. MacFarlane measured 1.50 by 1.22 inches. The largest taken by Mr. B. R. Ross, at Fort Simpson, measures 1.60 by 1.30 inches; their average measurement is 1.57 by 1.28 inches.

An egg of the European bird measures 1.55 by 1.30 inches.

Genus SYRNIUM, Savigny

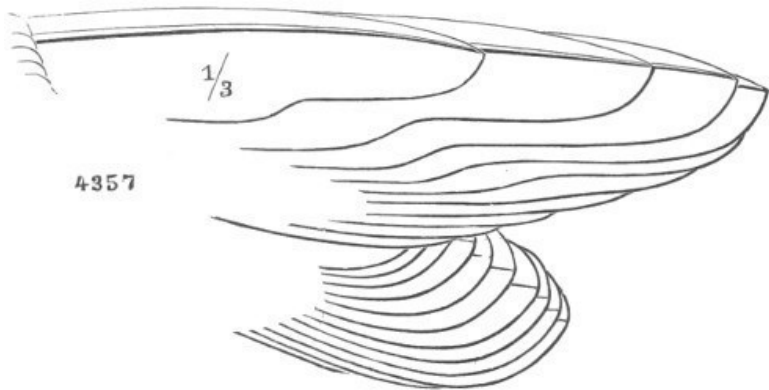
Syrnium, Savigny, Nat. Hist. Egypt, I, 112; 1809. (Type, *Strix aluco*, L.)

Scotiaptex, Swains., Classif. B. II, 1837, p. 216. (Type, *Strix cinerea*, Gmel.)

? *Ciccaba*, Wagl. Isis, 1831. (Type, *Strix huhula*, Daud.)

? *Pulsatrix*, Kaup, 1849. (*Strix torquatus*, Daud.)

Gen. Char. Size varying from medium to very large. No ear-tufts. Head very large, the eyes comparatively small. Four to six outer primaries with their inner webs sinuated. Tarsi and upper portion, or the whole of the toes, densely clothed with hair-like feathers. Tail considerably more than half as long as the wing, decidedly rounded. Ear-orifice very high, but not so high as the skull, and furnished with an anterior operculum, which does not usually extend along the full length; the two ears asymmetrical. Bill yellow.



4357 $\frac{1}{3}$

Syrnium nebulosum.

Subgenera

Scotiaptex. Six outer quills with their inner webs emarginated. Toes completely concealed by dense long hair-like feathers. Iris yellow. (Type, *S. cinereum.*)

Syrnium, Swainson. Five outer quills with their inner webs emarginated. Toes not completely concealed by feathers; sometimes nearly naked; terminal scutellæ always (?) exposed. Iris blackish. (Type, *S. aluco.*)

The typical species of this genus are confined to the Northern Hemisphere. It is yet doubtful whether the Tropical American species usually referred to this genus really belong here. The

genera *Ciccaba*, Wagl., and *Pulsatrix*, Kaup, have been instituted to include most of them; but whether these are generically or only subgenerically distinct from the typical species of *Syrnium* remains to be decided.

Our *S. nebulosum* and *S. occidentale* seem to be strictly congeneric with the *S. aluca*, the type of the subgenus *Syrnium*, since they agree in the minutest particulars in regard to their external form, and other characters not specific.



Species and Varieties

a. Scotiaptex, Swains

1. **S. cinereum.** Iris yellow; bill yellow. Dusky grayish-brown and grayish-white, the former prevailing above, the latter predominating beneath. The upper surface with mottlings of a transverse tendency; the lower surface with the markings in the form of ragged longitudinal stripes, which are transformed into transverse bars on the flanks, etc. Face grayish-white, with concentric rings of dusky. Wing, 16.00–18.00; tail, 11.00–12.50.

Dark markings predominating. *Hab.* Northern portions of the Nearctic Realm ... var. *cinereum*.

Light markings predominating. *Hab.* Northern portions of the Palæarctic Realm ... var. *lapponicum*.

b. Syrnium, Sav

Common Characters. Liver-brown or umber, variously spotted and barred with whitish or ochraceous. Bill yellow; iris brownish-black.

2. **S. nebulosum.** Lower parts striped longitudinally. Head and neck with transverse bars.

Colors reddish-umber and ochraceous-white. Face with obscure concentric rings of darker. Wing, 13.00–14.00; tail, 9.00–10.00. *Hab.* Eastern region of United States ... var. *nebulosum*.

Colors blackish-sepia and clear white. Face without any darker concentric rings. Wing, 14.80; tail, 9.00. *Hab.* Eastern Mexico (Mirador) ... var. *sartorii*.²¹

Colors tawny-brown and bright fulvous. Face without darker concentric rings (?). Wing, 12.50, 12.75; tail, 7.30, 8.50. *Hab.* Guatemala ... var. *fulvescens*.²²

²¹ *Syrnium nebulosum*, var. *sartorii*, Ridgway (Mexican Barred Owl). *Hab.* Mirador, Mexico. Char. *Adult* (♀, 43,131, Mirador, near Vera Cruz, Mexico, “pine region”; Dr. C. Sartorius). In general appearance like *nebulosum*, but the brown very much darker, and less reddish,—that of the markings below very nearly black; the pattern, however, precisely the same, and there is about the same proportion between the light and the dark bars as is seen in the average of *nebulosum*. The face is plain dirty white without the brown bars or semicircles,—a constant and conspicuous feature in *nebulosum*. There is the same number of spots on the primaries, and of bands on the tail, as in *nebulosum*. The white beneath is without any ochraceous tinge; the primary coverts are plain dark brown. Wing-formula: 4–3=5; 1 intermediate between 8 and 9. Wing, 14.80; tail, 9.00; culmen, 1.05; tarsus, 2.20; middle toe, 1.60. This race of the *S. nebulosum* presents very appreciable differences from the bird of the United States. As stated above, the brown is much darker and less reddish, while the face is wholly destitute of the concentric dusky rings seen in *nebulosum* proper. To Dr. Charles Sartorius, who, by the presentation to the Smithsonian Institution of numerous elegantly prepared specimens, has added so much to our knowledge of the birds of the vicinity of Mirador, I take great pleasure in dedicating this new form.

²² *Syrnium nebulosum*, var. *fulvescens*. *Syrnium fulvescens*, Salvin, P. Z. S. 1868, 58. Char. General appearance of var. *nebulosum*, but smaller and much more ochraceous.

3. **S. occidentale.** Lower parts transversely barred. Head and neck with roundish spots. Wing, 12.00–13.10; tail, 9.00. *Hab.* Southern California (Fort Tejon, Xantus) and Arizona (Tucson, Nov. 7, Bendire).

Syrnium (Scotiaptex) cinereum, Audubon

GREAT GRAY OWL

Strix cinerea, Gmel. Syst. Nat. p. 291, 1788.—Lath. Ind. Orn. p. 58, 1790; Syn. I, 134; Supp. I, 45; Gen. Hist. I, 337.—Vieill. Nouv. Dict. Hist. Nat. VII, 23, 1816; Enc. Méth. III, 1289; Ois. Am. Sept. I, 48.—Rich. & Swains. F. B. A. II, pl. xxxi, 1831.—Bonap. Ann. Lyc. N. Y. II, 436; Isis, 1832, p. 1140.—Aud. Birds Am. pl. cccli, 1831; Orn. Biog. IV, 364.—Nutt. Man. p. 128.—Tyzenhauz, Rev. Zoöl. 1851, p. 571. *Syrnium cinereum*, Aud. Synop. p. 26, 1839.—Cass. Birds Cal. & Tex. p. 184, 1854; Birds N. Am. 1858, p. 56.—Brew. (Wils.) Am. Orn. p. 687.—De Kay, Zoöl. N. Y. II, 26, pl. xiii, f. 29, 1844.—Strickl. Orn.

Ground-color of the plumage ochraceous, inclining to a deep fulvous tint on the upper parts, but paler below. Feathers of the upper surface tipped with dark umber-brown, and sometimes with an additional bar about the middle of the feather. The fulvous bars much exposed, so as to exceed the brown in amount. Face grayish-white, tinged outwardly with ochraceous. Beneath with the markings of *nebulosum* on a deep and uniform ochraceous ground. Wing, 12.75; tail, 8.50; culmen, .95; tarsus, 2.45; middle toe, 1.20 (Coll. Bost. Soc., No. 367, Guatemala; Van Patten).

Syn. I, 188, 1855.—Newb. P. R. R. Rept. VI, iv, 77, 1857.—Coop. & Suck. P. R. R. Rept. XII, ii, 156, 1860.—Kaup, Tr. Zoöl. Soc. IV, 1859, 256.—Dall & Bannister, Tr. Chicago Acad. I, 1869, 173.—Gray, Hand List, I, 48, 1869.—Maynard, Birds Eastern Mass., 1870, 130.—*Scotiaptex cinerea*, Swains. Classif. Birds, II, 217, 1837. *Syrnium lapponicum*, var. *cinereum*, Coues, Key, 1872, 204. *Strix acclamator*, Bart. Trans. 285, 1792.

Sp. Char. *Adult*. Ground-color of the upper surface dark vandyke-brown, but this relieved by a transverse mottling (on the edges of the feathers) of white, the medial portions of the feathers being scarcely variegated, causing an appearance of obsolete longitudinal dark stripes, these most conspicuous on the scapulars and back. The anterior portions above are more regularly barred transversely; the white bars interrupted, however, by the brown medial stripe. On the rump and upper tail-coverts the mottling is more profuse, causing a grayish appearance. On the wing-coverts the outer webs are most variegated by the white mottling. The alula and primary coverts have very obsolete bands of paler; the secondaries are crossed by nine (last terminal, and three concealed by coverts) bands of pale grayish-brown, inclining to white at the borders of the spots; primaries crossed by nine transverse series of quadrate spots of mottled pale brownish-gray on the outer webs, those beyond the emargination obscure,—the terminal crescentic bar distinct, however; upper secondaries and middle tail-feathers with coarse transverse mottling, almost forming bars. Tail with

about nine paler bands, these merely marked off by parallel, nearly white bars, enclosing a plain grayish-brown, sometimes slightly mottled space, just perceptibly darker than the ground-color; basally the feathers become profusely mottled, so that the bands are confused; the last band is terminal. Beneath with the ground-color grayish-white, each feather of the neck, breast, and abdomen with a broad, longitudinal ragged stripe of dark brown, like the ground-color of the upper parts; sides, flanks, crissum, and lower tail-coverts with regular transverse narrow bands; legs with finer, more irregular, transverse bars of dusky. "Eyebrows," lores, and chin grayish-white, a dusky space at anterior angle of the eye; face grayish-white, with distinct concentric semicircles of blackish-brown; facial circle dark brown, becoming white across the foreneck, where it is divided medially by a spot of brownish-black, covering the throat.

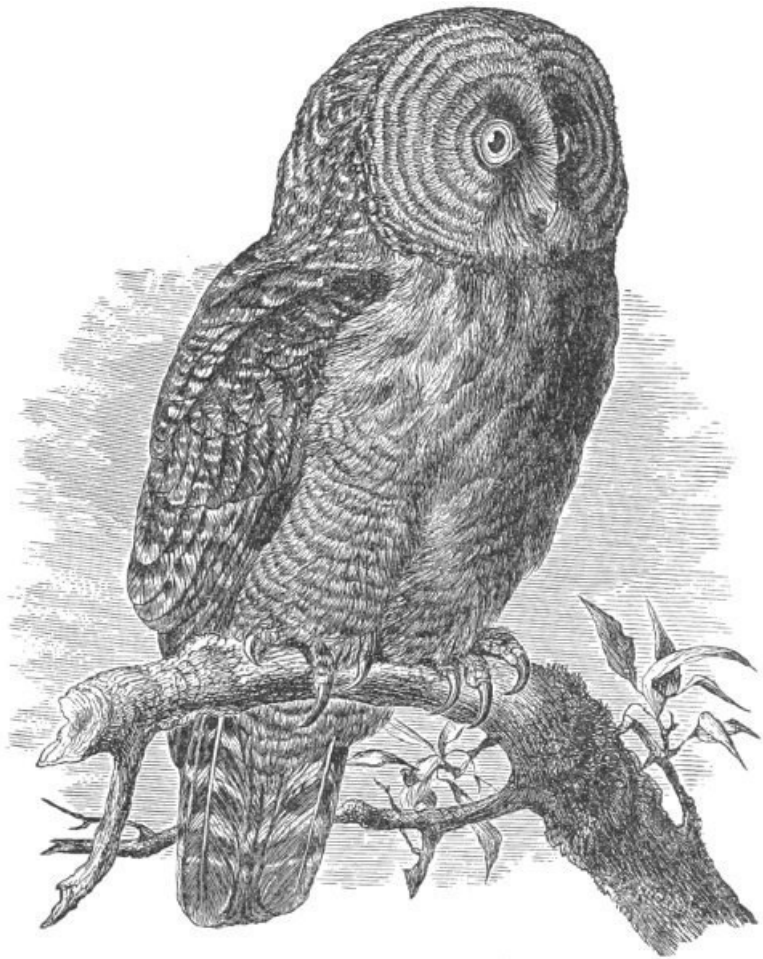
♂ (32,306, Moose Factory, Hudson Bay Territory; J. McKenzie). Wing-formula, 4=5, 3, 6-2, 7-8-9, 1. Wing, 16.00; tail, 11.00; culmen, 1.00; tarsus, 2.30; middle toe, 1.50.

♀ (54,358, Nulato, R. Am., April 11, 1868; W. H. Dall). Wing-formula, 4=5, 3, 6-2, 7-8-9, 1. Wing, 18.00; tail, 12.50; culmen, 1.00; tarsus, 2.20; middle toe, 1.70.

Hab. Arctic America (resident in Canada?). In winter extending into northern borders of United States (Massachusetts, Maynard).

The relationship between the *Syrnium cinereum* and the *S. lapponicum* is exactly parallel to that between the *Otus vulgaris*,

var. *wilsonianus*, and var. *vulgaris*, *Surnia ulula*, var. *hudsonia*, and the var. *ulula*, and *Nyctale tengmalmi*, var. *richardsoni*, and the var. *tengmalmi*. In conformity to the general rule among the species which belong to the two continents, the American race of the present bird is very decidedly darker than the European one, which has the whitish mottling much more prevalent, giving the plumage a lighter and more grayish aspect. The white predominates on the outer webs of the scapulars. On the head and neck the white equals the dusky in extent, while on the lower parts it largely prevails. The longitudinal stripes of the dorsal region are much more conspicuous in *lapponicum* than in *cinereum*.



Syrnium cinereum.

A specimen in the Schlütter collection, labelled as from "Nord-Europa," is not distinguishable from North American examples, and is so very unlike the usual Lapland style that we doubt its being a European specimen at all.

Habits. The Great Gray or Cinereous Owl appears to be confined to the more northern portions of North America. It is rarely met with in any part of the United States, and only in winter, with the exception of Washington Territory, where it is presumed to be a resident. It is also said to be a resident in Canada, and to be found in the vicinity of Montreal. Mr. Lawrence does not include this bird in his list of the birds of New York, but Mr. Turnbull states that several have been taken as far south as New Jersey. Throughout New England it is occasional in the winter, but comparatively rare. Mr. Allen did not hear of any having been taken near Springfield. On the coast of Massachusetts they are of infrequent occurrence, and are held at high prices. A fine specimen was shot in Lynn in the winter of 1872, and is now in the collection of my nephew, W. S. Brewer. On the Pacific coast it is resident as far south as the mouth of the Columbia, and is found in winter in Northern California.

Dr. Richardson met with this Owl in the fur regions, where it seemed to be by no means rare. He mentions it as an inhabitant of all the wooded districts which lie between Lake Superior and latitude 67° and 68° , and between Hudson's Bay and the Pacific. It was common on the borders of Great Bear Lake, in which region, as well as in a higher parallel of latitude, it pursues its

prey during the summer months by daylight. It was observed to keep constantly within the woods, and was not seen to frequent the barren grounds, in the manner of the Snowy Owl, nor was it so often met with in broad daylight as the Hawk Owl, apparently preferring to hunt when the sun was low and the recesses of the woods deeply shadowed, when the hares and other smaller quadrupeds, upon which it chiefly feeds, were most abundant.

On the 23d of May, Dr. Richardson discovered a nest of this Owl, built on the top of a lofty balsam-poplar, composed of sticks, with a lining of feathers. It contained three young birds, covered with a whitish down, to secure which it was necessary to cut down the tree. While this was going on, the parent birds flew in circles around the tree, keeping out of gun-shot, and apparently undisturbed by the light. The young birds were kept alive for several weeks, but finally escaped. They had the habit, when any one entered the room in which they were kept, of throwing themselves back and making a loud snapping noise with their bills.

In February, 1831, as Audubon was informed, a fine specimen of one of these Owls was taken alive in Marblehead, Mass., having been seen perched upon a woodpile early in the morning. It was obtained by Mr. Ives, of Salem, by whom it was kept several months. It was fed on fish and small birds, and ate its food readily. It would at times utter a tremulous cry, not unlike that of the common Screech-Owl (*Scops asio*), and manifested the greatest antipathy to cats and dogs.

Dr. Cooper found this bird near the mouth of the Columbia River, in a brackish meadow partially covered with small spruce-trees, where they sat concealed during the day, or made short flights from one to another. Dr. Cooper procured a specimen there in June, and has no doubt that the bird is resident and breeds in that neighborhood. He regards it as somewhat diurnal in its habits, and states that it is especially active toward sunset.

Dr. Newberry speaks of this Owl as one generally distributed over the western part of the continent, he having met with it in the Sacramento Valley, in the Cascade Mountains, in the Des Chutes Basin, and in Oregon, on the Columbia River. Mr. Robert MacFarlane found it in great abundance in the Anderson River region. On the 19th of July, as we find in one of his memoranda, he met with a nest of this species near Lockhart River, on the route to Fort Good Hope. The nest was on the top of a pine-tree, twenty feet from the ground. It contained two eggs and two young, both of which were dead. The nest was composed of sticks and mosses, and was lined thinly with down. The female was sitting on the nest, but left it at his approach, and flew to a tree at some distance, where she was shot.

Mr. Donald Gunn writes that the Cinereous Owl is to be found both in summer and in winter throughout all the country commonly known as the Hudson Bay Territory. He states that it hunts by night, preys upon rabbits and mice, and nests in tall poplar-trees, usually quite early in the season.

A single specimen of this Owl was taken at Sitka by Bischoff,

and on the 20th of April Mr. Dall obtained a female that had been shot at Takitesky, about twenty miles east of the Yukon, near Nulato. He subsequently obtained several specimens in that region. Mr. Dall describes it as very stupid, and easy to be caught by the hand during the daytime. From its awkward motions its Indian name of *nūhl-tūhl*, signifying "heavy walker," is derived. So far as observed by Mr. Dall, this Owl appeared to feed principally upon small birds, and he took no less than thirteen crania and other remains of *Ægiothus linaria* from the crop of a single bird.

Specimens of this Owl have also been received by the Smithsonian Institution, collected by Mr. Kennicott, from Fort Yukon and from Nulato; from Mr. J. McKenzie, Moose Factory; from J. Lockhart, obtained at Fort Resolution and at Fort Yukon; from J. Flett, at La Pierre House; from B. R. Ross, at Big Island; and from Mr. S. Jones and Mr. J. McDougall, at Fort Yukon. These were all taken between February 11 and July 19.

One of the eggs of this Owl, referred to above in Mr. MacFarlane's note, is in my cabinet. It is small for the size of the bird, and is of a dull soiled-white color, oblong in shape, and decidedly more pointed at one end than at the other. It measures 2.25 inches in length by 1.78 in breadth. The drawing of an egg of this species, made by Mr. Audubon from a supposed specimen of an egg of this species, referred to in the "North American Oölogy," and which measured 2.44 by 2.00 inches, was probably a sketch of the egg of the Snowy Owl.

Syrnium nebulosum, Gray

BARRED OWL; "HOOT OWL."

Strix nebulosa, Forst. Phil. Trans. XXII, 386 & 424, 1772.—Gmel. Syst. Nat. p. 291, 1789.—Lath. Ind. Orn. p. 58, 1790; Syn. I, 133; Gen. Hist. I, 338.—Daud. Tr. Orn. II, 191, 1800.—Shaw, Zoöl. VII, 245, 1839; Nat. Misc. pl. xxv.—Vieill. Ois. Am. Sept. pl. xvii, 1807; Nouv. Dict. Hist. Nat. VII, 32; Enc. Méth. III, 1292.—Aud. Birds Am. pl. xlvi, 1831; Orn. Biog. I, 242.—Temm. Man. Orn. pt. i, p. 88; pt. iii, p. 47.—Wern. Atl. Ois. Eur.—Meyer, Taschenb. Deutsch Vogelk. III, 21; Zusätze, p. 21.—Wils. Am. Orn. pl. xxxiii, f. 2, 1808.—Rich. & Swains. F. B. A. II, 81.—Bonap. Ann. Lyc. N. Y. II, 38; Isis, 1832, p. 1140.—Jard. (Wils.) Am. Orn. II, 57, 1832. *Ulula nebulosa*, Steph. Zoöl. XIII, pl. ii, p. 60, 1815.—Cuv. Reg. An. (ed. 2), I, 342, 1829.—James. (Wils.) Am. Orn. I, 107, 1831; IV, 280.—Bonaparte, List, page 7, 1838; Conspectus Avium, p. 53.—Gould, Birds Eur. pl. xlvi.—Less. Man. Orn. I, 113, 1828; Tr. Orn. p. 108.—Gray, Gen. B. fol. (ed. 2), p. 8, 1844.—De Kay, Zoöl. N. Y. II, 29, pl. x, f. 21, 1844. *Syrnium nebulosum*, Gray, Gen. B. fol. sp. 9, 1844; List Birds Brit. Mus. p. 104.—Cass. Birds Cal. & Tex. p. 184, 1854; Birds N. Am. 1858, 56.—Giraud, Birds Long

Island, p. 24, 1844.—Woodh. in Sitgr. Rept. Expl. Zuñi & Colorad. p. 63, 1853.—Brew. (Wils.) Am. Orn. p. 687, 1852.—Kaup, Monog. Strig. Cont. Orn. 1852, p. 121.—Ib. Tr. Zoöl. Soc. IV, 256.—Strickl. Orn. Syn. I, 189, 1855.—Max. Cab. Jour. VI, 1858, 28.—Dresser, Ibis, 1865, 330 (Texas, resident).—Coues, Key, 1872, 204.—Gray, Hand List, I, 48, 1869.

Sp. Char. *Adult*. Head, neck, breast, back, scapulars, and rump with broad regular transverse bars of ochraceous-white and deep umber-brown, the latter color always terminal; on the upper surface the brown somewhat exceeds the whitish in width, but on the neck and breast the white rather predominates. The lower third of the breast is somewhat differently marked from the upper portion, the brown bars being connected along the shaft of the feather, throwing the white into pairs of spots on opposite webs. Each feather of the abdomen, sides, flanks, and lower tail-coverts has a broad medial longitudinal stripe of brown somewhat deeper in tint than the transverse bars on the upper parts; the anal region is plain, more ochraceous, white; the legs have numerous, but rather faint, transverse spots of brown. Ground-color of the wings and tail brown, like the bars of the back; middle and secondary wing-coverts with roundish transverse spots of nearly pure white on lower webs; lesser coverts plain rich brown; secondaries crossed by six bands of pale grayish-brown, passing into paler on the edge of each feather,—the last is terminal, passing narrowly into whitish; primary coverts with four bands

of darker ochraceous-brown; primaries with transverse series of quadrate pale-brown spots on the outer webs (growing deeper in tint on inner quills), the last terminal; on the longest are about eight. Tail like the wings, crossed with six or seven sharply defined bands of pale brown, the last terminal.

Face grayish-white, with concentric semicircular bars of brown; eyebrows and lores with black shafts; a narrow crescent of black against anterior angle of the eye. Facial circle of blackish-brown and creamy-white bars, the former prevailing along the anterior edge, the latter more distinct posteriorly, and prevailing across the neck in front, where the brown forms disconnected transverse spots.

♀ (752, Carlisle, Penn.). Wing-formula, 4-3, 5-2, 6; 1=9. Wing, 13.00; tail, 9.00; culmen, 1.05; tarsus, 1.90; middle toe, 1.50.

♂. A little smaller. (No specimen marked ♂ in the collection.)

Hab. Eastern North America, west to the Missouri; Rio Grande region.

A female (?) from Calais, Me., (4,966; G. A. Boardman,) is somewhat lighter-colored than the type, owing to the clearer white of the bars. It measures, wing, 13.50; tail, 9.80.

A specimen (4,357, January) from Washington, D. C., is quite remarkable for the very dark tints of plumage and the unusual prevalence of the brown; this is of a more reddish cast than in all other specimens, becoming somewhat blackish on the head and neck; anteriorly it prevails so as to almost completely hide the

pale bars of the back and nape. The tail has no bars except three or four very obsolete ones near the end; beneath, the ochraceous tinge is quite deep. The toes, except their first joint, are perfectly naked; the middle one, however, has a narrow strip of feathering running along the outer side as far as the last joint. The darker shades of color, and more naked toes, seem to be distinguishing features of southern examples.



Syrnium nebulosum.

Habits. The Barred Owl has an extended range, having been met with nearly throughout North America, from about latitude 50° to Texas. Minnesota is the most western point to which, so far as I am aware, it has been traced. It is more abundant in

the Southern States than elsewhere, and in the more northern portions of North America is somewhat rare. Richardson did not encounter it in the more arctic portion of the fur countries, nor has it, so far as I can learn, been observed on the Pacific coast. It is said to be of accidental occurrence in northern Europe.

In Louisiana, as Mr. Audubon states, it is more abundant than anywhere else; and Dr. Woodhouse speaks of it as very common in the Indian Territories, and also in Texas and New Mexico, especially in the timbered lands bordering the streams and ponds of that region. In July, 1846, while in pursuit of shore birds in the island of Muskeget, near Nantucket, in the middle of a bright day, I was surprised by meeting one of these birds, which, uninvited, joined us in the hunt, and when shot proved to be a fine male adult specimen.

The Barred Owl was found in great abundance in Florida by Mr. J. A. Allen, the only species of Owl at all common, and where its ludicrous notes were heard at night everywhere, and even occasionally in the daytime. At night they not unfrequently startle the traveller by their strange utterances from the trees directly over his head.

Mr. Dresser speaks of it as very abundant at all seasons of the year in the wooded parts of Texas. He was not able to find its nest, but was told by the hunters that they build in hollow trees, near the banks of the rivers.

According to Mr. Downes, this Owl is common throughout Nova Scotia, where it is resident, and never leaves its particular

neighborhood. It breeds in the woods throughout all parts of that colony, and was observed by him to feed on hares, spruce and ruffed grouse, and other birds. It is said to be a quite common event for this bird to make its appearance at midnight about the camp-fires of the moose-hunter and the lumberer, and to disturb their slumbers with its cries, as with a demoniacal expression it peers into the glare of the embers. Distending its throat and pushing its head forward, it gives utterance to unearthly sounds that to the superstitious are quite appalling.

Mr. Wilson regarded this species as one of the most common of the Owls in the lower parts of Pennsylvania, where it was particularly numerous in winter, among the woods that border the extensive meadows of the Schuylkill and the Delaware River. He frequently observed it flying during the day, when it seemed to be able to see quite distinctly. He met with more than forty of these birds in one spring, either flying or sitting exposed in the daytime, and once discovered one of its nests situated in the crotch of a white oak, among thick foliage, and containing three young. It was rudely put together, made outwardly of sticks, intermixed with dry grasses and leaves, and lined with smaller twigs. He adds that this Owl screams in the day in the manner of a Hawk. Nuttall characterizes their peculiar hooting as a loud guttural call, which he expresses by *'koh-'koh-'ko-'ko-'ho*, or as *'whah-'whah-'whah-'whah-aa*, heard occasionally both by day and by night. It is a note of recognition, and may be easily imitated, and can be used as a means to decoy the birds. Nuttall

received a specimen that had been shot in November, hovering, in the daytime, over a covey of Quail.

Mr. Audubon speaks of the peculiar hooting cries of this species as strangely ludicrous in sound, and as suggestive of an affected burst of laughter. He adds that he has frequently seen this nocturnal marauder alight within a few yards of his camp-fire, exposing its whole body to the glare of the light, and eying him in a very curious manner, and with a noticeable liveliness and oddness of motion. In Louisiana, where he found them more abundant than anywhere else, Mr. Audubon states that, should the weather be lowering, and indicative of the approach of rain, their cries are so multiplied during the day, and especially in the evening, and they respond to each other in tones so strange, that one might imagine some extraordinary *fête* was about to take place among them. At this time their gesticulations are said to be of a very extraordinary nature.

The flight of this Owl is described as remarkably smooth, light, noiseless, and capable of being greatly protracted. So very lightly do they fly, that Mr. Audubon states he has frequently discovered one passing over him, and only a few yards distant, by first seeing its shadow on the ground, in the bright moonlight, when not the faintest rustling of its wings could be heard.

This Owl has the reputation of being very destructive to poultry, especially to half-grown chickens. In Louisiana they are said to nest in March, laying their eggs about the middle of the month. Audubon states that they nest in hollow trees on the dust

of the decomposed wood, and at other times take possession of the deserted nest of a crow, or of a Red-tailed Hawk. In New England I think they construct their own nest. Mr. William Street, of Easthampton, Mass., has twice found the nest of this Owl. On one occasion it had young, unfledged. Upon returning to get them, a few days later, they had disappeared, and as he conjectures, had been removed by their parents. Another time he found a nest in a lofty pine, and at a height of sixty feet. He saw and shot the old bird. He has often found them hiding themselves by day in a thick hemlock. In the winter of 1869, Mr. Street witnessed a singular contest between a Barred Owl and a Goshawk over a Grouse which the latter had killed, but of which the Owl contested the possession. The Hawk had decidedly the advantage in the fight, when the contest was arrested by shooting the Owl. He has noticed a pair of Barred Owls in his neighborhood for the past four years, and has never known them to hoot from the time they have reared their young to the 14th of February. They then begin about an hour after dark, and their hooting continues to increase until about the 8th of April, when they mate, at which time their hooting may be heard both day and night. There is a very great difference observable between the cries of the female and the utterances of the male. The latter seldom hoots, and there is as much difference between his voice and that of the female as between the crowing of a young bird and of the old cock.

In two instances I have known well-developed eggs of this Owl

taken from the oviduct of the female in February. One of these cases occurred near Niagara Falls in the spring of 1852. The other, in 1854, was noticed by Professor William Hopkins, then of Auburn, N. Y., to whose kindness I was indebted for the egg the parentage of which is so unquestionable. It is purely white, almost globular, and, except in shape, hardly distinguishable from the egg of the domestic Hen. It is 2.00 inches in length, and 1.69 in breadth.

Syrnium occidentale, Xantus

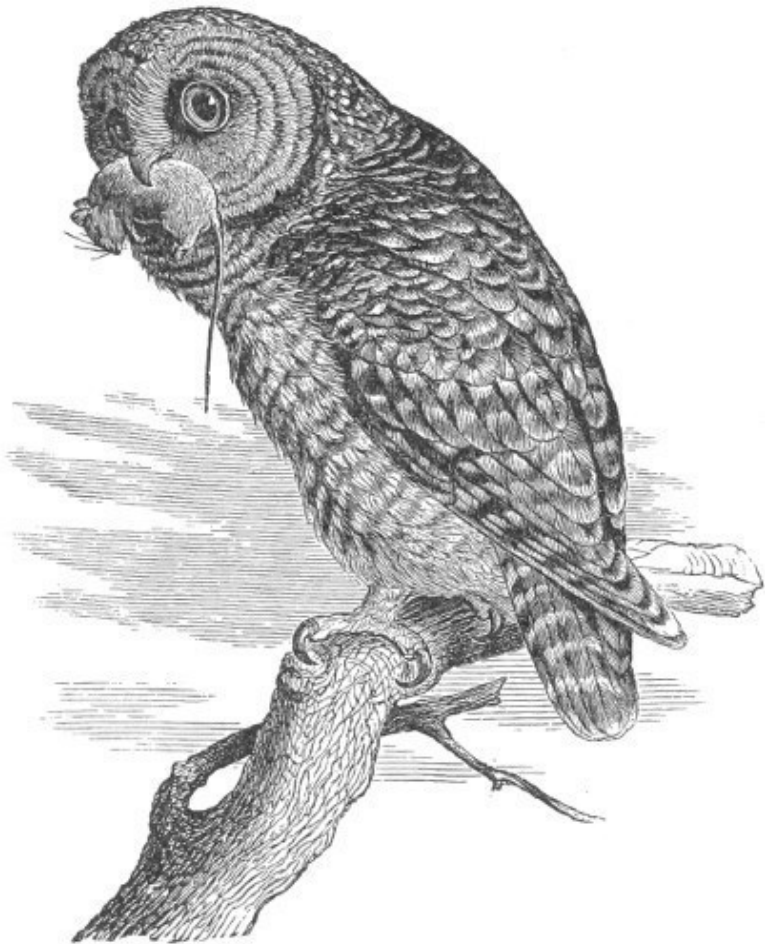
WESTERN BARRED OWL; SPOTTED OWL

Syrnium occidentale, Xantus, P. A. N. S. Philad. 1859, 193.—Baird, Birds N. Am. App. pl. lxvi.—Coues, Key, 1872, 204.

Sp. Char. *Adult* (♂, 17,200, Fort Tejon, California; J. Xantus. Type of Xantus's description). Above deep umber-brown, much as in *S. nebulosum*. Whole head and neck with circular and cordate spots of white, one near the end of each feather; on the scapulars and back, rump, wings, and tail, they are rather sparse and more transverse, but of very irregular form; they are most conspicuous on the scapulars and larger wing-coverts. Secondaries crossed with about six bands of paler brown,

each spot growing white on the edge of the feather,—the last band terminal; primaries with seven transverse series of pale brown, or brownish-white, quadrate spots on outer webs, the last terminal; these spots are almost clear white on the third, fourth, fifth, and sixth quills. Tail with about eight very narrow, rather obsolete, bands of pale brown, growing whiter and more distinct terminally, the last forming a conspicuous terminal band. Ground-color of the lower parts dull white, somewhat tinged with ochraceous laterally; everywhere with numerous transverse spots and bars of brown like the back,—this predominating anteriorly, the white forming spots on opposite webs; on the lower tail-coverts the transverse spots or bars are very sharply defined and regular, the brown rather exceeding the white. Face, eyebrows, and lores soiled brownish-white, the former with obscure concentric semicircles of darker brownish. Facial circle blackish-brown, spotted posteriorly with white; across the neck in front, it is more broken. Legs white, with sparse obsolete transverse specks. Wing-formula, 4, 3, 5–6–2; 1=9. Wing, 13.10; tail, 9.00; culmen, .85; tarsus, 2.10; middle toe, 1.30. Length, “18”; extent, “40.”

Hab. Southern Middle Province of United States (Fort Tejon, California, Xantus; and Tucson, Arizona, Bendire).



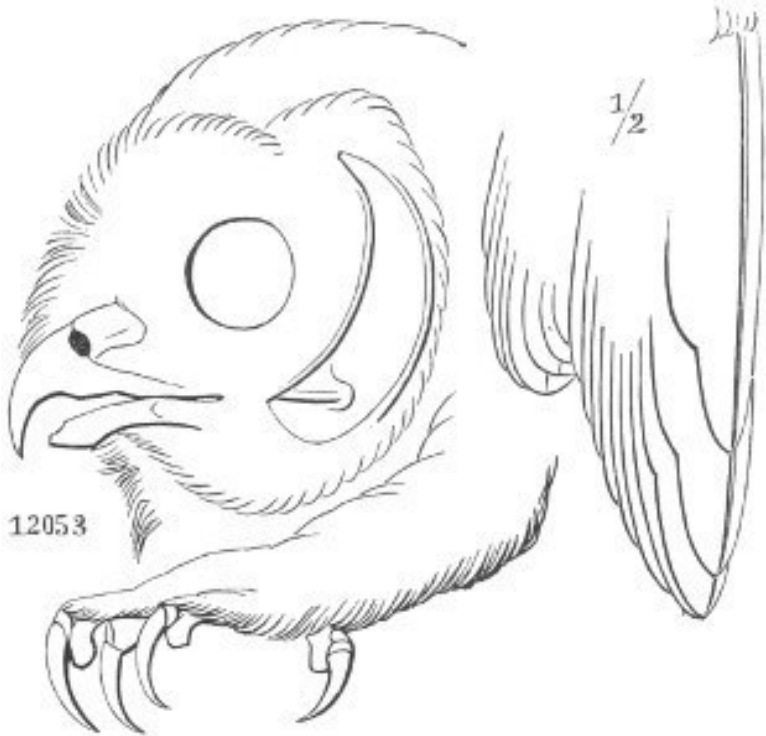
Syrnium occidentale.

Habits. Nothing is on record concerning the habits of this bird.

Genus NYCTALE, Brehm

Nyctale, Brehm, 1828. (Type, *Strix tengmalmi*, Gmel.)

Gen. Char. Size small. Head very large, without ear-tufts. Eyes moderate; iris yellow. Two outer primaries only with their inner webs distinctly emarginated. Tarsi and toes densely, but closely, feathered. Ear-conch very large, nearly as high as the skull, with an anterior operculum; the two ears exceedingly asymmetrical, not only externally, but in their osteological structure. Furcula not anchylosed posteriorly, but joined by a membrane.



12053 $\frac{1}{2}$

Nyctale acadica.

Of this genus only three species are as yet known; two of these belong to the Northern Hemisphere, one of them (*N. tengmalmi*) being circumpolar, the other (*N. acadica*) peculiar to North America. The habitat of the remaining species (*N. harrisi*) is

unknown, but is supposed to be South America. If it be really from that portion of the New World, it was probably obtained in a mountainous region.

Species and Races

Common Characters. Above umber, or chocolate, brown, spotted with white (more or less uniform in the young); beneath white with longitudinal stripes of reddish-brown (adult), or ochraceous without markings (young).

A. Nostril sunken, elongate-oval, obliquely vertical, opening laterally; cere not inflated. Tail considerably more than half the wing. Bill yellow.

1. **N. tengmalmi**. Wing, 7.20; tail, 4.50; culmen, .60; tarsus, 1.00; middle toe, .67 (average).

Legs white, almost, or quite, unspotted; lower tail-coverts with narrow shaft-streaks of brown. (Light tints generally predominating.) *Hab.* Northern portions of Palæarctic Realm ... var. *tengmalmi*.²³

Legs ochraceous, thickly spotted with brown; lower tail-coverts with broad medial stripes of brown. (Dark

²³ *Nyctale tengmalmi*, var. *tengmalmi*. *Strix tengmalmi*, Gmel. S. N. p. 291, 1789 (et Auct. var.). *Nyctale t.*, Bonap. et Auct. *Noctua t.*, Cuv. et Auct. *Athene t.*, Boie. *Ulula t.*, Bonap. et Auct. *Scotophilus t.*, Swains. *Strix dasypus*, Bechst. (1791) et Auct. *Nyctale d.*, Gray. *Strix passerina*, A. Meyer, 1794.—Pallas. *Nyctale planiceps*, Brehm, 1831. *N. pinetorum*, Brehm, 1831. *N. abietum*, Brehm, 1831. *N. funerea*, Bonap. 1842 (not of Linn., 1761, which is *Surnia ulula*). "*N. kirtlandi*," Elliot, Ibis, II, Jan., 1872, p. 48 (not of Hoy!).

tints generally predominating.) *Hab.* Northern portions of Nearctic Realm ... var. *richardsoni*.

B. Nostril prominent, nearly circular, opening anteriorly; cere somewhat inflated. Tail scarcely more than half the wing. Bill black.

2. **N. acadica.** Wing, 5.25 to 5.80; tail, 2.60 to 3.00; culmen, .50; tarsus, .80; middle toe, .60. *Juv.* Face dark brown; forehead and crown brown; occiput brown; eyebrows and sides of chin white; throat and breast umber-brown. (= "*albifrons*," Shaw = "*kirtlandi*," Hoy.) *Hab.* Cold temperate portions of Nearctic Realm.

3. **N. harrisi.**²⁴ Wing, 5.80; tail, 3.00; culmen, .50; tarsus, 1.00; middle toe, .80. *Juv.* (?) Face and forehead and anterior half of crown and whole nape ochraceous; posterior half of crown and occiput black; eyebrows and sides of chin ochraceous; throat and breast ochraceous. A narrow belt of black spots in ruff across throat. *Hab.* South America?

Nyctale tengmalmi, var. richardsoni, Bonap

AMERICAN SPARROW OWL; RICHARDSON'S OWL

Nyctale richardsoni, Bonap. List. E. & N. A. Birds, p.

²⁴ *Nyctale harrisi*, Cassin, Pr. Ac. Nat. Sc. Philad. IV, p. 157, Feb., 1849.—Ib. Tr. A. N. S. II, 2d series, Nov., 1850, pl. v.

7, 1838; Consp. Av. p. 54, 1850.—Gray, Gen. B. fol. sp. 2, 1844.—Cass. Birds Cal. & Tex. p. 185, 1854; Birds N. Am. 1858, p. 57.—Kaup, Monog. Strig. Cont. Orn. 1852, p. 105 (sub. *tengmalmi*).—Ib. Tr. Zoöl. Soc. IV, 1859, 208.—Strickl. Orn. Syn. I, 176, 1865.—Maynard, Birds Eastern Mass. 1870, 133.—Gray, Hand List, I, 51, 1869. *Strix tengmalmi*, Rich. & Swains. F. B. A. II, 94, pl. xxxii, 1831.—Aud. Birds Am. pl. ccclxxx, 1831; Orn. Biog. IV, 599, 1831.—Peab. Birds Mass. p. 91, 1841. *Nyctale tengmalmi*, Dall & Bannister, Tr. Chicago Acad. I, 1869, 273. *Nyctale tengmalmi*, var. *richardsoni*, Ridgway, Am. Nat. VI, May, 1872, 285.—Coues, Key, 1872, 206.

Sp. Char. *Adult* (♀, 3,886, Montreal, Canada, September, 1853; Broome). Upper surface brownish-olive or umber-brown. Forehead and crown with numerous elliptical (longitudinal) marks of white, feathers everywhere with large partly concealed spots of the same; these spots are largest on the neck and scapulars, on the latter of a roundish form, the outer webs of those next the wing being almost wholly white, the edge only brown; on the nape the spots form V-shaped marks, the spots themselves being somewhat pointed; below this is a transverse, less distinct collar, of more concealed spots; wing-coverts toward the edge of the wing with a few large, nearly circular, white spots; secondaries with two transverse series of smaller white spots, these crossing about the middle, remote from the end and base; outer feathers of the alula with two white spots along the margin; primary coverts plain; primaries with four or five

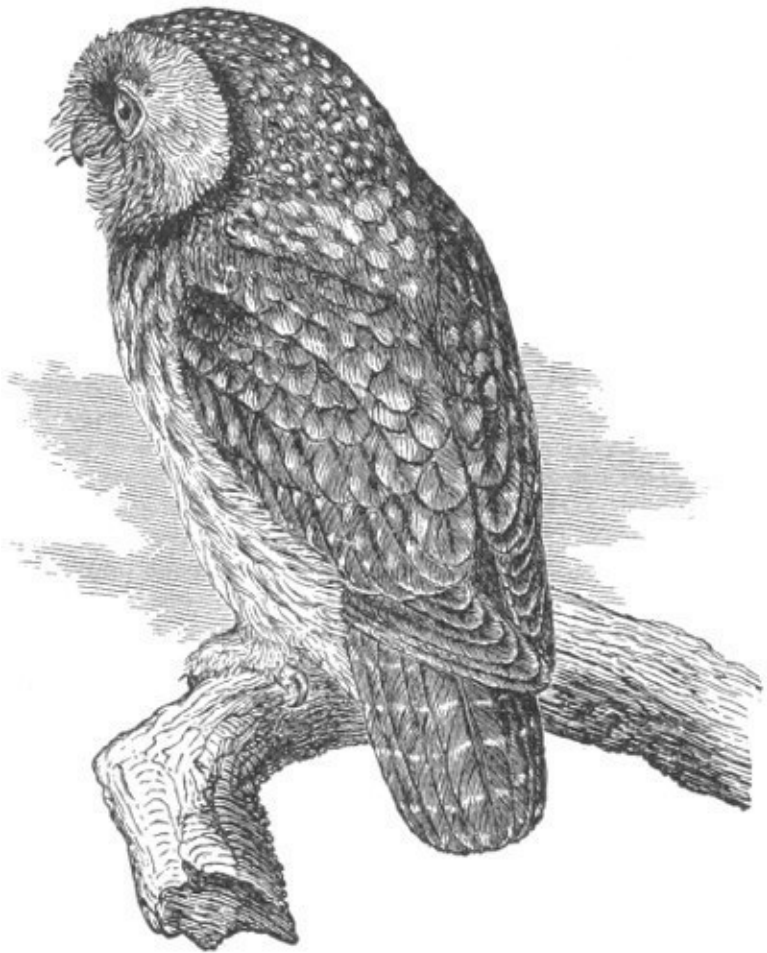
transverse series of white spots; tail with the same number of narrow transverse spots, forming incontinuous bands, the spots not touching the shaft,—the last spot not terminal. Facial circle much darker brown than the crown, and speckled with irregular spots of white, these either medial or upon only one web; across the throat the circle becomes paler brown, without the white spotting. Eyebrows and face grayish-white; lores and eyelids blackish. Lower parts white, becoming pale ochraceous on the legs; sides of the breast, sides, flanks, and lower tail-coverts with daubs of brown (slightly lighter and more reddish than on the back), those of the breast somewhat transverse, but posteriorly they are decidedly longitudinal; front of tarsus clouded with brown. Wing-formula, 3, 4–2–5–6–7–1. Wing, 7.20; tail, 4.50; culmen, .60; tarsus, 1.00; middle toe, .67.

A female from Alaska (49,802, Nulato, April 28, 1867; W. H. Dall) is considerably darker than the specimen described above; the occiput has numerous circular spots of white, and the tarsi are more thickly spotted; no other differences, however, are appreciable. Two specimens from Quebec (17,064 and 17,065; Wm. Cooper) are exactly similar to the last, but the numerous white spots on the forehead are circular.

Hab. Arctic America; in winter south into northern border of United States; Canada (Dr. Hall); Wisconsin (Dr. Hoy); Oregon (J. K. Townsend); Massachusetts (Maynard).

The *Nyctale richardsoni*, though, without doubt, specifically the same as the *N. tengmalmi* of Europe, is, nevertheless, to

be distinguished from it. The colors of the European bird are very much paler; the legs are white, scarcely variegated, instead of ochraceous, thickly spotted; the lower tail-coverts have merely shaft-streaks of brown, instead of broad stripes. Very perfect specimens from Europe enable me to make a satisfactory comparison.



Nyctale richardsoni.

From an article by Mr. D. G. Elliot in *Ibis* (1872, p. 48), it would appear that the young of *N. tengmalmi* is very different from the adult in being darker and without spots; a stripe from the eye over the nostrils, and a patch under the eye at the base of bill, white. It is probable, therefore, that the American race has a similar plumage, which, however, has as yet escaped the honor of a name; more fortunate than the young of *N. acadica*, which boasts a similar plumage. This (*N. albifrons*) Mr. Elliot erroneously refers to the *N. tengmalmi*, judging from specimens examined by him from the Alps, from Russia, and from Norway. The most striking difference, judging from the description, apart from that of size, appears to be in the whiter bill of the *tengmalmi*.

Habits. This race is an exclusively northern bird, peculiar to North America, and rarely met with in the limits of the United States. A few specimens only have been obtained in Massachusetts. Dr. Hoy mentions it as a bird of Wisconsin, and on the Pacific Dr. Townsend met with it as far south as Oregon, where it seems to be more abundant than on the eastern coast.

Mr. Boardman thinks that this Owl is probably a resident in the vicinity of Calais, where, however, it is not common. It was not taken by Professor Verrill at Norway, Maine. Mr. J. A. Allen regards it as a very rare winter visitant in Western Massachusetts, but obtained a specimen near Springfield in December, 1859. In the same winter another was shot near Boston, and one by Dr. Wood, near Hartford, Conn. Mr. Allen subsequently records

the capture of a specimen in Lynn, Mass., by Mr. J. Southwick, in the winter of 1863, and mentions two other specimens, also taken within the limits of the State. It is not mentioned by Dr. Cooper as among the birds of California.

Specimens of this Owl were taken at Fort Simpson in May, and at Fort Resolution by Mr. B. R. Ross, at Big Island by Mr. J. Reid, at Fort Rae by Mr. L. Clarke, and at Fort Yukon by Mr. J. Lockhart and Mr. J. McDougall, and at Selkirk Settlement, in February and March, by Mr. Donald Gunn.

Mr. B. R. Ross states that though no specimens of this Owl were received from north of Fort Simpson, yet he is quite certain that it ranges to the Arctic Circle. He says it is a fierce bird, and creates great havoc among the flocks of Linnets and other small birds. Its nest is built on trees, and the eggs are three or four in number, of a pure white color and nearly round shape. It sometimes seizes on the deserted hole of a Woodpecker for a habitation.

Mr. Dall obtained a female specimen of this Owl at Nulato, April 28, where it was not uncommon. It was often heard crying in the evenings, almost like a human being, and was quite fearless. It could be readily taken in the hand without its making any attempt to fly away, but it had a habit of biting viciously. It was frequently seen in the daytime sitting on trees. According to the Indians, it generally nests in holes in dead trees, and lays six spherical white eggs. Richardson informs us that it inhabits all the wooded country from Great Slave Lake

to the United States, and is very common on the banks of the Saskatchewan. It was obtained in Canada by the Countess of Dalhousie, but at what season the bird was met with is not stated; the Smithsonian Institution also possesses specimens from the vicinity of Montreal. It probably does not breed so far south as that place, or, if so, very rarely. Mr. Audubon procured a specimen near Bangor, Maine, in September, the only one he ever met with.

This Owl, according to Mr. Hutchins, builds a nest of grass half-way up a pine-tree, and lays two eggs in the month of May.

A drawing, taken by Mr. Audubon from a specimen in an English cabinet, represents a nearly spherical egg, the color of which is white with a slight tinge of yellowish, and which measures 1.18 inches in length by one inch in breadth.

The only authenticated eggs of this variety which have come under my notice are three collected at Fort Simpson, May 4, 1861, by B. R. Ross. One of these measures 1.28 by 1.06 inches.

Nyctale acadica, Bonap

SAW-WHET OWL; WHITE- FRONTED OWL; KIRTLAND'S OWL

Strix acadica, Gmel. Syst. Nat. p. 296, 1789.—Daud. Tr.

Orn. II, 206, 1800.—Vieill. Ois. Am. Sept. I, 49, 1807.—Aud. Birds Am. pl. cxcix, 1831; Orn. Biog. V, 397.—Rich. & Swains. F. B. A. II, 97, 1831.—Bonap. Ann. Lyc. N. Y. II, pp. 38, 436; Isis, 1832, p. 1140.—Jard. (Wils.) Am. Orn. II, 66.—Naum. Nat. Vög. Deutschl. (ed. Nov.) I, 434, pl. xliii, figs. 1 & 2.—Peab. Birds Mass. p. 90.—Nutt. Man. p. 137, 1833. *Nyctale acadica*, Bonap. List, p. 7, 1838; Consp. Av. p. 44.—Gray, Gen. B. fol. App. p. 3, 1844.—Kaup, Monog. Strig. Cont. Orn. 1852, p. 104.—Ib. Tr. Zoöl. Soc. IV, 1859, 206.—Strickl. Orn. Syn. I, 176, 1855.—Newb. P. R. R. Rept. VI, 77, 1857.—Cass. Birds N. Am. 1858, 58.—Coop. & Suck. P. R. R. Rept. XII, ii, 156, 1860.—Coues, Prod. B. Ariz. 14, 1866.—Gray, Hand List, I, 1869, 51.—Lord, Pr. R. A. I. IV, iii (Brit. Columb.).—Ridgway, Am. Nat. VI, May, 1872, 285.—Coues, Key, 1872, 206.—Gray, Hand List, I, 51, 1869. *Scotophilus acadicus*, Swains. Classif. Birds II, 217, 1837. *Strix passerina*, Penn. Arct. Zoöl. p. 236, sp. 126, 1785.—Forst. Phil. Transl. LXII, 385.—Wils. Am. Orn. pl. xxxiv, f. 1, 1808. *Ulula passerina*, James. (Wils.), Am. Orn. I, 159, 1831. *Strix acadiensis*, Lath. Ind. Orn. p. 65, 1790. *S. albifrons*, Shaw, Nat. Misc. V, pl. clxxi, 1794; Zoöl. VII, 238, 1809.—Lath. Orn. Supp. p. 14. *Bubo albifrons*, Vieill. Ois. Am. Sept. I, 54, 1807. *Scops albifrons*, Steph. Zoöl. XIII, ii, 51. *Nyctale albifrons*, Cass. Birds Cal. & Tex. 187, 1854.—Bonap. Consp. Av. p. 54.—Cass. Birds N. Am. 1858, 57.—Gray, Hand List, I, 52, 1869. *Strix frontalis*, Licht. Abh. Ak. Berl. 1838, 430. *Nyctale kirtlandi*, Hoy, Proc. Ac. Nat. Sc. Phil. VI, 210, 1852. *S. phalænoides*, Daud. Tr. Orn. II, 206, 1800.—Lath.

Ind. Orn. Supp. p. 16, 1802; Syn. Supp. II, 66; Gen. Hist. I, 372, 1828. *Athene phalaenoides*, Gray, Gen. B. fol. sp. 43, 1844. *Athene wilsoni*, Boie, Isis, 1828, 315.

Sp. Char. *Adult* (♀, 120,044, Washington, D. C., Feb., 1859; C. Drexler). Upper surface plain soft reddish-olive, almost exactly as in *N. richardsoni*; forehead, anterior part of the crown, and the facial circle, with each feather with a short medial line of white; feathers of the neck white beneath the surface, forming a collar of blotches; lower webs of scapulars white bordered with brown; wing-coverts with a few rounded white spots; alula with the outer feathers broadly edged with white. Primary coverts and secondaries perfectly plain; five outer primaries with semi-rounded white spots on the outer webs, these decreasing toward the ends of the feathers, leaving but about four series well defined. Tail crossed with three widely separated narrow bands of white, formed of spots not touching the shaft on either web; the last band is terminal. "Eyebrow" and sides of the throat white; lores with a blackish suffusion, this more concentrated around the eye; face dirty white, feathers indistinctly edged with brownish, causing an obsoletely streaked appearance; the facial circle in its extension across the throat is converted into reddish-umber spots. Lower parts, generally, silky-white, becoming fine ochraceous on the tibiae and tarsi; sides of the breast like the back, but of a more reddish or burnt-sienna tint; sides and flanks with longitudinal daubs of the same; jugulum, abdomen, lower tail-coverts, tarsi, and tibiae, immaculate. Wing formula, 4-3=5-

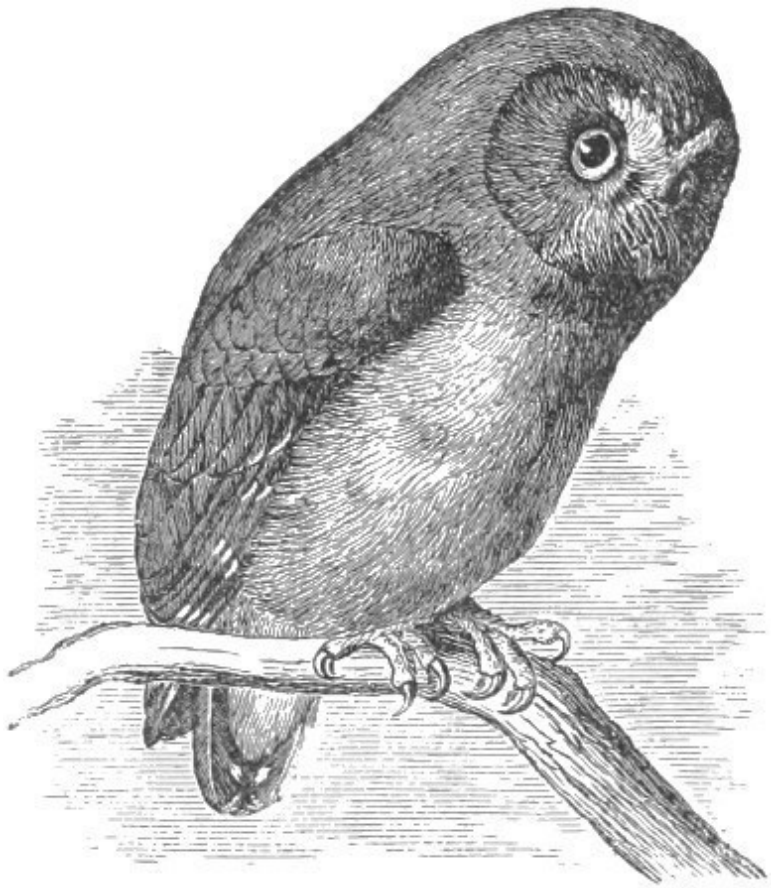
1=8. Wing, 5.40; tail, 2.80; culmen, .50; tarsus, .80; middle toe, .60.

Seven specimens before me vary from, wing, 5.25 to 5.80; tail, 2.60 to 3.00 (♀). The largest specimen is 12,053 (♀, Fort Tejon, California; J. Xantus). This differs from the specimen described in whiter face, more conspicuous white streaks on forehead, smaller, less numerous, red spots below, and in having a fourth white band on the tail; this, however, is very inconspicuous. 32,301 (Moose Factory; J. McKenzie), 9,152 (Fort Vancouver, February; Dr. J. G. Cooper), and 11,793 (Simiahmoo, October; Dr. C. B. Kennedy) are exactly like the type. There are no authentic males before me, though only two are marked as females; the extremes of the series probably represent the sexual discrepancy in size.

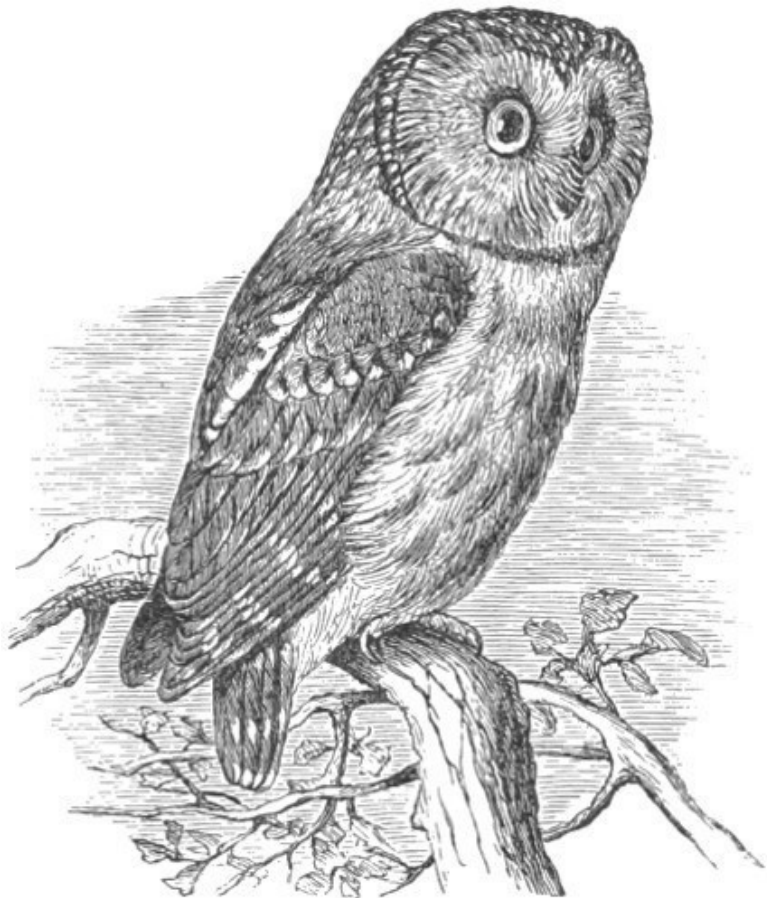
Young (♂, 12,814, Racine, Wisconsin, July, 1859; Dr. R. P. Hoy). Upper surface continuous plain dark sepia-olive; face darker, approaching fuliginous-vandyke,—perfectly uniform; around the edge of the forehead, a few shaft-lines of white; scapulars with a concealed spot of pale ochraceous on lower web; lower feathers of wing-coverts with a few white spots; outer feather of the alula scalloped with white; primary coverts perfectly plain; five outer primaries with white spots on outer webs, these diminishing toward the end of the feathers, leaving only two or three series well defined; tail darker than the wings, with three narrow bands composed of white spots, these not touching the shaft on either web. “Eyebrows” immaculate white;

lores more dusky; face and eyelids dark vandyke-brown; sides of the chin white. Throat and whole breast like the back, but the latter paler medially, becoming here more fulvous; rest of the lower parts plain fulvous-ochraceous, growing gradually paler posteriorly,—immaculate. Lining of the wing plain dull white; under surface of primaries with dusky prevailing, but this crossed by bands of large whitish spots; the three outer feathers, however, present a nearly uniformly dusky aspect, being varied only basally. Wing formula, 3, 4–2=5 6–7, 1. Wing, 5.50; tail, 2.80; culmen, .45; tarsus, .80; middle toe, .65.

Hab. North America generally. Cold temperate portions in the breeding-season, migrating southward in winter. Mexico (Oaxaca, Sclater, P. Z. S. 1858, 295); California (Dr. Cooper); Cantonment Burgwyn, New Mexico (Dr. Anderson); Washington Territory (Dr. Kennerly).



Nyctale acadica. Young.



Nyctale acadica. Adult.

A specimen (15,917, ♂, Dr. C. B. Kennerly, Camp Skagitt,

September 29, 1859) from Washington Territory is exactly similar to the young described above. No. 10,702 (Fort Burgwyn, New Mexico; Dr. Anderson) is much like it, but the facial circle is quite conspicuous, the feathers having medial white lines; the reddish-olive of the breast and the fulvous of the belly are paler, also, than in the type. No. 12,866, United States, (Professor Baird's collection, from Audubon,) is perfectly similar to the last.

My reasons for considering the *N. albifrons* as the young of *N. acadica* are the following (see American Naturalist, May, 1872):

1st. All specimens examined (including Hoy's type of *N. kirtlandi*) are young birds, as is unmistakably apparent from the texture of their plumage.

2d. All specimens examined of the *N. acadica* are adults. I have seen no description of the young.

3d. The geographical distribution, the size and proportions, the pattern of coloration (except that of the head and body, which in all Owls is more or less different in the young and adult stages), and the shades of colors on the general upper plumage, are the same in both. The white "scalloping" on the outer web of the alula, the number of white spots on the primaries, and the precise number and position of the white bars on the tail, are features common to the two.

4th. The most extreme example of *albifrons* has the facial circle uniform brown, like the neck, has no spots on the forehead, and the face is entirely uniform dark brown; but,

5th. Three out of the four specimens in the collection have the facial circle composed of white and brown streaks (adult feathers), precisely as in *acadica*, and the forehead similarly streaked (with adult feathers). Two of them have new feathers appearing upon the sides of the breast (beneath the brown patch), as well as upon the face; these new feathers are, in the most minute respects, like the common (adult) dress of *N. acadica*.

The above facts point conclusively to the identity of the *Nyctale "albifrons"* and *N. acadica*. This species is easily distinguishable from the *N. tengmalmi*, which belongs to both continents, though the North American and European specimens are readily separable, and therefore should be recognized as geographical races.

Since the above was published in the American Naturalist for May, 1872, Dr. J. W. Velie, of Chicago, writing under date of November 20, 1872, furnishes the following proof of the identity of *N. "albifrons"* and *N. acadica*: "In 1868, I kept a fine specimen of "*Nyctale albifrons*" until it moulted and became a fine specimen of *Nyctale acadica*. I had, until the fire, all the notes about this interesting little species, and photographs in the different stages of moulting."

Habits. The Little Acadian or Saw-Whet Owl, as this bird is more generally denominated, appears to have a widespread distribution over temperate North America. It is not known to be anywhere very abundant, though its nocturnal and secluded habits tend to prevent any intimate acquaintance either with its

habits or its numbers in any particular locality. It is rarely found in the daytime out of its hiding-places. It was not met with by Richardson in the fur regions, yet it is generally supposed to be a somewhat northern species, occurring only in winter south of Pennsylvania, but for this impression there does not seem to be any assignable reason or any confirmatory evidence. It has been said to breed near Cleveland, Ohio, and its nest and eggs to have been secured. The taking of Kirtland's Owl, which is now known to be the immature bird of this species, near that city, as well as in Racine, and at Hamilton, Canada, is also suggestive that this Owl may breed in those localities.

Dr. Townsend is said to have found this Owl in Oregon, Dr. Gambel met with it in California, Mr. Audubon has taken it both in Kentucky and in Louisiana, Mr. Wilson met with it in New Jersey, Mr. McCulloch in Nova Scotia, and Dr. Hoy in Wisconsin. Dr. Newberry met with this bird in Oregon, but saw none in California. Dr. Suckley obtained it at the Dalles, on the north side of the Columbia, in December. This was several miles from the timbered region, and the bird was supposed to be living in the basaltic cliffs of the vicinity. Dr. Cooper found one at Vancouver in February. It was dead, and had apparently died of starvation. Professor Snow speaks of it as rare in Kansas. Mr. Boardman and Professor Verrill both give it as resident and as common in Maine. It is rather occasional and rare in Eastern Massachusetts, and Mr. Allen did not find it common near Springfield. On one occasion I found one of these birds in April,

at Nahant. It was apparently migrating, and had sought shelter in the rocky cliffs of that peninsula. It was greatly bewildered by the light, and was several times almost on the point of being captured by hand.

This Owl is not unfrequently kept in confinement. It seems easily reconciled to captivity, becomes quite tame, suffers itself to be handled by strangers without resenting the familiarity, but is greatly excited at the sight of mice or rats. Captain Bland had one of these birds in captivity at Halifax, which he put into the same room with a rat. The bird immediately attacked and killed the rat, but died soon after of exhaustion.

The notes of this Owl, during the breeding-season, are said to resemble the noise made by the filing of a saw, and it is known in certain localities as the Saw-Whet. Mr. Audubon, on one occasion, hearing these notes in a forest, and unaware of their source, imagined he was in the vicinity of a saw-mill.

According to Mr. Audubon, this Owl breeds in hollow trees, or in the deserted nests of other birds; and lays from four to six glossy-white eggs, which are almost spherical. He states, also, that he found near Natchez a nest in the broken stump of a small decayed tree not more than four feet high. He also mentions the occasional occurrence of one of these Owls in the midst of one of our crowded cities. One of them was thus taken in Cincinnati, where it was found resting on the edge of a child's cradle. Mr. McCulloch, quoted by Audubon, gives an interesting account of the notes and the ventriloquial powers of this bird. On one

occasion he heard what seemed to him to be the faint notes of a distant bell. Upon approaching the place from which these sounds proceeded, they appeared at one time to be in front of him, then behind him, now on his right hand, now on his left, again at a great distance, and then close behind him. At last he discovered the bird at the entrance of a small hole in a birch-tree, where it was calling to its mate. As he stood at the foot of the tree, in full sight of the bird, he observed the singular power it possessed of altering its voice, making it seem near or remote,—a faculty which he had never noticed in any other bird.

An egg given me by Mr. Rufus E. Winslow as one of this bird, and figured in the North American Oölogy, was undoubtedly that of a Woodpecker. It is of a crystalline whiteness, nearly spherical, and measures 1.13 inches in length by .87 of an inch in breadth.

A well-identified egg in the collection of the Smithsonian Institution, taken by Mr. R. Christ at Nazareth, Penn., (No. 14,538, S. I.,) measures .95 of an inch by .88. The two ends are exactly similar or symmetrical. The egg is white, and is marked as having been collected April 25, 1867.

Genus SCOPS, Savigny

Scops, Savigny, 1809. (Type, *Strix scops*, L. = *Scops zorca* (Gm.) Swains.)

Ephialitis, Keys. & Bl. 1840, *nec* Schrank, 1802.

Megascops, Kaup, 1848. (Type, *Strix asio*, L.)

Gen. Char. Size small, the head provided with ear-tufts. Bill light-colored; iris yellow. Three to four outer quills with inner webs sinuated. Wings long (more than twice the length of the tail, which is short and slightly rounded); second to fifth quills longest. Toes naked, or only scantily feathered. Ear-conch small and simple. Plumage exceedingly variegated, the colors different shades of brown, with rufous, black, and white, in fine mottlings and pencillings; feathers above and below usually with blackish shaft-streaks, those beneath usually with five transverse bars; primaries spotted with whitish, and outer webs of the lower row of scapulars the same edged terminally with black. Tail obscurely banded.



1/2

Scops asio.

The species of this genus are cosmopolitan, the greater number, however, being found in tropical regions. All the American species differ from *S. zorca* of Europe in having the fourth and fifth quills longest, instead of the second, and in having three to four, instead of only two, of the outer quills with the inner web sinuated, as well as in having the quills shorter, broader, and more bowed, and their under surface more concave. They may, perhaps, be distinguished as a separate subgenus

(*Megascops*, Kaup). Of the American species all but *S. asio* (including its several races) have the toes perfectly naked to their very bases.

Species and Races

Common Characters. Plumage brown, gray, or rufous, and whitish, finely mottled above; lower parts transversely barred, and with dark shaft-streaks. Outer webs of lower scapulars light-colored (white or ochraceous) and without markings. Tail crossed by rather obscure mottled light and dark bars of nearly equal width. Outer webs of primaries with nearly equal bands of whitish and dusky.

1. **S. asio.** Toes covered (more or less densely) with bristles, or hair-like feathers. Wing, 5.50–7.80; tail, 3.20–4.10; culmen, .50–.70; tarsus, 1.00–1.70; middle toe, .70–.80. Ear-tufts well developed; facial circle black.

Colors smoky-brown and pale fulvous, with little or none of pure white. Outer webs of the scapulars pale ochraceous-fulvous. Wing, 6.90–7.30; tail, 3.50–4.50. *Hab.* North Pacific region, from Western Idaho and Washington Territory, northward to Sitka ... var. *kennicotti*.

Colors ashy-gray and pure white, with little or none of fulvous. Outer webs of the scapulars pure white. Varying to bright brick-red, or lateritious-rufous.

Mottlings coarse, the blackish median streaks above not sharply defined, and the bars beneath heavy and distinct.

Wing, 6.10–7.75; tail, 3.30–4.35. In the red plumage, white prevailing on the lower parts, where the red markings are not broken into transverse bars. *Hab.* United States; except the Southern Middle Province, the northwest region, and Florida ... var. *asio*.

Wing, 5.50–6.00; tail, 2.75–3.10. In the red plumage, red prevailing on the lower parts, where the markings are much broken into transverse bars. *Hab.* Florida and Southern Georgia ... var. *floridanus*.

Wing, 5.50–5.80; tail, 3.20–3.30. Gray plumage, like var. *asio*, but the mottling above much coarser, and the nape with a strongly indicated collar of rounded white spots in pairs, on opposite webs. Red plumage not seen. *Hab.* Eastern Mexico and Guatemala ... var. *enano*.²⁵

Mottlings fine, the blackish median streaks above very sharply defined and conspicuous; bars beneath delicate and indistinct.

Wing, 6.20–6.50; tail, 3.35–3.50. *Hab.* Southern Middle Province, and Southern California; Cape St. Lucas ... var. *macalli*.

2. **S. flammeola.** Toes perfectly naked, the feathering of the tarsus terminating abruptly at the lower joint. Wing, 5.40; tail, 2.80; culmen, .35; tarsus, .90; middle toe, .55.

²⁵ *Scops asio*, var. *enano*, Lawrence, MSS. This well-marked race is founded upon two specimens,—one from Mexico, in the cabinet of Mr. Lawrence, and another from Guatemala, in the collection of the Boston Society of Natural History. They are exactly similar in colors; but, as might be expected, the more southern specimen is the smaller of the two. This form very closely resembles the *S. atricapilla* (Natt.) Steph. (Temm. Pl. Col. 145), but may be readily distinguished by the haired toes, they being perfectly naked in *atricapilla*. The latter species is found as far northward as Mirador.

Ear-tufts short, or rudimentary. Facial circle rusty. Outer webs of the scapulars rusty-ochraceous, in striking contrast to the grayish of the wings and back. Other markings and colors much as in *asio*. *Hab.* Mountain regions of Mexico and California, from Guatemala to Fort Crook, Northern California.

Scops asio, Bonap

LITTLE RED OWL; MOTTLED OWL; "SCREECH-OWL."

Noctua aurita minor, Catesby, Carol. I, 1754, 7, pl. vii. *Asio scops carolinensis*, Briss. Orn. I, 1760, 497. *Strix asio*, Linn. Syst. Nat. 1758, 92.—Gmel. S. N. 1789, 287.—Lath. Ind. Orn. 1790, 54.—Ib. Syn. I, 123.—Ib. Supp. I, 42; Gen. Hist. I, 314.—Daud. Tr. Orn. II, 1800, 216.—Shaw, Zoöl. VII, 1809, 229.—Temm. Pl. Col. 80.—Wils. Am. Orn. 1808, pl. xlii, f. 1.—Jard. (ed. Wils.) Orn. I, 1831, 307.—Bonap. Ann. N. Y. Lyc. II, 36.—Ib. Isis, 1832, 1139.—Audubon, Birds N. A. 1831, pl. xcvi.—Ib. Orn. Biog. I, 486.—Brewer (ed. Wils.) Orn. 1852, p. 687.—Hobs. Nat. 1855, 169. *Bubo asio*, Vieill. Ois. Am., Sept., 1807, 53, pl. xxi.—Giraud, Birds Long Island, 1844, 28.—Max. Cab. J. VI, 1858, 23. *Otus asio*, Stephens, Zoöl. XIII, pt. ii, 1815, 57. *Scops asio*, Bonap. List, 1838, 6.—Less. Tr. Orn. 107.

—Cass. Birds Cal. & Tex. 1854, 179.—Ib. Birds N. Am. 1858, 51.—Kaup, Monog. Strig. Cont. Orn. 1852, 112.—Strickl. Orn. Syn. I, 1855, 199.—Heerm. P. R. Rept. II, 1855, 35.—Coop. & Suckl. P. R. Rept. 155.—Maynard, Birds Eastern Mass., 1870, 131.—Coues, Key, 1872, 202.—Gray, Hand List, I, 1869, 46. *Ephialtes asio*, Gray, Gen. B. fol. 1844, sp. 9.—Ib. List Birds Brit. Mus. 1844, p. 96.—Woodh. 1853, 62. *Strix naevia*, Gmel. S. N. 1789, 289.—Lath. Ind. Orn. 1790, p. 55.—Ib. Syn. I, 126; Gen. Hist. I, 321.—Daud. Tr. Orn. II, 1800, 217.—Shaw, Zoöl. VII, 1809, 230.—Wils. Am. Orn. 1808, pl. xix, f. 1. *Asio naevia*, Less. Man. Orn. I, 1828, 117. *Otus naevius*, Cuv. Reg. An. (ed. 2), I, 1829, 341. *Surnia naevia*, James. (ed. Wils.), Orn., 1831, I, 96 & 99.

a. Normal plumage

Sp. Char. *Adult*. Ground-color above brownish-cinereous, palest on the head, purest ashy on the wings, minutely mottled with fine zigzag transverse bars of black, each feather with a medial ragged stripe of the same along the shaft. Inner webs of ear-tufts, outer webs of scapulars, and oval spots occupying most of the outer webs of the two or three lower feathers of the middle and secondary wing-coverts, white, forming (except on the first) conspicuous spots, those of the scapulars bordered with black. Secondaries crossed with about seven regular paler bands, each enclosing a more irregular dusky one; the ground-color,

however, is so mottled with grayish, and the pale bands with dusky, that they are by no means sharply defined or conspicuous, though they are very regular; alula and primary coverts more sharply barred with cream-colored spots, those on the former nearly white; primaries with broad quadrate spots of creamy-white on outer webs, these forming from seven (♂) to eight (♀) transverse bands, the last of which is not terminal. Tail more irregularly mottled than the wings, and crossed by seven (♂) to eight (♀) narrow, obsolete, but continuous, pale bands.

Eye brows white, the feathers bordered with dusky (most broadly so in ♂); cheeks, ear-coverts, and lower throat dull white, with transverse bars of blackish (most numerous in the ♂); chin immaculate; upper eyelid dark brown; facial circle black; neck and jugulum like the cheeks, but more strongly barred, and with blackish along the shaft. Ground-color of the lower parts white, each feather with a medial stripe of black, this throwing off distinct bars to the edge of the feather; the medial black is largest on sides of the breast, where it expands into very large conspicuous spots, having a slight rusty exterior suffusion; the abdomen medially, the anal region, and the lower tail-coverts, are almost unvaried white. Tibiæ and tarsi in the male dull white, much barred transversely with blackish; in the female, pale ochraceous, more sparsely barred with dark brownish. Lining of the wing creamy-white, varied only along the edge; light bars on under surface of primaries very obsolete.

♂ (16,027, Fort Crook, North California; John Feilner).

Wing, 6.70; tail, 3.80; culmen, .61; tarsus, 1.35; middle toe, .72; ear-tufts, 1.00; wing-formula, 3=4, 5-2, 6, 1=9. "Length, 9.50; extent, 23.75."

♀ (18,299, Hellgate, Montana; Jno. Pearsall). Wing, 7.80; tail, 4.10; culmen, .70; tarsus, 1.70; middle toe, .80; ear-tufts, 1.00.

Young ♂ (No. 29,738, Wood's Hole, Mass., July 25, 1863; S. F. Baird. "Parent gray"). Secondaries, primaries, and tail, as in the adult, gray plumage; but the latter more mottled, the bands confused. Rest of the plumage everywhere grayish-white, with numerous transverse bars of dusky-brown; eyebrows and lores scarcely variegated dull white; facial circle obsolete.

♀ (41,891, Philadelphia, Penn.; J. Krider). Whole head, neck, back, rump, and entire lower parts transversely barred with dark brown and grayish-white, the bands of the former on the upper parts rather exceeding the white in width, but on the lower surface much narrower; scapulars with large transverse spots of white on the outer webs. Wings and tail as in the adult. Facial disk conspicuous. (More advanced in age than the preceding.)

b. Rufescent plumage

Adult. General pattern of the preceding; but the grayish tints replaced by lateritious-rufous, very fine and bright, with a slight vinaceous cast: this is uniform, and shows no trace of the transverse dark mottling; there are, however, black shaft-lines to the feathers (these most conspicuous on the head above, and

scapulars, and narrower and more sharply defined than in the gray plumage). The inner webs of the ear-tufts, outer webs of scapulars, and lower secondary and middle wing-coverts, are white, as in the gray plumage; those of the scapulars are also bordered with black. The secondaries, primaries, and tail are less bright rufous than the other portions, the markings as in the gray plumage, only the tints being different. The upper eyelid, and, in fact, all round the eye, fine light rufous; cheeks and ear-coverts paler, scarcely variegated; black facial circle rather narrower than in the gray plumage. Lower parts without the transverse bars of the gray plumage, but in their place an irregular clouding of fine light red, like the back; the lower parts medially (very broadly) immaculate snowy-white; most of the feathers having the red spotting show black shaft-stripes, but the pectoral spots are not near so large or conspicuous as in the gray bird. Tibiæ fine pale ochraceous-rufous; tarsi the same posteriorly, in front white with cuneate specks of rufous; lower tail-coverts each with a medial transversely cordate spot of dilute rufous, the shaft black. Lining of the wing with numerous rufous spots.

♂ (12,045, Washington, D. C., January). Wing, 6.30; tail, 3.00.

♀ (22,512, Maryland; R. G. Campbell). Wing, 6.70; tail, 3.50.

Young (29,792, Peoria, Illinois; Ferd. Bischoff). Wings and tail as in adult; markings on head and body as in the young gray bird, but white bars more reddish, and dark ones more brown.

Hab. Temperate North America, from the South Atlantic

States to Oregon, and from the northern United States to Texas. Replaced in the southern Middle Province and Southern California by var. *maccalli*, in Florida by var. *floridana*, and on the northwestern coast region by var. *kennicotti*.

Localities: (?) Cuba (Cabanis, Journ. III, 465).

The above stages of plumage have caused ornithologists a great deal of perplexity; and it is only very recently that they have become correctly understood. Even yet many persist in regarding the red plumage as being that of the young bird.



Scops asio.

That these two very different plumages are entirely

independent of age, sex, or season, and that they are purely individual, there can be no doubt; since in one nest there may often be found both red and gray young ones, while their parents may be either both red or both gray, the male red and the female gray, or *vice versa*. Occasionally specimens (such as No. 39,093, ♂, Neosho Falls, Kansas, April 13; parent of five eggs, and captured on the nest with a gray male) are exactly intermediate between these two plumages, it being difficult to decide which predominates; the combination is not only of the tints, but of the markings, of the two stages.

Habits. The habit of all the varieties of *Scops asio* in their different localities will be found after their zoölogical description.

Scops asio, var. floridana, Ridgway

Scops asio, Allen, Bull. Mus. Comp. Zoöl. and other citations from Florida.

Char. Similar to var. *asio*, but much smaller, and the colors deeper. The gray stage very similar to that of var. *asio*, but the red phase very appreciably different, in there being a greater amount of rufous on the lower parts, the breast being nearly uniformly colored, and the rufous broken elsewhere into transverse broad bars, connected along the shaft. Wing, 5.50–6.00; tail, 2.75–3.10.

Hab. Florida and Lower Georgia.

This extreme southern form is much smaller than the more northern ones, being about the same in size as the var. *enano* (see p. 1374) of Middle America, and the *S. atricapilla*, Temm., of Tropical America generally. The colors, as may be expected, are also darker and richer.

In the collection of the Smithsonian Institution there are both red and gray birds from Florida; a red one (No. 5,857, Indian River; Dr. A. W. Wall) measures, wing, 5.50; tail, 2.70; culmen, .55; tarsus, 1.05; middle toe, .65; ear-tufts, .70. The colors are much darker than those of typical *asio*. The rufous of the neck, all around, shows obsolete darker transverse bars; the black border to the white scapular spots is restricted to the tip, as in the gray plumage; the inner webs of the ear-tufts are scarcely paler than the outer; the neck and face are deeper rufous, while the rufous of the lower parts is more general, and more in transverse rays; tibiae and tarsi plain rufous; the middle of the abdomen and the anal region only are pure white.

Scops asio, var. macalli, Cass

WESTERN MOTTLED OWL

Scops macalli, Cass. Birds Cal. & Tex. p. 180, 1850;

Birds N. Am. 1858, 52.—Strickl. Orn. Syn. I, 200, 1865.—Coues, Prod. Orn. Ariz., p. 13, 1869.—Scl. & Salv. P. Z. S., 1868, 57 (= *trichopsis*, Wagl. Isis, 1832, 276! see remarks below).—Baird, Mex. Bound. II, 4, pl. i.—Gray, Hand List, I, 47, 1869. *Scops asio*, var. *maccalli* (Ridgway) Coues, Key, 1872, 203. *Ephialtes choliba* (not of Vieillot!), Lawr. Ann. N. Y. Lyc. VI, 1853, p. 4.

Char. *Adult* (9,147, Camp 118, New Mexico, February 10, 1854; Kennerly and Möllhausen). Above cinereous, the ashy appearance being caused by a minute transverse mottling of blackish and pale ashy, on a deeper ash ground; each feather with a distinct medial stripe of black, these broadest on the forehead; outer webs of only a few scapulars white, these not bordered with black; outer webs of two or three lower middle and secondary coverts white. Secondaries with about seven transverse, mottled pale bands; primaries with about eight transverse series of white spots; tail with about eight narrow pale bands.

Ear-coverts, cheeks, throat, neck, and jugulum finely and uniformly barred transversely with dusky and grayish-white; the facial circle interrupted across the throat, where in its place is a series of longitudinal black dashes.

Lower parts grayish-white, with numerous, very narrow transverse bars of dusky, rather more distant from each other than those of the neck, etc.; each feather with a medial narrow stripe of black, those on the breast forming conspicuous spots; tibiae and tarsi dull soiled white, with numerous spots of dark

brown; lower tail-coverts immaculate. Wing-formula, 3=4-2, 5, 6, 7, 8-1-9. Wing, 6.50; tail, 3.30; culmen, .55; tarsus, 1.15; middle toe, .70; ear-tufts, .85.

(A specimen from California (Stockton, E. S. Holden), kindly sent by Mr. Lawrence for examination, differs from the preceding in rather more brown ground-color above; the black shaft-streaks more obscure. In other respects as regards plumage it is the same, and is typical *macalli*. The size is less, it measuring, wing, 6.20; tail, 3.10.)

Young (first full, but incomplete plumage; 16,932, Cape St. Lucas, Lower California). Secondaries, primaries, and tail as in the gray adult. Rest of the plumage transversely barred with grayish-white and dusky, the latter predominating on the upper parts; eyebrows and lores white; rings finely transversely mottled with white, this forming spots on the lower feathers; tibiae and tarsi with numerous transverse dusky bars. Wing, 5.40; tail, 2.65; tarsi, 1.00; middle toe, .63. No. 16,933 (same locality, etc.) is similar, but smaller, measuring, 5.00, 2.00, 1.00, and .60.

Hab. Southern Middle Province of United States; Lower and Southern California.

Localities. (?) Oaxaca (Scl. 1858, 296); (?) Guatemala (Scl. Ibis, I, 220); (?) Texas (Dresser, Ibis, 1856, 330).

While the *Scops macalli* is without doubt to be distinguished from *S. asio*, its being specifically distinct is not a matter of so much certainty; with a simple statement of the differences between the two, I shall leave the value of these differences to

the appreciation of each one, according to his own fancy. The species is represented in the collection by but four specimens, two adult and two young. I have not seen the red plumage as described by Cassin.

The characters of this race, as given in the diagnosis, appear to be really constant; and there is not a specimen in the series of those from the west which may not readily be referred to one or the other.

The gray adult *maccalli* differs from that of *asio* in the much finer mottling of the general plumage; the medial black stripes of the feathers above being more sharply defined, and more distinct from the transverse zigzags. Below, the transverse dark bars are much finer, and nearer together. The face, neck, and jugulum more finely and uniformly barred. The white scapular spots have not the black border seen in *asio*. The size is smaller.

The young of *maccalli* differs from that of *asio* in much finer bars above, the dusky rather prevailing; below, also, the bars are finer and nearer together.

It is not necessary to compare this bird with any other than the *S. asio*, since it is not at all related to *choliba*, or any other southern species.

Scops maccalli is entirely distinct from the *S. trichopsis*, Wagler, notwithstanding the statement in the Ibis, for April, 1872 (p. 6), that "the name" is "really synonymous with *S. trichopsis* of Wagler, the bird being quite distinct from *S. asio*, as has been pointed out elsewhere." (P. Z. S. 1868, p. 57.)

Scops asio, var. kennicotti, Elliot

KENNICOTT'S OWL

Scops kennicotti, Elliot, Pr. Ac. Nat. Sc. Phil. 1867, p. 69; Illust. Am. Birds, pl. xi.—Baird, Trans. Chicago Acad. Sc. I, ii, 311, pl. xxvii, 1869.—Dall & Bannister, Tr. Chic. Ac. I, 1869, 273.—Gray, Hand List, I, 47, 1869.—Elliot, Illust. Birds Am. I, xxvii.—Finsch, Abh. Nat. III, 28.—*Scops asio*, var. *kennicotti*, (Ridgway) Coues, Key, 1872, 203. ? *Scops asio*, Coop. & Suck. P. R. R. Rept. XII, ii, 155, 1860 (all citations from northwest coast).

Sp. Char. *Adult* (♂, 59,847, Sitka, Alaska, March, 1866; Ferd. Bischoff. Elliott's type). Above umber-brown, with a reddish cast; feathers confusedly mottled transversely with dusky, and showing rounded spots of rufous, most conspicuous on the nape; each feather with a conspicuous medial broad ragged stripe of black, these stripes most conspicuous on the forehead and scapulars; outer webs of scapulars light rufous, bordered terminally with black. Wings of a more grayish cast than the back, but similarly variegated; lower feathers of the middle and secondary wing-coverts, each with a large oval pale rufous spot, covering most of the lower web. Secondaries crossed by six narrow obscure bands of pale rufous; primaries with seven

somewhat rounded, quadrate spots of the same on the outer webs, forming as many transverse series; each light spot with a central dusky mottling. Tail more finely and confusedly mottled than the wings; the bands, though present, are so obsolete as to be scarcely traceable, and so irregular or badly defined as to be of uncertain number. The ear-tufts are black and rusty, the former along the shafts, and in transverse spots; on the outer webs the black predominates, on the inner the rusty.

The lores and basal half of the frontal bristles are white, the terminal half abruptly black; eyebrows about equally blackish and paler, the former bordering the feathers; eye surrounded by dark snuff-brown; cheeks and ear-coverts pale rusty, transversely barred with deeper rusty; facial circle not well defined, black. Chin and lores only white.

Ground-color of the lower parts dilute-rusty, becoming white on the flanks; each feather of the throat, jugulum, breast, sides, and flanks with a broad medial stripe of black, this throwing off very narrow, rather distant, bars to the edge; the spaces between these bars are alternately paler and deeper dilute-rusty; the black marks are broadest on the sides of the breast, where they have an external deep rusty suffusion; the abdomen medially, and the anal region, are scarcely maculate rusty-white; the lower tail-coverts have each a central cuneate longitudinal stripe of black. Tibiæ, tarsi, and lining of the wing, plain deep rusty. Wing-formula, 3=4, 5-2, 6-1=9. Wing, 7.40; tail, 4.00; culmen, .65; tarsus, 1.50; middle toe, .80.

No. 59,068 (Idaho; Dr. Whitehead) is considerably darker than the type, the ground-color above approaching to snuff-brown; it differs, however, in no other respect, as regards coloration; the size, however (as would be expected), is considerably smaller, measuring as follows: Wing, 6.80; tail, 3.50; culmen, .60; tarsus, 1.20; middle toe, .80. Wing-formula the same as in type.

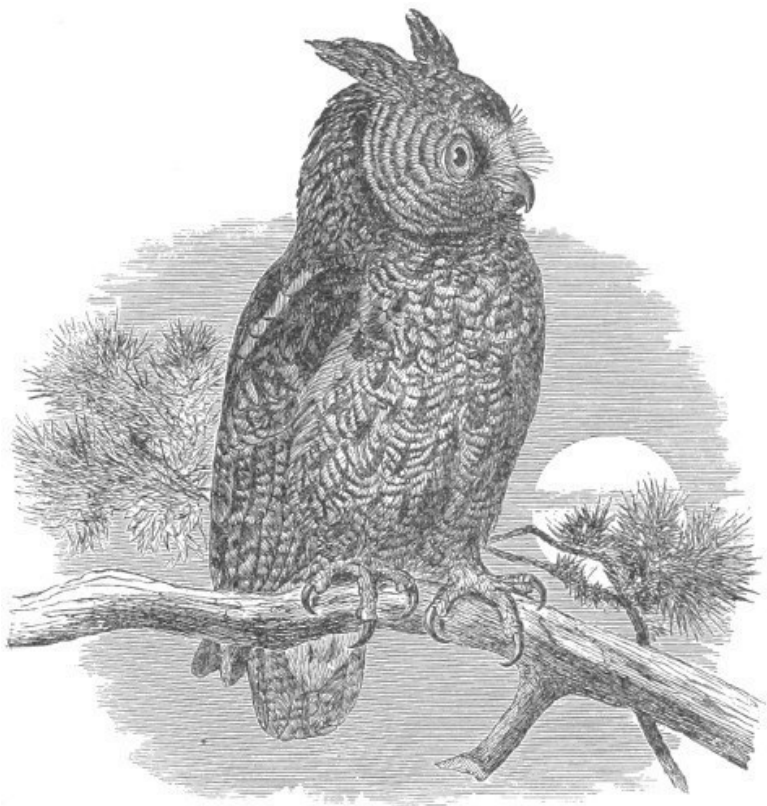
Hab. Northwestern coast of North America, from Columbia River, northward; Idaho (Dr. Whitehead).

No. 4,530 (Washington Territory; Dr. Geo. Suckley) is just intermediate in all respects between typical *kennicotti* and *asio*, being referrible to either with equal propriety, though perhaps inclining most to the former.

This well-marked form is, according to recognized laws, properly to be regarded as only an extremely dark northwestern form of *Scops asio*. There is no deviation from the specific pattern of coloration, the difference being merely in the tints; while in this it corresponds in every way with other species as modified in the northwest coast region; the somewhat greater size, too, merely results from its more northern habitat.

The only characters which we find in *kennicotti* which cannot be recognized in *asio* are the smaller, more quadrate, and more rufous spots on the primaries, and more obsolete bands on the tail; but this is merely the consequence of the greater extension of the brown markings, thus necessarily contrasting the lighter spots. In these respects only does the Washington Territory

specimen differ from the two typical examples before us, having the larger, more whitish, spots on primaries, and more distinct tail-bands, of *asio*.



Scops asio, var. *kennicotti*.

The *Scops kennicotti* must, however, be recognized as a well-marked geographical race, and, not taking into consideration any natural laws which influence changes in species, it would be very proper to recognize the validity of the present bird. If, however, the rule of which we speak will apply to others, as indeed it does to a majority of the birds of the region inhabited by the *Scops kennicotti*, the extreme conditions of some species of which are even more widely different than in the present instance, and which have been referred to their lighter representatives in consequence of the applicability of this law, we cannot possibly do otherwise with it.

In general appearance, size, and proportions, as well as in pattern and tints of coloration, except in their details, there is a wonderfully close resemblance in this race of *S. asio* to the *S. semitorques*, Schlegel, of Japan. Indeed, it is probable that the latter is also a mere geographical form of the same species. The only tangible points of difference are that in *semitorques* the jugulum is distinctly white centrally, there is a quite well-defined lighter nuchal band, with a more indistinct occipital one above it, and the pencillings on the lower parts are more delicate. The size and proportions are essentially the same; the shades of color are identical, while the markings differ only in minute detail, their pattern being essentially the same. In *kennicotti* the light nuchal collars are indicated, though they do not approach the distinctness shown by them in *semitorques*. Should they be considered as races of one species (*S. asio*), their differential

characters may be expressed as follows:—

Var. *semitorques*.²⁶ A well-defined nuchal collar, of mottled pale ochraceous; jugulum immaculate white centrally. Feathers of the lower parts with their transverse pencillings growing fainter towards the middle line, which is unvariegated white, from the central jugular spot to the anal region. Wing, 6.60–7.10; tail, 3.60–3.70; culmen, .60; tarsus, 1.25–1.40; middle toe, .80–.90. (Two specimens.)

Hab. Japan.

Var. *kennicotti*. No well-defined nuchal band; jugulum closely barred centrally; feathers of the lower parts with their transverse pencillings not growing fainter toward the middle line, which is unvariegated white only on the abdominal portion; the medial black streaks to the feathers of the lower surface much broader, and transverse pencillings rather coarser. Wing, 6.90–7.30; tail, 3.50–4.50; culmen, .60–.65; tarsus, 1.35–1.45; middle toe, .80–.90. (Three specimens.) *Hab.* North Pacific coast of North America from Sitka to Washington Territory, and Western Idaho.

The zoölogical characters of the different varieties of the *Scops asio* having been thus indicated, we proceed to consider the species as a whole, and to point out the more important features of its habits and history.

²⁶ *Scops semitorques*, Schlegel, Fauna Japonica, t. 8. For the privilege of comparing specimens of this bird with *S. kennicotti*, I am indebted to the courtesy of the officers of the New York Museum, who kindly sent the fine specimens of that museum for examination.

Habits. The common Mottled Owl has an extended distribution throughout the temperate portion of North America. It is also the most numerous of this family wherever found. It does not appear to have been detected in any part of the Arctic regions. Although given on the authority of Fabricius as a bird of Greenland, it is not retained in the list of Reinhardt. It was not met with by Richardson, nor is any reference made to it in any of the Arctic notes furnished by Mr. MacFarlane or others. It is quite common throughout New England, as well as in the Central, the Western, and some of the Southern States. Mr. Boardman gives it as resident, but not very common, near Calais, where it breeds. It is found near Hamilton, Canada, according to McIlwraith, but it is not common, although Dr. Hall found it quite numerous in the vicinity of Montreal. Mr. Downes does not mention its occurrence in Nova Scotia. It was found breeding by Dr. Lincecum, at Long Point, Texas. It occurs in California, and as *Scops kennicotti* as far to the northwest as Sitka.

The Mottled Owl is nocturnal in its habits, never appearing abroad in the daylight except when driven out by the attacks of hostile birds that have discovered it in its retreat. Its eyes cannot endure the light, and it experiences great inconvenience from such an exposure. During the day it hides in hollow trees, in dark recesses in the forests, or in dark corners of barns, and comes out from its retreat just before dark. During the night it utters a very peculiar wailing cry, not unlike the half-whining, half-barking complaints of a young puppy, alternating from high to

low, intermingled with deep guttural trills. These cries, which are sometimes prolonged until after midnight, usually elicit an answer from its mate or companions, and would seem to be uttered as a call soliciting a reply from some lost associate. When kept in confinement the Mottled Owl soon becomes familiarized to its new mode of life, and rarely attempts to injure its captors, though it will at first snap its bill in a threatening manner and manifest considerable irritation on being approached or handled. In the daytime they keep secluded, appear sleepy or stupid, with half-closed eyes, but, as night approaches, become quite lively and eager for their food. They utter their nocturnal cries in confinement, the doleful sounds of which are in singular contrast with the lively and excited air of the birds as they utter them. Their flight is noiseless and gliding, and they move in a manner so nearly silent as to be hardly perceptible. They are excellent mousers, and swallow their food whole, ejecting the indigestible parts, such as hair, bones, feathers, etc.

Wilson caught an adult bird, and kept it in confinement some time. At first it was restless and attempted to escape, beating against the glass of the window repeatedly, and several times with so much violence as to stun itself. In a few days it was reconciled to its situation, and became quite tame and familiar, and in the evening was very lively, sprightly, and active.

The food of the Screech-Owl is chiefly small quadrupeds, insects, and occasionally, when they have young, small birds. They destroy a vast number of mice, beetles, and vermin, and are

of great service to the agriculturist, although their services are not appreciated, and they are everywhere persecuted and hunted down without mercy or justice.

The nest of this species is usually constructed in hollow trees or stumps, most frequently in orchards in the vicinity of farm-houses, and not more than six or seven feet from the ground. Mr. Audubon states, however, that he has sometimes found them at the height of thirty or forty. To show the provident habits of this Owl in procuring for its young a great superabundance of food, Mr. Nuttall mentions finding in the hollow stump of an apple-tree, which contained a single brood of these young Owls, several Bluebirds, Blackbirds, and Song-Sparrows.

Dr. Cooper, on the other hand, relates an instance where one of these Owls resided as an inmate in a dove-cot, where it was not known to do any injury to its inmates.

The Screech-Owl can hardly be said to construct any nest, but lines the hollow in which it rears its young with a few loose leaves, dry grasses, and feathers. The eggs are usually five or six in number; they are pure white, and nearly round. Their average measurement is 1.38 inches in length by 1.19 in breadth.

In regard to the distinctive peculiarities of var. *maccalli*, we are in possession of but little information. Its habits probably do not essentially vary from those of the common *Scops asio*, which it so closely resembles in other respects, and of which it is to be regarded as a geographical race. It was first taken by Mr. E. S. Holden, near Sacramento, and described by Mr. Lawrence as the

Ephialtes choliba of Vieillot. It has since been found in other parts of California, in Northern Mexico, Arizona, and on the Rio Grande. It was obtained in Tamaulipas—where it is evidently rather common—by the late Dr. Berlandier, who had also procured its eggs. A single specimen of this Owl was obtained by Mr. A. Schott in Texas, and Mr. Dresser also obtained two small Owls which he doubtfully refers to this variety,—one near San Antonio, and the other in Bandera County. Lieutenant Bendire writes that it is quite common in the vicinity of Tucson, Arizona, though Dr. Coues did not meet with it. Dr. Kennerly observed it on Bill Williams Fork, in New Mexico. It was there found living in the large *Cereus giganteus* so common in that region, where it occupied the deserted holes of various kinds of Woodpeckers. It rarely made its appearance during the day, and then only to show its head from the hole, ready at any moment to disappear at the approach of danger. On one occasion it was observed among some very thick bushes near the water. It does not appear to have been met with by Dr. Cooper in California, where he refers all the Owls of this genus to the common *asio*. A single individual, referred doubtfully to this bird, was taken by Mr. Skinner in Guatemala. The eggs of this bird, taken in Tamaulipas by Dr. Berlandier, are of nearly globular shape, of a clear, almost crystal-white color, and measure 1.13 inches in length by 0.93 of an inch in breadth. As compared with the eggs of *Scops asio* they are much smaller, their relative capacity being only as five to eight.

The eggs of the var. *asio* vary greatly in size according to their locality. Those taken in Florida are so much smaller than those from Massachusetts as almost to be suggestive of specific differences. An egg from Hudson, Mass., taken by Mr. Jillson in April, 1870, measures 1.50 by 1.30 inches, while one from Monticello, Fla., taken by Mr. Samuel Pasco, measures 1.30 by 1.15 inches. Mr. T. H. Jackson, of Westchester, Penn., informs me that he has found a nest of this Owl containing six fresh eggs, on the 5th of April.

Scops flammeola, Licht

FEILNER'S OWL

Scops flammeola, Licht. Mus. Berol. Nomenclat. p. 7, 1854.—Kaup, Trans. Zoöl. Soc. IV, 226.—Schlegel, Mus. de Pays-Bas, *Oti*, p. 27.—Sclat. Proc. Zoöl. Soc. 1858, 96.—Scl. & Salv. P. Z. S. 1868, 57; Exot. Orn. VII, 99, pl. 1, July, 1868.—Gray, Hand List, I, 47, 1869.—Elliot, Illust. Birds Am. I, pl. xxviii.—Coues, Key, 1872, 203.

Sp. Char. *Adult* (42,159, Orizaba Mountains, "rare," February 3, 1865; Professor F. Sumichrast). Ground-color above pale cinereous, this overlaid on the top of the head, nape, and back by a brownish-olive shade, the ash showing pure only on the borders

of the crown and on the wing-coverts and scapulars; the whole upper surface transversely mottled with white and blackish, the latter in the form of fine zigzag lines and a splash along the shaft, this expanding transversely near the end of the feather; the white is in the form of larger transverse spots, these largest across the nape. Outer webs of the scapulars fine light orange-rufous (becoming white beneath the surface), bordered terminally with black. Coverts along the lower edge of the wing spotted with pale rufous; outer webs of the several lower feathers of the middle and secondary wing-coverts with a large conspicuous spot of white. Secondaries crossed by four well-defined narrow pale ochraceous bands; primary coverts transversely spotted with the same; primaries with about five transverse series of very large white spots on the outer webs, the spots approaching ochraceous next the shaft and towards the end of the feather. Tail profusely mottled like the back, and crossed with about five ragged, badly defined pale bands, the last of which is not terminal. Ear-tufts inconspicuous.

Eye-brow white, feathers bordered with blackish; eye encircled with rusty rufous; lores strongly tinged with the same; cheeks, ear-coverts, neck, and jugulum with numerous transverse dusky bars upon a grayish-white ground. Facial circle rusty-rufous spotted with black; throat with a tinge of rufous; chin white.



Scops flammeola.

Lower parts, in general, white; each feather with a black shaft-stripe, this throwing off bars in pairs, across the feather; the medial stripes are very broad, forming longitudinal spots on the breast, and have here an external rufous suffusion; lower tail-

coverts very sparsely marked. Tibiæ and tarsi white, with very sparse transverse dusky spots. Lining of the wing plain yellowish-white; bars on under surface of primaries very obsolete, except basally. Wing-formula, 3=4; 5, 2-6; 1=8. Wing, 5.40; tail, 2.45; culmen, .35; tarsus, .87; middle toe, .55.

Young (first full, but imperfect plumage: ♂, 24,172, Fort Crook, North California, August 23, 1860; John Feilner). Wings and tail as in the adult (last pale band of latter apparently terminal). Whole head and body with numerous, about equal, transverse bands of dusky and grayish-white; the two colors about equal, but on lower parts both are much wider and more distinct than above the white gradually increasing posteriorly. Breast and outer webs of scapulars with a rusty tinge, the latter scarcely variegated. Eyebrow white, feathers bordered with dusky; eye-circle and ear-coverts bright rusty-rufous; lores much tinged with the same. No facial circle. Wing, 5.50; tail, 2.70.

Hab. Guatemala and central Mexico, northward (along Sierra Nevada) to Fort Crook; California (breeding).

Habits. This is essentially a Mexican and Central American species, occurring among the mountains of Mexico and thence to Guatemala. One individual, however, the only one as yet recorded as taken in the United States, was obtained at Fort Crook by Captain John Feilner, and is now in the collection of the Smithsonian Institution. This was a young bird, evidently raised in that locality, and apparently showing that the species breeds in that vicinity. It has been taken also at Orizaba, in the State of

Vera Cruz, Mexico. Nothing is known as to any peculiarities of habit. These are not probably different from those of the *asio*.

Genus BUBO, Dum

Gen. Char. Size varying from medium to very large; head with or without ear-tufts. Bill black; iris yellow. Two to four outer quills with their inner webs emarginated. Third or fourth quill longest. Bill very robust, the lower mandible nearly truncated and with a deep notch near the end; cere gradually ascending basally (not arched) or nearly straight, not equal to the culmen. Tail short, a little more than half the wing, slightly rounded. Ear-conch small, simple, without operculum; the two ears symmetrical.

Subgenera

Bubo. Two to three outer quills with their inner webs emarginated. Ear-tufts well developed; loral feathers not hiding the bill, and the claws and terminal scutellæ of the toes exposed. Lower tail-coverts not reaching the end of the tail. (Type, *B. maximus*.)

Nyctea. Four outer quills with their inner webs emarginated. Ear-tufts rudimentary; loral feathers hiding the bill, and claws and entire toes concealed by long hair-like feathers. Lower tail-coverts reaching to end of the tail. (Type, *N. scandiaca*.)

The species of this genus are mostly of very large size, two of them (*B. maximus* and *N. scandiaca*) being the largest birds of

the family. They are nearly cosmopolitan, and are most numerous in the Eastern Hemisphere.

Subgenus BUBO, Dum

Bubo, Duméril, 1806. (Type, *Strix bubo*, Linn. = *B. maximus*, Sibb.)

Rhinostrix, Kaup, 1849. (Type, *Strix mexicana*, Gmel. = *B. mexicanus*, Ridgw.)

Rhinoptynx, Kaup, and *Rhenoptynx*, Kaup, 1857. (Same type.)

Species and Races

1. **B. virginianus**. Lower parts transversely barred with black, and without longitudinal stripes. Above without longitudinal stripes on the anterior portions.

a. A conspicuous patch of white on the jugulum; lining of the wing immaculate, or only faintly barred. Wing, 14.00–16.00; tail, 8.00–10.00; culmen, 1.10–1.20; tarsus, 2.00–2.20; middle toe, 1.95–2.10.

Rufous tints of the plumage prevailing; face dingy rufous. *Hab.* Atlantic Province of North America ... var. *virginianus*.

Lighter tints of the plumage prevailing; face dirty or fulvous white. All the colors lighter. *Hab.* Western Province of United States, and interior regions of British America. Upper Mississippi Valley in winter (Wisconsin, Hoy; Pekin,

Illinois, Museum, Cambridge) ... var. *arcticus*.

Dusky tints of the plumage prevailing; face dull grayish, barred with dusky. All the colors darker, chiefly brownish-black and grayish-white, with little or no rufous.

Hab. Littoral regions of northern North America, from Oregon northward, and around the northern coast to Labrador ... var. *pacificus*.

b. No conspicuous patch of white on the jugulum, which, with the lining of the wing, is distinctly barred with blackish. Wing, 12.00; tail, 7.50; culmen, 1.00; tarsus, 2.10; middle toe, 1.85.

Colors much as in var. *virginianus*, but more densely barred beneath, the dark bars narrower and closer together.

Hab. South America ... var. *magellanicus*.²⁷

2. **B. mexicanus**.²⁸ Lower parts longitudinally striped

²⁷ *Bubo virginianus*, var. *magellanicus*. *Strix* (δ) *bubo magellanicus*, Gmel. Syst. Nat. 1789, p. 286.—Daud. Tr. Orn. II, 210.—Less. Voy. Coq. I, 617; Isis, 1833, 76. *Asio mag.* Less. Man. Orn. I. p. 116, 1828. *Bubo mag.* Gray, List Birds Brit. Mus. 1844, p. 46. *Strix nacuruta*, Vieill. Nouv. Dict. Hist. Nat. VII, 44, 1816; Enc. Méth. III, 1281, 1823. *Strix crassirostris*, Vieill. Nouv. Dict. Hist. Nat. VII, 44 (1817); Enc. Méth. III, 1280. *Otus crass.* Gray, Gen. B. fol. sp. 6 (1844); List Birds Brit. Mus. p. 106. *Bubo crass.* Bonap. Consp. Av. p. 48 (1850).—Kaup, Monog. Strig. Cont. Orn. 1852, 116 (under *B. virginianus*). *Asio crass.* Strickl. Orn. Syn. I, 208, 1855. *Strix macrorhyncha*, Temm. Pl. Col. 62, 1820. *Otus ? macr.* Steph. Zoöl. XIII, pt. ii, p. 59. *Otus macr.* Cuv. Règ. An. (ed. 2), I, 341.—Less. Tr. Orn. p. 109. *Asio macr.* Less. Man. Orn. I, 117.

²⁸ *Bubo mexicanus* (Gmel.) Ridgw. *Asio mexicanus*, Briss. Orn. I, 498, 1760.—Strickl. Orn. Syn. I, 208, 1855 (excl. syn.). *Strix mexicana*, Gmel. S. N. p. 288, 1789.—Lath. Ind. Orn. p. 54; Syn. I, 123; Gen. Hist. I, 314, A.—Daud. Tr. Orn. II, 214.—Shaw, Zoöl. VII, 228.—*Otus mexicanus*, Steph. Zoöl. XIII, pt. ii, p. 57.—*Bubo clamator*, Vieill. Ois. Am. Sept. pl. xx, 1807. *Scops cl.* Gray, List Birds Brit. Mus. 1844, p. 45. *Strix clamata*, Vieill. Enc. Méth. III, 1279, 1823. *Strix longirostris*, Spix,

with black, and without transverse bars. Above with longitudinal stripes on the anterior portions. Wing, 11.20–12.00; tail, 6.00–6.50; culmen, .90; tarsus, 2.00; middle toe, 1.95. *Hab.* Middle and South America generally.

Subgenus NYCTEA, Stephens

Nyctea, Stephens, Cont. Shaw's Zoöl. XIII, 62, 1826. (Type *Strix nyctea*, Linn. *N. Scandiaca*, Linn.).

Species and Races

1. **N. scandiaca.** *Adult.* Color pure white, more or less barred transversely with clear dusky, or brownish-black. *Male* sometimes almost pure white. *Downy young*, sooty slate-color. Wing, 16.00–18.00; tail, 9.00–10.00.

Dusky bars sparse, narrow, umber-brown. *Hab.* Northern parts of Palæarctic Realm ... var. *scandiaca*.²⁹

Dusky bars more numerous, broader, and clear brownish-black. *Hab.* Northern parts of Nearctic

Av. Bras. pl. 9 a, 1824. *Strix maculata*, Max. Beitr. III, 281, 1830. *Hab.* Middle and South America generally. A very distinct species, and a typical *Bubo*, although usually referred to the genus *Otus*.

²⁹ *Nyctea scandiaca*, var. *nivea* (see p. 000). *Strix scandiaca*, Linn. S. N. (12th ed.) I, 132 (1766). *Nyctea scandiaca*, Yawell, Hist. Brit. B. 1872, 187. *Strix nyctea*, Linn. S. N. I, 1766, 132. *Strix nivea*, Daud. Tr. Orn. II, 1800. *Nyctea nivea*, Gray, Gen. fol. sp. 1, pl. xii, f. 2.

Realm ... var. *arctica*.

Bubo virginianus, var. virginianus, Bonap

GREAT HORNED OWL

Asio bubo virginianus, Briss. Orn. I, 484, 17, 1760. *Strix virginiana*, Gmel. Syst. Nat. I, 287, 1788.—Lath. Ind. Orn. p. 52; Syn. I, 119; Supp. I, 40; Gen. Hist. I, 304.—Daud. Tr. Orn. II, 210, pl. xiii.—Wils. Am. Orn. pl. I, f. 1.—Bonap. Ann. Lyc. N. Y. II, 37 and 435; Isis, 1832, p. 1139.—Aud. Birds Am. pl. lxi, 1831; Orn. Biog. I, 313.—Thomps. Nat. Hist. Vermont, pl. lxx.—Peab. Birds Mass. p. 87. *Bubo virginianus*, Bonap. List, p. 6, 1838; Consp. Av. p. 48.—Jard. (Wils.) Am. Orn. II, p. 257.—De Kay, Zoöl. N. Y. II, 24, pl. x, f. 2.—Nutt. Man. Orn. p. 124.—Max. Cab. Jour. 1853, VI, 23.—Kaup, Tr. Zoöl. Soc. IV, 1859, 241.—Coues, Key, 1872, 202. *Bubo virginianus atlanticus*, Cassin, Birds of Cal. & Tex. I, 178, 1854.—Birds N. Am. 1858, 49 (under *B. virginianus*). *Otus virginianus*, Steph. Zoöl. XIII, ii, 57, 1836. *Ulula virginiana*, James. (Wils.), Am. Orn. I, 100, 1831. *Strix virginiana*, α , Lath. Gen. Hist. I, 306, 1821. *Strix bubo*, δ , Lath. Ind. Orn. p. 52, 1790.—Shaw, Zoöl. VII, 215. *Strix maximus*, Bart. Trav. Carol. p. 285, 1792. *Bubo ludovicianus*, Daud. Tr. Orn. II, 210, 1800. *Bubo pinicola*, Vieill. Ois. Am. Sept. pl. xix, 1807; Enc.



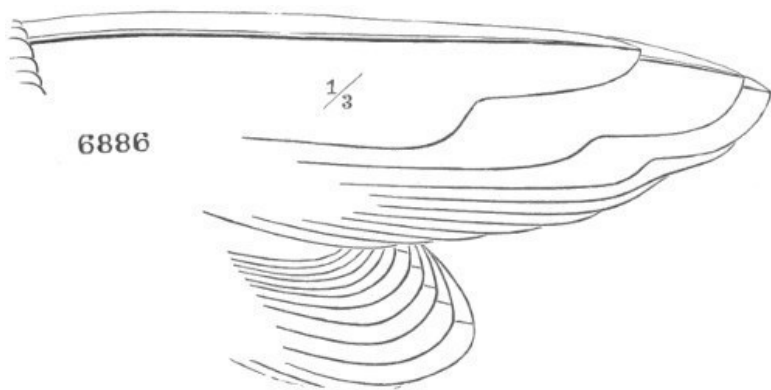
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Bubo virginianus.

Sp. Char. *Adult* ♂ (12,057, Philadelphia; C. Drexler). Bases of all the feathers yellowish-rufous, this partially exposed on the head above and nape, along the scapulars, on the rump, and

sides of the breast. On the upper surface this is overlaid by a rather coarse transverse mottling of brownish-black upon a white ground, the former rather predominating, particularly on the head and neck, where it forms broad ragged longitudinal stripes (almost obliterating the transverse bars), becoming prevalent, or blended, anteriorly. The lower feathers of the scapulars, and some of the lower feathers of the middle and secondary wing-coverts, with inconspicuous transverse spots of white. On the secondaries the mottling is finer, giving a grayish aspect, and crossed with eight sharply defined, but inconspicuous, bands of mottled dusky; primary coverts with the ground-color very dark, and crossed with three or four bands of plain blackish, the last terminal, though fainter than the rest; ground-color of the primaries more yellowish, the mottling more delicate; they are crossed by nine transverse series of quadrate dusky spots. The ground-color of the tail is pale ochraceous (transversely mottled with dusky), becoming white at the tip, crossed by seven bands of mottled blackish, these about equalling the light bands in width; on the middle feathers the bands are broken and confused, running obliquely, or, in places, longitudinally. Outer webs of ear-tufts pure black; inner webs almost wholly ochraceous; eyebrows and lores white, the feathers with black shafts; face dingy rufous; eye very narrowly encircled with whitish; a crescent of black bordering the upper eyelid, and confluent with the black of the ear-tufts. Facial circle continuous black, except across the foreneck; chin, throat, and jugulum pure immaculate white,

to the roots of the feathers. Beneath, white prevails, but the yellowish-rufous is prevalent on the sides of the breast, and shows as the base color wherever the feathers are disarranged. The sides of the breast, sides, and flanks have numerous sharply defined narrow transverse bars of brownish-black; anteriorly these are finer and more ragged, becoming coalesced so as to form conspicuous, somewhat longitudinal, black spots. On the lower tail-coverts the bars are distant, though not less sharply defined. The abdomen medially is scarcely maculate white. Legs and toes plain ochraceous-white.



6886 $\frac{1}{3}$

Bubo virginianus.

Wing-formula, 2, 3-4-1, 5. Wing, 14.50; tail, 8.20; culmen, 1.10; tarsus, 2.00; middle toe, 2.00.

♀ (12,065, Maryland; R. J. Pollard). General appearance same as the male. Black blotches on head above and nape less conspicuous, the surface being mottled like the back, etc.; primary coverts with three well-defined narrow pure black bands; primaries with only six bands, these broader than in the male; secondaries with only five bands; tail with but six dark bands, these very much narrower than the light ones. Tibiæ and tarsi with sparse transverse bars of dusky. Wing-formula, 3, 2, 4-1=5. Wing, 16.00; tail, 9.00; culmen, 1.20; tarsus, 2.20; middle toe, 2.10.

Young. Wings and tail as in adult. Downy plumage of head and body ochraceous, with detached, rather distant, transverse bars of dusky. (12,062, Washington, D. C., May 20, 1859; C. Drexler.)

Hab. Eastern North America, south of Labrador; west to the Missouri; south through Atlantic region of Mexico to Costa Rica; Jamaica (Gosse).

Localities: (?) Oaxaca (Scl. 1859, 390; possibly var. *arcticus*); Guatemala (Scl. Ibis, I. 222); Jamaica (Gosse, 23); Texas (Dresser, Ibis, 1865, 330, breeds); Costa Rica (Lawr. IX, 132).

Specimens from the regions indicated vary but little, the only two possessing differences of any note being one (58,747,³⁰ ♂) from Southern Illinois, and one (33,218, San Jose; J. Carmiol)

³⁰ No. 559, collection of R. Ridgway (♂, Mt. Carmel, Wabash County, Southern Illinois, October 14, 1869). 22½-54. Weight, 3½ lbs.; bill black; iris gamboge-yellow; toes ashy; claws horn-color, black at ends.

from Costa Rica. The first differs from all those from the eastern United States in much deeper and darker shades of color, the rufous predominant below, the legs and crissum being of quite a deep shade of this color; the transverse bars beneath are also very broad and pure black. This specimen is more like Audubon's figure than any other, and may possibly represent the peculiar style of the Lower Mississippi region. The Costa Rica bird is remarkable for the predominance of the rufous on all parts of the plumage; the legs, however, are whitish, as in specimens from the Atlantic coast of the United States. These specimens cannot, however, be considered as anything else than merely local styles of the *virginianus*, var. *virginianus*.

Bubo virginianus, var. arcticus, Swains

WESTERN GREAT HORNED OWL

? *Strix wapacuthu*, Gmel. Syst. Nat. 1789, p. 290.
Strix (Bubo) arctica, Swains. F. B. A. II, 1831, 86.
Heliaptex arcticus, Swains. Classif. Birds, I, 1837, 328;
Ib. II, 217. *Bubo virginianus arcticus*, Cass. Birds N. Am.
1858, 50 (*B. virginianus*).—Blakiston, Ibis, III, 1861, 320.
Bubo virginianus, var. *arcticus*, Coues, Key, 1872, 202.
Bubo subarcticus, Hoy, P. A. N. S. VI, 1852, 211. *Bubo*
virginianus pacificus, Cass. Birds Cal. & Tex. 1854, and

Birds N. Am. 1858 (*B. virginianus*, in part only). *Bubo magellanicus*, Cass. Birds Cal. & Tex. 1854, 178 (not *B. magellanicus* of Lesson!). *Bubo virginianus*, Heerm. 34.—Kennerly, 20.—Coues, Prod. (P. A. N. S. 1866, 13).—Blakiston, Ibis, III, 1861, 320. ? *Wapacuthu Owl*, Pennant, Arctic Zoöl. 231.—Lath. Syn. Supp. I, 49.

Char. Pattern of coloration precisely like that of var. *virginianus*, but the general aspect much lighter and more grayish, caused by a greater prevalence of the lighter tints, and contraction of dark pencillings. The ochraceous much lighter and less rufous. Face soiled white, instead of deep dingy rufous.

♂ (No. 21,581, Camp Kootenay, Washington Territory, August 2, 1860). Wing, 14.00; tail, 8.60; culmen, 1.10; tarsus, 2.00. Tail and primaries each with the dark bands nine in number; legs and feet immaculate white. Wing-formula, 3, 2=4—5—1.

♀ (No. 10,574, Fort Tejon, California). Wing, 14.70; tail, 9.50; culmen, 1.10; tarsus, 2.10; middle toe, 2.00. Tail and primaries each with seven dark bands; legs transversely barred with dusky. Wing-formula, 3, 4, 2—5—1, 6.

Hab. Western region of North America, from the interior Arctic districts to the table-lands of Mexico. Wisconsin (Hoy); Northern Illinois (Pekin, Mus. Cambridge); Lower California; ? Orizaba, Mexico.

Localities: (?) Orizaba (Scl. P. Z. S. 1860, 253); Arizona (Coues, P. A. N. S. 1866, 49).

The above description covers the average characters of a light grayish race of the *B. virginianus*, which represents the other styles in the whole of the western and interior regions of the continent. Farther northward, in the interior of the fur countries, the plumage becomes lighter still, some Arctic specimens being almost as white as the *Nyctea scandiaca*. The *B. arcticus* of Swainson was founded upon a specimen of this kind, and it is our strong opinion that the Wapecuthu Owl of Pennant (*Strix wapecuthu*, Gmel.) was nothing else than a similar individual, which had accidentally lost the ear-tufts, since there is no other discrepancy in the original description. The failure to mention ear-tufts, too, may have been merely a neglect on the part of the describer.

***Bubo virginianus*, var. *pacificus*, Cass**

Bubo virginianus pacificus, Cassin, Birds N. Am. 1858, 49. *Bubo virginianus*, var. *pacificus*, Coues, Key, 1872, 202. *Bubo virginianus*, Coop. & Suckley, P. R. Rept. XII, ii, 1860, 154.—Lord, Pr. R. A. S. IV, III (British Columbia). ? Dall & Bannister, Tr. Chicago Ac. I, 1869, 272 (Alaska). —? Finsch, Abh. Nat. III, 26 (Alaska).

Sp. Char. The opposite extreme from var. *arcticus*. The black shades predominating and the white mottling replaced by pale grayish; the form of the mottling above is less regularly transverse, being oblique or longitudinal, and more in blotches

than in the other styles. The primary coverts are plain black; the primaries are mottled gray and plain black. On the tail the mottling is very dark, the lighter markings on the middle feathers being thrown into longitudinal splashes. Beneath, the black bars are nearly as wide as the white, fully double their width in var. *arcticus*. The legs are always thickly barred. The lining of the wings is heavily barred with black. Face dull grayish, barred with dusky; ear-tufts almost wholly black.

♂ (45,842, Sitka, Alaska, November, 1866; Ferd. Bischoff). Wing-formula, 3, 2=4-5-1, 6. Wing, 14.00; tail, 8.00; culmen, 1.10; tarsus, 2.05; middle toe, .95.

Face with obscure bars of black; ochraceous of the bases of the feathers is distinct. There are seven black spots on the primaries, eight on the tail; on the latter exceeding the paler in width.

♀ (27,075, Yukon River, mouth Porcupine, April 16, 1861; R. Kennicott). Wing-formula, 3, 2=4-5-1, 6. Wing, 16.00; tail, 9.80; culmen, 1.15; tarsus, 2.00. Eight black spots on primaries, seven on tail.

Hab. Pacific coast north of the Columbia; Labrador. A northern littoral form.

A specimen from Labrador (34,958, Fort Niscopec, H. Connolly) is an extreme example of this well-marked variety. In this the rufous is entirely absent, the plumage consisting wholly of brownish-black and white, the former predominating; the jugulum and the abdomen medially are conspicuously snowy-

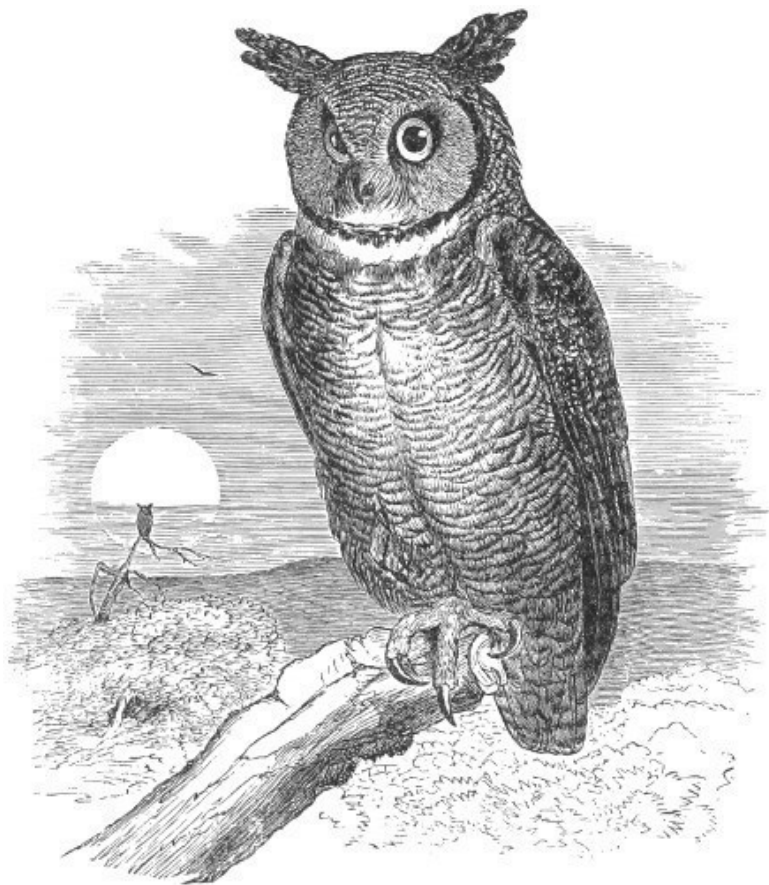
white; the black bars beneath are broad, and towards the end of each feather they become coalesced into a prevalent mottling, forming a spotted appearance.

Another (11,792, Simiahmoo, Dr. C. B. Kennerly) from Washington Territory has the black even more prevalent than in the last, being almost continuously uniform on the scapulars and lesser wing-coverts; beneath the black bars are much suffused. In this specimen the rufous tinge is present, as it is in all except the Labrador skin.

Habits. The Great Horned Owl has an extended distribution throughout at least the whole of North America from ocean to ocean, and from Central America to the Arctic regions. Throughout this widely extended area it is everywhere more or less abundant, except where it has been driven out by the increase of population. In this wide distribution the species naturally assumes varying forms and exhibits considerable diversities of coloring. These are provided with distinctive names to mark the races, but should all be regarded as belonging to one species, as they do not present any distinctive variation in habit.

Sir John Richardson speaks of it as not uncommon in the Arctic regions. It is abundant in Canada, and throughout all parts of the United States. Dr. Gambel met with it also in large numbers in the wooded regions of Upper California. Dr. Heermann found it very common around Sacramento in 1849, but afterwards, owing to the increase in population, it had become comparatively rare. Dr. Woodhouse met with it in

the Indian Territory, though not abundantly. Lieutenant Couch obtained specimens in Mexico, and Mr. Schott in Texas.



Bubo virginianus.

In the regions northwest of the Yukon River, Mr. Robert Kennicott found a pair of these birds breeding on the 10th of April. The female was procured, and proved to be of a dark plumage. The nest, formed of dry spruce branches retaining their leaves, was placed near the top of a large green spruce, in thick woods. It was large, measuring three or four feet across at base. The eggs were placed in a shallow depression, which was lined with a few feathers. Two more eggs were found in the ovary of the female,—one broken, the other not larger than a musket-ball. The eggs were frozen on their way to the fort. Mr. Ross states that he found this Owl very abundant around Great Slave Lake, but that it became less common as they proceeded farther north. It was remarkably plentiful in the marshes around Fort Resolution. Its food consisted of shrews and *Arvicolæ*, which are very abundant there. It is very tame and easily approached, and the Chipewyan Indians are said to eat with great relish the flesh, which is generally fat.

Mr. Gunn writes that this Owl is found over all the woody regions of the Hudson Bay Territory. In the summer it visits the shores of the bay, but retires to some distance inland on the approach of winter. It hunts in the dark, preying on rabbits, mice, muskrats, partridges, and any other fowls that it can find. With its bill it breaks the bones of hares into small pieces, which its stomach is able to digest. They pair in March, the only time at which they seem to enjoy each other's society. The nest is usually

made of twigs in the fork of some large poplar, where the female lays from three to six pale-white eggs. It is easily approached in clear sunny weather, but sees very well when the sky is clouded. It is not mentioned by Mr. MacFarlane as found near Anderson River. Mr. Dall caught alive several young birds not fully fledged, June 18, on the Yukon River, below the fort. He also met with it at Nulato, where it was not common, but was more plentiful farther up the river.

Mr. Salvin found this species in August at Duenas and at San Geronimo, in Guatemala. At Duenas it was said to be resident, and is so probably throughout the whole country. It was not uncommon, and its favorite locality was one of the hillsides near that village, well covered with low trees and shrubs, and with here and there a rocky precipice. They were frequently to be met with on afternoons, and at all hours of the night they made their proximity known by their deep cry.

Dr. Kennerly found it in Texas in the cañon of Devil River, and he adds that it seemed to live indifferently among the trees and the high and precipitous cliffs. It was found throughout Texas and New Mexico, wherever there are either large trees or deep cañons that afforded a hiding-place during the day. Attracted by the camp-fires of Dr. Kennerly's party, this Owl would occasionally sweep around their heads for a while, and then disappear in the darkness, to resume its dismal notes. Sometimes, frightened by the reverberating report of a gun, they would creep among the rocks, attempting to conceal themselves, and be thus taken alive.

Though frequently kept in captivity, the Great Horned Owl, even when taken young, is fierce and untamable, resenting all attempts at familiarity. It has no affection for its mate, this being especially true of the female. Mr. Downes mentions an instance within his knowledge, in which a female of this species, in confinement, killed and ate the male. Excepting during the brief period of mating, they are never seen in pairs.

Its flight is rapid and graceful, and more like that of an eagle than one of this family. It sails easily and in large circles. It is nocturnal in its habits, and is very rarely seen abroad in the day, and then only in cloudy weather or late in the afternoon. When detected in its hiding-place by the Jay, Crow, or Kingbird, and driven forth by their annoyances, it labors under great disadvantages, and flies at random in a hesitating flight, until twilight enables it to retaliate upon its tormentors. The hooting and nocturnal cries of the Great Horned Owl are a remarkable feature in its habits. These are chiefly during its breeding-season, especially the peculiar loud and vociferous cries known as its hooting. At times it will utter a single shriek, sounding like the yell of some unearthly being, while again it barks incessantly like a dog, and the resemblance is so natural as to provoke a rejoinder from its canine prototype. Occasionally it utters sounds resembling the half-choking cries of a person nearly strangled, and, attracted by the watchfire of a camp, fly over it, shrieking a cry resembling *waugh-hōō*. It is not surprising that with all these combinations and variations of unearthly cries these birds

should have been held in awe by the aborigines, their cries being sufficiently fearful to startle even the least timid.

It is one of the most destructive of the depredators upon the poultry-yard, far surpassing in this respect any of our Hawks. All its mischief is done at night, when it is almost impossible to detect and punish it. Whole plantations are often thus stripped in a single season.

The mating of this bird appears to have little or no reference to the season. A pair has been known to select a site for their nest, and begin to construct a new one, or seize upon that of a Red-tailed Hawk, and repair it, in September or October, keeping in its vicinity through the winter, and making their presence known by their continued hooting. Mr. Jillson found a female sitting on two eggs in February, in Hudson, Mass.; and Mr. William Street, of Easthampton, in the spring of 1869, found one of their nests on the 3d of March, the eggs in which had been incubated at least a week. If one nest is broken up, the pair immediately seek another, and make a renewed attempt to raise a brood. They rarely go more than a mile from their usual abode, and then only for food. Mr. Street's observations have led him to conclude that they mate about February 20, and deposit their eggs from the 25th to the 28th. They cease to hoot in the vicinity of their nest from the time of their mating until their young have left them in June. On the 19th of March, 1872, Mr. Street found two of their eggs containing young nearly ready to hatch.

Mr. Street's observations satisfied him that the period of

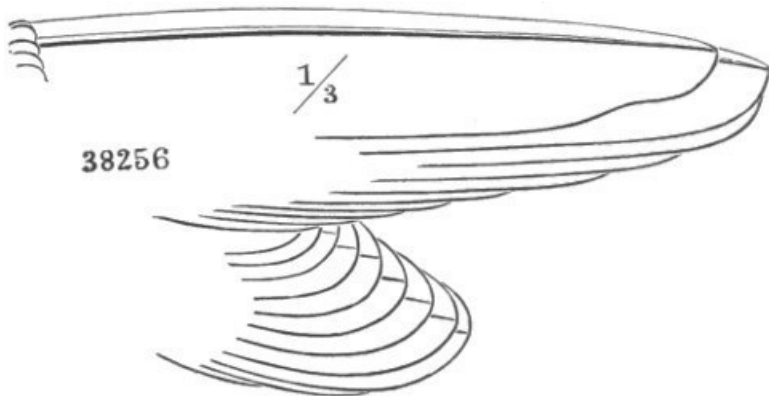
incubation of this Owl is about three weeks. When they have young and are hard pressed for food, they hunt by day as well as by night, and at this time they hoot a good deal. The young are ready to leave their nest about six weeks after hatching. At this time their feathers are nearly all grown, except their head-feathers, which have hardly started. In the spring of 1872 Mr. Street found a young bird that had fallen from its nest. Though very small it was untamable, and not to be softened by any attentions. Its savage disposition seemed to increase with age. It readily devoured all kinds of animal food, and was especially fond of fish and snakes. It was remarkable for its cowardice, being always ridiculously fearful of the smallest dog, the near approach of one always causing extravagant manifestations of alarm. He was therefore led to conclude that it does not prey upon quadrupeds larger than a hare, that it rarely is able to seize small birds, and that reptiles and fish form no inconsiderable portion of its food. The young Owl in question assumed its full plumage in November, when less than eight months old. It was of full size in all respects except in the length of its claws, which were hardly half the usual size.

Mr. T. H. Jackson, of West Chester, Penn., has met with fresh eggs of this Owl, February 13, 22, and 28, and has found young birds in their nests from the 2d of March to the 28th.

Mr. Audubon states that while the Great Horned Owl usually nests in large hollows of decayed trees, he has twice found the eggs in the fissures of rocks. In all these cases, little preparation

had been made previous to the laying of the eggs, the bed consisting of only a few grasses and feathers. Wilson, who found them breeding in the swamps of New Jersey, states that the nest was generally constructed in the fork of a tall tree, but sometimes in a smaller tree. They begin to build towards the close of winter, and, even in the Arctic regions, Sir John Richardson speaks of their hatching their eggs as early as March. The shape of the egg is very nearly exactly spherical, and its color is a dull white with a slightly yellowish tinge. An egg formerly in the old Peale's Museum of Philadelphia, taken in New Jersey by Alexander Wilson the ornithologist, and bearing his autograph upon its shell, measures 2.31 inches in length by 2.00 in breadth. Another, obtained in the vicinity of Salem, Mass., measures 2.25 inches in length by 1.88 in breadth. In the latter instance the nest was constructed on a tall and inaccessible tree in a somewhat exposed locality. The female was shot on the nest, and, as she fell, she clutched one of the eggs in a convulsive grasp, and brought it in her claws to the ground. An egg obtained in Tamaulipas, Mexico, on the Rio Grande, by Dr. Berlandier, measures 2.18 inches in length by 1.81 in breadth.

An egg from Wisconsin, taken by Mr. B. F. Goss, may be considered as about the average in size and color. It is nearly spherical, of a clear bluish-white, and measures 2.30 by 2.00 inches.



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Otus wilsonianus.

Nyctea scandiaca, var. arctica, Gray

AMERICAN SNOWY OWL

Strix arctica, Bartram, Trav. in Carolina, 1792, p. 285.
Strix nyctea, (not of Linn.!) Vieill. Ois. Am. Sept. 1807,
pl. xviii.—Swains. & Rich. F. B. A. II, 1831, 88.—Bonap.
Ann. N. Y. Lyc. II, 36.—Wils. Am. Orn. pl. xxxii, f. 1.
—Aud. Birds Am. pl. cxxi.—Ib. Orn. Biog. II, 135.—
Thomps. Nat. Hist. Vermont, p. 64.—Peab. Birds Mass.

III, 84. *Surnia nyctea* (Edmondst.), James. (ed. Wils.), Am. Orn. I, 1831, 92.—Nutt. Man. p. 116.—Kaup, Tr. Zoöl. Soc. IV, 1859, 214. *Syrnia nyctea* (Thomps.), Jardine's (ed. Wils.) Am. Orn. II, 1832, 46. *Nyctea nivea*, (Gray) Cass. Birds Cal. & Tex. 1854, 100.—Ib. Birds N. Am. 1858, 63.—Newton, P. Z. S. 1861, 394 (eggs).—Dresser, Ibis, 1865, 330 (Texas!).—Dall & Bannister, Tr. Chicago Acad. I, ii, 1869, 273 (Alaska).—Coues, Key, 1872, 205. *Nyctea candida*, (Lath.) Bonap. List, 1838, 6.

Sp. Char. *Adult*. Ground-color entirely snow-white, this marked with transverse bars of clear dusky, of varying amount in different individuals.

♂ (No. 12,059, Washington, D. C., December 4, 1858; C. Drexler). Across the top of the head, and interspersed over the wings and scapulars, are small transversely cordate spots of clear brownish-black, these inclining to the form of regular transverse bars on the scapulars; there is but one on each feather. The secondaries have mottled bars of more dilute dusky; the primaries have spots of black at their ends; the tail has a single series of irregular dusky spots crossing it near the end. Abdomen, sides, and flanks with transverse crescentic bars of clear brownish-black. Wing, 16.50; tail, 9.00; culmen, 1.00; tarsus, 1.90; middle toe, 1.30. Wing-formula, 3, 2=4-5, 1.

♀ (No. 12,058, Washington, D. C., December 4, 1858). Head above and nape with each feather blackish centrally, producing a conspicuously spotted appearance. Rest of the plumage with regular, sharply defined transverse bars of clear brownish-

black; those of the upper surface more crescentic, those on the lower tail-coverts narrower and more distant. Tail crossed by five bands, composed of detached transverse spots. Only the face, foreneck, middle of the breast, and feet, are immaculate; everywhere else, excepting on the crissum, the dusky and white are in nearly equal amount. Wing, 18.00; tail, 9.80; culmen, 1.10. Wing-formula, 3=4, 2-1=5.

Young (No. 36,434, Arctic America, August, 1863; MacFarlane). Only partially feathered. Wings and tail as in the adult female described, but the blackish bars rather broader. Down covering the head and body dark brownish or sooty slate, becoming paler on the legs.

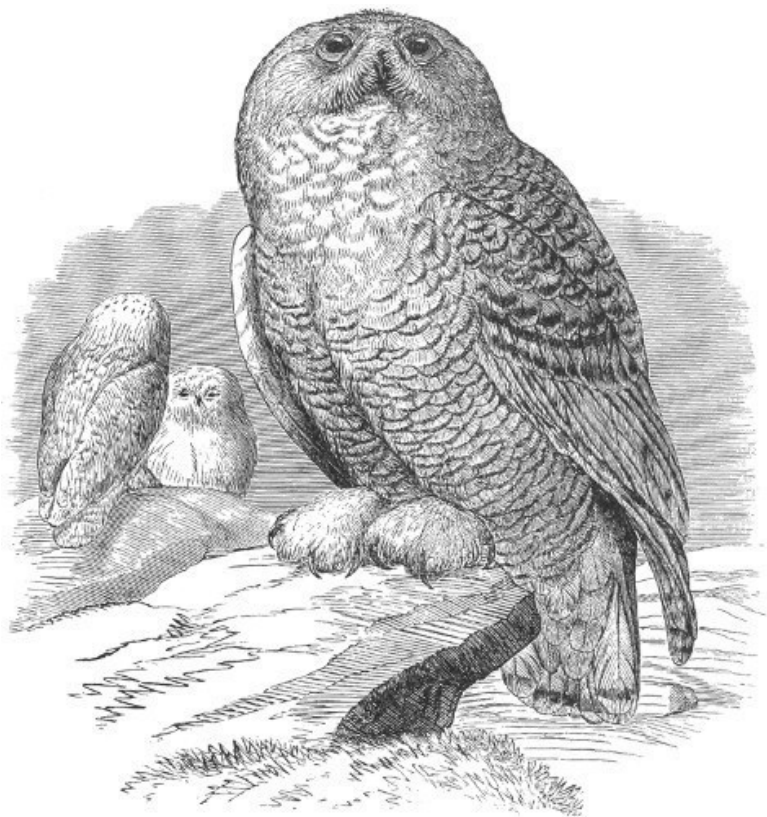
Hab. Northern portions of the Nearctic Realm. Breeding in the arctic and subarctic regions, and migrating in winter to the verge of the tropics. Bermuda (Jardine); South Carolina (Bartram and Audubon); Texas (Dresser).

Localities: Texas, San Antonio (Dresser, Ibis, 1865, 330).

The Snowy Owls of North America, though varying greatly among themselves, seem to be considerably darker, both in the extremes and average conditions of plumage, than European examples. Not only are the dusky bars darker, but they are usually broader, and more extended over the general surface.

Habits. This is an exclusively northern species, and is chiefly confined to the Arctic Circle and the adjacent portions of the temperate zone. It is met with in the United States only in midwinter, and is much more abundant in some years than in

others. Individual specimens have been occasionally noticed as far south as South Carolina, but very rarely. It has also been observed in Kentucky, Ohio, the Bermuda Islands, and in nearly every part of the United States.



Nyctea scandiaca.

In the Arctic regions of North America and in Greenland it is quite abundant, and has been observed as far to the north as Arctic voyagers have yet reached. Professor Reinhardt states that it is much more numerous in the northern than in the southern part of Greenland. Sir John Richardson, who, during seven years' residence in the Arctic regions, enjoyed unusual opportunities for studying the habits of this Owl, says that it hunts its prey in the daytime. It is generally found on the Barren Grounds, but is always so wary as to be approached with difficulty. In the wooded districts it is less cautious.

Mr. Downes states that this Owl is very abundant in Nova Scotia in winter, and that it is known to breed in the neighboring province of Newfoundland. In some years it appears to traverse the country in large flocks. In the winter of 1861-62, he adds, these birds made their appearance in Canada in large numbers.

Mr. Boardman states that they are present in winter in the vicinity of Calais, but that they are not common. A pair was noticed in the spring of 1862 as late as the last of May, and, in Mr. Boardman's opinion, were breeding in that neighborhood. In the western part of Maine Mr. Verrill found it also rather rare, and met with it only in winter. He states that it differs greatly in disposition from the Great Horned Owl, being naturally very gentle, and becoming very readily quite tame in confinement, differing very much in this respect from most large *Raptores*.

It makes its appearance in Massachusetts about the middle

or last of November, and in some seasons is quite common, though never present in very large numbers. It is bold, but rather wary; coming into thick groves of trees in close proximity to cities, which indeed it frequently enters, but keeping a sharp lookout, and never suffering a near approach. It hunts by daylight, and appears to distinguish objects without difficulty. Its flight is noiseless, graceful, easy, and at times quite rapid. In some seasons it appears to wander over the whole of the United States east of the Rocky Mountains, Dr. Heermann having obtained a specimen of it near San Antonio, Texas, in the winter of 1857.

It is more abundant, in winter, near the coast, than in the interior, and in the latter keeps in the neighborhood of rivers and streams, watching by the open places for opportunities to catch fish. Mr. Audubon describes it as very expert and cunning in fishing, crouching on the edges of air-holes in the ice, and instantly seizing any fish that may come to the surface. It also feeds on hares, squirrels, rats, and other small animals. It watches the traps set for animals, especially muskrats, and devours them when caught. In the stomach of one Mr. Audubon found the whole of a large house-rat. Its own flesh, Mr. Audubon affirms, is fine and delicate, and furnishes very good eating. It is described as a very silent bird, and Mr. Audubon has never known it to utter a note or to make any sound.

Richardson states that a few remain in the Arctic regions even in midwinter, but usually in the more sheltered districts, whither it has followed the Ptarmigan, on which it feeds. When seen

on the Barren Grounds, it was generally squatting on the earth, and, if disturbed, alighted again after a short flight. In the more wooded districts it is said to be bolder, and is even known to watch the Grouse-shooters, and to share in their spoils, skimming from its perch on a high tree, and carrying off the bird before the sportsman can get near it.

Mr. MacFarlane writes from Fort Anderson that he did not find this species abundant in that quarter, and that its eggs were unknown to him. Mr. B. R. Ross speaks of this Owl as widely distributed, but not common. He found it a winter resident, and has repeatedly seen it at that season near Fort Resolution, and it has been shot in February at Fort Norman. It is very destructive to the snares set by the Indians, eating the hares and breaking the snares, in which they are sometimes caught. The Indians are said to attract these birds near enough to be shot at, by tying a mouse or a piece of hare's skin to a line, and letting it drag behind them.

Mr. Donald Gunn writes that the Snowy Owl is merely a visitor in the districts to the west of Lake Winnipeg, but is a constant inhabitant of the country surrounding Hudson Bay. There they hatch their young, from three to five in number, making their nests in the forks of some tall poplar-tree. They lay their eggs very early in the spring, and have hatched their young before other birds begin to nest. This account of their breeding differs from all other statements I have seen, and, if correct, is probably exceptional.

Although a bird of great vigilance, seldom permitting the

hunter to get within range of shot, and equally careful in keeping at a distance from its foe in its flight, it is, Mr. Gunn states, readily deceived and decoyed within easy range by tying a bundle of dark rags to a piece of stout twine, and letting this drag from the end of the hunter's snow-shoe. The hungry Owl pounces upon the bait, and the hunter turns and shoots it. These birds are sometimes quite fat, and are much prized for food by the Indians. At times they migrate from the more northern regions to the more inland districts. An instance of this took place in the winter of 1855-56. These birds made their appearance about the Red River Settlement in October, and before the latter end of December became very numerous, especially on the plains, where they were to be seen flying at any time of the day. In March all left that vicinity and disappeared. A few pass the summer near Lake Winnipeg, as occasional birds are seen there in the spring and fall. These migrations are supposed to be caused by unusual snow-falls and the scarcity of the animals on which they feed.

Mr. Dall found them rather rare in the valley of the Lower Yukon, and he has noticed them occasionally flying over the ice in the winter season.

Mr. Hutchins, in his manuscript observations on the birds of Hudson Bay Territory, speaking of this Owl as the *Wapacuthu*, states that it makes its nest in the moss on the dry ground, and lays from five to ten eggs in May. Professor Alfred Newton (Proc. Zoöl. Soc. 1861, p. 395) thinks there can be no doubt he refers to this Owl. Richardson states, as the result of his own

inquiries, that it breeds on the ground, which the observations of Mr. Hearne confirm. Professor Lilljeborg (*Naumannia*, 1854, p. 78) found, June 3, 1843, on the Dovrefjeld, a nest of this species which contained seven eggs. It was placed on a little shelf, on the top of a bare mountain, far from the forest, and easy of access. Professor Nilsson was informed, on good authority, that in East Fiarmark the Snowy Owl is said by the Lapps to lay from eight to ten eggs in a little depression of the bare ground on the high mountains. Mr. John Wolley received similar information, and was told that the old birds sometimes attack persons that approach their nests. The 16th to the 24th of May is said to be the time when they usually breed. I received in 1860 an egg of this Owl from Herr Möschler. It had been taken near Okkak, a missionary station of the Moravians, in Labrador, and collected by the Esquimaux. The accounts given by these collectors confirm the statement that this bird always breeds on the ground in open places, and frequently lays quite a large number of eggs. This specimen measures 2.50 inches in length and 1.88 in breadth. It is oblong-oval in shape, equally rounded at either end, and of a dull soiled white. The egg is much discolored, apparently by its contact with the ground.

Mr. H. S. Hawkins (*Ibis*, 1870, p. 298) gives an account of the nest and eggs of this species, derived from a correspondent at one of the Moravian missionary stations on the coast of Labrador. The nest is said to consist of only a few feathers, and to be placed generally on a ledge of rocks where there is a slight hollow,

sufficient to prevent the eggs from rolling out, but sometimes on the ground. The usual number of eggs is eight; these are not all laid and brooded at one time, but the first two are often hatched by the time the last is laid, so that you may find in one nest young birds, fresh eggs, and others more or less incubated.

Herr von Heuglin, in his Notes on the birds of Novaja Zemlia (Ibis, 1872, p. 61), mentions meeting with this Owl in Seal's Bay, on Matthew's Strait, in the Sea of Kara, where he found three nests with two young birds covered with down. The nest was formed of a shallow depression in the turf, without any lining. The food of the Snowy Owl, in Novaja Zemlia, during the summer time, consisted exclusively of a species of *Myodes*, which were very numerous. The down of the young is plain brownish-gray. They were easily tamed, and their comical gestures and vivacity are said to have been very amusing.

Captain C. F. Hall, the celebrated Arctic voyager, during one of his expeditions found a nest and four eggs of this species on the bare ground. These were packed up in an old moccasin, and sent, without emptying, to the Smithsonian Institution, where, after an interval of several months, they were successfully emptied, and are now among the choice treasures of the national museum.

Genus SURNIA, Duméril

Surnia, Duméril, Zoöl. Anal. 1806, 34. (Type, *Strix ulula*, Linn.)

Gen. Char. Size medium; form elongated, and general aspect hawk-like. No ear-tufts. Four outer quills with their inner webs sinuated, the third longest; tail nearly as long as the wing, graduated. Ear-conch small, simple, oval. Bill strong, yellow; eyes small, the iris yellow. Tarsi and toes thickly covered with soft dense feathers; tarsus shorter than the middle toe. Plumage much more compact, and less downy, and remiges and rectrices stiffer and straighter than in other Owls.

The single species of this genus belongs exclusively to the cold temperate and arctic zones of the Northern Hemisphere, and is circumpolar. Though somewhat hawk-like in its appearance, it is nevertheless a true Owl, and possesses no affinities of structure with the Hawks, any more than other species of *Strigidae*.

Species and Races

S. ulula. Above dark vandyke-brown, the head above dotted with white, and the scapulars spotted with the same. Beneath transversely barred with vandyke-brown and white, the bars regular, continuous, and sharply defined. Head and neck with

two lateral, and one posterior medial, stripes of brownish-black, the space between them with white prevailing. Bill and iris yellow. Wing, about 9.00; tail, 6.80–7.00.

White spotting prevailing. *Hab.* Palæarctic Realm ... var. *ulula*.³¹

Brown spotting prevailing. *Hab.* Nearctic Realm ... var. *hudsonia*.

Surnia ulula, var. hudsonia (Gmelin)

AMERICAN HAWK OWL

Strix freti hudsonis, Briss. Orn. I, 520, 1760. *Strix hudsonia*, Gmel. Syst. Nat. p. 295, 1789.—Wils. Am. Orn. pl. 1, f. 6, 1808.—Shaw, Zoöl. VII, 274, 1809.—Vieill. Ois. Am. Sept. I, 50. *Surnia hudsonia*, James. (Wils.) Am. Orn. I, 90, 1831. *Surnia ulula*, var. *hudsonica*, (Ridgway) Coues, Key, 1872, 205. *Strix canadensis*, Briss. Orn. I, 518, pl. xxxvii, f. 2, 1789.—Shaw, Zoöl. VII, 273, 1809. *Strix funerea* (not of Linnæus!), Rich. & Swains. F. B. A. II, 92, 1831.—Aud. Birds Am. pl. ccclxxxviii, 1831; Orn. Biog. IV. 550.—Bonap. Ann. Lyc. N. York, II, 35.—Brewer (Wils.), Am. Orn. p. 686.—Thomps. Hist. Vermont, p. 64.—Peab.

³¹ *Surnia ulula*, var. *ulula*. *Strix ulula*, Linn. S. N. I, 1766, 133. *Surnia ulula*, Bonap. Cat. 1838, 22.

Birds Mass. III, 83. *Sturnia ulula* (not *ulula* of Linn.!), Cass. Birds Calif. & Tex. p. 191, 1854.—Birds N. Am. 1858, 64.—Gray, Hand List, I, 39, 1869.—Blackist. Ibis, III, 320.—Lord, Pr. R. A. I. IV, iii (Brit. Columb.).—Kaup, Tr. Zoöl. Soc. IV, 1859, 214.—Dall & Bannister, Tr. Chicago Acad. I, ii, 274.—Maynard, Birds Eastern Mass., 1870, 133.

Sp. Char. *Adult*. Above rich dark vandyke-brown, darker anteriorly, less intense and more grayish on tail. A narrow streak of brownish-black originating over the middle of eye, and extending backward above the upper edge of the ear-coverts, where it forms an elbow passing downward in a broad stripe over the ends of the ear-coverts; confluent with this, at about the middle of the vertical stripe, is another of similar tint, which passes more broadly down the side of the nape; between the last stripes (those of opposite sides) is another or medial one of less pure black, extending from the occiput down the nape. Every feather of the forehead, crown, and occiput with a central ovate dot of white; those anterior more circular, on the occiput less numerous and more linear. Between the lateral and posterior nuchal stripes the white prevails, the brown forming irregular terminal and transverse or medial spots; these grow more linear toward the back. Interscapulars plain; posterior scapulars variegated with partially concealed large transverse spots of white, the lower feathers with nearly the whole outer webs white, their confluence causing a conspicuous elongated patch above the wing. Rump with sparse, irregular, but generally

transverse, spots of white; upper tail-coverts with broader, more regular bars of the same, these about equal to the brown in width. Lower feathers of the middle and secondary wing-coverts each with an ovoid spot of white on the outer web; secondaries crossed by about three transverse series of longitudinally ovoid white spots (situated on the edge of the feather), and very narrowly tipped with the same; primary coverts with one or two less continuous transverse series of spots, these found only on the outer feathers; primaries with about seven transverse series of white spots, these obsolete except on the five outer feathers, on which those anterior to the emargination are most conspicuous; all the primaries are very narrowly bordered with white at the ends. Tail with seven or eight very narrow bands of white, those on the middle feathers purely so, becoming obsolete exteriorly; the last is terminal. Eyebrows, lores, and face grayish-white, the grayish appearance caused by the blackish shafts of the feathers; that of the face continues (contracting considerably) across the lower part of the throat, separating a large space of dark brown, which covers nearly the whole throat, from an indistinct collar of the same extending across the jugulum,—this collar uniting the lower ends of the auricular and cervical dusky bands, the space between which is nearly clear white. Ground-color of the lower parts white, but everywhere with numerous very regular transverse bars of deep brown, of a tint more reddish than the back, the brown bars rather more than half as wide as the white ones; across the upper part of the breast (beneath the

dark gular collar) the white invades very much and reduces the brown, forming a broad lighter belt across the jugulum; below this the brown bars increase in width, their aggregation tending somewhat to a suffusion, giving the white jugular belt better definition. On the legs and toes the bars are narrower, more distant, and less regular.

The whole lining of the wing is barred just like the sides. The dark brown prevails on the under surface of the primaries, etc.; the former having transverse, irregular, elliptical spots of white, these touching neither the shaft nor the edge: on the longest quill are seven of these spots; on all they are anterior to the emargination.

♂ (49,808, Nulato, Alaska, April 21, 1867; W. H. Dall). Wing-formula, 3, 4-2-5-6-1. Wing, 9.00; tail, 7.00; culmen, .70; tarsus (of another specimen; wanting in the present), .90; middle toe, .82.

♀ (49,807, Nulato, April 20; W. H. Dall). Wing-formula, 3, 4-2-5-6-7=1. Wing, 9.00; tail, 6.80; culmen, .70; middle toe, .80.

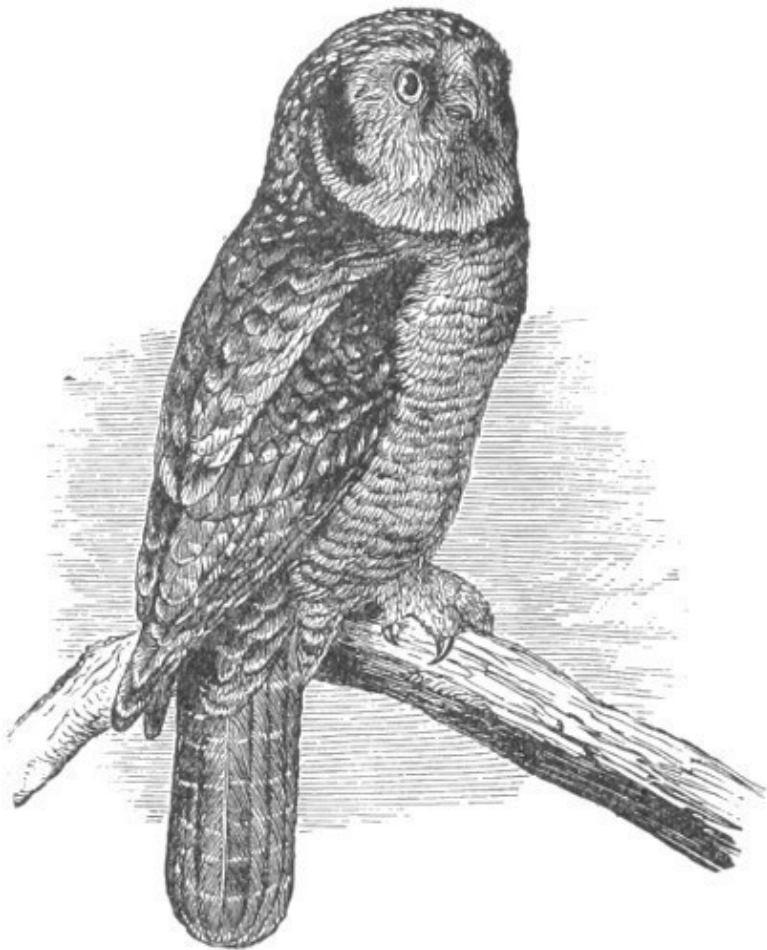
Hab. Arctic America, south in winter into northern United States; Wisconsin (Dr. Hoy); Massachusetts (Dr. Brewer; Maynard); Dakota and Montana (Mus. S. I.).

The Hawk Owl of North America is to be distinguished from that of Europe and Siberia by the same characters which distinguish the American Sparrow Owl from the European, namely, much darker shade of the brown and its greater prevalence. Three perfect specimens of the Old World bird

(a pair from Lapland, and a specimen from Kamtschatka, Petropawloosk, W. H. Dall) agree in prevalence of the white over the head above, the confluence of the spots on the scapulars forming a larger, more conspicuous patch, and very broad and almost immaculate jugular belt; the brown bars beneath are very much narrower than in the American bird, and the tint is not different from that of the back. The legs and toes are scarcely variegated. While acknowledging the identity of the two representative forms, the differences are such as to entitle them to separation as races.

Habits. The American form of the Hawk Owl inhabits the northern portions of both continents, and is common in the Arctic portions. On the Atlantic coast of this continent it has been found as far south as Philadelphia and the State of New Jersey, but its presence south of latitude 45° is probably only occasional and rather rare. The European form, according to Mr. Dresser, has not been known to exist in the British Islands, but several instances are quoted of the occurrence of the American form in Great Britain. One was taken off the coast of Cornwall in March, 1830; another was shot near Yatton, in Somersetshire, on a sunny afternoon in August, 1847; a third had previously been taken at Maryhill, near Glasgow, in December, 1863. On the Pacific coast it has not been taken farther south than Alaska, though it is quite probable it may yet be found to be an occasional visitant in Washington Territory and Oregon, and even the northern portions of California. It remains all the winter in high northern

latitudes, and the instances of its having been taken even in Massachusetts, so far as is now known, are not many. Wilson only met with two specimens. Audubon and Nuttall never met with one of these birds alive.



Surnia ulula.

Mr. Downes states that the Hawk Owl is very abundant in Nova Scotia in the winter time in some years, but may not be seen again for four or five seasons. It is common in Newfoundland, where it breeds in the Caribou districts. Mr. Downes often kept living specimens in confinement, which had been taken on board the Cunard steamers off the coast.

Mr. Boardman gives this species as resident, though rare, in the neighborhood of Calais, being occasionally found there in the breeding-season. In Oxford County, Maine, Professor A. E. Verrill says it is a common autumnal and winter visitant, and that it is quite abundant from the first of November to the middle of March, but not found there in the summer. Mr. Allen has never met with it in Western Massachusetts. Near Boston, in some seasons, it is not uncommon, though never occurring with any frequency, and only singly. It is found throughout the State, and is probably more common late in November than at any other time; several having been taken in Westfield, and also in Berkshire County, among the Green Mountains. I am not aware that any have been taken farther south than Philadelphia, near which city Mr. Edward Harris obtained one specimen, while another was shot at Haddington in 1866. Mr. McIlwraith calls it a rare winter visitant near Hamilton, Canada.

Richardson states that it is a common species throughout the fur countries from Hudson Bay to the Pacific, where it is killed by the hunters more frequently than any other, which may be attributed to its boldness and to its diurnal habits. During the

summer season it feeds principally upon mice and insects, but in the regions in which it is found in winter, where the snow is very deep, and where this food is not procurable, it must depend on the Ptarmigan, and, indeed, is found a constant attendant upon the flocks of these birds in their spring migrations. When the hunters are shooting Grouse, it is said to be occasionally attracted by the report of the gun, and is often bold enough, when a bird has been killed, to pounce down upon it, although it is unable, from its inferior size, to carry it off. It is also said to occasionally hover round the fires made by the Indians at night.

To this account of its habits Richardson adds that it builds its nest on a tree, of sticks, grass, and feathers, and lays two white eggs. In regard to the number of eggs, he is now known to be inaccurate. Mr. MacFarlane met with this bird in considerable numbers in the region of Anderson River, where he found several nests, and all of which he made any record were built in pine-trees at considerable height from the ground. One nest is said to have been on the top of a pine about twenty feet in height, and was composed of small sticks and twigs, lined with moss. Both parents were obtained. This nest contained two young birds—one of which was about ten days old, the other about three weeks—and an addled egg. This nest was found on the 20th of June, showing that the bird began to incubate early in May.

Another nest, taken on the 28th of April, was found to contain six eggs. It was built in the top crotch of a tall pine, was composed of dry sticks, and lined with hay and a few feathers. A third nest

also contained six eggs, and was lined with green mosses and deer's hair. One nest contained as many as seven eggs, and all but one had as many as six. Mr. MacFarlane speaks of it as a winter resident.

Mr. B. R. Ross states that he found this bird throughout the Great Slave Lake district, but not plentiful. It winters in even the northernmost parts of the wooded country. It is said to build its nest not only on trees, but also on cliffs, and to lay as early as the last of March or the first of April. He states that the eggs are usually four in number, and describes them as of a dead white, of an oblong-oval shape, and as measuring 1.39 inches by 1.21. He received three eggs with the parent bird, taken at Lapierre's House, and another parent, with nest and four eggs, from Salt River.

Mr. Dall found this the most common species of Owl about Nulato. Many of both sexes were obtained, and on the 16th of April he took from the ovary of a female an egg ready for laying. On the 5th of May Mr. Dall obtained six eggs which were laid on the top of an old birch stump, and fifteen feet from the ground. There was no nest other than that the rotten wood was somewhat hollowed out, and the eggs laid directly upon it. As he was climbing to the nest, the male bird which had been sitting on the nest attacked Mr. Dall, and knocked off his cap. The female did not appear.

Mr. Donald Gunn states that these Owls hunt in the daytime, and feed chiefly upon mice; and Mr. Dall seldom found anything

but mice in their crops, and adds that it is very fond of flying, towards dusk, from the top of one tall spruce to another, apparently swinging or balancing itself, calling to its mate at intervals, while chasing or being chased by it.

Captain Drummond states, in "Contributions to Ornithology" (p. 37), that he noticed a bird of this species, on the wing, within a few yards of him, in the Bermudas.

Mr. Dresser, who had ample opportunities of observing the Hawk Owl in New Brunswick, where he found it by no means uncommon, describes it as a true day Owl. It was often seen by him hawking after prey in the strongest sunshine, or seated quietly blinking on the top of an old blasted tree, apparently undisturbed by the glare of the sun. In its general appearance, and particularly in its flight, it appeared to him to have considerable affinity to the Sparrow Hawk. In New Brunswick it affected the open plains or so-called blueberry barrens, where the open country is covered with low bushes and an occasional scathed tree. It would sit on one of these trees for hours in an upright hawk-like position, occasionally hunting over the ground, like the Kestrel of Europe, in search of small field-mice. It showed but little fear, and could be easily approached within gun-shot. When shot at and missed, it would take a short flight and return to its former perch. On one occasion Mr. Dresser, firing at one with a rifle, cut the branch close under the bird, which returned almost immediately to another branch, was a second time missed, and finally fell under a third shot.

Its note is said to be a shrill cry, similar to the call of the European Kestrel, and generally uttered on the wing. The stomach was generally found filled with small field-mice, and rarely contained any remains of small birds. They appeared to hunt after food chiefly early in the forenoon and in the evening. During the day they rested on some elevated perch. In the night they retired to rest like other diurnal *Raptores*.

An egg of this Owl, taken from the oviduct of its parent by Mr. B. R. Ross, April 16, at Fort Simpson, measures 1.50 inches in length by 1.20 in breadth. It is of oval shape, and of a dull-white color. Another egg measures 1.62 by 1.30 inches, is of a rounded oval, equally obtuse at either end, and of a yellowish-white color. It was taken by Mr. MacFarlane at Fort Anderson.

Genus GLAUCIDIUM, Boie

Glaucidium, Boie, Isis, 1826, 970. *Microptynx*, Kaup. (Type, *Strix passerina*, Linn.)

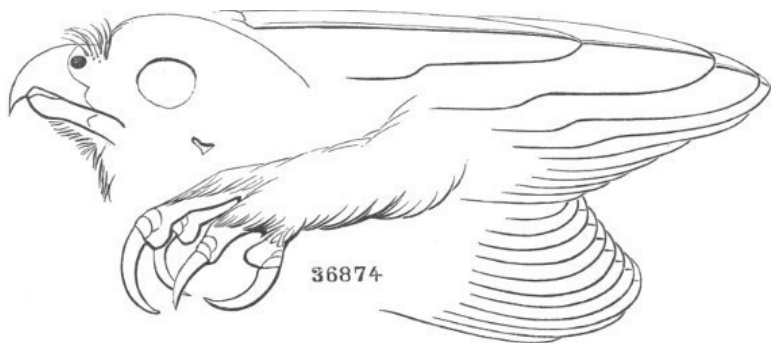
Microglaux, Kaup. (Type, *Strix havanense*, Kaup, = *G. siju* (D'Orb.) Cab.)

? *Taenioptynx*, Kaup. (Type, *Noctua brodiei*, Burt.)

Gen. Char. Size very small; head rather small; bill and feet very strong and robust; no ear-tufts; tail long, about three fourths as long as the wing, rounded. Nostrils circular, opening in the middle of the inflated cere-membrane (except in *G. siju*). Tarsus about equal to the middle toe, densely feathered; toes haired. Four outer quills with their inner webs emarginated; third to fourth longest. Ear-conch very small, simple, rounded. Bill yellowish (except in *G. phalaenoides*?); iris yellow.

The genus is most largely developed within the tropical regions, only one species (*G. passerinum*) belonging to the cold temperate zone, and this is found on both continents. They are the most robustly organized of all Owls, and, for their size, are very predatory, as in the next genus (*Micrathene*), though themselves hardly larger than a Sparrow, they frequently feed upon small birds, and, no doubt, often destroy the passerine species of nearly their own size. Like the most of the group to which this genus belongs, they are diurnal in their habits, and fly about during the brightest sunshine. They inhabit chiefly dense

forests, and for this reason, are less well known than the more easily accessible Owls.



36874

Glaucidium californicum.

The following synopsis includes only the North American and Mexican species of *Glaucidium*. In tropical America are several others very distinct from those here given.

Species and Races

Common Characters. Above brown, varying from nearly gray to bright ferruginous, in some species this color interrupted by a more or less distinct whitish nuchal collar, with an adjacent blackish spot (sometimes concealed) on each side of the neck. Tail with narrow bands. Beneath white, the sides striped with

brown or blackish. Throat and jugulum white, with a dusky collar between. Crown speckled or streaked with lighter; wings more or less spotted with the same.

A. Markings on the crown circular, or dot-like.

1. **G. passerinum.** Tail with six to eight narrow white bands. Upper parts varying from brownish-gray to chocolate-brown. Ground-color of the lower parts pure white.

Tail, and stripes on sides, not darker than the back; tail-bands six, and continuous; toes rather thickly feathered. *Hab.* Europe ... var. *passerinum*.³²

Tail, and stripes on sides, much darker than the back; tail-bands 7 (♂)—8 (♀), not continuous; toes only scantily haired. Wing, 3.50–4.00; tail, 2.50–2.80; culmen, .43–.48; tarsus, .60; middle toe, .55. *Hab.* Western Province of North America. Table-lands of Mexico ... var. *californicum*.

B. Markings on the crown longitudinal and linear.

2. **G. infuscatum.** Tail dark brown, crossed by six to seven non-continuous bands of white, narrower than the dark ones. Above varying from grayish-brown to reddish-umber and sepia. Beneath white, the stripes on the sides grayish-brown or dark brown, like the back.

³² *Glaucidium passerinum*, var. *passerinum*. *Strix passerina*, Linn. I, 133, 1766. *Glaucidium passerinum*, Boie, Isis, 1826, 976.—Sharpe & Dresser, Birds Europe, II, April, 1871. *Surnia passerina*, Keys. & Blas. Wirb. Europ. 32, 1840. *Microptynx passerina*, Kaup, Contr. Orn. 1852, 107. *Noctua passerina*, Schleg. Mus. Pays-Bas. Striges, p. 41, 1862. *Strix pusilla*, Daud. Tr. Orn. II, 205, 1800. *Strix pygmæa*, Bechst. Nat. Deutschl. IV, 978, t. xxiv, 1805. *Strix acadica*, Temm. Man. d'Orn. I, p. 96, 1820 (*nec* Gmel.).

Above dark sepia, or blackish-brown. Tail brownish-black or deep black. Wing, 3.70–3.90; tail, 2.50–2.90; culmen, .45; tarsus, .65–.80; middle toe, .65–.70. *Hab.* Eastern South America ... var. *infuscatum*.³³

Above grayish, or reddish-umber. Tail clear dark brown, or grayish-umber.

Wing, 3.60–3.90; tail, 2.35–2.75; culmen, .45–.50; tarsus, .65–.80; middle toe, .60–.70. *Hab.* Middle America, from the Rio Grande (probably in Texas) to Panama ... var. *gnoma*.³⁴

3. **G. ferrugineum.** Tail crossed by seven to nine continuous bands of dark brown and bright rufous, of nearly equal width. Above varying from grayish-brown to bright ferruginous; beneath varying from pure white to pale rufous, the stripes on the sides like the back. Wing, 3.70–4.15; tail, 2.20–2.90; culmen, .45–.50; tarsus, .70–.80; middle toe, .70–.75. *Hab.* Tropical America, from southern border of United States to Southern Brazil.

³³ *Glaucidium infuscatum*, var. *infuscatum*. *Strix infuscata*, Temm. Ind. Général, 1821. *Athene i.*, Bonap. Consp. 37, 1850 (excl. syn.). *Glaucidium i.*, Kaup, Cont. Orn. 1852, 103. ? *Strix eluta*, Illig. in Mus. Berl. Cab. Azar. No. 49. *Strix passerinoides*, Temm. Pl. Col. 344. *Surnia p.*, Bonap. Os. Cuv. Règ. An. I, 57. *Noctua p.*, Less. Man. & Tr. Orn.

³⁴ *Glaucidium infuscatum*, var. *gnoma*. *Glaucidium gnoma*, Wagl. Isis, 1832, 275.—Kaup, Monog. *Strigidae*, in Contr. to Orn. 1852, 103 (under *G. infuscatum*).—Strickl. Orn. Syn. I, 163, 1855 (under *G. infuscatum*). *Athene gnoma*, Gray, Gen. Birds, fol. sp. 35, 1844. *Hab.* Whole of Middle America, from Panama northward to the Rio Grande and Mazatlan. Probably yet to be found in Texas or New Mexico.

Glaucidium passerinum, var. californicum (Sclater)

THE CALIFORNIA PIGMY OWL

Glaucidium californicum, Sclater, Proc. Zool. Soc. Lond. 1857, p. 4. *Glaucidium passerinum*, var. *californicum* (Ridgway) Coues, Key, 1872, 206. *Strix passerinoides* (not of Temminck!), Aud. Orn. Biog. V, 271, 1831. *Glaucidium infuscatum* (not of Temm.), Cass. Birds of Cal. & Tex. p. 189, 1854.—Newb. P. R. R. Rept. VI, iv, 77, 1857. *Glaucidium gnoma* (not of Wagler!), Cass. Birds N. Am. 1858, 62.—Heerm. P. R. R. Rept. VII, 31, 1857.—Coop. & Suck. P. R. R. Rept. XII, ii, 158, 1860.—Coues, Prod. Orn. Ariz. p. 14, 1866.—Cab. Jour. 1862, 336.—Lord. Int. Obs. 1865, 409 (habits).—Gray, Hand List, I, 42, 1869.—Cab. Ueb. Berl. Mus. 1869, 207.

Sp. Char. *Adult* (♂, 12,054, Puget Sound, Washington Territory; Dr. C. B. Kennerly). Above, including the auriculars, umber-brown, with a faint reddish cast; this tinge most apparent in a sharply defined band across the throat. The continuity of the brown above is interrupted by a scarcely observable collar round the nape of concealed whitish; this is discernible only laterally, where there is also an inconspicuous black space. Whole head above, and neck behind, with numerous small circular spots of

reddish-white; back, scapulars, and wings more sparsely and more minutely marked with the same; the two or three lower feathers of the secondary coverts have each a terminal, somewhat oval, larger spot of pure white. Secondaries crossed by three (exposed) bands of pure white, and narrowly tipped with the same; the bands formed by semicircular spots on the outer webs. Primaries almost plain, but showing faintly defined obsolete bands,—the third, fourth, and fifth with two or three conspicuous white spots on outer webs, beyond their emargination; primary coverts perfectly plain. Tail considerably darker than the wings, and purer umber; crossed with seven narrow bands of pure white, the last of which is terminal and not well defined,—these bands are formed by transverse spots, not touching the shaft on either web. Lores, sides of the forehead, sides of the throat (beneath the cheeks and ear-coverts), and lower parts in general, pure white; the ante-orbital white continuing back over the eye to its middle, but not beyond it. Lateral portion of the neck and breast (confluent with the gular belt), and sides, umber, like the back, but more numerous, though more obsoletely, speckled, the spots rather larger and more longitudinal on the sides. Breast, abdomen, anal region, and lower tail-coverts with narrow longitudinal stripes of nearly pure black. Jugulum immaculate. Tarsi mottled on the outside with brown. Lining of the wing white; a transverse patch of blackish across the ends of the under primary coverts, formed by the terminal deltoid spot of each feather; a blackish stripe, formed of blended streaks (parallel

with the edge of the wing), running from the bend to the primary coverts. Under surface of primaries dusky, with transverse spots of white anterior to the emargination; these white spots on the longest quill are eight in number. Axillars plain white.

Wing, 3.60; tail, 2.60; culmen, .45; tarsus, .60; middle toe, .55. Wing-formula, 4, 3, 5-2, 6, 7, 8, 9, 10, 1.

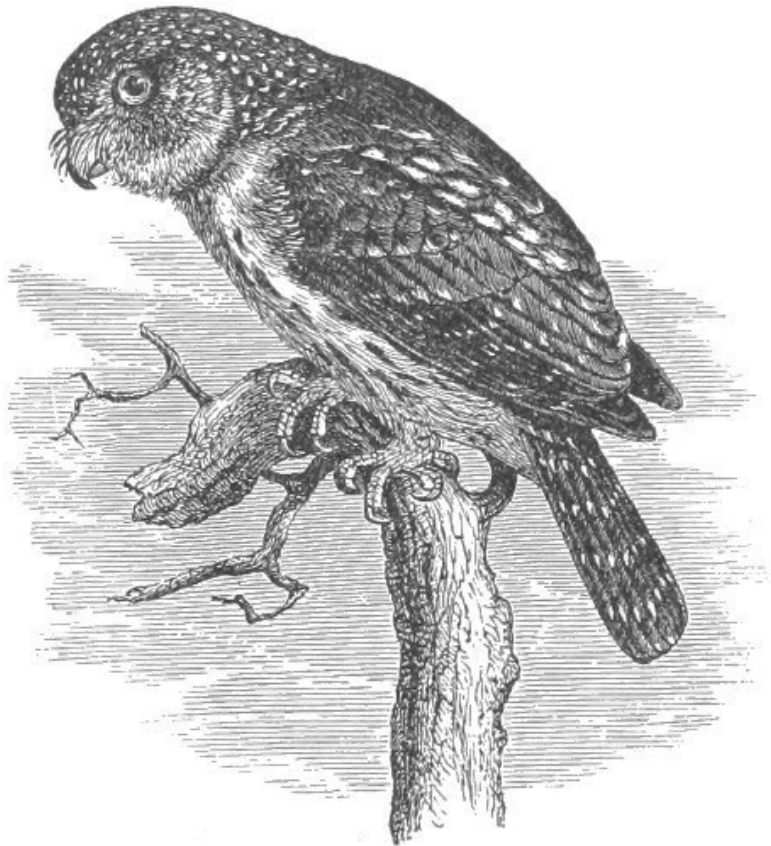
♀ (36,874, Fort Whipple, near Prescott, Arizona, October 11, 1864; Dr. Coues). In general appearance scarcely different from the male. Upper surface more ashy, the specks of whitish less numerous, being confined chiefly to the head; those on the scapulars, however, are large, though very sparse. The middle wing-coverts have each a conspicuous roundish white spot near the end of the outer web; the secondary coverts are similarly marked, forming a band across the wing. The primaries and tail are as in the male, except that the latter has eight, instead of seven, white bands. The brown of the gular band extends upward over the throat to the recurved feathers of the chin; the white dots in the brown of the sides are considerably larger and (though very irregular) more circular than in the male; the stripes on the abdomen, etc., are rather broader and less deeply black than in the male. Wing, 4.00; tail, 2.80; culmen, .48. (Wing-formula as in male.)

Hab. Pacific Province of North America, from Vancouver Island southward; Arizona (Fort Whipple); Colorado (El Paso Co., Aiken); Table-lands of Mexico (Coll., G. N. Lawrence). Perhaps whole of the Western Province, from the Rocky

Mountains to the Pacific.

One specimen in the collection (59,069) differs from those described in much darker colors. The original label is lost, but it was probably received from the northwest coast, as the darker, more reddish colors bear about the same relation to the paler gray tints of the southern birds that the dark northwest coast style of *Scops asio* (var. *kennicotti*) does to the true *asio*. The stripes beneath are nearly pure black, the general tint above being a reddish sepia-brown. Wing, 3.65; tail, 2.70.

The *Glaucidium californicum* requires comparison only with the *G. passerinum* of Europe, to which it is quite closely related, though easily distinguishable by the characters pointed out in the diagnoses; it is not at all like *gnoma*, nor indeed any other American species, with which it has been confounded by nearly all ornithologists, even by Cabanis, in his excellent paper above cited.



Glaucidium californicum.

I have seen only one Mexican specimen of this species, which is one in Mr. Lawrence's collection; the locality is not given, but it is probably from the higher regions of the interior. It differs

in no respect, except in size, from North American examples; it measures, wing, 3.40; tail, 2.60.

Habits. This species, one of the smallest of our North American Owls, was first obtained on the Columbia River by Dr. Townsend, near Fort Vancouver; and subsequently, Dr. Merideth Gairdner procured several others from the same locality, which were sent to the Edinburgh Museum. Dr. Townsend's specimen was said to have been taken on the wing at midday.

Dr. Cooper met with a single specimen in Washington Territory early in November, 1854. He observed it among a flock of Sparrows, that did not seem at all disturbed by its presence. At first he mistook it for one of these birds. Its stomach was found to contain only insects.

Dr. Suckley obtained two specimens at Puget Sound, where he found it moderately abundant. It seemed to be diurnal in its habits, gliding about in shady situations in pursuit of its prey. He saw one about midday in a shady alder-swamp near Nisqually. It flitted noiselessly past him several times, alighting near by, on a low branch, as if to examine the intruder.

Near a small lake in the neighborhood of Fort Steilacoom, Dr. Suckley frequently heard the voice of a diminutive Owl, which he supposed to come from one of these birds, as this is the only small species of the family he ever saw in that neighborhood. The notes were subdued and clear, like the soft, low notes of a flute.

Dr. Newberry procured specimens of the Pigmy Owl on the Cascade Mountains, in Oregon, where, however, it was

not common. It occurs also in California, as he saw several individuals in San Francisco that had been obtained in that State, but he did not meet with any in the Sacramento Valley. It was apparently confined to wooded districts, which is probably the reason why it is not more frequent in the open country of California. He adds that it flies about with great freedom and activity by day, pursuing the small birds upon which it subsists, apparently as little incommoded by the light as they are. It is, however, doubtful whether it subsists, to any large extent, on small birds. So far as observed it appears to feed almost exclusively on insects, although the Owl taken by Townsend is said to have had the entire body of a *Regulus* in its stomach.

Dr. Cooper speaks of this Owl as not uncommon in the middle part of California, though he did not meet with it in the southern part of the State. It is probable that it is occasional in Southern California, as it has been found in Mexico, where however, it is undoubtedly rare, as Mr. Ridgway informs me that only a single specimen of this Owl, among a hundred others from Mexico, has ever been seen by him.

Dr. Heermann met with this beautiful little species among the mountainous districts of the mining regions of California, where it was by no means rare. It was, however, seldom captured by him, and he regarded its flying by night as the reason; but this view is not corroborated by the observations of others. In 1852 he procured three specimens on the borders of the Calaveras River, others were taken on the Cosumnes River, and Mr. J. G.

Bell, of New York, met with it on the American River, thus demonstrating its wide and general distribution throughout the State.

Mr. John K. Lord met with a pair on Vancouver Island. He characterizes the bird as of shy and solitary habits, always hiding among the thick foliage of the oak or pine, except when feeding. Early one spring, while collecting specimens of the smaller migrant birds, he was favored with unusual opportunities for watching their habits. The pair had made their home in the hollow of an oak-tree that stood in an open patch of gravelly ground near a small lake. The remains of an Indian lodge which was close to the place enabled Mr. Lord to watch closely the habits of this interesting pair. In the first morning twilight the Owls were up and in motion, hungry after a whole night's fasting. Their flight was short, quick, and jerking, similar to that of the Sparrow Hawk, but wholly unlike the muffled, noiseless flap of the Night Owls. Their food was found to be entirely insectivorous, chiefly grasshoppers and field-cricket, with an occasional beetle or butterfly. When in pursuit of food, they perch on a small branch near the ground, and sit bolt upright in an indolent drowsy manner until their quick eye detects an insect, when they suddenly pounce upon it, hold it down with their small but powerful claws, and with their sharp beaks tear it to pieces. Only the soft abdominal parts are thus eaten. As soon as their hunger is satiated they return to the tree, cuddling close together, and doze away the greater part of the day. In

the evening twilight the Owls again come out of their hole and take erratic flights around their abode, chasing each other up and down the plain, and performing all kinds of inexplicable manœuvres. Occasionally they settle on the ground, but never long at a time.

Mr. Lord never observed them to capture an insect while on the wing, and a very small quantity of food seemed to supply their wants. As soon as it became dark they retired to their nest, and there apparently passed the night.

To this account Mr. Lord adds, that early in May two small eggs were laid, white in color, round and very rough on their surface, a large knot-hole in the branch of the tree having been selected as the nesting-place. Nothing of any kind was used as a lining, the eggs being deposited on the bare wood. The length of time occupied in incubation Mr. Lord was not able to ascertain in consequence of the shortness of his stay.

Glaucidium ferrugineum, Kaup

THE RED-TAILED OWL

Strix ferruginea, Max. Reis. Bras. I, 105, 1820; Trav. Bras. p. 88; Beitr. III, 234.—Temm. Pl. Col. 199.—Lath. Gen. Hist. I, 373. *Noctua f.*, Steph. Zoöl. XIII, pt. ii, p. 69.—Less. Man. Orn. I, 111; Tr. Orn. 104.—Cuv. Règ.

An. (ed. 2), I, 346.—Tschudi, Av. Consp. Wieg. Archiv. 1844, 267; Faun. Per. pp. 19, 117. *Surnia f.*, Bonap. Oss. Cuv. Règ. An. p. 56; Isis, 1833, 1053. *Athene f.*, Gray, Gen. B. fol. sp. 17; List B. Brit. Mus. p. 92.—Bonap. Consp. Av. p. 38.—Strickl. Orn. Syn. I, 162, 1855. *Glaucidium f.*, Kaup, Mon. Strig. Cont. Orn. 1852, 104.—Burm. Thier. Bras. II, 141, 146.—Caban. Ueb. Berl. Mus. 1869, 206.—Coues, Am. Nat. VI, 370 (Arizona).—Ib. Key, 1872, 206. ? *Athene nana* (King), Gray, Gen. 1844, pl. xii (normal plumage).

a. Normal plumage

Sp. Char. *Adult* (♂, 23,792, Mazatlan, Mexico; J. Xantus). Upper surface umber-brown, more ashy anteriorly, posteriorly more brownish. Head above with a few narrow longitudinal lines of yellowish-white, anteriorly and laterally; a quite distinct collar of whitish spots across the nape, the black lateral spaces rather obsolete; scapulars with a few conspicuous oval spots of pure white; two lower feathers of secondary coverts each with a similar spot on outer web. Secondaries darker brown, crossed with five bands of dull rufous, the last not terminal; outer webs of primaries with semicircular pale spots along the margin, these nearly white beyond the sinuation of the feathers, anteriorly brownish. Tail bright rufous, crossed with about seven distinct bands of dark brown, these hardly equalling the rufous in width,

which is also terminal. Longitudinal stripes of the sides of the same soft grayish-brown tint as the head; tarsi sparsely speckled with the same on outer side. Wing-formula, 4, 5, 3-6-7, 2, 8; first shortest. Wing, 3.70; tail, 2.20; culmen, .45; tarsus, .70; middle toe, .70.

b. Rufescent plumage

Adult. Upper surface continuously deep lateritious-rufous, all the lighter markings almost obliterated. Bars on the tail scarcely traceable. Black cervical transverse space conspicuous. Sides of the breast and stripes of the sides duller rufous than the tint above; white of ground-color with yellowish tinge; legs pale rufous, deepest on outer side, immaculate. Gular collar blackish.

♂ (43,055, La Palma, Costa Rica, January 27, 1866; José Zeledon). Wing-formula, 4=5, 3-6-2; first shortest. Wing, 3.80; tail, 2.40.

♀ (33,216, San José, Costa Rica; J. Carmiol). Wing-formula, 4, 3=5-6, 2; first shortest. Wing, 4.15; tail, 2.90; tarsus, .80; middle toe, .75.

Hab. Whole of eastern South America, and Middle America (both coasts) north into southern border of United States (Arizona, Bendire; probably entire southern border).

The numerous specimens examined come from the Rio Grande of Texas (across the whole breadth of Middle America) to Paraguay, everywhere the same species, those from the

extremes of its range showing scarcely any difference.

A specimen of the ferruginous plumage, in the collection of the Philadelphia Academy, is remarkable for the great intensity and uniformity of the rufous; the entire plumage, in fact, being of this color, a fine light tint of which replaces the white below. There is no trace of bars on either wings or tail.

In the very large series before me I find in individuals every possible shade between the two extremes described. Over fifty specimens have come under my notice.

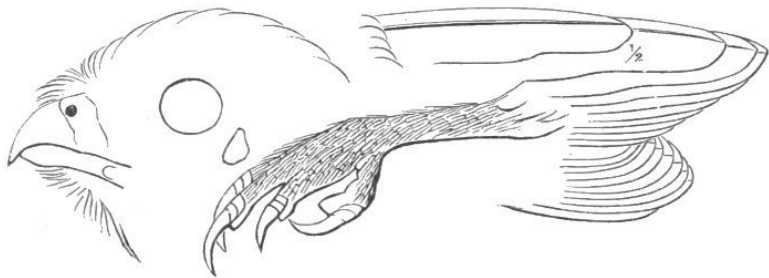
Habits. This little Owl claims a place in our fauna on the strength of several specimens taken in Southern Arizona by Captain Bendire. It is a southern bird, found throughout the whole of Mexico, and ranges thence though the whole of South America, except the Pacific coast, as far south as Southern Brazil. In Mexico it is as abundant on the Pacific as on the eastern coast, and is by far the most common Owl of its genus found in that country.

Mr. E. C. Taylor states that he found this bird pretty common in Trinidad, where it is said to fly about in the daytime, apparently indifferent to the blazing tropical sun, and is much smaller than any other species of Owl he met with.

Genus MICRATHENE, Coues

Micrathene, Coues, P. A. N. S. Philad. 1866, 57. (Type, *Athene whitneyi*, Cooper.)

Gen. Char. Size very small (the smallest Owl known); head small, and without ear-tufts. Bill and feet weak. Tail short, less than half the wing, even. Nostril small, circular, opening in the middle of the much inflated ceral membrane. Tarsus a little longer than the middle toe, naked, scantily haired, as are also the toes. Four outer quills with their inner webs sinuated; fourth longest. Ear-conch very small, simple, roundish. Bill pale greenish; iris yellow.



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Micrathene whitneyi.

This well-marked genus is represented by a single species,

found in the Colorado region of the United States, and in Western Mexico. It is the smallest of all known Owls, and has the general aspect of a *Glaucidium*. From the fact that feathers of birds were found in its stomach, we may reasonably infer that it is of exceedingly rapacious habits, like the species of that genus.

Species

M. whitneyi. Above grayish olive-brown, sprinkled with small, rather obscure, spots of pale rusty, and interrupted by a whitish nuchal collar; outer webs of the lower series of scapulars pure white. Wings spotted with white and pale fawn-color; tail grayish-brown, crossed by five to six narrow interrupted bands of pale fawn-color. Eyebrows and lores pure white; a cravat of the same on the chin. Beneath white, marked with large, rather longitudinal, ragged blotches of pale rusty, mottled with dusky. Bill pale greenish; iris yellow. Length, 5.50–6.25; extent of wings, 14.25–15.25 (measurements of freshly killed specimens). Wing, 4.00–4.40; tail, 1.90–2.30. *Hab.* Fort Mohave, California (April), and Socorro Island, west coast of Mexico.

Micrathene whitneyi, Coues

WHITNEY'S OWL

Athene whitneyi, Cooper, Proc. Cal. Acad. Sc. 1861, p. 118. *Micrathene whitneyi*, Coues, Pr. Ac. Nat. Sc. Philad. 1866, 15.—Elliot, Illust. Am. B. I, xxix.—Grayson (Lawrence), Ann. N. Y. Lyc.—Coues, Key, 1872, 207.

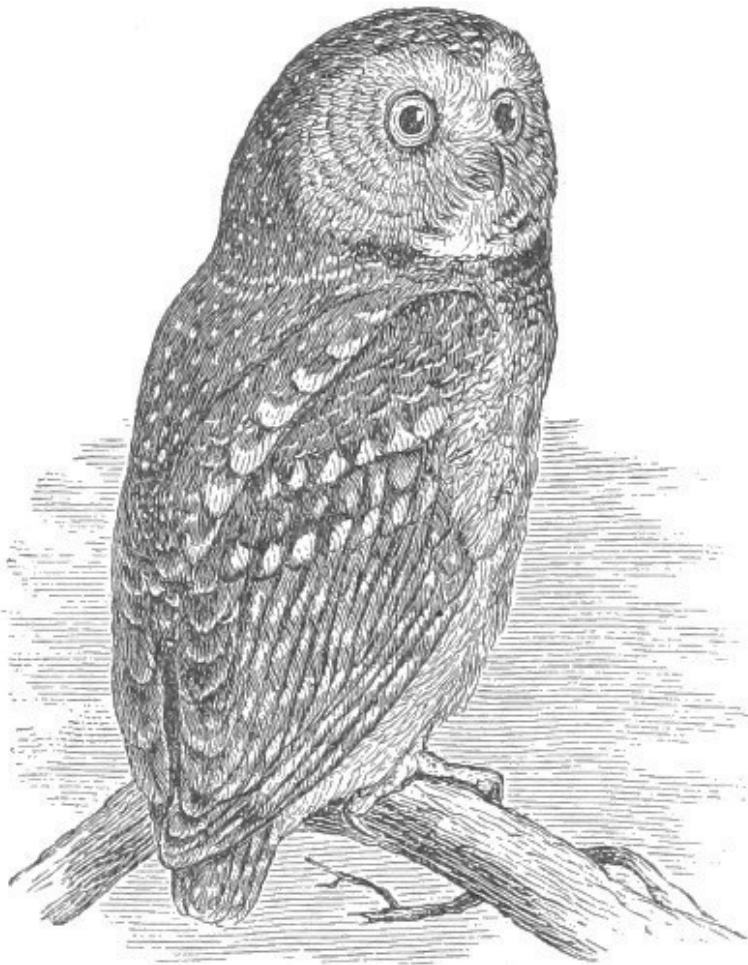
Sp. Char. *Adult* (♂, 208, J. G. Cooper, Fort Mohave, California, April 26, 1861). Above umber-brown (less pure and uniform than in *Glaucidium*), each feather with an irregular, transversely elliptical spot of pale rufous, these largest on the forehead, bordering the white eyebrows; the feathers everywhere minutely mottled transversely with darker, this being most noticeable where bordering the yellowish spots. Scapulars with their outer webs almost wholly white. Wings with the ground-color a little darker than the back; lesser coverts with numerous spots of light rufous, there being two on each feather, one concealed; middle and secondary coverts with a very large oval spot of pure white terminating the outer webs, the white spot on the latter preceded by a pale rufous one. Secondaries with five (exposed) bands of pale ochraceous (the last terminal), these passing into white on the edge; primary coverts with three

large ochraceous spots; primaries with about six (including the terminal) conspicuous spots of the same, those anterior to the emargination, on the third, fourth, and fifth quills, almost white. Tail like the wings, but more uniform; crossed by six irregular narrow bands of pale ochraceous, the last, or terminal, of which is not well defined; these do not touch the shaft, and on the inner webs they are pure white. Lores and eyebrows, cheeks, lining of the wings, and ground-color of the lower parts, white; ear-coverts and sub-orbital space like the crown, but more rusty; lateral lower parts much washed with plumbeous, this especially prevalent on the flanks. Behind the sharply defined white of the cheeks is a black transverse wash. Throat, jugulum, breast, and abdomen, with each feather having a medial longitudinal ragged-edged blotch of pale rufous, these blotches most clearly defined on the abdomen, more confused anteriorly; anal region and tibiae almost immaculate; tibiae with numerous transverse narrow blackish bars, on a pale ochraceous ground. Lining of the wing faintly spotted at the bend, and on the primary coverts, the terminal half of which is plain dusky; under surface of primaries blackish, with obscure transverse paler spots,—those anterior to the emargination almost white; those beyond darker, the last being scarcely distinguishable; on the longest quill eight can be detected. Wing-formula, 4, 3=5–2, 6, 7, 8, 9–1. Length, “6.25”; extent, “15.25”; wing, 4.40; tail, 2.30; culmen, .35; tarsus, .80; middle toe, .60.

A male from Socorro Island (49,678, Colonel A. J. Grayson)

is less adult than the preceding. The upper plumage is more brownish and more mottled; the rufous spots, though deeper and larger, are less sharply defined; the spots on the primaries are all ochraceous; the bands on the tail are broader, though of the same number. Beneath the longitudinal blotches do not appear, but the rusty rufous covers nearly the whole surface, leaving the medial portion only white, and this not well defined; the rusty shows ragged minute transverse bars of blackish. The whitish collar round the nape is also better defined than in the type. Wing, 4.20; tail, 2.10. Wing-formula, 4, 3=5-6, 2-7, 8, 9, 10, 1. Length, 5.20; extent, 14.25.

Another specimen, 50,765, from the same locality, also apparently immature, is just like the preceding in plumage. It measures, wing, 4.00; tail, 1.90.



Micrathene whitneyi.

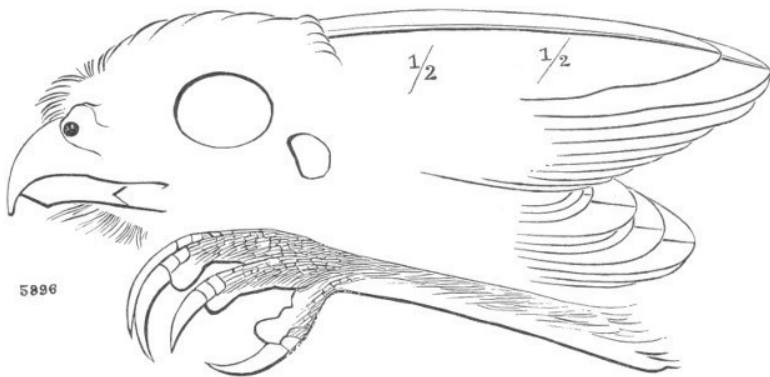
Habits. The type specimen of this diminutive species was shot at Fort Mohave, in the Colorado Valley, latitude 35°, April 26, 1861, and two others have since been taken on the Socorro Islands, off the western coast of Mexico, by Colonel Grayson. It is smaller even than the little California Pygmy Owl, and is therefore the smallest known to inhabit North America. It resembles that species in its colors, but is thought by Dr. Cooper to be more similar to the burrowing Owls in its generic characters. It was found in a dense thicket, on a very windy morning, and where it may have taken only a temporary refuge, after having been blown down from some of the caverns in the barren mountains surrounding the valley. In its stomach were found the remains of insects and the feathers of small birds. Several specimens of this Owl were taken in Arizona by Captain Bendire, one of which is now in the collection of the Boston Society of Natural History. Captain Bendire also found one of their nests, with two fully fledged young ones, in a hole of a mesquite stump.

Genus SPEOTYTO, Gloger

Speotyto, “Gloger, 1842.” (Type, *Strix cunicularia*, Mol.)

“*Pholeoptynx*, Kaup, 1848.” (Same type.)

Gen. Char. Size small; head small, and without ear-tufts. Bill moderately strong, pale yellowish. Tarsi more than twice as long as the middle toe, feathered in front, naked behind; toes scantily haired. Tail short, less than half the wing, nearly even, or very slightly rounded. Three outer quills with their inner webs emarginated; second to fourth longest. Ear-conch very small, simple, roundish. Diurnal and terrestrial.



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Speotyto hypogaea.

This genus is peculiar to America, where it is distributed over the whole of the southern and the western half of the northern continent, as well as in some of the West India Islands. There appears to be but one well-characterized species,³⁵ this one modified into representative races in the several geographical provinces over which it ranges. The species is terrestrial, inhabiting the abandoned burrows of Armadillos and Rodents. It is diurnal, possessing as much freedom of sight, hearing, and motion in the brightest sunlight, as any species of the *Falconidæ*.

Species and Races

S. cunicularia. Colors umber-brown and ochraceous-white, the former predominating above, the latter prevailing below. Upper parts spotted with whitish; lower parts transversely barred with brown on the breast and sides, and sometimes on the abdomen. A white gular patch, and jugular collar, with a brown band between them. Legs, crissum, anal and femoral regions, always immaculate.

A. Primaries with broad regular bars of ochraceous-white on both webs; primary coverts with large spots of the same.

Brown markings of the lower parts irregularly

³⁵ Gray, in his "Hand List," gives in addition *S. fusca*, Vieill., a West Indian ("Antilles") species, which proves to be not congeneric with *S. cunicularia*, and also *S. domingensis* (Gm.) Müll., which I cannot identify as one of the races of *S. cunicularia*.

transverse, and ragged. White spots on the upper parts nearly equal in extent to the brown.

Wing, 6.15–6.40; tail, 2.90–3.60; culmen, .58–.62; tarsus, 1.50–1.80; middle toe, .65. *Hab.* Peru ... var. *grallaria*.³⁶

Brown markings on the lower parts regularly transverse, and not ragged. White spots on the upper parts much less than the brown in extent.

Wing, 7.00–7.50; tail, 3.30–4.00; culmen, .70; tarsus, 1.70–1.85; middle toe, .85. Outer tail-feathers and inner webs of primaries with the white much greater in amount than the brown (sometimes continuous along outer webs of the latter). *Hab.* Southern South America (Chile, Buenos Ayres, Paraguay, etc.) ... var. *cunicularia*.³⁷

Wing, 6.40–7.00; tail, 3.00–3.30; culmen, .50–.60; tarsus, 1.50–1.70; middle toe, .80. Outer tail-feathers and inner webs of the primaries with the white less in extent than the brown (never continuous along outer webs of the primaries). *Hab.* Middle America, and Western Province of North America ... var. *hypogæa*.

B. Primaries without broad or regular bars of whitish on

³⁶ *Speotyto cunicularia*, var. *grallaria*? ? *Strix grallaria*, Spix, Av. Braz. I, 21, 1824. —? Tem. Pl. Col. 146. I am by no means satisfied that this form is the true *grallaria*, but it seems to come nearer to it than any other described. Three specimens (two from Peru, in the National Museum, and one, without label, in the Museum of the Boston Society of Natural History) have been examined, and agree in the characters diagnosed above.

³⁷ *Speotyto cunicularia*, var. *cunicularia*. *Strix cunicularia*, Molina, St. Chil. 1782, 343. Gmel. S. N. 292, sp. 28,—and of other authors referring to the South American bird.

either web; primary coverts plain brown.

Brown markings on the lower parts regularly transverse, and equal in extent to the white. White spots on the upper parts very small, reduced to mere specks on the dorsal region.

Wing, 6.40; tail, 3.40; culmen, .60; tarsus, 1.82; middle toe, .85. Outer tail-feathers and inner webs of the primaries with the light (ochraceous) bars only about one fourth as wide as the brown (disappearing on the inner quills). *Hab.* Guadeloupe ... var. *guadeloupensis*.³⁸

Spheotyto cunicularia, var. hypogæa, Bonap

BURROWING OWL

Strix hypogæa, Bonap. Am. Orn. I, 72, 1825. *Athene hypogæa*, Bonap. Consp. Av. p. 39, 1850.—Woodh. (Sitgr.) Expl. Zuñi and Colorado, p. 62, 1853.—Cass. Birds N. Am. 1858, 59.—Newb. P. R. R. Rept. VI, 77, 1857.—Coop. & Suck. P. R. R. Rept. XII, ii, 157, 1860.—Gray, Hand List, I, 52, 1869. *Speotyto cunicularia*, var. *hypogæa*, (Ridgway) Coues, Key, 1872, 207. *Strix cunicularia* (not of Molina!), Aud. B. Am. pl. ccccxiii, 1831; Orn. Biog. V, 264; Synop.

³⁸ *Speotyto cunicularia*, var. *guadeloupensis*, Ridgway. This bird is merely a very dark local form of the common species, though it differs very appreciably in the sharper definition, greater extent, and more intense tint of the brown markings of its plumage.

p. 22.—Nutt. Man. Orn. p. 118, 1844.—Bonap. Am. Orn. p. 68, pl. vii, f. 2, 1825; Ann. Lyc. N. Y. II, 36.—James. (Wils.), Am. Orn. IV, 30.—Say, Long's Exp. Rocky Mts., II, 36, 200. *Ulula cunicularia*, Jard. (Wils.) Am. Orn. III, 325, 1832. *Athene cunicularia*, Bonap. List, p. 6; Consp. Av. p. 38. Strickl. Orn. Syn. I, 160, 1855.—Cassin, Birds N. Am. 1858, 60.—Coop. & Suck. P. R. R. Rept. XII, ii, 157, 1860.—Canfield, Am. Nat. 1869, 583 (habits). *Strix californica*, Aud. B. Am. pl. cccxxxii, 1831. *Athene socialis*, Gamb. Pr. Acad. Nat. Sc. Phil. III, 47, 1846.

Sp. Char. *Adult*. Above earth-brown, the whole surface covered with numerous spots of dull white,—those on the scapulars roundish, and in pairs (on both webs); of similar form, but larger and more sparse, on the wings. Anteriorly they become more longitudinal (nearly linear), and medial; on the rump and upper tail-coverts, they are nearly obsolete. Secondaries crossed by four distinct bands of dull white, the last terminal; primaries with five to six transverse series of semi-rounded spots of ochraceous-white on their outer webs; primary coverts with about three transverse series of whitish spots. Tail with five to six bands of dull white, or pale ochraceous (the last terminal), composed of transverse oval spots, those on the middle pair of feathers not touching either the shaft or the edge. Ear-coverts uniform brown, becoming gradually paler beneath the eye and on the cheeks; eyebrows, a transverse chin-patch,—covering the whole chin and jaw and reaching back beneath the auriculars, and another across the jugulum, immaculate cottony-white; shafts of

the loreal bristles blackish; a broad, well-defined collar across the throat, between the white malar and jugular bands, deep brown, mixed with paler spots.

Beneath white with a faint ochraceous tinge, especially on the legs; the breast, abdomen, and sides with transverse spots of brown, this often predominating on the breast; legs, anal region, and crissum, immaculate. Whole lining of the wing immaculate creamy-white, the primary coverts, however, with large terminal spots of dusky; under surface of the primaries grayish-brown, deeper terminally, and with large, transversely ovate spots of ochraceous-white (about five in number on the longest quill), and growing larger basally.

♂. Wing, 6.40–7.00; tail, 3.00–3.30; culmen, .55–.60; tarsus, 1.50–1.70; middle toe, .80. (Smallest, No. 5,183, Fort Pierre, Nebraska; largest, No. 6,881, Sacramento, California.)

♀. Wing, 6.50–6.80; tail, 3.15–3.30; culmen, .51–.55; tarsus, 1.50–1.60; middle toe, .80. (Smallest, No. 45,020, Laredo, Texas; largest, No. 3,971, San José, Lower California.)

Juv. Upper surface earth-brown, as in the adult, but entirely uniform, except the wings and tail; upper tail-coverts, and a large oval patch on the wing (covering the middle coverts and the posterior half of the lesser-covert region), plain isabella-white; the anterior portion of the lesser-covert region darker brown than the back. Gular region well-defined pure white; jugular collar conspicuous and unspotted. Whole lower parts immaculate isabella-white.

Hab. Western Province of United States, from the Plains to the Pacific, and from the Rio Grande to Cape St. Lucas; Mexico.

Localities: Xalapa (Scl. 1857, 290); Texas (Dresser, Ibis, 1865, 330; resident).

Specimens never vary in the pattern of coloration, and but little in the relative amount of the brown and white spotting; the shade of the brown and the depth of the ochraceous tinge vary considerably, however, in different individuals,—but irrespective of locality,—the brown being paler and the white purer in summer than in fall and winter, after the new dress is freshly assumed. The brown on the breast varies considerably in quantity, being sometimes nearly uniform, thereby abruptly contrasting with the white jugular band, and again frequently with the brown hardly greater in amount than the white, the two colors being in regular bars, as on the sides and flanks.

There is certainly but one species, or even race, of Burrowing Owl in North America. This is represented in the Smithsonian collection by over fifty specimens, including examples from all parts of its range. Upon a close inspection of all the specimens in this extensive series, I was very much surprised to find so little variation; indeed, all the specimens are so much alike that a detailed description of the colors of one would answer for almost any individual. The shade of color varies mainly according to the age of the feathers, those newly acquired having a darkness of tint and a softness of texture not seen in those more worn (as in midsummer dress), which have a bleached or faded appearance.

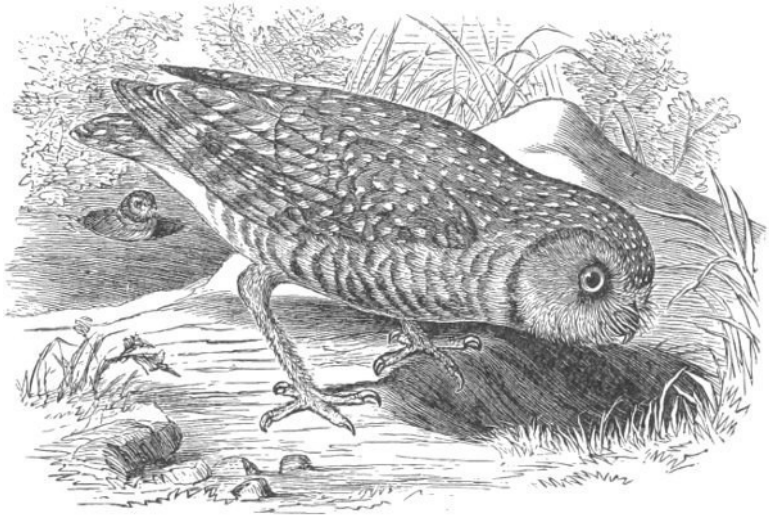
I fail entirely to detect the different styles of plumage which Mr. Cassin has described, and his diagnoses of two supposed species will not at all hold good when applied to specimens from either of the two regions which they were considered to characterize.

Examining critically the large series at my command, I find that the principal discrepancy among individuals is the amount of feathering on the tarsus; this extending to the toes was supposed to characterize the *A. cunicularia* of North America the habitat of which was considered as restricted in North America to the west of the Rocky Mountains (see Cassin, Birds of North America, as cited above); the nearly naked tarsus was believed to be characteristic of the *A. hypogæa*, as restricted, and the habitat assigned to this was "from the Mississippi River to the Rocky Mountains." Now, dividing the series under examination into two sets, according to this feature, we have, first, *cunicularia* from the following localities: from the Rio Grande, all specimens but one; Tongue River, Montana; and Petaluma, Santa Clara, and San Francisco, California. Next, *hypogæa* represents the following localities, besides places within the range ascribed to it: Utah; Lower California, including Cape St. Lucas, all specimens; San Diego, California, several specimens; Santa Barbara, San Francisco, Sacramento, and Fort Tejon, California; and Tamaulipas, Mexico.

Though we have but one species or form in North America, the South American bird is different: this is the true *cunicularia* of Molina, and though not specifically distinct from our bird, is

nevertheless an easily recognized geographical race. It is larger, the wing measuring from 7.00 to 7.50, instead of 6.40 to 7.00; the brown of the plumage is appreciably darker than that of most specimens of *hypogæa*, but less extended; on the outer web of the primaries the white spots are larger,—sometimes confluent along the edge,—and on their inner webs the white largely prevails, the dusky bars appearing only towards the ends; the outer tail-feather is almost wholly white, instead of having brown bars, broader than the white ones. Of the var. *cunicularia* there are eight specimens in the collection (chiefly from Paraguay, Buenos Ayres, and Chile), while numerous others, in various collections, have been examined besides. All the American forms of this subgenus seem clearly referrible to one species, as being at the most but geographical races.

Habits. The Burrowing Owl of North America inhabits the country between the Pacific coast and the Mississippi River, especially in the lower plains in Nebraska and in Kansas, as well as in particular districts in Utah, Arkansas, New Mexico, the Indian Territory, Texas, Arizona, California, and Mexico. They are usually very abundant, congregating together in large communities, and differing from most members of their family by living and breeding in burrows in the ground. Their habits are peculiar and interesting.



Speotyto hypogaea.

Thomas Say, during Colonel Long's expedition to the Rocky Mountains, was the first of American naturalists to meet with this bird. He encountered it in our trans-Mississippian Territories, where he described it as residing exclusively in the villages of the prairie-dog, whose excavations are so commodious as to make it unnecessary for the bird to dig for itself, which it is able to do when occasion requires. These villages are very numerous, and variable in their extent, sometimes covering only a few acres, and at others spreading over the surface of the country for miles together. They are composed of slightly elevated mounds, having the form of a

truncated cone, about two feet in width at base, and seldom rising as high as eighteen inches above the surface. The entrance is at the top or on the side. From the entrance the passage descends vertically one or two feet, and thence it continues obliquely downward until it terminates in the snug apartment where these animals enjoy their winter's sleep, and where they and the Owls are common, but unfriendly, occupants.

Mr. Dresser noticed this bird at all seasons, in the prairie country of Texas. They were rather common near the Rio Leon and Medina, and in one place he found they had taken possession of some deserted rat-holes. He obtained several specimens near San Antonio and at Eagle Pass. In the latter place he found them quite common on the sand plains near the town. The stomachs of those he shot were found to contain coleopterous insects and field-mice.

Dr. Newberry states that he found this species in Northern California, in several places between San Francisco and Fort Reading, and again at the Klamath Basin, though less frequently at the northward than in the Sacramento Valley. There they occupied the burrows made by the Beechey's and the Douglass's *Spermophile*. He usually saw them standing at the entrance to these burrows, often permitting him to approach within gun-shot, and before taking to flight twisting their heads about and bowing with many ludicrous gestures, apparently in order to aid their imperfect sight, and to get a better view of the intruder. When shot at or otherwise alarmed, they fly with an irregular jerking

motion, dropping down much like a Woodcock.

Dr. Suckley obtained a specimen near Fort Benton, on the Upper Missouri, in Dakotah, and Dr. Cooper procured others thirty-five miles west of Fort Kearney, in Nebraska, in August. He saw them in great numbers on the plains of Nebraska, and did not observe any difference in habits between them and the birds of California.

This species was found in Texas, near Fort Davis, and also at El Paso, by Mr. J. H. Clark. It was taken in Tamaulipas, Mexico, by Lieutenant Couch. Mr. Clark remarks that they were seen by him only in the prairie-dog towns, and were found in conjunction with the rattlesnake, and accuses them of feeding upon the young of the prairie-dog; but this ungrateful requital of the hospitality given them in the burrows of this marmot is discredited by Dr. Kennerly and others, who regard the apparent harmony in which the two dwell together as altogether incompatible with this habit.

This species is also found on our Pacific coast, west of the Rocky Mountains, as far north as British Columbia. Mr. Lord met with it along the entire course of the boundary-line. It was not by any means plentiful, but pairs of them were occasionally seen. While in camp at the Dalles he dug out several squirrel-holes. In one he found two eggs of this species, the female bird, a racer-snake, and a female ground-squirrel (*Spermophilus douglassi*). The Owl he found to be strictly of diurnal habits, feeding principally on crickets, grasshoppers, large beetles, and larvæ. He thinks it never captures small animals or birds, and

regards it as a peaceful and harmless bird.

Dr. Kennerly met with this species near Los Angeles, California. At any hour of the day they might be seen seated upon the mounds erected around the holes of the marmot, or else with head protruding from its orifice, disappearing immediately when approached. When molested, they commence bowing and chattering in a somewhat ludicrous manner at the intruder, or fly swiftly away, keeping near the earth and alighting suddenly in the vicinity of a burrow to renew these amusing motions. He found it very abundant in the valley of the San Gabriel River, where it associated with the large ground-squirrel of that region.

Dr. Heermann, who found them common on the extensive open prairies, speaks of its sight as very clear by day, and adds that it will not allow the hunter on foot to approach within shooting distance; but that, if approached on a horse or a mule, it may be easily shot. The nests he found were formed of a few straws carelessly thrown together at the bottom of its tortuous burrow, which is from six to eight feet in length. The eggs were usually four in number, and are described as nearly spherical, and as pure white.

Dr. Townsend states that this Owl resorts to the forsaken burrows of marmots and badgers, but never lives on terms of intimacy with either. The nest he describes as of fine grass, and placed at the extremity of the hole. The eggs are uniformly four in number, pale white, and about the size of those of the common House Pigeon.

Dr. Gambel, who observed this bird in California, states that he has occasionally found it in solitary burrows, and also that it often makes use of the holes dug by the *Spermophilus beecheyi*. They occasionally dig their own burrows, and live in scattered companies of four or five. Dr. Gambel also states that the bird is a resident of California throughout the year.

Mr. Darwin, in the Zoölogy of the Beagle, met with the var. *cunicularia* in crossing the pampas of South America. In Banda Oriental, he says, it is its own workman, and excavates its burrows on any level spot of sandy soil; but in the pampas, or wherever the Bizcacha is found, it uses those made by that animal. It usually preys on mice and reptiles. Lieutenant Gilliss gives a similar account of it, from observations made in Chile.

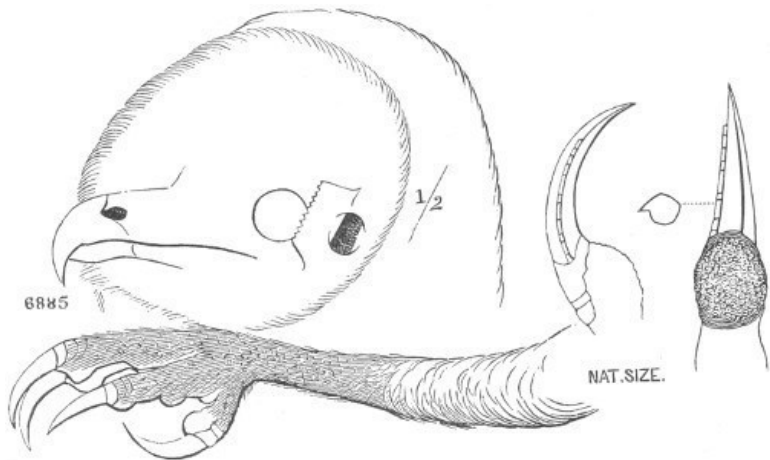
Mr. Nathaniel H. Bishop met with *cunicularia* on the banks of the river San Juan, in Banda Oriental, where a few pairs were seen, devouring mice and insects. After crossing the river Las Vacas, and coming upon a sandy waste covered with scattered trees and low bushes, he again encountered it. Upon the pampas of the Argentine Republic they were found in great numbers, from a few miles west of Rosario to the vicinity of San Luis, where the pampas end. On these immense plains of grass it lives in company with the Bizcacha (*Lagostomus trichodactylus*), dwelling with it in perfect harmony, and during the day, while the animal is sleeping, a pair of Owls stand a few inches within the main entrance of the burrow, and at the first sound, be it near or distant, leave their station and remain outside the hole, or upon

the mound that forms the roof of their domicile. At the approach of man, both birds, with their irides dilated, mount above him in the air, and keep up an alarm-note until he passes. Then they quietly settle down in the grass, or return to their former place. On the pampas Mr. Bishop did not observe them taking their prey during the daytime, but as soon as the sun had set, the Bizcacha and Owls both leave their holes in search of food, the young of the former playing about the birds as they alight near them. They do not associate in companies, there being but one pair to a hole. Each couple keep separate from their neighbors, and at night do not stray from their homes.

It is both diurnal and nocturnal, and feeds at all hours. Outside the town of San Juan, which lies upon the eastern base of the Andes, Mr. Bishop had a fine opportunity to watch their habits in a locality differing entirely from the pampas. The country around San Juan is a dreary desert, covered with low thorn-trees, and over this waste a few Owls are found, principally near the town itself, in the vicinity of the pastures that are cultivated by irrigation. They mate in September and October. "One evening," Mr. Bishop writes, "I was attracted by a strange sound that I supposed proceeded from a frog, but it proved to be the love-note of a little *Athene cunicularia*, and which was answered by its mate. It alighted upon a post, and commenced turning around upon it, with throat dilated, and emitting a guttural sound. These antics were continued for more than a minute, it occasionally bowing its head in a mysterious manner. The female soon after

joined it, and they flew away. Each night it perched upon a tall flagstaff and uttered its love-note. Close by the house was a lagoon, the borders of which were swampy, and over this a pair often hovered in search of food. I watched one that kept on the wing for nearly two hours, some fifty feet from the ground, and during that time did not change its position in any other way than by rising or falling a few feet. A boy brought me a female with five eggs, that had been taken from a burrow five feet from the mouth. The bird was very fierce, and fought me with her wings and beak, uttering all the while a long shrill note, resembling a file drawn across the teeth of a saw. I supplied her with eleven full-grown mice, which she devoured during the first thirty-six hours of her confinement. It is said to place a small nest of feathers at the end of the hole, in which are deposited five white eggs.”

The eggs of the var. *cunicularia* are of a rounded-oval shape, more obtuse at one end than at the other, measure 1.30 inches in length by 1.05 in breadth, and are of a uniform white color, with a slightly bluish tinge.



6885 $\frac{1}{2}$ nat. size.

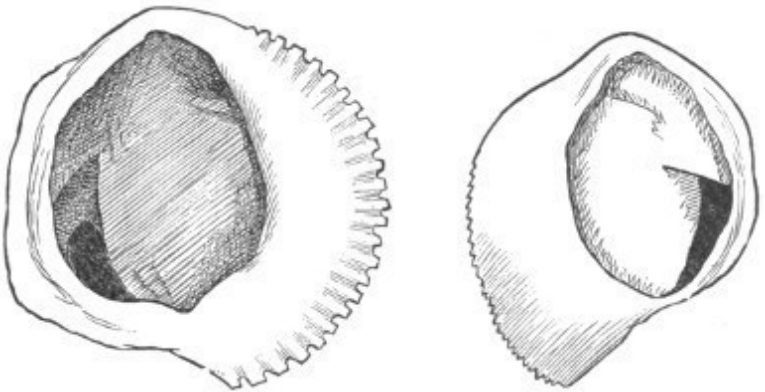
Strix pratincola. (See page 10.)

The egg of the *A. hypogaea* is of a rounded-oval shape, equally obtuse at either end, and averages 1.35 inches in length by 1.13 in breadth, and is of a uniform clear white color. This description is taken from an egg obtained by Mr. E. S. Holden near Stockton in California. Captain Bendire writes that he has found as many as nine, and once even ten, eggs in the nest of the North American species.

NOTE

The crania of the Owls present many features of interest, which may serve a good purpose in the definition of the sections and the genera, and to which attention has been occasionally called in the preceding pages. The tendency to asymmetry is especially marked in some species, and the better to illustrate this and other features we append several plates, in which the corresponding views are placed side by side.³⁹ The figures and accompanying lettering tell their own story, without any necessity of a labored description.

R. R.

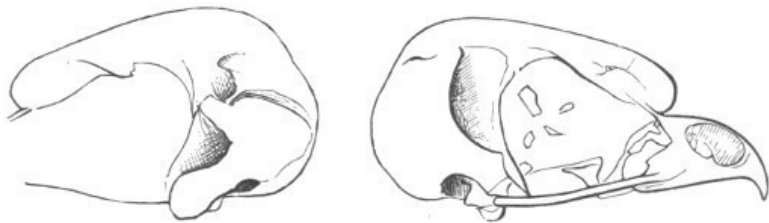


³⁹ We give, above, three well-marked illustrations of asymmetry: two relating to the auditory apparatus of the two sides of the head, and one of opposite sides of the skull.

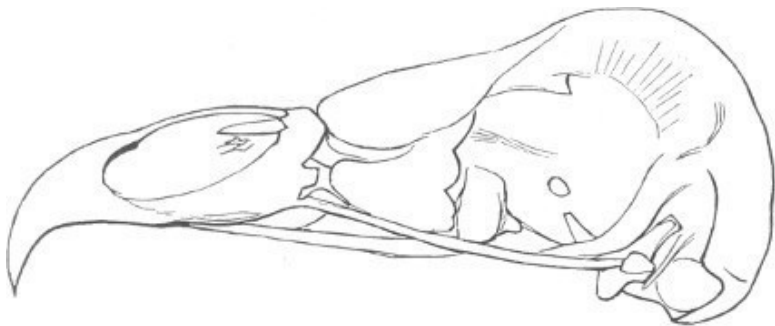
Syrnium aluco (copied from Kaup).



Athene noctua (from Kaup).



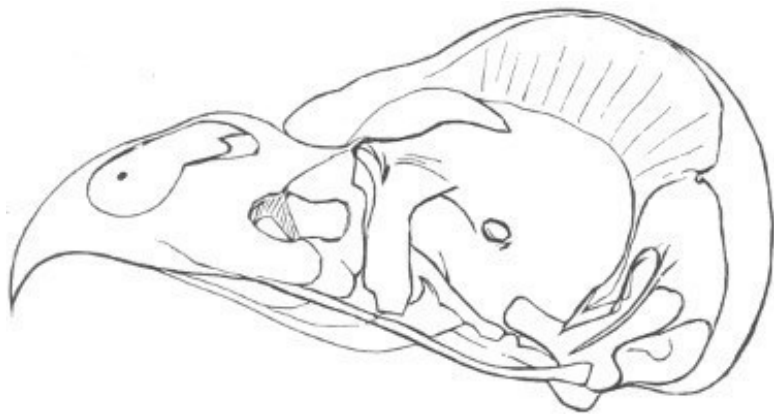
Nyctale richardsoni.



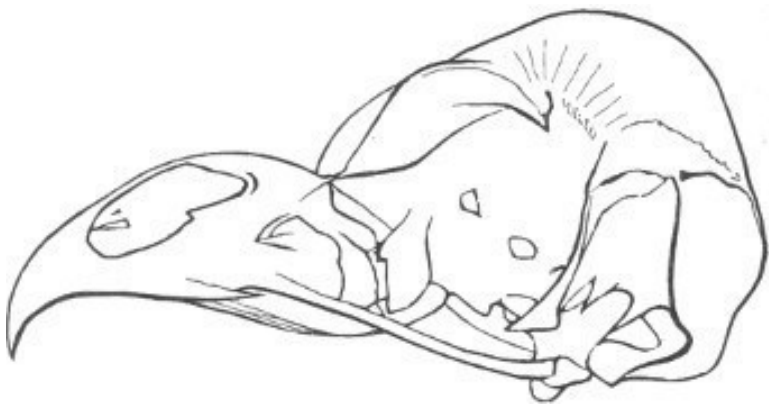
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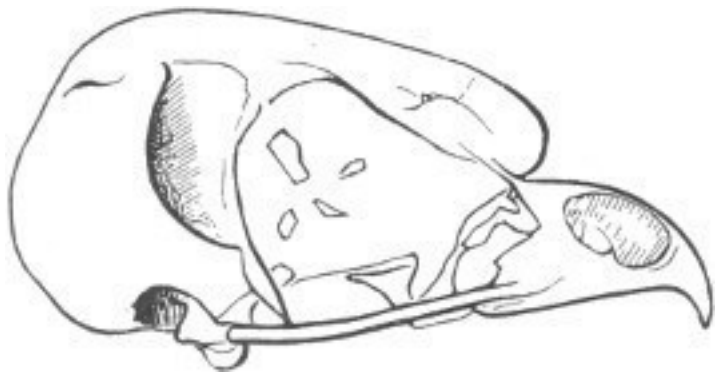
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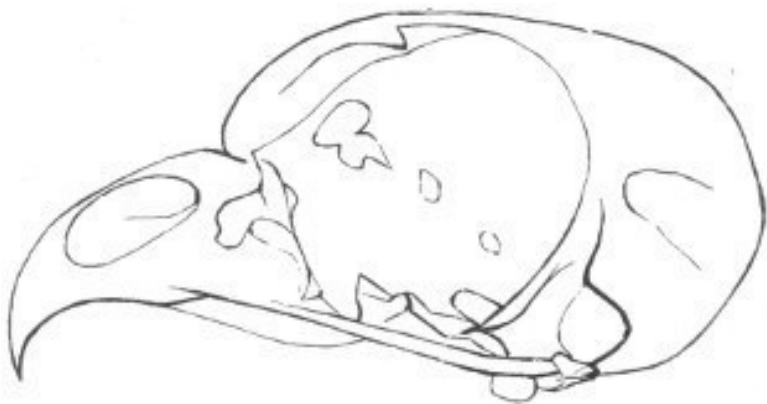
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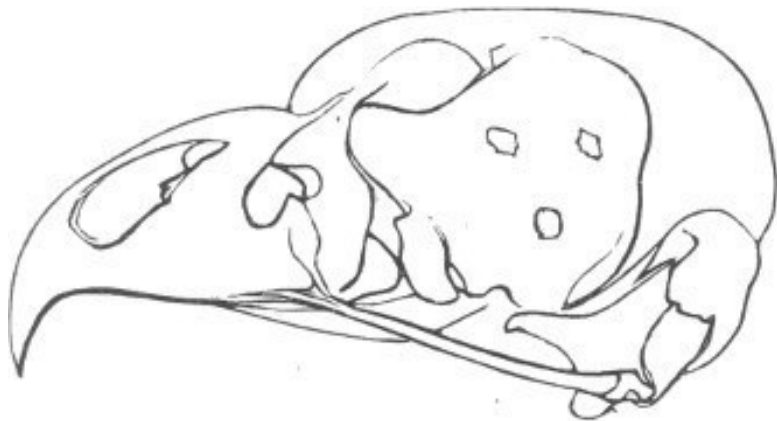
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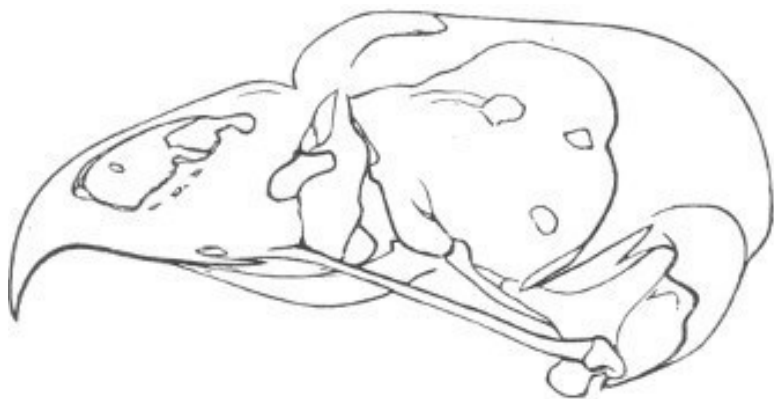
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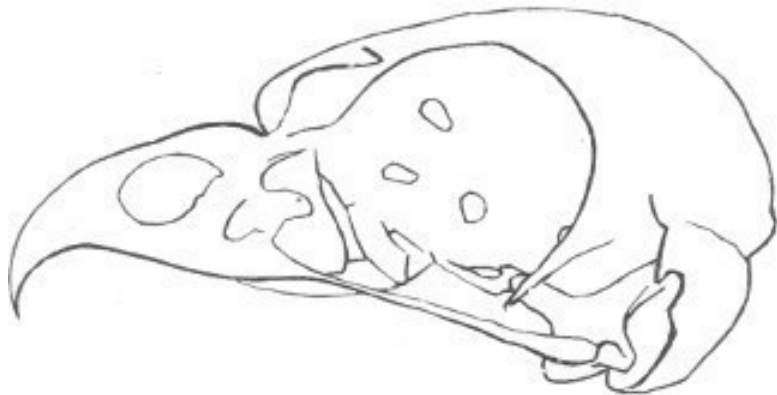
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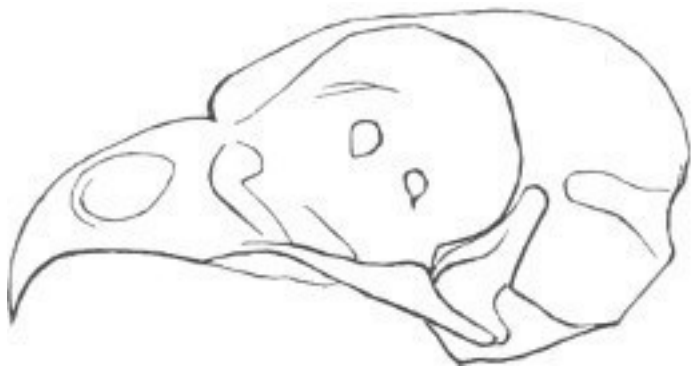
773.



628.



7897.



437.

7449. *Strix pratincola*. Natural size.

4886. *Otus wilsonianus*. Natural size.

7272. *Scotiaptex cinereum*. Two thirds.

7899. *Nyctale richardsoni*. Natural size.

414. *Scops asio*. Natural size.

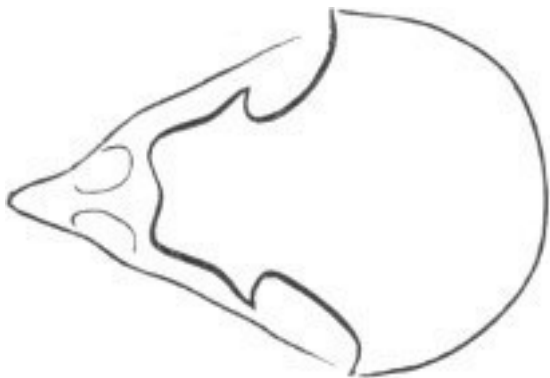
773. *Bubo virginianus*. Two thirds.

628. *Nyctea nivea*. Two thirds.

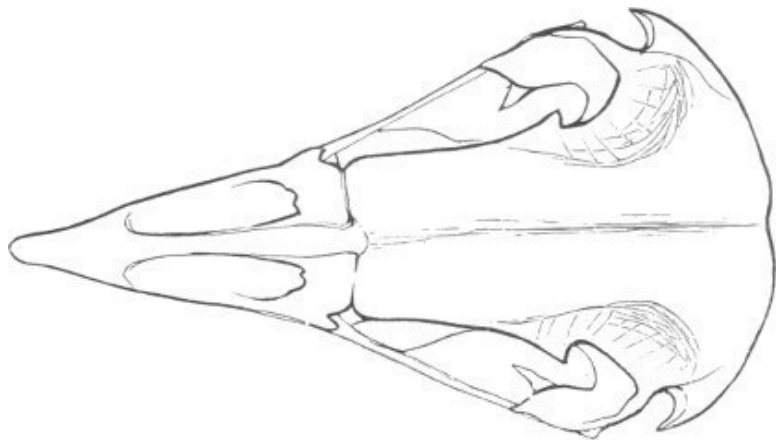
7897. *Surnia ulula*. Natural size.

428. *Glaucidium ferrugineum*. Natural size.

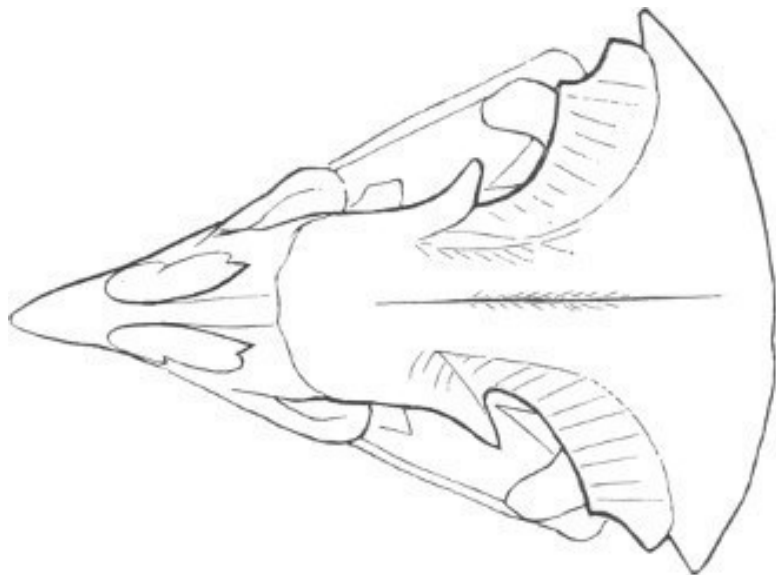
437. *Speotyto hypogaea*. Natural size.



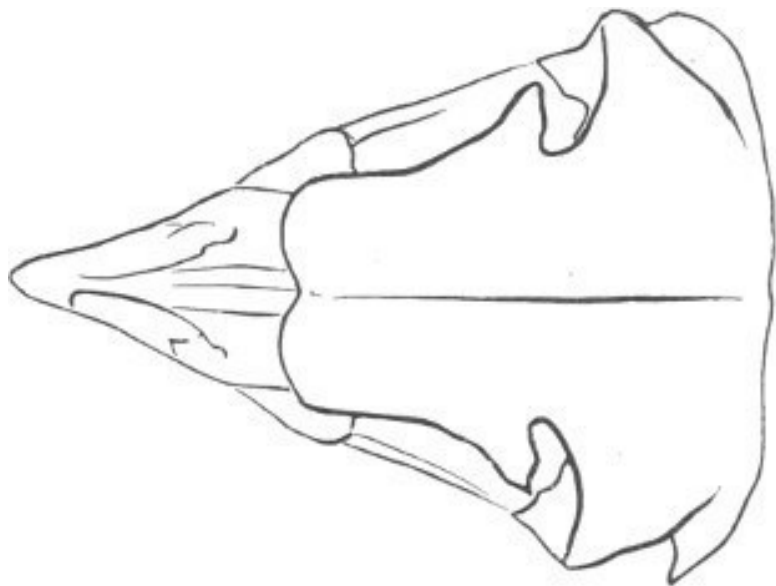
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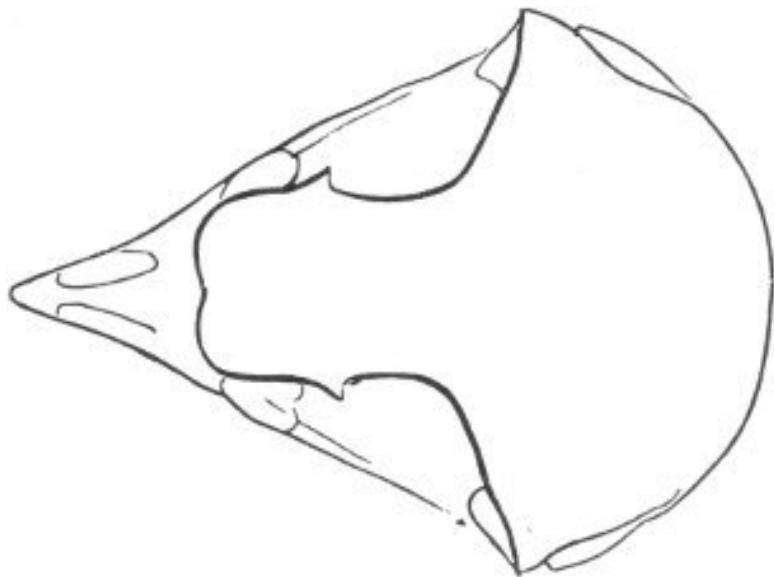
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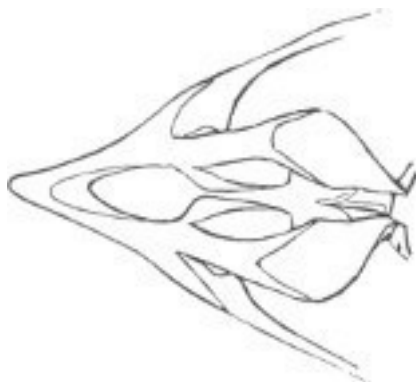
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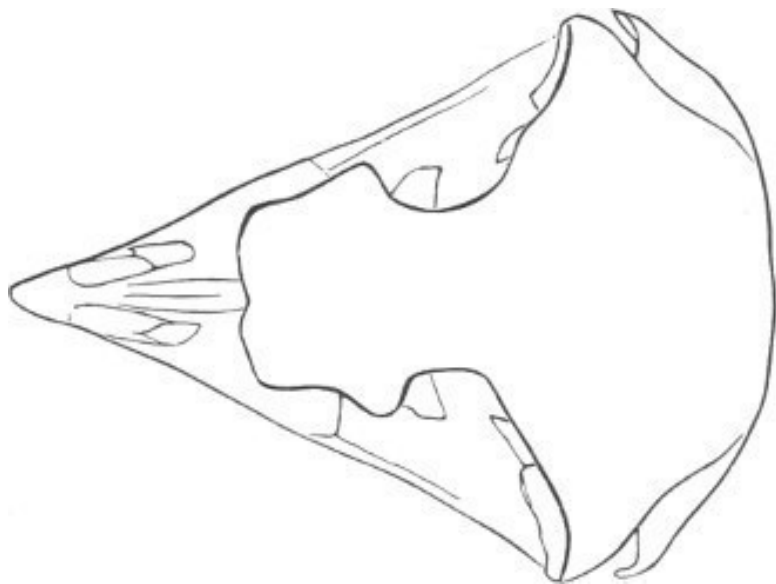
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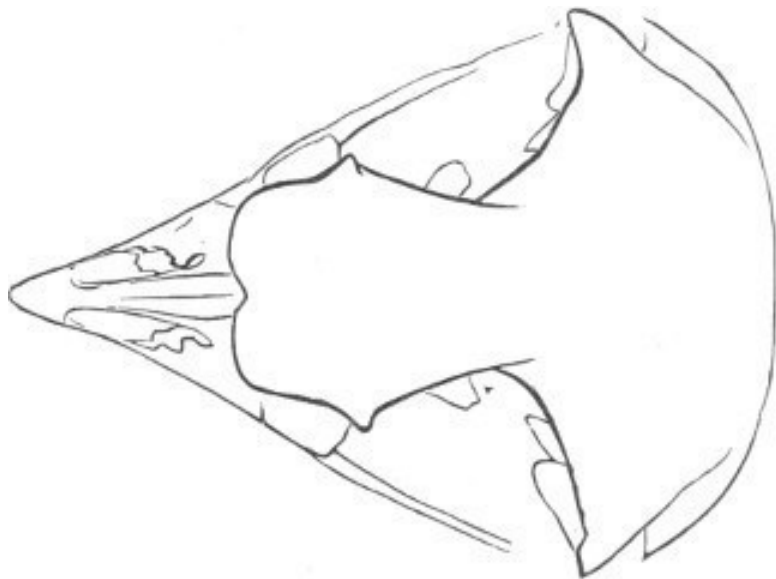
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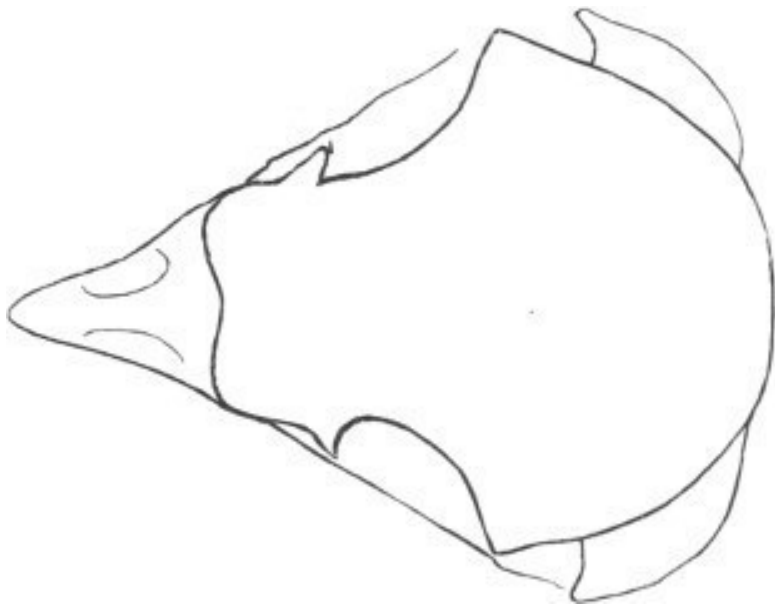
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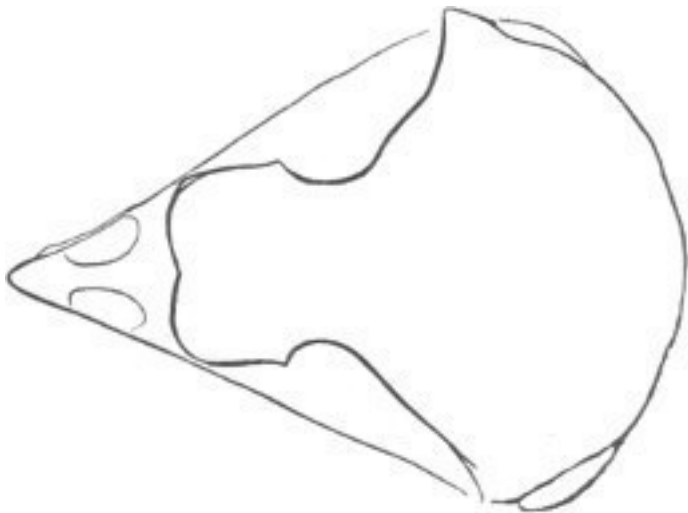
773.



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7897.



437.

7449. *Strix pratincola*. Natural size.

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7272. *Scotiaptex cinereum*. Two thirds.

7899. *Nyctale richardsoni*. Natural size.

414. *Scops asio*. Natural size.

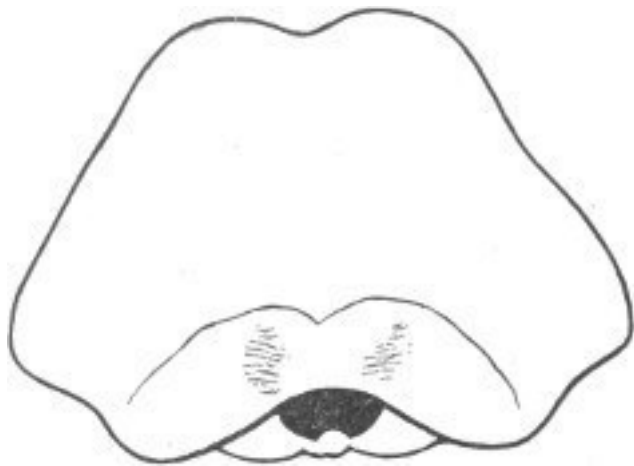
773. *Bubo virginianus*. Two thirds.

628. *Nyctea nivea*. Two thirds.

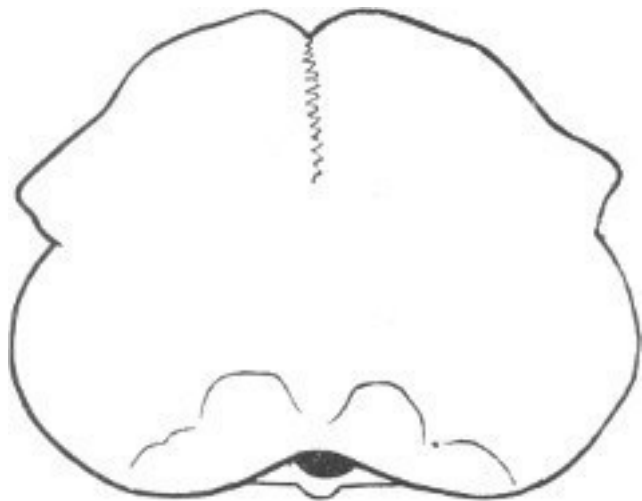
7897. *Surnia ulula*. Natural size.

428. *Glaucidium ferrugineum*. Natural size.

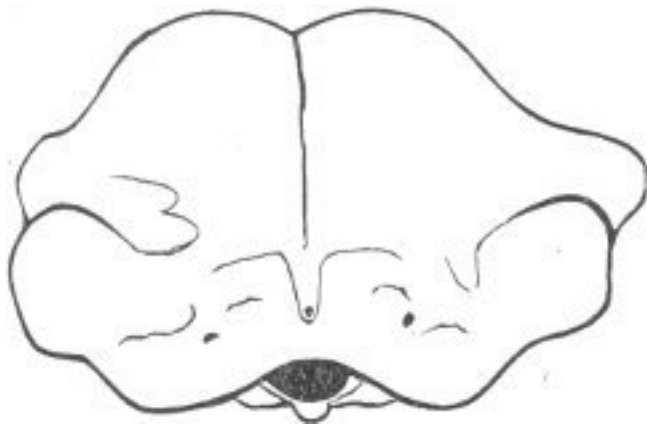
437. *Spheotyto hypogaea*. Natural size.



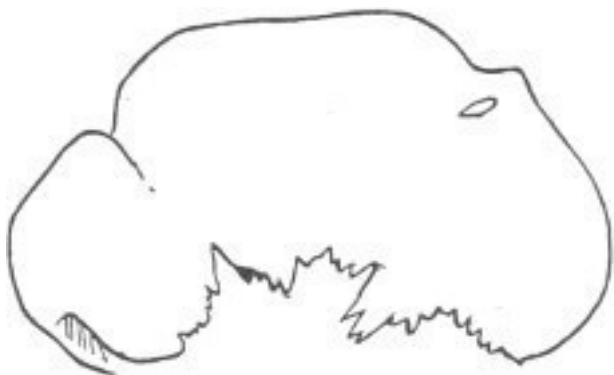
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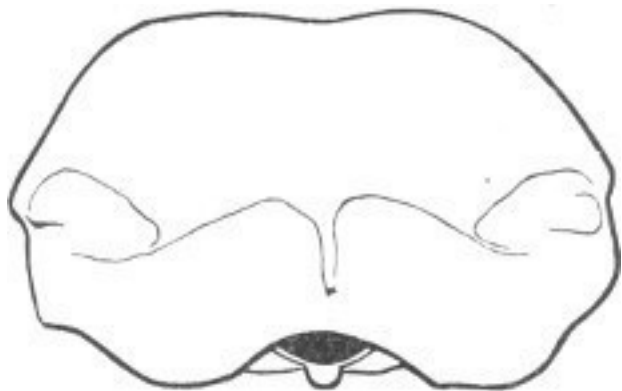
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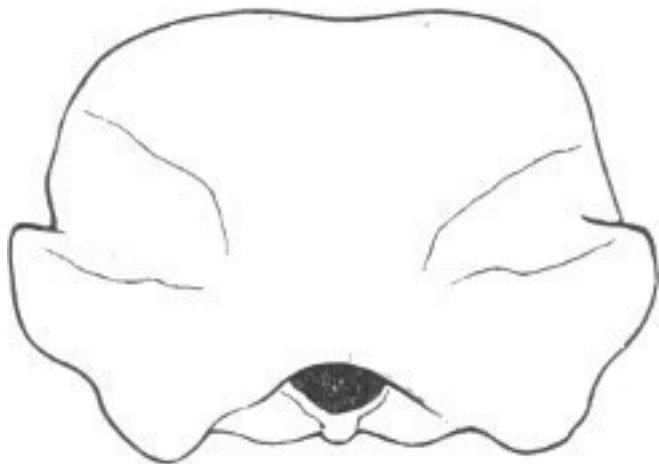
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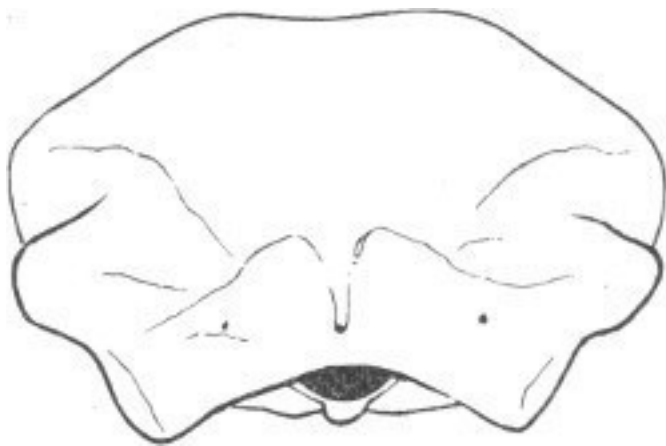
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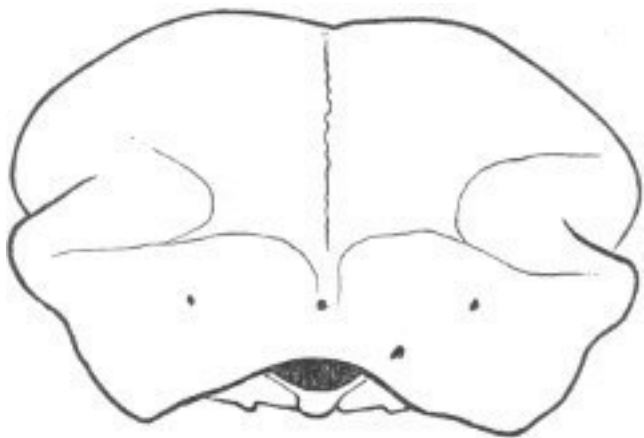
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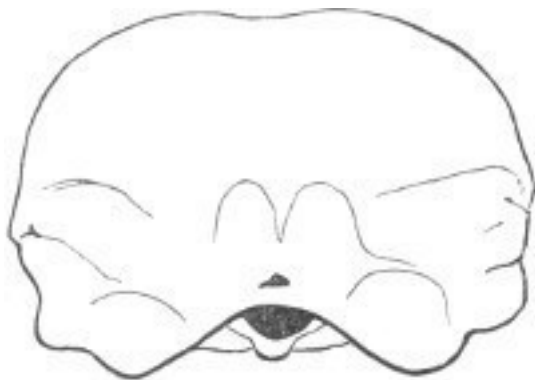
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428.

7449. *Strix pratincola*. Natural size.

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7272. *Scotiaptex cinereum*. Two thirds.

7899. *Nyctale richardsoni*. Natural size.

414. *Scops asio*. Natural size.

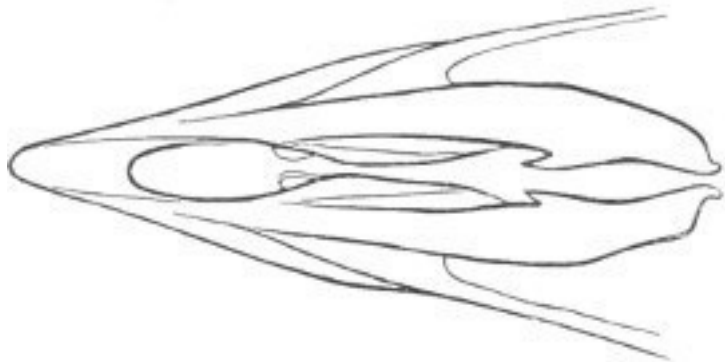
773. *Bubo virginianus*. Two thirds.

628. *Nyctea nivea*. Two thirds.

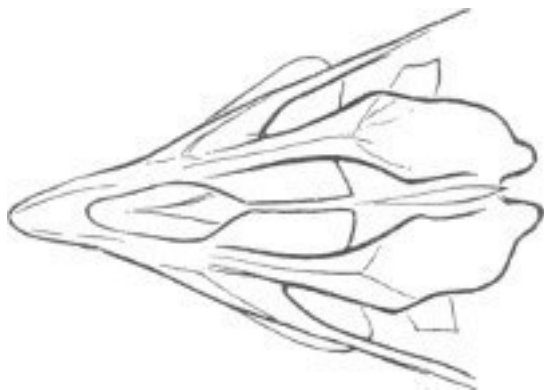
7897. *Surnia ulula*. Natural size.

428. *Glaucidium ferrugineum*. Natural size.

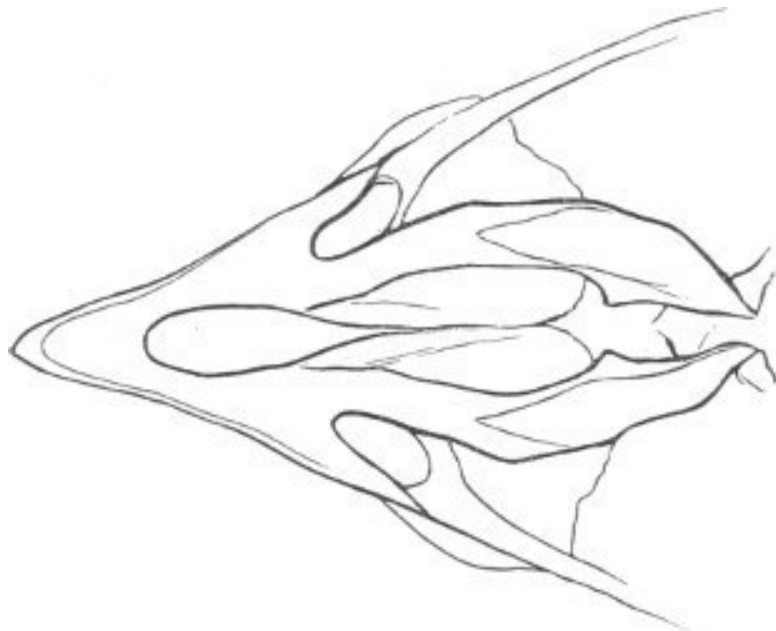
437. *Speotyto hypogaea*. Natural size.



7449.



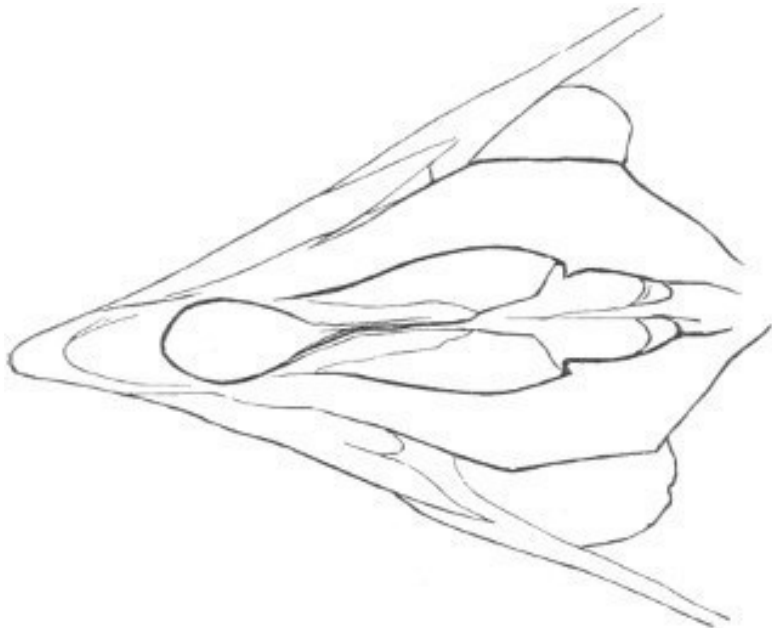
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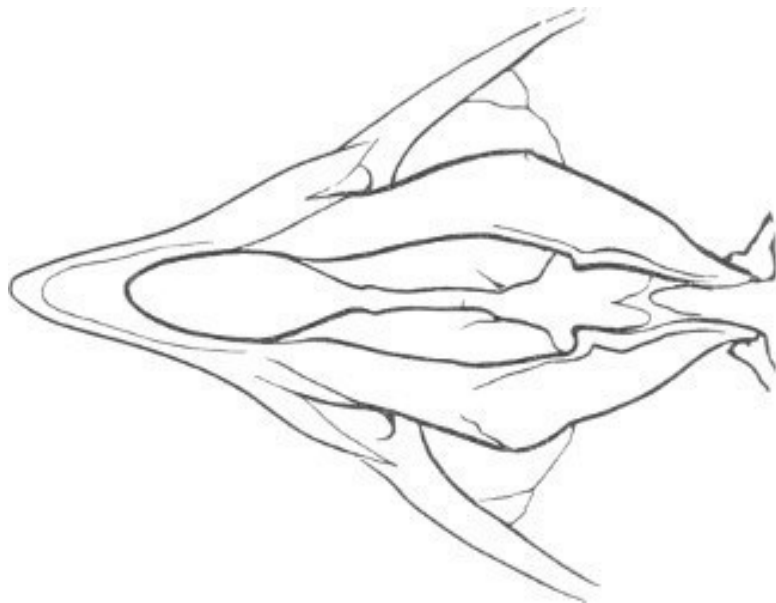
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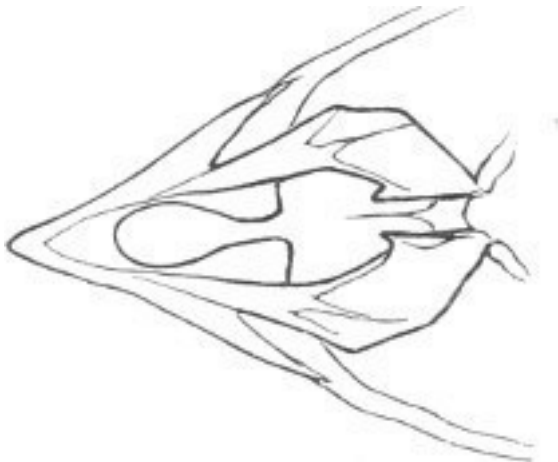
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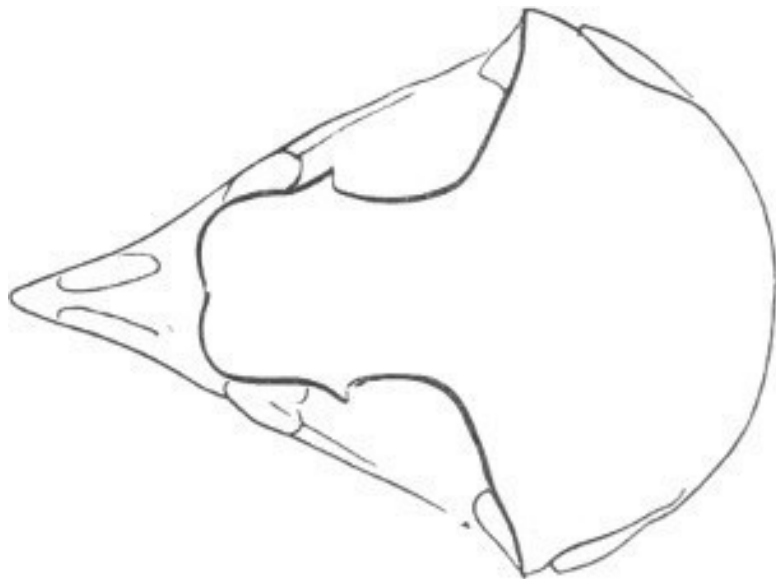
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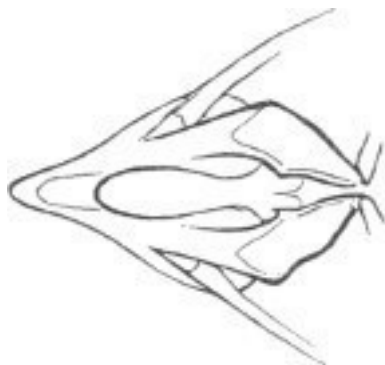
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428.

7449. *Strix pratincola*.

4886. *Otus wilsonianus*.

7272. *Scotiaptex cinereum*.

7899. *Nyctale richardsoni*.

414. *Scops asio*.

773. *Bubo virginianus*.

628. *Nyctea nivea*.

7897. *Surnia ulula*.

428. *Glaucidium ferrugineum*.

437. *Spheotyto hypogaea*.

(All natural size.)



12088.

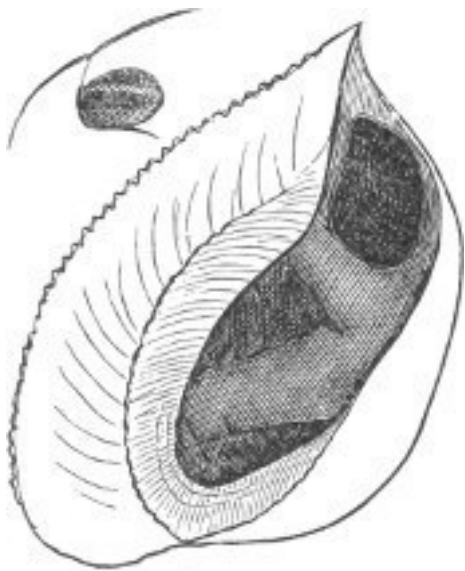


504.

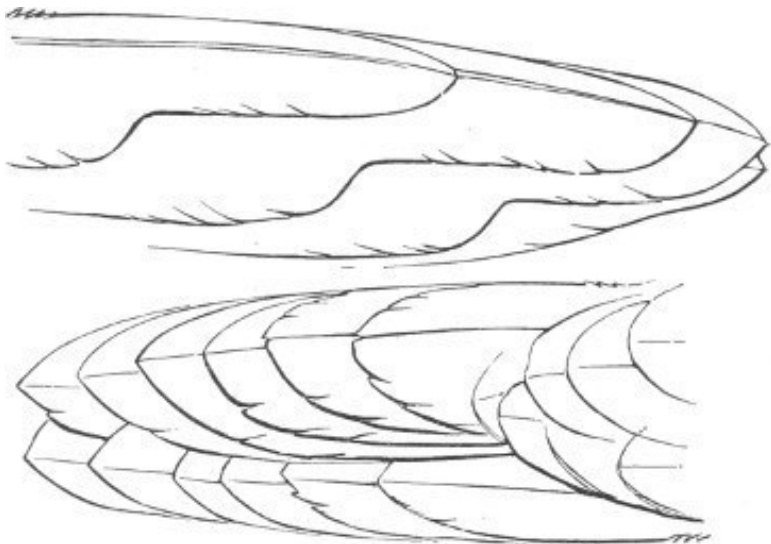


49808.





A.



49808.

12088. *Nyctea nivea*. (Ear copied from Swainson, F. B. A)

504. *Scotiaptex cinereum*.

49808. *Surnia ulula*. (Ear copied from Swainson.)

A. *Brachyotus "cassini"*. (Left ear and nostril, from fresh specimen.)

Family FALCONIDÆ.—The Falcons

Char. Eyes directed laterally, and eyelids provided with lashes. Toes invariably naked, and tarsus usually naked and scutellate (feathered only in *Aquila* and *Archibuteo*). Outer toe not reversible (except in *Pandion*). Head never with ear-tufts, and never wholly naked (except in the *Vulturinæ*, of the Old World).

The above characters are about the only readily observable points in the external anatomy in which the *Falconidæ* differ strikingly from the *Strigidæ* and *Cathartidæ*, and may serve to distinguish the birds of this family from those of the two others. The osteological characters, however, as expressed on page 1328, are more decided and important in a taxonomic point of view, and serve to separate the Hawk family as a well-defined group.

In the following treatment of the North American *Falconidæ*, I confine that part relating to the systematic arrangement strictly to the species embraced within the province of our work, for the reason that in a forthcoming monograph of all the American species I hope to present a systematic classification based upon the species of the whole world. All preliminary details regarding the general characteristics and distinctive peculiarities of the family, as well as all discussions and generalizations upon the subject, will therefore be omitted here.

The following synopsis of the North American genera is intended as an artificial arrangement which may enable the

student to identify, by simple and readily understood characters, the forms belonging to this country.⁴⁰

⁴⁰ As in the case of the *Strigidae*, my determinations of the North American species of *Falconidae* were furnished, according to request, to Dr. Coues, for use in his "Key to North American Birds." (R. R.)

Genera

A. Nasal bones almost completely ossified, the nostril being a small orifice, with a conspicuous central bony tubercle; its form nearly or quite circular, or linear and oblique (in *Polyborus*), with its upper end the posterior one *Falconinæ*.

1. **Falco.** Nostril circular. Commissure with a prominent tooth and notch; lower mandible abruptly truncated and notched. Primaries stiff and hard, and more or less pointed, the first to the second longest, and the outer one or two with their inner webs cut, the angular emargination being near the end of the quill. Middle toe much more than half as long as the tarsus; claws strongly curved, very acute.

2. **Polyborus.** Nostril linear, oblique, the upper end the posterior one; commissure without prominent tooth nor notch; lower mandible not distinctly truncated or notched. Primaries soft, obtuse, the third longest, and the outer four or five with their inner webs cut, the shallow sinuation being toward the middle of the quill. Middle toe less than half the tarsus; claws weakly curved, very obtuse. Face and cheeks naked, and scantily haired.

B. Nasal bones very incompletely ossified, the nostril being a large, more or less oval, opening, of oblique direction, its lower end being invariably the posterior one; without a bony tubercle, and never perfectly circular. (*Accipitrinæ*.)

a. Sides of the head densely feathered close up to the

eyelids.

3. **Pandion.** Outer toe reversible; claws contracted and rounded on their under surface, and not graduated in size.⁴¹ Wing long, third quill longest; outer four with inner webs emarginated. Tail rather short, rounded.

4. **Nauclerus.** Outer toe not reversible; claws not contracted or rounded on under side, and graduated in size. Wing long, third quill longest; outer two with inner webs sinuated. Tail excessively lengthened and forked, the lateral pair of feathers more than twice as long as the middle pair.

b. Sides of the head with a more scantily feathered orbital space, with a projecting superciliary “shield” covered with a naked skin.

* A well-developed membrane, or “web,” between the outer and middle toes at the base.

† Tarsus about equal to the middle toe.

§ Claws short and robust; two outer quills with their inner webs cut.

5. **Ictinia.** Commissure irregularly toothed and notched; front of tarsus with transverse scutellæ. Tail emarginated; third quill longest.

6. **Elanus.** Commissure without irregularities; front of tarsus with minute roundish scales. Tail double-rounded; second quill longest.

§§ Claws long and slender; five outer quills with inner

⁴¹ By this is meant that they are all of equal length and thickness, and not progressively smaller from the posterior one to the outer, as in all *Falconidæ* with the sole exception of *Pandion*, though there is a very near approach to this feature in one or two of the species of *Haliaetus*.

webs cut.

7. **Rostrhamus.** End of bill bent downward, with a long pendent hook; inner edge of middle claw slightly pectinated, or serrated. Tail emarginated; third or fourth quill longest.

†† Tarsus very much longer than the middle toe.

¶ Front of tarsus unfeathered, and, with the posterior face, covered with a continuous series of broad transverse scutellæ.

α. Form very long and slender, the head small, the tail and legs long and claws excessively acute; bill weak, compressed, very high through the base, the culmen greatly ascending basally, and the cere much arched; commissure usually with a very prominent “festoon.”

8. **Circus.** Face surrounded by a “ruff” of stiffened, differently formed feathers, as in the Owls. Tarsus more than twice as long as the middle toe. Wing very long, hardly concave beneath; third to fourth quill longest; outer four with inner webs sinuated.

9. **Nisus.** Face not surrounded by a ruff. Tarsus less than twice as long as the middle toe. Wing short, very concave beneath, the outer quill much bowed; third to fifth quills longest; outer five with inner webs sinuated.

β. Form short and heavy, the head larger, the tail shorter, the legs more robust. Bill stronger, less compressed, lower through the base, the upper outline less ascending basally, and the cere less arched. Commissure variable.

10. **Antenor.** Form heavy, the wings and tail moderately long, and feet very robust; bill rather elongated, the commissural lobe prominent, and the base of the culmen

somewhat depressed. Fourth quill longest; outer five with inner webs cut. Lores naked, and almost destitute of bristles.

11. **Onychotes.** Outstretched feet reaching beyond end of tail; tibial plumes short, close, not reaching below the joint. Wing short, rounded, very concave beneath, the fourth quill longest; outer five with inner webs sinuated. Tail short, but little more than half the wing, slightly rounded. Claws very long, and extremely acute.

12. **Asturina.** Bill and feet as in *Antenor*; lores densely bristled; wing short, rounded, concave beneath, the third to fourth quills longest; outer four with their inner webs cut.

13. **Buteo.** Form of *Antenor*, but primaries longer and more pointed, the fourth usually longest, and the outer three or four with inner webs cut. Bill and feet as in *Asturina*. Tail moderate, or rather short, nearly even, or slightly rounded.

¶¶ Front of the tarsus densely feathered down to the base of the toes.

14. **Archibuteo.** Feathering of the tarsus interrupted behind by a bare strip along the full length; middle toe less than half as long as the tarsus. Nostril broadly oval, obliquely horizontal; bill weak, the upper outline of the cere much ascending basally. Feathers of the nape normal, blended. Third to fourth quills longest; outer four or five with inner webs cut.

15. **Aquila.** Feathering of the tarsus uninterrupted behind; middle toe more than half as long as the tarsus. Nostril narrowly oval, obliquely vertical; bill strong, the upper outline of the cere nearly parallel with the lower. Feathers of the nape lanceolate, distinct. Fourth quill

longest; five to six with inner webs cut.

** No trace of membrane between outer and middle toes.

16. **Haliaetus.** Tarsus feathered in front one third, or more, of the way down; the naked portion with an imperfectly continuous frontal, and less well defined posterior, series of transverse plates, and covered elsewhere with roundish granular scales. Feathers of the neck, all round, lanceolate, distinct. Bill very large, the chord of the culmen more than twice as long as the cere on top; nostril oval, obliquely vertical. Third to fifth quills longest; outer six with inner webs cut. Tail rounded or cuneate, sometimes consisting of fourteen feathers.

The foregoing diagnoses embrace merely the more conspicuous external characters whereby the genera may be most readily distinguished by the student. The following table presents additional accompanying characters afforded by the osteological and anatomical structure, of more importance in defining with precision the several groups embraced in our fauna.

A. Scapular process of the coracoid produced forward so as to meet the clavicle⁴² (Huxley). Nasal bones almost completely ossified, the nostril being a small, usually circular opening, with a raised or “rimmed” margin, and conspicuous, usually central, bony tubercle. Inferior surface of the supermaxillary bone with a prominent median angular ridge. Superciliary process of the

⁴² As in all the *Strigidae*.

lachrymal consisting of a single piece. (*Falconinae*.⁴³)

B. Scapular process of the coracoid not produced forward so as to meet the clavicle (Huxley). Nasal bones incompletely ossified, the nostrils being very large, and without bony rim or tubercle. Inferior surface of the supramaxillary bone without a median ridge. Superciliary process of the lachrymal variable. (*Accipitrinae*.)

a. Superciliary process of the lachrymal composed of a single, excessively abbreviated piece;⁴⁴ posterior margin of the sternum with a pair of indentations, and without foramina. (*Pandion* and *Nauclerus*.)

b. Superciliary process of the lachrymal double, or composed of two pieces, joined by a cartilaginous “hinge,” and reaching nearly across the orbit. Posterior margin of the sternum without indentations, and usually with a pair of foramina. (All except *Pandion* and *Nauclerus*.)

† Septum of the orbits and nostrils incompletely ossified (the former always and the latter usually) and with foramina; posterior margin of the sternum most produced backwards laterally, and incompletely ossified, there being usually a pair of foramina. Intestinal canal short, broad, with the duodenum simple, forming a single loop (McGillvray). A well-developed “web” between the outer and middle toes. (All but *Halietus*.)

†† Septum of the orbits and nostrils completely ossified,

⁴³ Embracing besides the *Falcones* all the Polyborine genera, besides *Herpetotheres* and *Micrastur*.

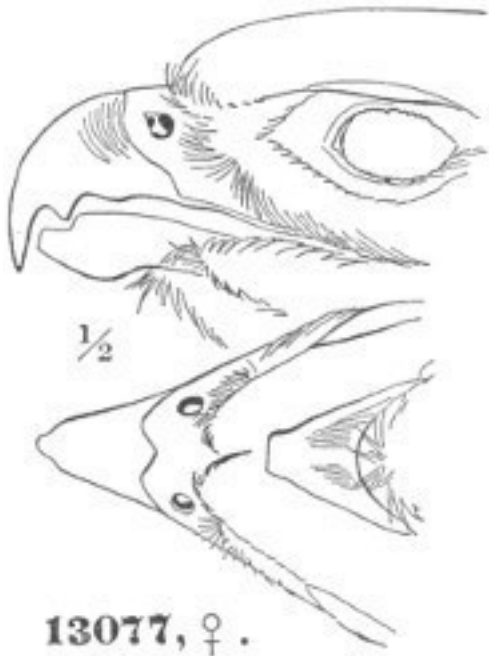
⁴⁴ As in the Polyborine forms of the *Falconinae*.

and without any trace of foramina; posterior margin of the sternum produced medially into a convex lobe, and without any trace of foramina. Intestinal canal extremely elongated, attenuated, with the duodenum arranged in several convolutions (McGillvray). No trace of a web between outer and middle toes. (*Halicetus*.)

Subfamily FALCONINÆ

Genus FALCO, Auct

Gen. Char. Bill strong, its breadth at the base equalling or exceeding its height; upper outline of cere on a level with, or rather lower than, the base of the culmen; gonys much arched, the chord of the arch equalling about half that of the culmen. Near the tip of the upper mandible is a prominent tooth on the commissure, and near the end of the lower mandible, which is truncated, is a deep notch corresponding; the end of the upper mandible is compressed, giving the situation of the tooth an inflated appearance when viewed from above. Nostrils circular, with a conspicuous central tubercle. Orbital region bare; projecting superciliary shield conspicuous, arched, but not very prominent. Tail shorter than wing, the feathers hard and stiff. Primaries very strong, elongated, tapering rapidly toward their points; only the first or first and second with their inner webs emarginated, the cutting being angular, and near the end of the quill. Tarsus never with a single series of transverse scutellæ either in front or behind; middle toe very long.



13077, ♀. 1/2

Subgenera

One primary only with inner web emarginated; first to second longest; first longer than fourth.

Tarsus longer than middle toe, and feathered far below the knee; first quill shorter than third. Coloration of the

sexes alike; old and young slightly different in pattern and tints. Size large ... *Hierofalco*.

Tarsus not longer than middle toe, and scarcely feathered below the knee; first quill equal to or longer than the third. Coloration of the sexes alike; old and young very different in pattern and tints. Size, very small to large ... *Falco*.

Two primaries with inner webs emarginated; second to third longest; first shorter than fourth.

Basal joint of toes without transverse scutellæ; tarsus about equal to middle toe.

Coloration of the sexes in adult plumage very different in tints; in the young alike, the young ♂ resembling the adult ♀. Size small ... *Æsalon*.

Basal joint of toes with transverse scutellæ; tarsus longer than middle toe.

Coloration of the sexes very different, in pattern and tints, at all ages; old and young alike. Scutellæ of the toes and tarsus interrupted at the digito-tarsal joint; tarsus much longer than middle toe. Bill small, the cere on top less than one fourth the culmen. Size small ... *Tinnunculus*.

Coloration of the sexes alike at all ages; old and young slightly different in pattern and tints. Scutellæ of tarsus and toes uninterrupted from "knees" to claws; tarsus but little longer than middle toe. Bill large, the cere on top about one third the culmen. Size medium; form very slender ... *Rhynchofalco*.

Subgenus **HIEROFALCO**, Cuvier

Hierofalco, Cuvier, 1817. (Type, *Falco gyrfalco*, Linn.)

Jerafalco, Boie, 1822; Kaup, 1851. (Same type.)

Gennaia, Kaup, 1847. (Type, *Falco jugger*, Gray.)

Species and Races

1. F. gyrfalco. Wing, 13.00–17.00; tail, 8.50–11.50; culmen, .85–1.05; tarsus, 2.10–3.00; middle toe, 1.80–2.25.⁴⁵ Ground-color varying from entirely pure white to wholly dusky, but generally bluish (in adult) or grayish-brown (in young) above, and white beneath. *Adult*. All the markings transverse.⁴⁶ No lighter nuchal band. *Young*. Markings of the lower surface longitudinal, the upper parts without transverse bars (except on the tail⁴⁷).

a. Lower parts with white predominating, or wholly white.

Lower tail-coverts never with markings. No tinge of blue anywhere on the plumage, the ground-color of which is entirely pure white at all ages.

⁴⁵ Extremes of sixty specimens.

⁴⁶ Sometimes there are more or less distinct linear streaks on the head and neck, or on the pectoral region.

⁴⁷ Sometimes the irregular markings above have a transverse tendency.

1. *Adult.* Upper parts, excepting head and neck, with transverse crescentic bars of dark plumbeous; lower parts immaculate, or else without well-defined markings. *Young.* Upper parts with longitudinal stripes of dark plumbeous; lower parts usually conspicuously striped. *Hab.* Greenland (in the breeding-season); in winter, occasionally wandering into the northern portions of Europe and North America ... var. *candicans*.

Lower tail-coverts always with markings. A tinge of ashy-blue more or less prevalent above. Young dusky above.

Head and neck above abruptly lighter than the back. Young plain grayish-brown above, with conspicuous whitish borders to the feathers.

2. *Adult.* Upper parts white, passing into bluish posteriorly; everywhere (except on head and neck) with sharply defined, transverse (not crescentic, but continuous) bars of dark plumbeous. Abdomen and flanks with transverse spots of the same. *Young* without irregular light mottling to the plumage above, and with broad longitudinal stripes beneath. *Hab.* Iceland and Southern Greenland, in the breeding-season; in winter, south into Northeastern United States, and Northern Europe ... var. *islandicus*.

Head and neck above abruptly darker than the back. Young (of var. *sacer*) variegated grayish-brown above, without light borders to the feathers.

3. *Adult.* Top of the head streaked with whitish; back with sharply defined, continuous, narrow transverse bars, of creamy-white. *Hab.* Interior regions of Continental Arctic America (Slave Lake, Yukon, and McKenzie River

district) ... var. *sacer*.

4. *Adult*. Top of head not streaked with whitish; back without sharply defined bars of the same. *Hab.* Continental Arctic Europe (Scandinavia) and Siberia. Migrating south, in winter, to Bengal (Hardwicke) ... var. *gyrfalco*.⁴⁸

b. Lower parts with dusky predominating, or wholly dusky.

5. *Adult*. Almost entirely dusky, without well-defined markings anywhere. *Hab.* Littoral regions of the Hudson Bay Territory and Labrador ... var. *labradora*.

2. F. lanarius. Wing, 11.50–16.00; tail, 6.60–9.50; culmen, .70–1.00; tarsus, 1.90–2.40; middle toe, 1.65–2.00. Ground-color varying from pale grayish-plumbeous to dark sepia-brown; beneath white, with sparse markings, these coalesced into a broken patch on the flanks. *Adult*. Above obscurely barred transversely with pale ashy and brownish-dusky, the former prevailing posteriorly, the latter anteriorly; a lighter nuchal band. Spots on the sides and flanks transverse. *Young*. Above brown, varying from grayish-drab to dark sepia, the feathers usually bordered with paler (rusty in youngest individuals); markings beneath all longitudinal.

a. Outer webs of tail-feathers with large well-defined

⁴⁸ *Falco gyrfalco*, var. *gyrfalco* (Linn.). *Falco gyrfalco*, Linn. S. N. 1766, p. 130.—Gmel. S. N. 275.—Schleg. Rev. Crit. II, Tr. de Fauc. pl. iii; F. van Nederl. Vog. pls. iii and iv.—Naum. Vog. pl. cccxci. *Hierofalco gyrfalco*, Schleg. Bonap. Rev. Zool. 1854, 535.—Newton, Oötheca Wolleyana, I, 87, pl. c. *F. gyrfalco norvegicus*, Wolley. *Falco gyrfalco norvegicus*, Schleg. Mus. Pays-Bas, 1862, 12. *Falco candicans*, var. γ, Blas. Wing, 13.00–14.50; tail, 9.30; culmen, .98; tarsus, 2.50; middle toe, 1.92.

light spots; outer webs of the primaries sometimes with light spots on the basal portion; secondaries without distinct spots on the outer webs. Lower tail-coverts immaculate.

Wing, 13.65–16.00; tail, 8.40–9.50; culmen, .85–1.00; tarsus, 1.95–2.15; middle toe, 1.85–1.95. Top of the head white, with narrow streaks of dark brown. *Hab.* Central and Eastern Europe, Western Asia, and adjoining portions of Africa ... var. *lanarius*.⁴⁹

b. Outer webs of tail-feathers without distinct light spots, or without any at all; outer webs of primaries with no trace of spots; secondaries with light spots on outer webs. Lower tail-coverts sparsely spotted.

Wing, 12.00–14.25; tail, 7.60–9.00; culmen, .75–.90; tarsus, 2.15–2.40; middle toe, 1.70–2.00. Top of head brown, with narrow black streaks. *Adult.* Above with obscure transverse spots of bluish. *Young.* Above with feathers bordered with rusty ... var. *polyagrus*.

Wing, 11.50; tail, 6.60; culmen, .70; tarsus, 1.90; middle toe, 1.65. Above uniform dark brown, with a faint plumbeous cast, the feathers without trace of light or rusty edges; outer web of tail-feathers without trace of light spots. *Hab.* Mexico ... var. *mexicanus*.⁵⁰

⁴⁹ *Falco lanarius*, var. *lanarius* (Schlegel). *Falco lanarius*, Schleg. Krit. Ueb. II, et 11.—Ib. Tr. Fauc. 6; Mus. Pays-Bas, *Falcones* 14; Abh. Zool. 16; Rev. 1844, 2; Naum. 1855, 252; Ibis, 1859, 86.—Bree, B. Eur. I, 1859, 37 (plate of adult!).—Tristram, Ibis, 284.—Gray, Hand List, I, 1869, 19, No. 171. Pelz. Ueb. der Geier und Falk. II, 1863, 20. *Falco lanarius* α, Schleg. Tr. Fauc. 23. *Gennaia lanarius*, Schleg.—Bonap. Rev. 1854, 535. *Falco feldeggii*, Schleg. Abh. Zool. 3–6.

⁵⁰ *Falco lanarius*, var. *mexicanus* (Licht.). *Falco mexicanus*, “Licht. Mus. Berol.”—Schleg. Abh. Zool. 1841, 15.—Schleg. *Falcones*, Mus. Pays-Bas, 1862, 18.—Pelz.

Wing, 13.60–14.30; tail, 8.25–9.00; culmen, .80–.87; tarsus, 1.85–1.90; middle toe, 1.85–1.90. Colors similar to the last; entire auriculars white; mustache narrow and conspicuous. *Hab.* Southern Asia ... var. *jugger*.⁵¹

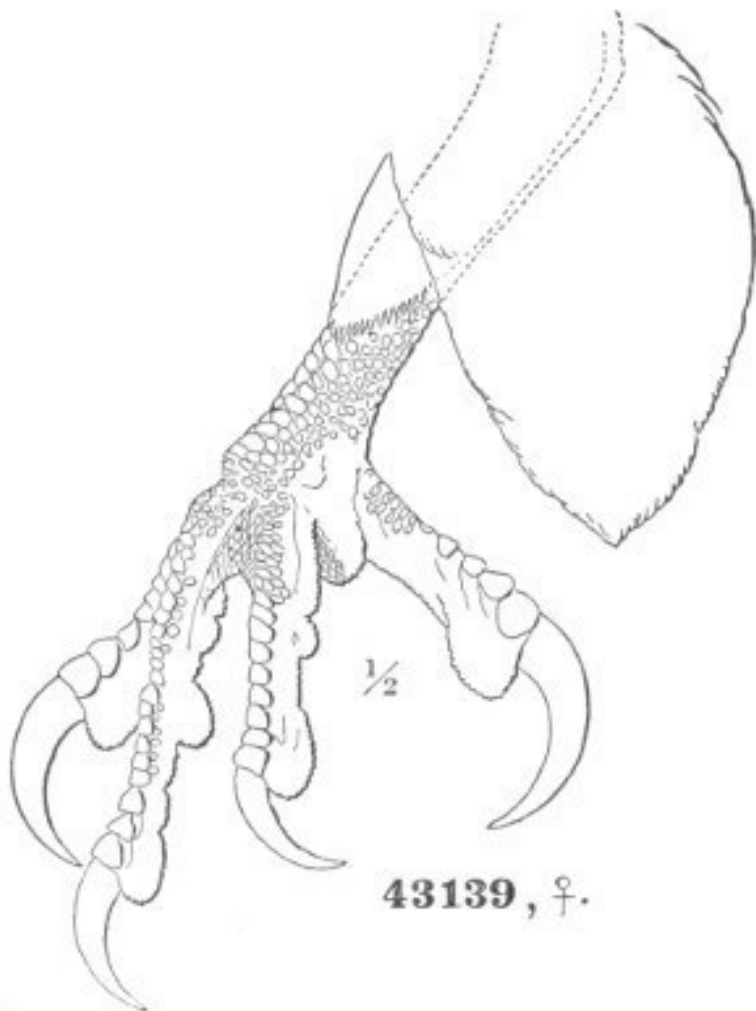
The only point of difference in the external anatomy between the Lanner Falcons and Gerfalcons consists in the different degree of feathering on the upper part of the tarsus; this is much denser and extends farther down and more around the posterior face in the Gerfalcons, but they, being inhabitants of a very northern latitude, need this protection against the rigor of the climate. These slight specific differences are illustrated by the figures on page 1430. The same difference is observable in many birds whose habitat extends through a great range of latitude, as, for instance, the *Pediocætes phasianellus*, the northern race of which has the feathers covering the base of the toes so long as to reach beyond the claws and nearly conceal them, while in the southern form (var. *columbianus*) the toes are almost completely naked.

My determination of the number and character of the geographical races of *F. gyrfalco* is the result of a very careful

Neb. der Geier und Falk. II, 1863, 19. "*Falco sublanarius*, Natterer."—Pelz. Ueb. der Geier und Falk. II, 1863, 19.

⁵¹ *Falco lanarius*, var. *jugger* (Gray). *Falco jugger*, Gray, Hardw. Ill. Ind. Zool. II, pl. xxvi, 1832.—Bonap. Consp. 24.—Gould, B. Asia, pl. i.—Jerdon, B. India, 30.—Strickl. Orn. Syn. 1855, 79, No. 129.—Schleg. Abh. pl. xv; Mus. Pays-Bas. I, 17. *Falco lugger*, Jerd. Aladr. Journ. X, p. 80; Ill. Ind. Orn. pl. xlv.—Blyth, Journ. Ass. Soc. Bengal, XI, 104. *Falco thermophilus*, Hodgs. Zool. Misc. 1844, 81. *Falco lanarius*? Blyth, J. As. Soc. Beng. XIX, 318.

critical examination of over sixty specimens, aided by the important conclusions of Mr. Hancock (*Annals and Magazine of Natural History*, 2d ser., XIII, 110; London, 1834), Schlegel (*Falcones*, Muséum d'Histoire Naturelle des Pays-Bas, 1862), Pelzeln (*Uebersicht der Geier und Falken der Kaiserlichen ornithologischen Sammlung*, April, 1863), and Alfred Newton (*History of British Birds*, revised ed., part 1, June, 1871, pp. 36–52, and *Proc. Acad. Nat. Sc. Philadelphia*, July, 1871, pp. 94, 95), in their important papers bearing upon this subject, which, though they each express the peculiar individual views of the writer, together clear up pretty satisfactorily the problem of the number, character, and habitats of the several races, as well as the different phases of variation to which each is subject.



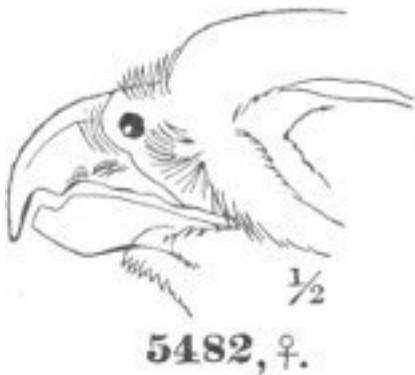
43139, ♀.

43139, ♀. $\frac{1}{2}$

Falco sacer.



43139, ♀. $\frac{1}{4}$



5482, ♀. $\frac{1}{2}$

Falco polyagrus.



43139, ♀. 1/2



5482, ♀. $\frac{1}{2}$

In studying the *F. lanarius*, I have experienced most discouraging difficulties from the want of sufficient series of the Old World races, and from the unsatisfactory character of most descriptions and figures of them, besides being much perplexed by the confusion of their synonymy by different authors. In consequence of this, my diagnoses of the four races of which alone I have seen examples may be very unsatisfactory as regards the characters by which they may be most readily distinguished. Having seen the adult of only a single one of these four races, I am therefore compelled to base my differential characters upon

the immature stages.

In addition to the four races of *F. lanarius* characterized above, there are several geographical forms belonging to the Old World, chiefly intertropical Asia and Africa. These are the var. *babylonicus*, Scl. and Irby, (Gray's Hand List, I, p. 20, No. 173,) of Southeastern Europe and Western Asia; var. *barbarus*, L. (Gray's Hand List, p. 20, No. 174), of Northern Africa; and var. *tanypterus*, Licht. (Gray's Hand List, No. 175), of both the preceding regions, which Mr. Gurney writes me "is simply the intertropical race of *F. lanarius*, from which it only differs in being of a darker shade throughout." The *F. saker*, Schleg. (Gray's Hand List, No. 176), seems, to judge from the descriptions and figures which I have seen, to be also merely a form of the same species, but I have seen no specimens of it.

Falco (Hierofalco) gyrfalco, Linn

Var. candicans, Gmelin

WHITE GERFALCON

Accipiter falco freti hudsonis, Bris. Orn. I, 356, 1763.
A. gyrfalco, Briss. Orn. I, 370, pl. xxx, f. 2, 1763. *Falco*

rusticolus, Fabr. Faun. Groen. p. 55, 1780.—Lath. Syn. Supp. I, 15, 1781. *F. candicans*, Gmel. Syst. Nat. p. 275, 1788.—Daud. Tr. Orn. II, 101, 1800.—Benick, Isis, 1824, 882.—Schleg. Krit. Ubers. p. 1, 1844.—Bonap. Rev. Zool. 1850, 484; Consp. Av. p. 33.—Cassin, Proc. Ac. Nat. Sc. Phil. 1855, 278; Birds N. Am. 1858, 13.—Strickl. Orn. Syn. I, 77, 1855.—Blasius, Cab. Jour. 1862, 43 (thinks all boreal ones same in Europe and America).—Elliot, Birds N. Am. pl. xii. *Hierofalco candicans*, Cuv. Reg. An. ed. 1, I, 312, 1817; ed. 2, I, 323, 1829.—Less. Man. Orn. I, 80, 1828; Tr. Orn. p. 97, pl. xvi, p. 2.—Gray, Hand List I, 18, 1869. *Falco islandicus*, Lath. Ind. Orn. p. 32, 1790; Syn. I, 71, A, B; Gen. Hist. I, 72, A, 1821.—Steph. Zool. XIII, pt. ii, p. 39, 1826.—Gould, B. Eur. pl. xix.—Aud. Birds Am. 1831, pl. ccclxvi. *F. buteo* β , Lath. Ind. Orn. p. 24, 1790; Gen. Hist. I, 80, A. *F. lagopus*, β , Lath. Ind. Orn. p. 19, 1790; Syn. Supp. I, 36; Gen. Hist. I, 68, A. *F. grælandicus*, Daud. Tr. Orn. II, 157, 1800. *Hierofalco grælandicus*, Brehm. Voy. Deutsch, I, 16, 1831. *F. gyrfalco*, Bonap. List, p. 4, 1838.

Sp. Char. *Adult* (♀, 18,577, Greenland; Univ. Zool. Mus. Copenhagen). Ground-color entirely pure white; whole upper surface (posterior to the nape) with transverse crescentic bars of dark plumbeous-brown, generally about two on each feather, the first concealed by the feather which overlaps. Primaries crossed at regular intervals with quadrate spots of the same tint, these becoming fused toward ends of quills, forming a terminal dusky space of two or three inches in extent; tips of all the quills

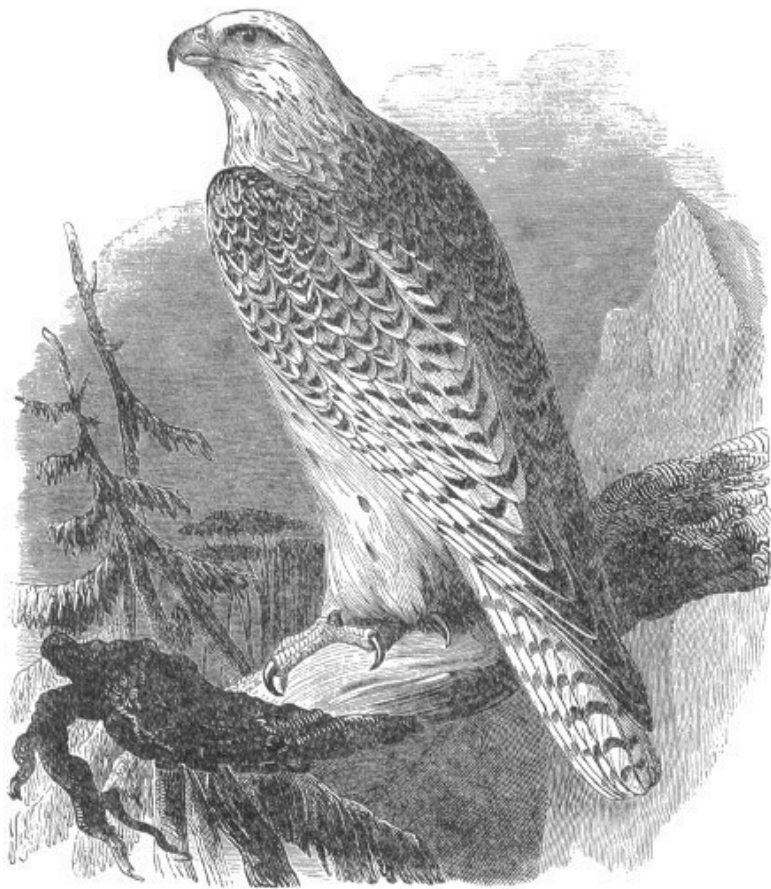
narrowly white; the black bars do not extend quite to the primary coverts, and decrease both in extent and regularity toward the base. Middle tail-feathers crossed with seven or eight imperfect bars of dusky, the shafts of the feathers blackish; rest of tail immaculate, the shafts pure white. Nape with a very few fine shaft-streaks of dusky. Whole lower surface of body and wing utterly immaculate. Wing-formula, 2-3-1. Wing, 16.50; tail, 9.00; culmen, 1.05; tarsus, 2.10-1.35; middle toe, 2.20; inner, 1.50; outer, 1.50; posterior, 1.00.

(No. 56,152, ♀, Greenland; Schlüter Collection.) Head above, occiput, nape, and upper half of ear-coverts, with sparse shaft-streaks of black, these most numerous on the latter region; primaries barred to the coverts. Tail entirely crossed by eleven plumbeous bars. Bars above clearer plumbeous. The snowy-white beneath is relieved by a few minute variable flecks of dusky upon the lower part of the abdomen, becoming larger as they approach the sides. Wing-formula, 2-3-1. Wing, 16.70; tail, 9.30.

Juv. transition stage? (♂ 56,047, "Hoher Norden"; Schlüter Collection). Markings above quite different from those of the two preceding; each feather has a large central longitudinal sagittate spot of dusky, leaving only the borders (of the exposed portion) white; on the primaries the dusky is almost confined to the terminal portion; the rump and upper tail-coverts have each feathers with a medial longitudinal stripe of dusky. The tail is immaculate, but the shafts of the middle feathers are dusky. The

neck, breast, abdomen, and sides have numerous cuneate marks of dusky, one near the end of each feather. The lining of the wing, even, has a few narrow streaks. Wing, 14.75; tail, 9.40.

No. 56,049 (♀, Greenland, Schl. Coll.) is similar in pattern of markings, but above the dusky is more extended, forming the predominating color; the rump, etc., has broad sagittate spots instead of narrow stripes; the primaries are barred to the coverts; the tail is crossed by about ten continuous bands of dusky. Beneath the lanceolate spots or streaks cover the whole surface, except the anal region, lower tail-coverts, and throat. On the lining of the wing the streaks are less sparse than in the preceding, though they are by no means numerous. Wing, 15.75; tail, 9.50.



Falco candicans.

Juv. first plumage (♀, 56,053, Greenland; Schlüter Coll.). All the markings are longitudinal, instead of directly the reverse.

The upper parts have longitudinal tear-shaped stripes, a medial one on each feather; they are sparse, however, on the wings; the rump has narrow shaft-lines of dusky. The tail and upper coverts are immaculate, but the shafts of all the feathers are nearly pure black. The bars on the primaries are found only immediately next the dusky terminal space. The streaks beneath are not very numerous, and are found only on the breast, upper part of abdomen, and on the sides; the nape and sides of the neck are, however, thickly streaked.

(No. 17,966, ♀, Moose Factory, Hudson Bay Territory.) In character of markings resembling the last, but the stripes are fainter and narrower; they are also less numerous. On the under parts they are wanting. Unfortunately, the tail of this specimen, which is the only North American one in the collection, is missing.

In all specimens the anal region and lower tail-coverts are immaculate.

Hab. Greenland, and continent of North America, north of Hudson Bay (breeding in latter region). Of irregular occurrence in winter throughout the circumpolar regions; Ural Mountains (Eversman); Behring's Strait (Bannister).

LIST OF SPECIMENS EXAMINED

National Museum, 7; Boston Society, 2; Philadelphia Academy, 3; New York Museum, 6; collection of R. Ridgway,

1. Total, 19.

Measurements.

<i>Sex.</i>	<i>Wing.</i>	<i>Tail.</i>	<i>Culmen.</i>	<i>Tarsus.</i>	<i>Middle Toe.</i>	<i>Specimens.</i>
♂	14.40–14.75	9.70–10.00	.90–1.00	2.15–2.45	1.95–2.00	3
♀	15.75–16.25	10.00–11.00	.98–1.00	2.20–2.50	2.05–2.15	6

Var. islandicus, Sabine

ICELAND GERFALCON

Accipiter falco islandicus, Briss. Orn. I, 336, 1763. *Falco islandicus*, Sab. Linn. Trans. XII, 528, 1818.—Temm. Man. Orn. pt. x; 17, pt. iii, p. 9; Tab. Meth. p. 2, 1836. —Faber, Prod. Island. Orn. 1822, p. 2; Isis, 1827, 62.—Rich. & Swains. F. B. A. II, 27, 1831.—Hoy, Mag. Nat. Hist. Ser. 1, VI, 107.—Hancock, Ann. Nat. Hist. II, 247; Rev. Zoöl. 1839, 123.—Bonap. Consp. Av. p. 24.—Strickl. Orn. Syn. I, 77, 1855.—Cassin, Birds N. Am. 1858, 13. *Hierofalco islandicus*, Gray, Gen. B. p. 3 (ed. 2, p. 4), 1844; Hand List, I, 18, 1869. *Falco candicans islandicus*, Schleg. Krit. übers. p. 1, 1844. *Falco lanarius*, Faber, Isis, 1827, 68. *Falco gyrfalco*, Keyserling & Blasius, Wirbelth. Eur. p. 135, 1840.

Sp. Char. *Adult* (♂, Iceland; No. 12, Coll. Geo. N. Lawrence).

Ground-color of the plumage dull white, gradually becoming somewhat bluish posteriorly, this color especially noticeable on the tail. Whole upper parts crossed with broad transverse bands of dark plumbeous, these bands continuous, and more than twice as wide as the pale ones, except on the upper tail-coverts and tail, where the bands of the two colors are more regularly defined and about equal; in addition to the transverse bands, the feathers anteriorly have narrow borders of white. Tail with the dark bands twelve in number; the terminal pale band is purer white than the others. The dusky plumbeous prevails on the primaries, and is unvariegated beyond the middle portion; the anterior half, however, is marked with quadrate ragged spots, of a slightly yellowish-white; all are margined terminally with purer white. Each feather of the head and neck with a narrow medial streak of dusky, but the general aspect abruptly lighter than the back; the streaks are more condensed along the upper and terminal portion of the ear-coverts. Jugulum and breast with a medial narrow streak on each feather; abdomen with more elliptical streaks; sides with circular and cordate spots, and flanks and tibiae with transverse spots; lower tail-coverts with narrow shaft-streaks of dusky. Lining of the wing with sparse narrow streaks of dusky; under surface of primaries with white prevailing, this, however, crossed by narrow bars of dusky, these numbering about sixteen on the longest. Wing-formula, 2-3-1. Wing, 14.60; tail, 7.80; culmen, 1.00; tarsus, 2.30; middle toe, 2.00.

Juv. (No. 20,344, Iceland). Ground-color of head, neck,

and lower parts, white. Upper surface grayish umber-brown, becoming paler and more grayish on the tail; each feather above sharply bordered (both webs, all round) with dull white, producing a somewhat squamate appearance; in places, a few obsolete hidden spots of yellowish-white. Tail ashy-drab (feathers somewhat paler along edges), crossed with about eleven transverse series of spots of ochraceous or creamy white; these very obsolete on middle feathers, and sharply defined only on inner webs; the last is terminal. Primaries plain brown, somewhat darker than the back, and becoming insensibly darker terminally; skirted with white, and somewhat mottled or irregularly spotted toward their bases with yellowish-white. Head and neck, each feather, with a medial streak of dusky, but white the prevailing aspect; these streaks condensed and somewhat suffused along upper border of ear-coverts, and from the lores along cheeks, forming an obsolete "mustache"; every feather beneath (including lining of wings) with a medial broad stripe of clear plumbeous vandyke-brown, the shaft pure black; under surface of primaries with transverse spaces of white, these numbering thirteen on the longest. Wing-formula, 2-3, 1. Wing, 15.00; tail, 9.20.

Hab. Iceland and Southern Greenland. Northeastern North America in winter, straggling accidentally south to the New England States; Rhode Island (Museum, Cambridge); Norway, Maine "not uncommon" (Verrill); Massachusetts (Peabody & Jillson); Long Island (Cab., G. N. Lawrence).



Falco islandicus.

No. 56,050, Greenland (Schlüter Collection), is moulting, and assuming the adult dress; the adult and young stages above described being nearly equally combined. No. 56,055, from Greenland, differs from the other young individuals which I have seen in being considerably darker. The feathers of the upper surface are not bordered with whitish, but are merely paler on their edges, along which are specks of yellowish. On the head and neck the dark streaks predominate, while the stripes below are very broad. It approaches quite nearly toward the young of var. *sacer*.

The only specimen of this race which I have seen from Continental North America, is a young individual, obtained during the winter of 1864–65, near Providence, R. I., taken by Mr. Newton Dexter, and now in the Cambridge Museum, where I had the pleasure of seeing it.

LIST OF SPECIMENS EXAMINED

National Museum, 5; Boston Society, 3; Philadelphia Academy, 9; Coll. G. N. Lawrence, 2; Museum Comp. Zoöl., 1; New York Museum, 5. Total, 25.

Measurements.

<i>Sex.</i>	<i>Wing.</i>	<i>Tail.</i>	<i>Culmen.</i>	<i>Tarsus.</i>	<i>Middle Toe.</i>	<i>Specimens.</i>
♂	14.35–14.75	8.80–10.00	.91–1.00	2.20–3.00	1.95–2.15	9
♀	16.25–16.50	10.00–11.50	1.00–1.05	2.30–2.70	2.00–2.25	10

Var. *sacer*, Forster

MacFARLANE'S GERFALCON

Falco sacer, Forster, Phil. Trans. LXII, 1772, 383 and 423.—Coues, Birds of New England, 1868, 6.—Baird, Trans. Chicago Acad. Sc. I, ii, 271. ? *Falco cinereus*, Gmel. Syst. Nat. p. 267, 1789.

Sp. Char. *Adult* (♂, 51,689, Yukon, mouth of Porcupine River; Strachan Jones). Whole upper surface with numerous transverse bands of brownish-plumbeous and ashy-white. Anteriorly the light bars are about half the width of the dark ones; posteriorly they gradually increase, the bands of the two colors being about of equal width on the upper tail-coverts and tail; with the increase of the lighter bars, they become more ashy, and, correspondingly, the darker ones are more plumbeous; on the rump there is but little contrast between the bands of the two, causing a prevalent bluish cast. The bands are everywhere continuous, the light ones being interrupted only by

the black shaft; there are generally on the anterior portions about three light bars on each feather, the last always terminal. Tail tipped with white, and crossed with equal continuous bands of hoary-plumbeous and ashy-white; the latter eleven in number, and finely sprinkled with deeper ash. Primaries brownish-plumbeous, plain past the middle portion, but on the anterior half with quadrate spots of creamy white on the outer web. Head above brownish-plumbeous, this prevailing; but along the median line the feathers are edged with buffy white; forehead dull white, this continuing back in a streaked superciliary stripe to the occiput; cheeks very thinly marked with fine streaks of dusky, this prevailing along the upper border of the ear-coverts; a deeper dusky suffusion beneath the anterior angle of the eye. Lower surface pure white; chin and throat, only, immaculate; jugulum with very sparse, narrow longitudinal streaks of blackish; sides with scattered cordate or nearly circular spots, these larger and transverse on the flanks and tibiæ; abdomen with scattered minute elliptical spots; lower tail-coverts with minute irregular sagittate or transverse spots of dusky. Under surface of the wing white; each feather of the lining with a medial tear-shaped streak of dusky; primaries crossed with narrow bars of dusky, fifteen in number on the longest. Wing-formula, 2-3-4-1-5. Wing, 13.50; tail, 8.60; culmen, .90; tarsus, 2.15; middle toe, 1.87.

♀ (43,139, Fort Anderson, May 24, 1864, "♀ and two eggs"; R. MacFarlane). Generally similar to the male. Head above conspicuously streaked, but the dusky prevailing. Above the

transverse bands are less regular and continuous, anteriorly the plumbeous largely prevailing; posterior portions, however, as in the male, but on the rump the bands are more distinct. Beneath, the markings are more numerous, larger, and broader; those on the jugulum linear; those of the abdomen medially elliptical, laterally they are transversely cordate, and on the flanks in form of broad transverse spots, or broad bars; on the tibiæ and lower tail-coverts they form regular transverse bars,—on the latter, quite distant. Wing-formula, 2–3–4, 1. Wing, 15.50; tail, 9.50; tarsus, 2.15 and .80; middle toe, 1.95.

Juv. (♂, 55,400, Alaska, Nulato, February 10, 1868; W. H. Dall). Above plumbeous-umber, precisely as in young of *islandicus*, but on the rump having a decided ashy cast. No white edges to the feathers, as in *islandicus*, but, instead, numerous irregular transverse spots or obsolete ragged bars of cream-color or pale ochraceous-buff; the whole upper surface is quite thickly variegated with these irregular markings. Tail crossed with thirteen narrow bands of creamy-white, these so thickly mottled with dusky on the outer webs as to be obscure, but on inner webs they are regular and sharply defined; the last is terminal. Primaries plain dusky, skirted obscurely with paler, and marked toward bases with obsolete mottled spots of cream-color. Head streaked with dusky and creamy-white, the former predominating on upper surface, along upper edge of ear-coverts, and across the cheeks, on the latter forming a mustache; the white prevails over the ear-coverts in a broad supra-oral stripe,

and on the forehead and lores. Beneath, soft dull white; chin and upper part of throat, only, immaculate; each feather with a broad medial stripe of clear dark plumbeous-brown, on the flanks and tibiae prevailing, the whitish assuming the form of roundish spots; lining of the wing similarly marked; prevailing aspect of under surface of primaries white, crossed with narrow bars of ash, fifteen in number on the longest. Wing-formula, 2, 3-1=4. Wing, 14.00; tail, 8.40.

Hab. Interior regions of Arctic America; Anderson River, McKenzie, Yukon, and Severn River regions. Breeding abundantly in the former district, whence numerous specimens of skins and eggs have been received by the Smithsonian Institution.

In the young specimen described, there are one or two new feathers appearing on the rump and upper tail-coverts, precisely as in the blue plumage, and proving conclusively their relationship. The species is as different from the Iceland bird in the young stage as in the mature. The most readily apparent differences are, lack of sharp white edges of feathers above, and in their stead numerous ragged transverse spots of yellowish; dark aspect of head above, etc.

Specimens vary considerably in the shades of color and distribution of the markings, but the types of the above descriptions are the lightest of the series. The darkest example is No. 43,144½ ("♀ and eggs"), Fort Anderson, May 22, 1864. In this the whole head and neck (except underneath) are continuous

blackish-plumbeous, only the middle of the auriculars being faintly streaked; the back is nearly plain dusky, and even on the wings the bars are very obscure and much reduced in width. The rump is plain ashy-blue, the darker bars being nearly obsolete. The longitudinal markings on the pectoral region are enlarged into conspicuous stripes, while on the sides and flanks the transverse bars form heavy spots. The transverse bars on the tibiæ are ashy-blue; those on the crissum clear plumbeous, and regularly transverse. Wing, 15.75; tail, 9.30. Upon comparing this specimen with the figures of a pair of var. *gyrfalco*, by Wolf, in Newton's Oötheca Wolleyana, I can discover no difference at all; thus it would seem that our bird occasionally closely approaches in tints and markings this race of Continental Europe, of which I have seen only one immature example, and no adults.

I cannot agree with Mr. Newton in considering the Gerfalcons of the interior of Arctic America as identical with the Iceland form, though that distinguished ornithologist considers them so in his paper in the Proceedings of the Philadelphia Academy for July, 1871, basing his conclusion upon the specimens from which the above descriptions were taken, which had been sent over to England for comparison. I have never yet seen a specimen of *islandicus* which could not be distinguished, by the characters given in my synopsis, from these examples, while they can be separated from that race by the characters which Mr. Newton himself gives, in his diagnostic table in the paper above cited, for

distinguishing the adults of *islandicus* and *gyrfalco*.

The var. *sacer* is evidently separable from both *islandicus* and *gyrfalco*, and about as much related to one as to the other; combining the size and proportions of the former with the colors of the latter, while in the wide amount of individual variation of plumage its lighter extreme approaches one, while its darkest phase approximates as closely to the average plumage of the other.

LIST OF SPECIMENS EXAMINED

National Museum, 6.

Measurements.

<i>Sex.</i>	<i>Wing.</i>	<i>Tail.</i>	<i>Culmen.</i>	<i>Tarsus.</i>	<i>Middle Toe.</i>	<i>Specimens.</i>
♂	13.35–14.25	8.50–9.00	.86–.93	2.15–2.40	1.80–1.95	3
♀	15.50–16.00	10.00–10.50	1.00–.00	2.35–2.55	2.00–2.15	3

Var. *labradora*, Audubon

BLACK GERFALCON

Falco labradora, Aud. B. Am. pl. cxcvi, 1831.

Sp. Char. *Adult* (♀ breeding plumage? 30,375, Rigolet,

Labrador; Mr. Conolly). Ground-color of the plumage uniform, very deep, clear, dark plumbeous-brown, continuously uniform above; larger scapulars, secondaries, secondary coverts, and primaries more dilute along edges, however, the tint palest and broadest terminally. Tail perfectly uniform, except at the end; the tip being narrowly whitish, and about half an inch anterior to this, a transverse series of hidden irregular transverse creamy-white spots. The head (except beneath) is unvariegated. Beneath, the dark tint inclines more to blackish clove-brown, more dilute on the tibiæ; feathers edged laterally with white, this prevailing on the throat, but everywhere else far less than the dusky in amount; on the tibiæ and lower tail-coverts the white is in the form of irregular spots. Anal region unvariegated; lining of the wing with circular spots of white along the outer webs of the feathers. Under surface of primaries with plumbeous prevalent, but this crossed with mottlings of whitish, forming transverse bars; but terminally and basally they become confused or lost. Wing-formula, 2, 3-1, 4. Wing, 16.20; tail, 9.50; tarsus, 2.00-.90; middle toe, 2.05; inner, 1.50; outer, 1.50; posterior, .90.

Hab. Labrador; south and westward in winter, and shores of Hudson Bay.

Nos. 17,063 (♀, Quebec, W. Cooper) and 34,960 (♀, Fort Nescopce, Labrador) differ from the preceding in having ten small narrow transverse spots of reddish-white on the tail-feathers, forming as many indistinct bands; these spots touch neither the shaft nor the edge of the feather, and are almost

concealed, unless the tail is spread; on the latter specimen they are very obsolete, the subterminal one only being distinct, as in the specimen selected for description. The upper tail-coverts also show faintly indicated spots, and the former specimen has the wing-coverts with very narrow irregular spots on the edge of the feathers. In this specimen there is also one feather in the scapulars which has broader white edges; it also has the white below about equal to the black in amount; the anal region, however, in all, is unvaried blackish, and the transverse oblique bands on the lower tail-coverts are a constant feature.

No. 41,185 (♀, Fort Nescopec, Labrador; H. Conolly) is the darkest of all. In this the blackish plumbeous-brown is uniform over the whole surface; even the throat is unvariegated. Abdomen with a few of the feathers edged with white, and sides with a few small circular spots of the same; lower tail-coverts transversely spotted with white; tibiæ scarcely variegated, showing only narrow indistinct whitish edges. Mottling on inner webs of primaries reduced so as to be scarcely visible. Tail with the usual number (two) of irregular whitish bars,—one terminal, the other near the end.

LIST OF SPECIMENS EXAMINED

National Museum, 2; Boston Society, 1. Total, 3.

Measurements.

<i>Sex.</i>	<i>Wing.</i>	<i>Tail.</i>	<i>Culmen.</i>	<i>Tarsus.</i>	<i>Middle Toe.</i>	<i>Specimens.</i>
♂	14.50—00.00	9.00—00.00	.90—0.00	2.12—0.00	1.90—0.00	1
♀	15.50—15.75	9.50—10.00	1.00—1.05	2.00—2.35	2.00—2.10	2

Habits. In treating of the general habits of the Gerfalcons of North America it will not be necessary, nor will it be possible, to give the distinctive peculiarities belonging to the several forms in which these Falcons occur. Whether, on account of their variations of plumage, we consider them as races or as specifically distinct, does not affect their history in this respect. There is no good reason for presuming that they have any very noticeable variations as to any of their habits, although certain writers claim for some of them certain well-marked peculiarities of character.

In the matter of geographical distribution they are all, for the most part, rarely seen, even in midwinter, south of the 50th parallel of north latitude, and are found in the summer as far north as the Arctic Ocean. The Gerfalcons of the McKenzie River region, occurring from the Slave Lake to Anderson River and the Yukon, is the form elsewhere given as the *F. sacer*. Along our eastern coast region occurs another form, the *F. labradora*, which is the bird met with in Labrador, and described by Mr. Audubon. The *F. candicans* or *grœnlandicus* is a form peculiar to Greenland, visiting also, in the winter, the Hudson's Bay region; while the *F. islandicus*, a well-known European form, occurs in

Greenland also, and occasionally farther south.

Holböll, in his account of the birds of Greenland (Isis, 1845), appears to recognize but one species of Gerfalcon as occurring there, to which he gives the name of *islandicus*. This is, he states, the most abundant Falcon in Greenland, and is equally common in the northern and in the southern parts. Their great variations in color he regarded as indicative of differences in ages to only a very limited extent, and as in no respect specific. These differences in color were found among both nestlings and breeding birds, white and dark birds being found together in both circumstances. The white birds were more numerous in Northern Greenland, and the dark ones oftener seen in the southern portion.

He found the young birds moulting throughout the winter. On the 4th of January, 1840, he shot a young female that showed signs of moulting about the head and neck, with a striped white appearance from the sprouting feathers. The ovaries were quite well developed, and it was evident that the birds of this species breed in the first season after their birth. Holböll adds that they breed in January, that their eggs are of nearly the same color as those of the Ptarmigan, but are twice as large. They nest usually in inaccessible cliffs. They prey chiefly upon water-fowl and Ptarmigans, and usually build near "bird rocks," from which they obtain the young without much trouble. He mentions having once seen one with a young *Larus tridactylus* in each foot, and another with two *Tringa maritima* carried in the same

manner. Its rapidity of flight Holböll did not regard as very great. He had for years kept pigeons, and only lost two young birds, which were seized when at rest. Almost every day, especially in October and November, these Falcons would chase the old Pigeons unsuccessfully, and were often shot when they followed them too near the house. They were not particularly shy, and were occasionally decoyed and killed by throwing a dead bird towards them.

During the summer they are most numerous along the bays, especially where there are "bird-rocks" near. In September they go southerly along the coast, and also in October and November. At this time they are not rare, and approach the houses of the Danes, near which they are often seen fighting with the Ravens. Their spring migrations are not so regular as they are in the autumn, or perhaps at this time they do not approach the houses so frequently. When they are near the settlements, it is noticed that in the morning they fly towards the south, and in the evening towards the north.

Richardson speaks of the Gersfalcon as a constant resident in the Hudson Bay territory, where it is known as the Speckled Partridge-Hawk, and also as the Winterer. Its southern limit he could not give, but he never met with it south of 52° . He traced it northward to the coast of the Arctic Sea, and probably to the most northern Georgian islands. He cites Captain Sabine as authority for its occurring as far north as latitude 74° on the west coast of Greenland. Richardson often met with it during his journeys over

the Barren Grounds, where its habitual prey was the Ptarmigan, and where it also destroyed Plover, Ducks, and Geese. He relates that in the middle of June, 1821, a pair of these birds attacked him as he was climbing to the vicinity of their nest, which was built on a lofty precipice on the borders of Point Lake, in latitude $65^{\circ} 30'$. The bird flew in circles, uttering loud and harsh screams, stooping alternately with such velocity that their motions through the air produced a loud rushing noise. They struck their claws within an inch or two of his head. Keeping the barrel of his gun close to his cheek, and suddenly elevating its muzzle when they were in the act of striking, he found that they invariably rose above the obstacle with the rapidity of thought, showing equal power of motion. They bore considerable resemblance to the Snowy Owl, but their flight was much more rapid.

Mr. MacFarlane, in the memoranda of his collections in the neighborhood of Anderson River and Fort Anderson, furnishes notes of eighteen nests of the Gerfalcon obtained by him in that region. With only two exceptions, these were placed near the tops of pines, or other trees, at distances from the ground varying from ten to twenty-five feet. In some instances the nest was placed on the very top of the tree, in others on a lower limb against the trunk. They were composed of twigs and small branches, and lined with mosses, hay, deer's hair, feathers, and other substances. The parents were always very much excited whenever their nests were approached, making a great noise, and not unfrequently their loud screams drew attention to nests that

would otherwise have escaped notice. In one instance a nest had been built on a ledge of rocks thirty miles northwest of Fort Anderson. It was composed of a few withered twigs, and lined with mosses and hay. It was found on the 27th of May, and contained two eggs nearly fresh, and two in a state of greater development. One nest, placed on a broad branch of a tree, near the trunk, was of considerable size. Another nest was on the ground, on the side of a steep and high hill. The earliest date of finding these nests is given as the 10th of May. The eggs then found were fresh. The ground at that time was still thickly covered with snow, and the weather was very cold. In a nest found five days later the eggs contained partially developed embryos. In nearly every instance the eggs seem to have been in different stages of development in the same nest. In some, young birds were in the same nest with eggs only partially developed, and in another an egg perfectly fresh was in the same nest with others nearly ready to hatch. A nest found July 3 contained young about two days old; another, on May 27, had eggs with large embryos; and one, on June 25, had young nearly ready to fly.

Mr. Donald Gunn claims that this Falcon is the only Hawk that is resident in the Arctic regions throughout the year. It is known to the Indians by the name of Pepunesu, and this name is applied to it because it passes the winter with them. It is a very powerful bird, and commits great havoc among the Partridges, so much so that in former times the Hudson Bay Company gave a reward of a quart of rum to every hunter who brought in the head of one

of these Falcons. All the other Hawks are only summer visitors.

Mr. Bannister was informed by the residents of St. Michaels that a Hawk, presumed to be this species, is not unfrequent there, though he did not happen to meet with it. On his voyage home, on the 21st of October, 1866, when off the coast of Kamtschatka, north of Behring's Island, one alighted in the rigging of the ship, and continued with them for several hours.

Although very rare in any part of the United States, occasional individuals have been taken in different localities, and in one instance a pair was known to breed for several successive seasons in Vermont. This information I have from Mr. Clarence King, who, when a lad at school in the town of Dummerston, observed a pair nesting among some high cliffs, and informed me of the fact at the time of the occurrence. One of these birds is recorded by Mr. Lawrence as having been taken on Long Island in the winter of 1856.

Mr. Boardman gives it as occurring near Calais in winter, but very rare. Professor Verrill found them not uncommon in Oxford County, Me., where they were frequently seen during winter, flying about the extensive meadows near Norway; but they were very shy and watchful, and it was hardly possible to procure a specimen. It is very unusual in Eastern Massachusetts, and only very rarely and occasionally have specimens been taken. Mr. Jillson obtained a specimen, in 1840, at Seekonk. One was shot, in 1864, near Providence, R. I., by Mr. Newton Dexter.

Mr. Audubon relates that, August 6, 1833, his son, John W.

Audubon, found a nest of this Falcon among some rocky cliffs near Bras d'Or, Labrador, containing four young birds ready to fly, two of which were procured. The nest was placed among the rocks, about fifty feet from their summit and more than a hundred from their base. It was inaccessible, but, having been examined from above, was seen to be empty. It was composed of sticks, sea-weeds, and mosses, was about two feet in diameter, and was almost flat. Its edges were strewn with the remains of their food, and beneath the nest was an accumulation of the wings of Ptarmigans, Mormons, Uriæ, etc., mingled with large pellets of fur, bones, and various substances.

Their flight is spoken of as similar to that of the Peregrine Falcon, but more elevated, majestic, and rapid. Their cries were also like those of that Falcon, being very loud, shrill, and piercing. Occasionally this bird was seen to alight on one of the high stakes placed on the shore. There it would stand, in the position of a Tern, for a few moments, and then would pounce upon a Puffin, as the latter bird was standing at the entrance of its burrow, unaware of the approach of its enemy. The weight of the Puffin seemed to form no impediment to the Hawk in its flight.

The European Gerfalcons are said to seldom appear south of the 52d parallel of latitude, or north of 74°. They are nowhere numerous, and were formerly much sought for, and purchased, at immense prices, for purposes of falconry. Great differences were supposed to exist in regard to the habits and other peculiarities of the several races. The Iceland Falcons commanded the highest

prices, and were regarded as a species quite distinct from the *F. gyrfalco*. The former was much the more valuable, both as more rare, and as a bird of higher courage and of a more rapid and bolder flight, and a bird that could, on that account, be “flown” successfully at larger game.

The Gerfalcons, in Europe, build on the rocky coasts of Norway and Iceland, and are said to defend their young with great courage and determination. They are comparatively rare in the British Islands, especially the more southern portions. Even in the Orkneys it is only an occasional visitor.

All the eggs of the several forms of Gerfalcon that I have seen present common characteristics, and do not differ from each other more than eggs known to belong to the same species of Hawk are frequently found to vary. One from Greenland, presumed to belong to the *candicans*, measures 2.37 inches in length by 1.71 in breadth. The predominant color of its markings is a deep reddish-brown, very generally and nearly equally diffused over its surface, concealing the ground-color, which is lighter and of a yellowish-brown shade.

An egg of the *islandicus*, from Iceland, has the same measurements, but is so slightly yet uniformly marked with light yellowish-brown as to seem to be of one color only,—a light brown, shaded with yellow.

An egg from Norway, of the form *gyrfalco*, is 2.42 inches in length, 1.71 in breadth, has a ground-color of a dirty yellowish-white, and is marked with spots, dottings, and confluent blotches

of yellowish-brown, more so about the larger end.

The series of eggs of *Falco sacer* in the Smithsonian Collection exhibits the following range of variation in size, color, and markings: length, from 2.30 to 2.45 inches; breadth, 1.60 to 1.90 inches; ground-color usually a light reddish-ochre, varying to pinkish on the one hand, and to rufous on the other. They are usually sprinkled all over with small spots, which are sometimes not distinguishable from the ground-color when this is very deep, and again larger and quite conspicuous.

An egg of the variety *candicans*, from Greenland (No. 2,606, S. I.), measures 2.25 inches by 1.80. In color and in markings it is like the average eggs of variety *sacer*, namely, pale rufous, sprinkled over with a slightly deeper shade.

Falco lanarius

Var. polyagrus, Cassin

AMERICAN LANNER; PRAIRIE FALCON

Falco polyagrus, Cassin, B. Cal. & Tex. 1853, 88.—
Ib. P. A. N. S. 1855, 277; B. N. Am. 1858, 12.—Heerm.
Pacific R. Rep't, II, 1855, 31.—Kennerly, P. R. R. III,

1856, 19.—Coop. & Suckl. P. R. R. XII, 1860, 143.—
Coues, P. A. N. S. 1866, 7.—Strickl. Orn. Syn. I, 1855,
85.—Dresser, Ibis, 1865, 323.—Gray, Hand List, I, 1869,
20. *Falco lanarius*, var. *mexicanus*, Ridgway in Coues' Key,
1872.

Sp. Char. *Adult* (♂, No. 59,063, Wahsatch Mountains, Utah, May 23, 1868; parent of eggs; L. E. Ricksecker). Above cinereous-drab, becoming gradually paler and more bluish posteriorly, barred, indistinctly, everywhere with a more dusky tint, the shafts of all the feathers blackish; anteriorly the darker shade predominates, while posteriorly the bluish prevails; on the anterior portions the light bars are much restricted in width, and of a more ochraceous tint. Tail plain, very pale ashy-drab, narrowly tipped with reddish-white, this changing to pale rusty on the middle pair; the concealed portion of the feathers outside the shaft show obsolete, or faint traces of, darker bars, which on the middle pair are apparently about eleven in number. On the inner webs the paler bars become broader than the darker ones, and incline to ochraceous in tint, the lateral feather being edged externally with this color. Primaries plain ashy-drab, with a hoary tinge, growing insensibly darker terminally, and with a slightly paler apical margin. Head and neck above, dark umber-brown, with conspicuous shaft-streaks of black. Lores, a broad superciliary stripe (somewhat interrupted above the eyes), white, finely and sparsely streaked, the two stripes confluent across the occiput; a broad heavy "mustache" from the lores and rictus

downward and obliquely backwards, across the maxilla, and a wider postocular stripe, like the crown. Beneath continuous white, with a faint ochraceous tinge on the abdomen and crissum; abdomen and sides of the breast with a few scattered, small, ovate spots of vandyke-brown; sides transversely spotted with vandyke-brown, the spots coalesced into a broken patch on the flanks; outside of the tibiae with transverse spots of the same. Axillars plain, clear vandyke-brown, with a few nearly obsolete rusty specks near their ends; lining of the wing clear white, the feathers with central spaces of dusky-brown, which toward the edge become aggregated into a longitudinal patch; inner webs of the primaries with broad transverse spots of white, which reach nearly to the shaft; they are about thirteen in number on the longest quill. Feet yellow; base of the bill tinged with the same. Wing-formula, 2, 3-1, 4. Wing, 12.00; tail, 7.50; tarsus, 1.90; middle toe, 1.70; outer, 1.22; inner, 1.12; posterior, .77.

♀ (not *adult?* 18,258, Fort Buchanan, New Mexico; Dr. Irwin). Above continuous umber-drab, growing gradually lighter posteriorly, the tail being pale drab; no transverse bars (except a few concealed obsolete ones on back and secondaries), but all the feathers faintly bordered with paler rusty-brown, these edgings being on upper tail-coverts almost white. Tail tipped with creamy-white, and with many transverse spots or broad bars of the same on inner webs, outer feather irregularly skirted with the same, and all decidedly paler than the ground-color along their edges. Head as in the male, but forehead white,

and superciliary stripe more continuous. Breast and abdomen with longitudinal lanceolate or cuneate streaks of dark vandyke-brown; patch of same on flanks more continuous than in the male; axillars unvariegated clear dark vandyke-brown; longest primary with eleven transverse spots of white; posterior outer face of tibiae with sagittate spots of dark brown. Wing-formula, 2, 3-1, 4. Wing, 14.25; tail, 8.00; tarsus, 2.10; middle toe, 2.00.

Juv. (♂, 32,207, South Fork of the Platte River, July 19, 1838; C. S. McCarthy). Above darker umber than the last, each feather distinctly bordered terminally with rusty-ochraceous. Beneath with a deeper cream-colored tinge, streaks blacker; flank-patch more conspicuous and uniform; axillars unvariegated dusky. Wing-formula, 2, 3-1=4. Wing, 13.25; tail, 7.25.

Hab. Western division of North America, eastward to Illinois; Oregon to Lower California, and Texas. Localities: Texas, San Antonio and Eagle Pass (Dresser); Arizona (Coues).

The different stages of plumage are in this by no means so well defined as in other species, there being nearly the same general appearance in all. There is, also, very little variation in different specimens of the same age. No. 8,504, (♀, Dalles, Oregon; Dr. George Suckley) has the black markings on the sides of the breast more circular, and the vandyke-black of the axillars with a few circular white spots on the edges of the feathers. Wing, 14.50; tail, 8.40. Nos. 17,204 (♀, San José, Lower California; John Xantus, January, 1860) and 18,258 (♂ ? Fort Buchanan, N. M.) have the upper surface almost perfectly continuous grayish-drab,

the first absolutely unvariegated by markings, though the feathers fade a little on edges. Beneath, the white is very pure; the streaks are numerous, sharply defined and longitudinal. Wing, 13.25; tail, 7.50 (17,204).

The American Lanner Falcon is so very closely related to the Lanners of Europe and Asia (var. *lanarius* and var. *jugger*) that it is very difficult to indicate the differences which separate them. The two Old World forms above named are more unlike each other than they are from the two American races; the var. *jugger* differing from *mexicanus* apparently only in larger size; and the var. *lanarius*, more like *polyagrus* than it is like either *jugger* or *mexicanus*, differs from *polyagrus* mainly in the greater amount of white on the plumage, this imparting a lighter aspect to the pileum, and causing a greater development of the light spots on the outer webs of the primaries and rectrices.



Falco polyagrus.

The var. *polyagrus*, compared with var. *lanarius*, is much

darker, having, at all ages, the crown uniformly brown, with darker streaks, instead of having these streaks upon a white ground. The "mustache" is more distinct in the American bird, while in the European the bands on the tail are much more distinct, and the spots forming them are on the outer webs, as well as on the inner, instead of on the latter alone; the dark bars between the light spots are in the American bird much narrower and more numerous, and in the young the light ones come to the edge of the web, instead of being enclosed within the dark color. Two very young birds (i.e. in first perfect plumage) appear almost identical until closely examined, the chief differences being a lighter tint to the crown in the European, and heavier dark stripes on the breast, besides the peculiar character of the tail-spots, which are always distinctive. In shades of color, there is not the slightest difference.

I have seen no specimen of any of the Old World forms in the plumage corresponding to that transversely barred above, described here as the adult, though figures of the adult *lanarius* indicate a very similar plumage. The series of the latter race at my command is unfortunately limited to a very few immature specimens. One marked "ad." (56,051, Hungary; Schlüter Coll.) measures as follows: Wing, 14.50; tail, 8.00; culmen, .83; tarsus, 1.90; middle toe, 1.80. Its colors are as described in the synopsis (p. 1429) for the young bird.

The var. *mexicanus* and var. *jugger*, which are both much darker, and more uniform in the coloring of the upper parts, than

var. *polyagrus*, are more nearly alike; in fact, the only tangible difference that I can find between a specimen of the former in the Museum of the Boston Society of Natural History (No. 1,438, ♂, Juv. Lafr. Collection; "Mexico") and two examples of the latter in the New York Museum, consist in the larger size of the var. *jugger* (see synopsis), besides its whiter cheeks and more isolated and distinct "mustache." A direct comparison of these two races may show other tangible points of distinction, or, on the contrary, may show even these slight distinguishing features to be inconstant. The former result is, however, most reasonably to be expected.

LIST OF SPECIMENS EXAMINED

National Museum, 9; Boston Society, 2; Philadelphia Academy, 4; Museum Comp. Zoöl. 1; G. N. Lawrence, 2; R. Ridgway, 5. Total, 23.

Measurements.

<i>Sex.</i>	<i>Wing.</i>	<i>Tail.</i>	<i>Culmen.</i>	<i>Tarsus.</i>	<i>Middle Toe.</i>	<i>Specimens.</i>
♂	12.00–00.00	7.60–0.00	.00–.75	.00–2.15	.00–1.70	6
♀	13.25–14.25	8.00–9.00	.85–.90	2.05–2.40	1.85–2.00	12

Habits. This is an exclusively western species, occurring from the valley of the Mississippi to the Pacific coast. Specimens have been obtained as far east as Illinois. Several others have

been taken on the Upper Missouri and the Yellowstone Rivers, in Nebraska, at Fort Thorne, New Mexico, and on the Little Colorado River. A specimen was shot by Dr. Heermann on the Farallones, on the California coast; but Dr. Cooper thinks it rarely visits the coast border, though he several times saw, near San Diego, a bird which he supposed to belong to this species. At Martinez, in December, 1863, he succeeded in shooting one as it flew from its perch at the approach of the wagon in which he was riding.

It is said to extend its migrations in summer to the Upper Columbia, avoiding the densely forest-clad regions. Dr. Heermann saw a young unfledged individual at San Francisco, from which it may be inferred that a few may breed within the State.

The first individual of this species was taken by Dr. Townsend during his trip across the continent, in 1834. It was obtained among the mountainous regions of Oregon, near the sources of the Platte River. Mr. Cassin states that Dr. Heermann procured several specimens in the Sacramento Valley.

Mr. Cassin remarks that this species, except in its greatly superior size and strength, bears a very close resemblance to the well-known Jugger Falcon of India, a bird much used for the purposes of falconry.

Dr. Kennerly, who procured a single specimen of this species while his party was encamped on the Little Colorado, found it busily engaged in seeking its prey among the bushes that grew

along the river-bank. It was shy, and was procured with difficulty.

Dr. Suckley speaks of this Hawk as not at all rare in Oregon. He procured a specimen of it at Fort Dalles, in the beginning of the winter of 1854–55, which had been killed in the act of carrying off a barn-yard fowl of about its own weight, and which it had just seized near the door of a dwelling-house,—an act demonstrative of a union of courage, ferocity, and strength inferior to none of its congeners.

Dr. Cooper characterizes this as one of the shyest of Hawks, as it is also one of the swiftest, flying with rapid flappings of the wings. It seems to prefer the borders of prairies, where it catches hares, quails, and even larger game.

Mr. Ridgway informs me that this Hawk was seen by him in Southern Illinois, near Mt. Carmel, September 27, 1871. It had been obtained once before within the limits of Illinois, but in the northwestern part of the State, at Rock Island, by I. Dickenson Sergeant, of Philadelphia, and presented by him to the Academy of Natural Science.

Its nest and eggs were taken in Utah by Mr. Ricksecker. I have no notes in regard to the former. A finely marked specimen of one of the eggs procured by him is in my cabinet. It measures 2.15 inches in length by 1.65 in breadth. It is of a somewhat less rounded-oval shape than are the eggs of the *anatum*. The ground-color is a rich cream, with a slightly pinkish tinge, and is beautifully marked with blotches of various sizes, shapes, and shades of a red-brown tinged with chestnut, and with occasional

shadings of purplish. These are confluent about one end, which in the specimen before me chances to be the smaller one. It very closely resembles the eggs of the European *F. lanarius*.

An egg in the Smithsonian Collection (15,596), taken at Gilmer, Wyoming Territory, May 13, 1870, by Mr. H. R. Durkee, has a ground-color of pinkish-white, varying in two eggs to diluted vinaceous, thickly spotted and minutely freckled with a single shade of a purplish-rufous. In shape they are nearly elliptical, the smaller end being scarcely more pointed than the larger. They measure 2.27 by 1.60 to 1.65 inches. The nest was built on the edge of a cliff. Its eggs were also taken by Dr. Hayden while with Captain Reynolds, at Gros Vent Fork, June 8, 1860.

Subgenus **FALCO**, Mœhring

Falco, Mœhring, 1752. (Type, *Falco peregrinus*, Gm. = *F. communis*, Gm.)

Rhynchodon, Nitzsch, 1840. (In part only.)

Euhierax, Webb. & Berth., 1844. (Type, *Falco*—?)

Ichhierax, Kaup, 1844. (Type, *Falco frontalis*, Daud.)



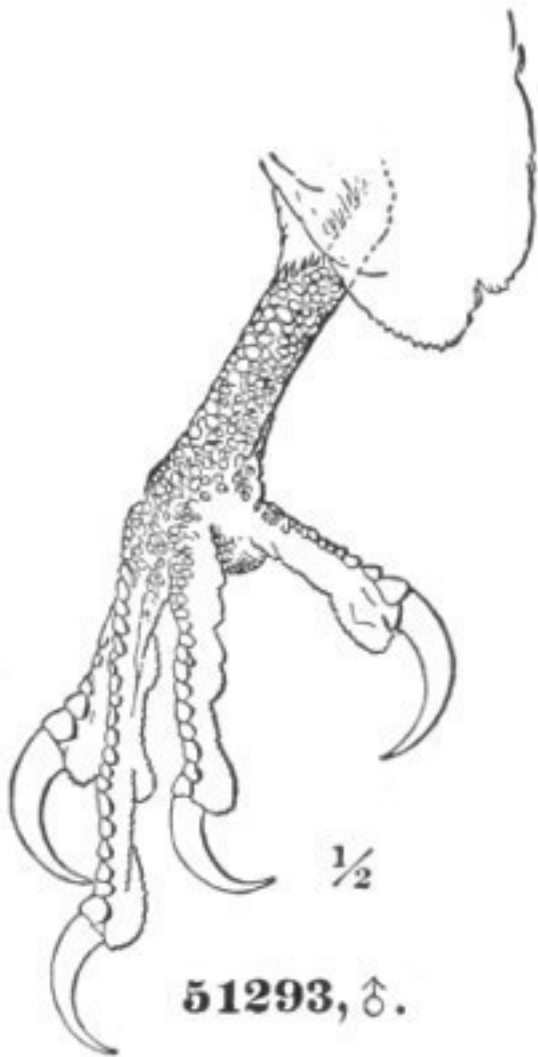
51293, ♂. $\frac{1}{4}$

F. aurantius.



52814, ♀.

F. rufigularis (nat. size).

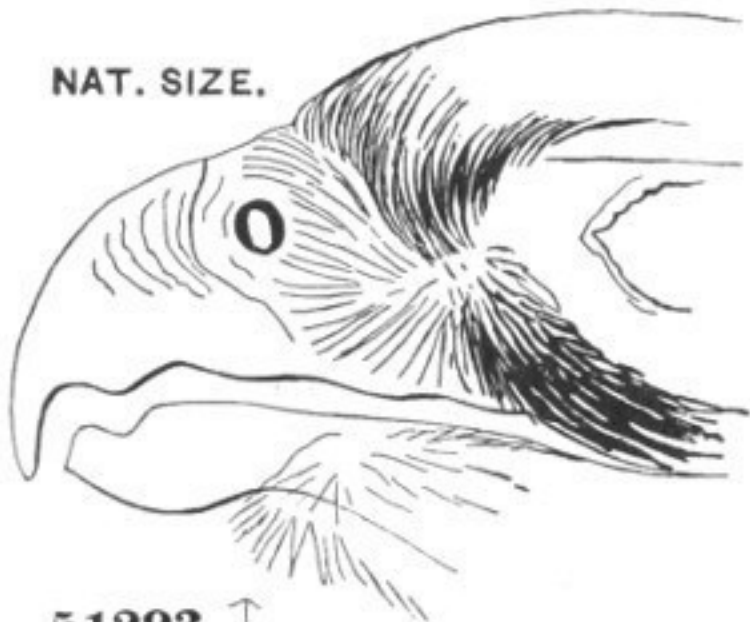


51293, ♂.

51293, ♂. ½

F. aurantius.

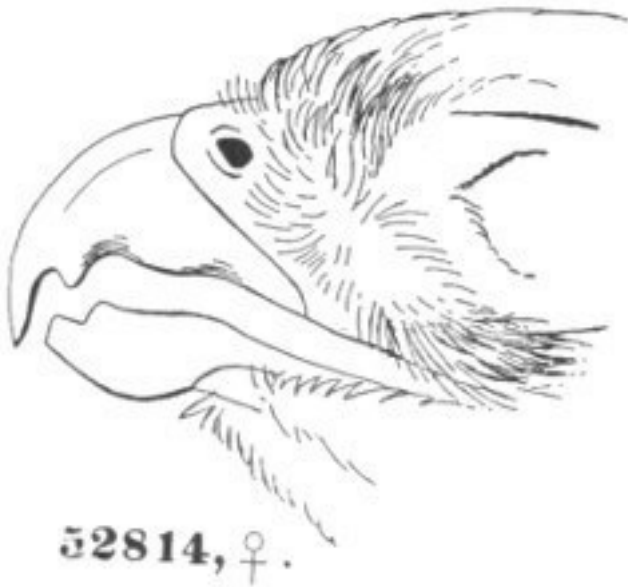
NAT. SIZE.



51293, ♂.

51293, ♂. nat. size.

F. aurantius.



52814, ♀.

F. ruficularis (nat. size).

The following synopsis of the three American species of this subgenus may serve to distinguish them from each other, though only two of them (*F. aurantius* and *F. ruficularis*) are very closely related. The comparative characters of the several geographical races of the other one (*F. communis*), which is cosmopolitan in its habitat, being included under the head of that species, may explain the reasons why they are separated from each other.

Species and Races

A. First and second quills equal and longest; first with inner web emarginated, second with inner web slightly sinuated. Young with longitudinal stripes on the lower parts. Adult and young stages very different.

1. **F. communis.** Wing, 11.50–14.30; tail, 7.00–8.50; culmen, .72–.95; tarsus, 1.65–2.20; middle toe, 1.80–2.30.⁵² Second quill longest; first shorter than, equal to, or longer than third. *Adult.* Above plumbeous, darker anteriorly, lighter and more bluish posteriorly; anteriorly plain, posteriorly with darker transverse bars, these growing more sharply defined towards the tail. Beneath ochraceous-white, varying in tint from nearly pure white to deep ochraceous, those portions posterior to the jugulum transversely barred, more or less, with blackish or dark plumbeous; anterior lower parts (from the breast forward) without transverse bars. *Young.* No transverse bars on the body, above or below. Above blackish-brown, varying to black, the feathers usually bordered terminally with ochraceous or rusty; forehead usually more or less washed with the same. Beneath ochraceous, varying in shade; the whole surface with longitudinal stripes of blackish. Inner webs of tail-feathers and primaries with numerous transverse elliptical spots of ochraceous. *Hab.*

⁵² Extremes of more than one hundred specimens measured!

Cosmopolitan.

a. Young dark brown above, the feathers bordered with rusty or whitish. Beneath white or ochraceous, with narrow longitudinal stripes of dusky. Inner webs of tail-feathers with transverse bars.

Auriculars white, cutting off the black of the cheeks with a prominent "mustache."

Beneath pure white, the breast and middle of the abdomen without markings. Wing, 12.75; tail, 7.30; culmen, .80; tarsus, 2.00; middle toe, 1.80. *Hab.* Eastern Asia ... var. *orientalist*.⁵³

Beneath pale ochraceous, the breast always with longitudinal dashes, or elliptical spots, of dusky; middle of abdomen barred. Wing, 11.50–14.30; tail, 7.00–8.50; culmen, .72–.95; tarsus, 1.65–2.20; middle toe, 1.80–2.30. *Hab.* Europe ... var. *communis*.⁵⁴

Beneath varying from deep ochraceous to nearly pure white, the breast never with distinct longitudinal or other spots, usually with none at all. Middle of abdomen barred, or not. Wing, 11.30–14.75; tail, 6.00–9.00; culmen, .75–

⁵³ *Falco communis*, var. *orientalis* (Gmelin). *Falco orientalis*, Gmel. S. N. 1789, 264. —Lath. Ind. Orn. 22.—Ib. Gen. Hist. I, 162.—Daud. Tr. Orn. II, 76.—Strickl. Orn. Syn. I, 1855, 83. Two specimens examined, from Japan (Nat. Mus., 1; Philad. Acad., 1).

⁵⁴ *Falco communis*, var. *communis* (Gmelin). *Falco communis*, Gmel. S. N. 1789, 270.—Schleg. Krit. übers., p. 14.—Ib. Mus. Pays-Bas, 1862, *Falcones*, 1.—Pelz. Ueb. der Geier und Falk. 1863, 23. *Falco peregrinus*, Gmel. S. N. 1789, 272.—Strickl. Orn. Syn. I, 81, et Auct. Seventeen specimens of this race have been examined. They are distributed as follows: Nat. Mus., 5; Bost. Soc., 6; Philad. Acad., 4; Cambridge Mus., 2. Total, 17.

1.00; tarsus, 1.60–2.10; middle toe, 1.75–2.20. *Hab.* America (entire continent) ... var. *anatum*.

Auriculars black, nearly, or quite, as far down as the lower end of the “mustache.”

Beneath varying from deep ochraceous to white, the breast streaked or not. Lower parts more uniformly and heavily barred than in the other races. *Young* with narrower streaks beneath. Wing, 11.15–12.60; tail, 6.11–8.00; culmen, .81–.90; tarsus, 1.60–2.05; middle toe, 1.75–2.15. *Hab.* Australia ... var. *melanogenys*.⁵⁵

b. Young unvariegated brownish-black above. Beneath brownish-black, faintly streaked with white, or nearly unvariegated. Inner webs of tail-feathers without transverse bars.

Wing, 14.90–15.09; tail, 8.50; culmen, .95–1.00; tarsus, 2.10; middle toe, 2.15–2.21. *Hab.* Northwest coast of North America, from Oregon to Sitka ... var. *pealei*.

B. Second quill longest; first with inner web emarginated, the second with inner web not sinuated. Young without longitudinal stripes on lower parts. Adult and young stages hardly appreciably

⁵⁵ *Falco communis*, var. *melanogenys* (Gould). *Falco communis*, Lath. New S. Wales Dr. II, No. 4. *Falco peregrinus*, Vig. Linn. Trans. XV, p. 183.—Ib. Isis, 1830, 260.—Bonap. Consp. 23, No. 2. *Falco melanogenys*, Gould, P. Z. S. pt. 5, 1837, 139.—Ib. Synop. B. Austr. pt. 3, pl. xl, fig. 2; Birds of Austr. I, pl. 8; Intr. B. Austr. 19.—Gray, Gen. B. fol. sp. 6.—Ib. List. B. Brit. Mus. 51.—Bonap. Rev. Zoöl. 1850, 484.—Kaup, Monog. Falc. in Jardine's Contr. Orn. 1850, 56.—Sturt, Exp. Austr. App. 14.—Strickl. Orn. Syn. I, 1855, 84.—Gray, Hand List, I, 1869, 19, No. 167. *Falco macropus*, Swains. An. Menag. 1838, 341. Eight specimens examined, including the types of Gould's figures and descriptions in the Birds of Australia.

different.

Above plumbeous or black; beneath black from the jugulum to the tibiæ, with transverse bars of white, ochraceous, or rufous; throat and jugulum white, white and rufous, or wholly ochraceous, with a semicircular outline posteriorly; tibiæ, anal region, and crissum uniform deep rufous, or spotted with black on an ochraceous or a white and rufous ground. *Adult*. Plumbeous above, the feathers darker centrally, and with obscure darker bars posteriorly; jugulum immaculate. *Young*. Black above, the feathers bordered terminally with rusty, or else dark plumbeous without transverse bars; jugulum with longitudinal streaks.

2. **F aurantius**.⁵⁶ Wing, 9.50–12.00; tail, 5.40–6.25;

⁵⁶ *Falco aurantius*, Gmel. (Rufous-bellied Falcon). *Falco aurantius*, Gmel. Syst. Nat. p. 283, 1789.—Lath. Ind. Orn. p. 48, 1790, Gen. Hist. I, 289.—Daud. Tr. Orn. II, 130.—Shaw, Zoöl. VII, 194.—Steph. Zoöl. XIII, ii, 40.—Cuv. Reg. An. (ed. 2), I, 322.—Less. Tr. Orn. p. 91. Bonap. Consp. Av. p. 25.—Strickl. Orn. Syn. I, 89, 1855. *Hypotriorchis aurantius*, Kaup, Ueb. Falk. Mus. Senck. p. 257, 1845. *Bidens aurantius*, Spix, Av. Bras. I, 17, 1824. *Falco deiroleucus*, Temm. Pl. Col. 348, 1836.—Less. Man. Orn. I, 79.—Gray, List B. Brit. Mus. 1844, p. 25; Gen. B. fol. sp. 12.—Bonap. Rev. Zool. 1850, 486. *Falco rufigularis* (not of Daudin!) Gray, List B. Brit. Mus. p. 54, 1844. Sp. Char. *Adult* (♂, Costa Rica; Coll. G. N. Lawrence). Above bluish-plumbeous, the feathers darker centrally; anteriorly the black increases in extent, first leaving the plumbeous only as a border to the feathers, and then dropping it altogether, the head and nape being plain black; posteriorly the plumbeous predominates, and shows a tendency to form transverse bars. On the head and neck the black occupies the whole upper and lateral portions, reaching down to the throat, involving the whole of the cheeks and maxillæ, which it covers in an angular patch. Primaries and tail deep black; the former immaculate on their outer surface; the latter crossed by six (the last terminal) incomplete very narrow bands of pure white, formed by transverse bars, which touch neither the shaft nor edges of the feathers; upper tail-coverts crossed

culmen, .96; tarsus, 1.50–1.60; middle toe, 1.75–2.10.

by about two bars of pure white. Immaculate area of the throat and jugulum deep rufous posteriorly and laterally, pure white anteriorly and centrally; from the jugulum to the tibiae, and including the entire lining of the wing, continuous black, with transverse bars of white; tibiae plain rufous; crissum mixed rufous and white,—the former predominating,—and thickly marked with large transverse spots of black; inner webs of primaries with transverse ovate spots of white, touching neither shaft nor edge of the feather; these number seven on the longest quill (second). Wing-formula, 2–1, 3–4. Wing, 9.90; tail, 5.50; tarsus, 1.55; middle toe, 1.75. *Juv.* (♂, 51,293, Costa Rica, La Palma, August 25, 1867; José C. Zeledon). Whole upper surface black, deepest on the tail; it occupies the whole head (except the chin, throat, and sides of the neck), the black cheek-patch having considerable prominence; feathers everywhere (except on the head and neck) indistinctly bordered with light brownish, this becoming more distinct posteriorly; upper tail-coverts tipped and barred beneath the surface with pure white; secondaries, primaries, and primary coverts narrowly but sharply tipped with pure white; tail crossed with five very sharp bars of pure white, the last terminal, the first two concealed by the coverts; these transverse spots touch the shaft, but not the edge of the feather; on the lateral feather they are confined to the inner web. Chin, throat, neck, and breast, abdomen, crissum, and lower tail-coverts, deep orange (not chestnut) rufous; in fact, this forms the ground-color of the whole lower parts; but the sides, flanks, and abdomen have such large transverse spots of black (these exceeding the orange in amount), giving the prevailing color; the orange of the jugulum is sharply defined, with a semicircular outline, against the black of the belly, and has distinct lanceolate shaft-streaks of black; the lower part of the abdomen, and the tibiae, have cordate or broadly sagittate black spots, rather exceeding the orange; the lower tail-coverts have broad transverse spots of black. (The orange is deepest on the jugulum and crissum, being palest where most thickly spotted; it is immaculate only on chin, throat, and neck; the markings are longitudinal only on the jugulum.) Lining of the wing like the belly, that is, the black predominating; under surface of primaries with transverse elliptical spots of pale cream-color, seven in number on the longest. Wing-formula, 2, 1–3. Wing, 9.90; tail, 5.40; culmen, .72; tarsus, 1.40; middle toe, 1.75; outer toe, 1.20; inner, 1.00; posterior, .80. *List of Specimens examined*.—National Museum, 1; G. N. Lawrence, 1; Boston Society, 2; Philadelphia Academy, 3. Total, 7. *Measurements*.—♀. Wing, 10.90–11.30; tail, 6.00–6.25; culmen, .90; tarsus, 1.50–1.60; middle toe,

Second quill longest; first longer than third. Crissum ochraceous, or white and rufous, with large transverse spots of black; upper tail-coverts sharply barred with pure white or pale ash. *Adult*. Above plumbeous-black, the feathers conspicuously bordered with plumbeous-blue. Throat and jugulum immaculate; white centrally and anteriorly, deep rufous laterally and posteriorly. Tibiæ plain rufous. *Young*. Above uniform dull black, the feathers sometimes bordered inconspicuously with rusty. Throat and jugulum varying from white to ochraceous or rufous (this always deepest laterally and posteriorly). Tibiæ sometimes thickly spotted transversely with black. *Hab*. Tropical America, north to Southern Mexico.

3. **F. rufigularis.**⁵⁷ Wing, 7.20–9.00 (♂, wing, 7.70;

1.85–2.10.

⁵⁷ *Falco rufigularis*, Daud. Tr. Orn. II, 131, 1800.—Strickl. Orn. Syn. I, 88, 1855. *Hypotriorchis rufigularis*, Gray, Gen. B. fol. sp. 5, 1844; List B. Brit. Mus. p. 54, 1848; Hand List, I, 21, 1869.—Bonap. Consp. Av. (sub *F. aurantius*).—Gray, Hand List, I, 21, 1869. *Falco aurantius*, β, Lath. Ind. Orn. I, 48, 1790. *Falco aurantius*, γ, Lath. Ind. Orn. I, 48, 1790. *Falco aurantius*, Temm. Pl. Col. sub. pl. cccxlviii, 1836.—Licht. Verz. Doubl. p. 61, 1823.—Cass. B. N. Am. 1858, 10.—Elliot, Birds N. Am. pl. xi. *Falco albigularis*, Daud. Tr. Orn. II, 131, 1800. *Falco hæmorrhoidalis*, Hahn, Vög. XV, Lief. pl. i, 1818. *Falco cucullatus*, Swains. An. Menag. p. 340, 1838. *Falco thoracicus*, Donovan, Nat. Rep. pl. xlv, 1822. Sp. Char. *Adult* (♂, 52,820, Mazatlan, Western Mexico; Col. A. J. Grayson). Above dark slate, with a bluish-plumbeous cast, and uniform over whole surface (wings included) from nape to tail. Anteriorly the tint is almost black, this covering continuously the whole upper and lateral portion of the head, reaching down to the throat, and forming a broad angular projection over the cheeks, which are purer black. All the feathers above darker centrally, but the obscure spots so formed mostly concealed; shafts of the feathers inconspicuously black; upper tail-coverts each with two broad transverse spots of black. Secondaries,

tail, 3.95–5.50; culmen, .45–.58; tarsus, 1.20–1.55; middle

primary coverts, and primaries uniform dull black; the former, and inner feathers of the latter, very narrowly ashy-whitish on terminal border,—the coverts with a bluish shade terminally. Tail black (dull light brown at apical margin), crossed with about six obsolete narrow bands of plumbeous, these changing to narrower white bars on the inner webs. Chin, base of maxillæ, throat, sides of the neck, and jugulum, ochraceous-white, the ochraceous tinge deepest posteriorly; breast (broadly across) and sides black, with numerous narrow transverse bars of reddish-white, becoming more ashy posteriorly; abdomen, anal region, tibiæ, femorals, and lower tail-coverts uniform deep, almost castaneous, rufous. Lining of the wing dull black, with circular ochraceous-white spots, but former predominating; whole under surface of primaries and secondaries a similar blackish-dusky, the former with narrow transverse elliptical spots of white, of which there are eight (the first and last merely indicated) on the longest quill. Wing-formula, 2–1–3. Wing, 7.70; tail, 3.95; tarsus, 1.20; middle toe, 1.20. Tail slightly emarginated; second and third feathers longest (counting from exterior).♀ (5,218, Mazatlan; Colonel Grayson). Almost precisely similar to the male; less contrast between blackish-plumbeous of the nape, and more bluish of the back; bands on tail five in number; bars on black beneath more reddish. Wing-formula same. Wing, 8.80; tail, 4.40; tarsus, 1.30; middle toe, 1.30. *Juv.* (Bryant Coll. 1,531, Orizaba, Mex.). Above continuous dull black, without bluish cast or concealed spots; tail-bands narrower, purer white; black beneath duller, transverse bars more obsolete, broader, and pale rusty; chestnut-rufous of posterior lower portions lighter and less uniform; lower tail-coverts with broad transverse spots of plumbeous-black. Wing-formula as in adult. Wing, 8.75; tail, 4.40. Two young males from Tehuantepec, Mexico (Nos. 613 and 613, May 16, 1871; F. Sumichrast), differ from that described above in some remarkable respects: the upper parts are in one black, but without the rusty margins to the feathers; in the other, almost exactly as in the adult plumage described. The lower parts, however, are most different; the throat and jugular are uniform deep soft ochraceous, with a few longitudinal streaks of black near the black abdominal patch; the bars in this last are deep rufous, and the terminal band of the tail is also deep rufous. The weak bill, and soft, blended character of the plumage, indicate unmistakably the very young age of these specimens, which are also marked “very young” by M. Sumichrast. In colors, as well as in size and form, this very handsome little Falcon closely resembles the *F. severus*, Horsf., of Manilla and the neighboring East Indian

toe, 1.15–1.40). Second quill longest; first longer than third. Crissum uniform deep reddish-rufous, rarely barred with white and dusky. Upper tail-coverts obsoletely barred with plumbeous.

Adult. Above plumbeous-black, the feathers lightening into plumbeous-blue on the edges and ends, and showing obscure bars on the posterior portions. Throat and jugulum ochraceous-white, the ochraceous tinge deepest posteriorly and without any streaks. *Young.* Above plumbeous-black, without lighter obscure bars, or with a brownish cast, and with faint rusty edges to the feathers. Throat and jugulum deep soft ochraceous, deepest laterally, the posterior portion usually with a few longitudinal streaks of dusky. *Hab.* Tropical America, north to Middle Mexico.

Islands; the main difference is that in that species the lower surface is wholly deep rufous, instead of partly black. *List of Specimens examined.*—National Museum, 11; Boston Society, 6; Philadelphia Academy, 7; New York Museum, 3; G. N. Lawrence, 3; R. Ridgway, 2. Total, 32. *Measurements.*—♂. Wing, 7.20–8.80; tail, 4.20–5.10; culmen, .45–.55; tarsus, 1.25–1.50; middle toe, 1.15–1.30. Specimens, 13. ♀. Wing, 8.50–9.00; tail, 5.00–5.50; culmen, .58; tarsus, 1.48–1.55; middle toe, 1.30–1.40. Specimens, 8. *Hab.* Tropical America, northward through Central America and Mexico almost to southern border of United States. *Localities:* Veragua, Scl. & Salv. 1869, 252.

Falco communis, Gmel

Var. anatum, Bonap

AMERICAN PEREGRINE FALCON; DUCK HAWK

? *Accipiter falco maculatus*, Briss. Orn. I, 329. ? *Falco nævius*, Gmel. S. N. 1789, 271. *Falco communis* ζ, and *F. communis* η, Lath. Ind. Orn. p. 31. *Falco communis*, Coues, Key, 1872, 213, f. 141. *Falco peregrinus*, Ord. Wils. Am. Orn. 1808, pl. lxvi.—Sab. L. Trans. XII, 529.—Rich. Parry's 2d Voy. App. 342.—Ib. F. B. A. II, 1831, 23.—Bonap. N. Y. Lyc. II, 27.—Ib. Isis, 1832, 1136; Consp. 1850, 23, No. 4.—King, Voy. Beag. I, 1839, 532.—James. Wils. Am. Orn. 677, Synop. 1852, 683.—Wedderb. Jard. Contr. to Orn. 1849, 81.—Woodh. Sitgr. Zuñi, 1853, 60.—Giraud, B. Long Island, 1844, 14.—Peale, U. S. Ex. Ex. 1848, 66.—Gray, List B. Brit. Mus. 1841, 51. *Falco anatum*, Bonap. Eur. & N. Am. B. 1838, 4.—Ib. Rev. Zoöl. 1850, 484.—Bridg. Proc. Zoöl. Soc. pl. xi, 109.—Ib. Ann. N. H. XIII, 499.—Gosse, B. Jam. 1847, 16.—Cass. B. Cal. & Tex. 1854, 86.—Ib. Birds N. Am. 1858, 7.—De Kay,

Zoöl. N. Y. II, 13, pl. iii, f. 8.—Nutt. Man. 1833, 53.—
Peab. B. Mass. 1841, 83.—Strickl. Orn. Syn. I, 1855, 83.
—Blakist. Ibis, III, 1861, 315.—March, Pr. Ac. N. S. 1863,
304. *Falco nigriceps*, Cass. B. Cal. & Tex. I, 1853, 87.—Ib.
Birds N. Am. 1858, 8.—Strickl. Orn. Syn. I, 85.—Coop. &
Suckl. P. R. R. Rep't, VII, ii, 1860, 142.—Gray, Hand List,
I, 1869, 19, No. 166.—Sharpe, Ann. & Mag. N. H. *Falco*
orientalis, (Gm.) Gray, Hand List, I, 1869, 19, No. 165 (in
part). ? *Falco cassini*, Sharpe, Ann. & Mag. N. H.

Sp. Char. *Adult* (♂, 43,134, Fort Resolution, Brit. N. Am., June; J. Lockhart). Upper parts dark bluish-plumbeous, approaching black anteriorly, but on rump and upper tail-coverts becoming fine bluish plumbeous-ash. On the head and neck the continuous plumbeous-black covers all the former except the chin and throat, and the back portion of the latter; an invasion or indentation of the white of lower parts up behind the ear-coverts separating that of the cheeks from the posterior black, throwing the former into a prominent angular patch; forehead and lores grayish. All the feathers above (posterior to the nape) with transverse bars of plumbeous-black, these most sharply defined posteriorly, where the plumbeous is lightest. Tail black, more plumbeous basally, very faintly paler at the tip, and showing ten or eleven transverse narrow bands of plumbeous, these most distinct anteriorly; the bars are clearest on inner webs. Alula, primary and secondary coverts, secondaries and primaries, uniform plumbeous-black, narrowly whitish on terminal margin, most observable on secondaries and inner primaries. Lower parts

white, tinged with delicate cream-color, this deepest on the abdomen; sides and tibiae tinged with bluish. Chin, throat, and jugulum immaculate; the breast, however, with faint longitudinal shaft-streaks of black; sides, flanks, and tibiae distinctly barred transversely with black, about four bars being on each feather; on the lower tail-coverts they are narrower and more distant; on the abdomen the markings are in the form of circular spots; anal region barred transversely. Lining of the wing (including all the under coverts) white tinged with blue, and barred like the sides; under surface of primaries slaty, with elliptical spots or bars of creamy-white on inner webs, twelve on the longest. Wing-formula, 2-1-3. Wing, 12.25; tail, 6.00; tarsus, 1.60; middle toe, 1.85; outer, 1.40; inner, 1.20; posterior, .80; culmen, .80.

♀ (13,077, Liberty Co., Georgia; Professor J. L. Leconte). Like the male, but ochraceous tinge beneath deeper; no ashy wash; bands on the tail more sharply defined, about ten dark ones being indicated; outer surface of primaries and secondaries with bands apparent; tail distinctly tipped with ochraceous-white. Inner web of longest primary with thirteen, more reddish, transverse spots. White of neck extending obliquely upward and forward toward the eye, giving the black cheek-patch more prominence. Markings beneath as in the male. Wing-formula the same. Wing, 14.50; tail, 7.00; tarsus, 1.95; middle toe, 2.10; culmen, .95.

Juv. (♂, 53,193, Truckee River, Nevada, July 24, 1867; R. Ridgway: first plumage). Above plumbeous-black, tail more

slaty. Every feather broadly bordered terminally with dull cinnamon; these crescentic bars becoming gradually broader posteriorly, narrower and more obsolete on the head above. Tail distinctly tipped with pale cinnamon, the inner webs of feathers with obsolete transverse spots of the same, these touching neither the edge nor the shaft; scarcely apparent indications of corresponding spots on outer webs. Region round the eye, and broad "mustache" across the cheeks, pure black, the latter more conspicuous than in the older stages, being cut off posteriorly by the extension of the cream-color of the neck nearly to the eye. A broad stripe of pale ochraceous running from above the ear-coverts back to the occiput, where the two of opposite sides nearly meet. Lower parts purplish cream-color, or rosy ochraceous-white, deepest posteriorly; jugulum, breast, sides, flanks, and tibiae with longitudinal stripes of plumbeous-black, these broadest on flanks and abdomen, and somewhat sagittate on the tibiae; lower tail-coverts with distant transverse bars. Lining of the wing like the sides, but the markings more transverse; inner web of longest primary with nine transverse purplish-ochre spots. Wing-formula, 2-1, 3. Wing, 12.50; tail, 7.00. Length, 16.50; expanse, 39.25. Weight, 1½ lbs. Basal half of bill pale bluish-white, cere rather darker; terminal half (rather abruptly) slate-color, the tip deepening into black; iris very dark vivid vandyke-brown; naked orbital space pale bluish-white, with a slight greenish tint; tarsi and toes lemon-yellow, with a slight green cast; claws jet-black.

Hab. Entire continent of America, and neighboring islands.

Localities: Guatemala (Scl. Ibis I, 219); Veragua (Salv. P. Z. S. 1867, 158); Sta. Cruz (Newton, Ibis, I, 63); Trinidad (Taylor, Ibis, 1864, 80); Bahamas (Bryant, Pr. Bost. Soc. 1859, VII); Cuba (Cab. Journ. II, lxxxiii); (Gundl. Repert. 1865, 225), Jamaica, (Gosse, B. Jam. 16; March, Pr. Ac. N. S. 1863, 304, et Mus. S. I.); Tierra del Fuego (Sharpe, Ann. & Mag. N. H.; "*F. cassini*, Sharpe").

The young plumage above described corresponds exactly with that of young *peregrinus* from Europe, a comparison of the specimen above described with one of the same age from Germany (54,064, Schlüter Col.) showing no differences that can be expressed. Many American specimens in this plumage (as 19,397, Fort Simpson) show a wash of whitish over the forehead and anterior part of the crown; having before us but the one specimen, we cannot say whether or not this is ever seen in the European bird. Specimens more advanced in season—perhaps in second year—are colored as follows: The black above is more brownish, the feathers margined with pale brown,—these margins broader, and approaching to white, on the upper tail-coverts; the tail shows the ochraceous bars only on inner webs. The supraoral stripe of the youngest plumage is also quite apparent.

A still younger one from the same locality (No. 37,397) has the upper plumage similar to the last, the pale edges to the feathers, however, more distinct; tail with conspicuous spots.

White beneath clearer, and invading the dusky of the head above as far back as the middle of the crown; the supraoral stripe is distinct, scarcely interrupted across the nape.

In the adult plumage the principal variation is in the extent and disposition of the bars beneath. In most individuals they are regularly transverse only laterally and posteriorly, those on the belly being somewhat broken into more irregular cordate spots, though always transverse; in no American specimen, however, are they as continuously transverse as in a male (No. 18,804) from Europe, which, however, in this respect, we think, forms an exception to most European examples, at least to those in the Smithsonian Collection. All variations in the form, thickness, and continuity of the markings below, and in the distinctness of the bars above, are individual.

Very old males (as 49,790, Fort Yukon; 27,188, Moose Factory (type of Elliott's figure of *F. peregrinus*, in Birds of America); and 42,997, Spanishtown, Jamaica) lack almost entirely the reddish tinge beneath, and have the lateral and posterior portions strongly tinged with blue; the latter feature is especially noticeable in the specimen from Jamaica, in which also the bars are almost utterly wanting medially. Immature birds from this island also lack to a great degree the ochraceous tinge, leaving the whitish everywhere purer.

A female adult European bird differs from the average of North American examples in the conspicuous longitudinal streaks on the jugulum; but in a male these are hardly more

distinct than in 13,077, ♀, Liberty Co., Georgia; 11,983, "United States"; 35,456, Peel's River; 35,449, ♀, and 35,445, ♀, Fort Yukon, Alaska; 35,452, La Pierre's Hous., H. B. Ter.; 35,459 ♂, Fort Anderson; and 28,099 ♀, Hartford, Conn. In none of these, however, are they so numerous and conspicuous as in a European female from the Schlüter Collection, which, however, differs in these respects only from North American specimens.

A somewhat melanistic individual (in second year? 32,735, Chicago, Ill.; Robert Kennicott) differs as follows: Above continuously pure black; upper tail-coverts and longer scapulars bordered terminally with rusty-whitish. Tail distinctly tipped with white; the inner webs of feathers with eight elliptical transverse bars of pale ochraceous, and indications of corresponding spots of the same on outer webs, forming as many inconspicuous bands. Beneath ochraceous-white; the neck, breast, and abdomen thickly marked with broad longitudinal stripes of clear black,—those on the jugulum cuneate, and on the breast and abdomen broadly sagittate; the tibiæ with numerous cordate spots, and sides marked more transversely; lower tail-coverts with narrow distant transverse bars. On the chin and throat only, the whitish is immaculate, on the other portions being somewhat exceeded in amount by the black. Inner web of longest primary with seven transverse elliptical bars of cream-color. Wing, 12.20; tail, 9.40.

Whether the North American and European Peregrine Falcons are or are not distinct has been a question undecided

up to the present day; almost every ornithologist having his own peculiar views upon the relationship of the different forms which have been from time to time characterized. The most favorably received opinion, however, seems to be that there are two species on the American continent, and that one of these, the northern one, is identical with the European bird. Both these views I hold to be entirely erroneous; for after examining and comparing critically a series of more than one hundred specimens of these birds, from every portion of America (except eastern South America), including nearly all the West India Islands, as well as numbers of localities throughout continental North and South America, I find that, with the exception of the melanistic littoral race of the northwest coast (var. *pealei*), they all fall under one race, which, though itself exceedingly variable, yet possesses characters whereby it may always be distinguished from the Peregrine of all portions of the Old World.

There is such a great amount of variability, in size, colors, and markings, that the *F. nigriceps*, Cassin, must be entirely ignored as being based upon specimens not distinguishable in any respect from typical *anatum*. Judging from the characters assigned to the *F. cassini* by its describer (who evidently had a very small series of American specimens at his command), the latter name must also most probably fall into the list of synonymes of *anatum*.

Slight as are the characters which separate the Peregrines of the New and Old World, i.e. the immaculate jugulum of the former and the streaked one of the latter, they are yet sufficiently

constant to warrant their separation as geographical races of one species; along with which the *F. melanogenys*, Gould (Australia), *F. minor*, Bonap. (South Africa), *F. orientalis*, Gmel. (E. Asia), and *F. calidus*, Lath. (Southern India and East Indies), must also rank as simple geographical races of the same species. Whether the *F. calidus* is tenable, I am unable to state, for I have not seen it; but the others appear to be all sufficiently differentiated. The *F. radama*, Verreaux (Gray's Hand List, p. 19, No. 170), Mr. Gurney writes me, is the young female of var. *minor*. Whether the *F. peregrinator*, Sundevall (Gray's Hand List, No. 169), is another of the regional forms of *F. communis*, or a distinct species, I am not able at present to say, not having specimens accessible to me for examination.

Mr. Cassin's type of "*nigriceps*" (13,856, ♂, July), from Chile, is before me, and upon comparison with adult males from Arctic America presents no tangible differences beyond its smaller size; the wing is a little more than half an inch, and the middle toe less than the eighth of an inch, shorter than in the smallest of the North American series,—a discrepancy slight indeed, and of little value as the sole specific character; the plumage being almost precisely similar to that of the specimen selected for the type of the description at the head of this article. In order to show the little consequence to be attached to the small size of the individual just mentioned, I would state that there is before me a young bird, received from the National Museum of Chile, and obtained in the vicinity of Santiago, which is precisely similar in

plumage to the Nevada specimen described, and in size is even considerably larger, though it is but just to say that it is a female; the wing measures 13.25, instead of 12.50, and the middle toe, 2.00, instead of 1.85. No. 37,336, Tres Marias Islands, Western Mexico,—a young male in second year,—has the wing just the same length as in the smallest North American example, while in plumage it is precisely similar to 26,785, of the same age, from Jamaica. No. 4,367, from Puget's Sound, Washington Territory,—also a young male,—has the wing of the same length as in the largest northern specimen, while the plumage is as usual.

Two adult females from Connecticut (Nos. 28,099 and 32,507, Talcott Mt.) are remarkable for their very deep colors, in which they differ from all other North American examples which I have seen, and answer in every particular to the description of *F. cassini*, Sharpe, above cited. The upper surface is plumbeous-black, becoming deep black anteriorly, the head without a single light feather in the black portions; the plumbeous bars are distinct only on the rump, upper tail-coverts, and tail, and are just perceptible on the secondaries. The lower parts are of a very deep reddish-ochraceous, deepest on the breast and abdomen, where it approaches a cinnamon tint,—the markings, however, as in other examples. They measure, wing, 14.75; tail, 7.50; culmen, 1.05–1.15; tarsus, 2.00; middle toe, 2.30. They were obtained from the nest, and kept in confinement three years, when they were sacrificed to science. The unusual size of the bill of these specimens (see measurements) is undoubtedly due to

the influence of confinement, or the result of a modified mode of feeding. The specimens were presented by Dr. S. S. Moses, of Hartford.

An adult male (No. 8,501) from Shoal-water Bay, Washington Territory, is exactly of the size of the male described. In this specimen there is not the slightest creamy tinge beneath, while the blue tinge on the lower parts laterally and posteriorly is very strong. No. 52,818, an adult female from Mazatlan, Western Mexico, has the wing three quarters of an inch shorter than in the largest of four northern females, and of the same length as in the smallest; there is nothing unusual about its plumage, except that the bars beneath are sparse, and the ochraceous tinge quite deep. No. 27,057, Fort Good Hope, H. B. T., is, however, exactly similar, in these respects, and the wing is but half an inch longer. In No. 47,588, ♂, from the Farallones Islands, near San Francisco, California, the wing is the same length as in the average of northern and eastern specimens, while the streaks on the jugulum are nearly as conspicuous as in a male from Europe.

In conclusion, I would say that the sole distinguishing character between the Peregrines from America and those from Europe, that can be relied on, appears to be found in the markings on the breast in the adult plumage; in all the specimens and figures of var. *communis* that I have seen, the breast has the longitudinal dashes very conspicuous; while, as a general rule, in *anatum* these markings are entirely absent, though sometimes present, and occasionally nearly as distinct as in

European examples. Therefore, if this conspicuous streaking of the breast is found in all European specimens, the American bird is entitled to separation as a variety; but if the breast is ever immaculate in European examples, then *anatum* must sink into a pure synonyme of *communis*. The var. *melanogenys* is distinguished from both *communis* and *anatum* by the black auriculars, or by a greater amount of black on the side of the neck, and by more numerous and narrower bars on the under surface. In the former feature examples of *anatum* from the southern extremity of South America approach quite closely to the Australian form, as might be expected from the relative geographical position of the two regions. The var. *minor* is merely the smaller intertropical race of the Old World, perhaps better characterized than the tropical American form named *F. nigriceps* by Cassin, the characters of which are so unimportant, and withal so inconstant, as to forbid our recognizing it as a race of the same rank with the others.

LIST OF SPECIMENS EXAMINED

National Museum, 45; Boston Society, 4; Philadelphia Academy, 22; Museum Comp. Zoöl. 5; New York Museum, 3; G. N. Lawrence, 6; R. Ridgway, 3. Total, 88.

Measurements.

<i>Sex.</i>	<i>Wing.</i>	<i>Tail.</i>	<i>Culmen.</i>	<i>Tarsus.</i>	<i>Middle Toe.</i>	<i>Specimens.</i>
♂	11.30–13.00	6.00–7.50	.75–0.80	1.60–1.90	1.78–2.05	29
♀	13.00–14.75	7.30–9.00	.85–1.00	1.95–2.10	1.95–2.20	28

Var. *pealei*, Ridgway

BLACK PEREGRINE FALCON

? ? *Accipiter falco niger*, Briss. Orn. I, 337. ? ? *Falco niger*, Gmel. S. N. 1789, 270. *Falco polyagrus*, Cass. B. Cal. & Tex. pl. xvi (dark figure).

Sp. Char. In colors almost exactly similar to *F. gyrfalco*, var. *labradora*. Above continuous dark vandyke-brown, approaching brownish-black on the head, which is variegated only on the gular region, and inclining to grayish-brown on the tail; the whole surface entirely free from spots or markings of any kind. Beneath similar in color to the upper parts, but the feathers edged with whitish, this rather predominating on the throat; flanks and tibiae with roundish white spots; lower tail-coverts with broad transverse bars of white. Lining of the wing with feathers narrowly tipped with white; inner webs of primaries with narrow, transverse elliptical spots of cream-color; inner webs of tail-feathers with badly defined, irregular, similar spots, or else

with these wanting, the whole web being plain dusky-brown.

No. 12,022 (♀, Oregon; T. R. Peale). Wing, 15.00; tail, 8.50; culmen, .95; tarsus, 2.10; middle toe, 2.15. (Figured by Cassin as *F. polyagrus*, in *Birds of California and Texas*, pl. xvi.)

No. 45,814 (♀, Sitka, Alaska, May, 1866; F. Bischoff). Wing, 14.90; tail, 8.50; tarsus, 2.10; middle toe, 2.20. The two similar in color, but in the latter the white streaks on the lower parts a little broader, and the middle of the auriculars slightly streaked.

Hab. Northwest coast of North America, from Oregon to Sitka.

This curious race of *Falco communis* is a good illustration of the climatic peculiarity of the northwest coast region, to which I have often referred before; the same melanistic tendency being apparent in birds of other species from the same region, as an example of which I may mention the Black Merlin (*Falco aesalon*, var. *suckleyi*), which is a perfect miniature of the present bird.

Habits. The Great-footed Hawk of North America is very closely allied to the well-known Peregrine Falcon of Europe, and so closely resembles it that by many writers, even at the present day, it is regarded as identical with it. Without doubt, the habits of the two races are very nearly the same, though the peculiarities of the North American bird are not so well known as are those of the European. In its distribution it is somewhat erratic, for the most part confined to the rocky sea-coast, the river-banks, and the high ground of the northeastern parts of America. It is known to breed in a few isolated rocky crags in various parts

of the country, even as far to the south as Pennsylvania, and it occurs probably both as migrant and resident in several of the West India Islands, in Central and in South America. A single specimen was taken by Dr. Woodhouse in the Creek country of the Indian Territory. Two individuals are reported by Von Pelzeln as having been taken in Brazil. The Newtons met with it in St. Croix. Mr. Gosse found it in Jamaica, and Dr. Gundlach gives it as a bird of Cuba. Jardine states it to be a bird of Bermuda, and also that it has been taken in the Straits of Magellan. A single specimen was taken at Dueñas, Guatemala, in February, by Mr. Salvin.

On the Pacific coast this Falcon has been traced as far south as the limit of the land. Dr. Cooper met with only two pairs, in March, 1854, frequenting a high wooded cliff at Shoal-water Bay. Dr. Suckley procured a single specimen from Steilacoom. Dr. Cooper states that the habits of these corresponded with those described for the *F. anatum* and *F. peregrinus*, and that, like these Falcons, it is a terror to all land animals weaker than itself. It is said to breed on the rocky cliffs of the Pacific.

An individual of this bird was taken by Colonel Grayson at the Tres Marias Islands. When shot, it was endeavoring to capture a Sparrow-hawk, indicating its indifference as to the game it pursues. He adds that this bird attacks with vigor everything it sees, from the size of a Mallard Duck down, and is the terror of all small birds. Its range must be very great, as it often ventures far out to sea. On his passage from Mazatlan to San Francisco, in

1858, on the bark *Carlota*, one of these Falcons came on board more than a hundred miles off the coast of Lower California, and took up its quarters on the main-top yard, where it remained two days, during which time it captured several Dusky Petrels. It would dart headlong upon these unsuspecting birds, seldom missing its aim. It would then return to its resting-place and partly devour its prize. At other times it dropped its victims into the sea in wanton sport. Finally, as if tired of this kind of game, it made several wide circles around the ship, ascended to a considerable height, and departed in the direction of the Mexican shore.

This Falcon is found along the Atlantic coast from Maine to the extreme northern portion, breeding on the high rocky cliffs of Grand Menan and in various favorable situations thence northward. A few breed on Mount Tom, near the Connecticut River in Massachusetts, on Talcott Mountain in Connecticut, in Pennsylvania, and near Harper's Ferry, in Maryland.

Mr. Boardman has several times taken their eggs from the cliffs of Grand Menan, where they breed in April, or early in May. In one instance he found the nest in close proximity to that of a pair of Ravens, the two families being apparently on terms of amity or mutual tolerance.

For several years two or more pairs of these birds have been known to breed regularly on Mount Tom, near Northampton. The nests were placed on the edges of precipitous rocks very early in the spring, the young having been fully grown by the last of June. Their young and their eggs have been taken year after

year, yet at the last accounts they still continued to nest in that locality. Dr. W. Wood has also found this species breeding on Talcott Mountain, near Hartford. Four young were found, nearly fledged, June 1. In one instance four eggs were taken from a nest on Mount Tom, by Mr. C. W. Bennett, as early as April 19. This was in 1864. Several times since he has taken their eggs from the same eyrie, though the Hawks have at times deserted it and sought other retreats. In one year a pair was twice robbed, and, as is supposed, made a third nest, and had unfledged young as late as August. Mr. Allen states that these Hawks repair to Mount Tom very early in the spring, and carefully watch and defend their eyrie, manifesting even more alarm at this early period, when it is approached, than they evince later, when it contains eggs or young. Mr. Bennett speaks of the nest as a mere apology for one.

This Hawk formerly nested on a high cliff near the house of Professor S. S. Haldeman, Columbia, Penn., who several times procured young birds which had fallen from the nest. The birds remained about this cliff ten or eleven months of the year, only disappearing during the coldest weather, and returning with the first favorable change. They bred early in spring, the young leaving the nest perhaps in May. Professor Haldeman was of the opinion that but a single pair remained, the young disappearing in the course of the season.

Sir John Richardson, in his Arctic expedition in 1845, while descending the Mackenzie River, latitude 65° , noticed what he presumed to be a nest of this species, placed on the cliff of a

sandstone rock. This Falcon was rare on that river.

Mr. MacFarlane found this species not uncommon on the banks of Lockhart and Anderson Rivers, in the Arctic regions. In one instance he mentions finding a nest on a cliff thirty feet from the ground. There were four eggs lying on a ledge of the shale of which the cliff was composed. Both parents were present, and kept up a continued screaming, though at too great a distance for him to shoot either. He adds that this bird is by no means scarce on Lockhart River, and he was informed that it also nests along the ramparts and other steep banks of the Upper Anderson, though he has not been able to learn that it has been found north of Fort Anderson. In another instance the nest was on a ledge of clayey mud,—the eggs, in fact, lying on the bare ground, and nothing resembling a nest to be seen. A third nest was found on a ledge of crumbling shale, along the banks of the Anderson River, near the outlet of the Lockhart. This Hawk, he remarks, so far as he was able to observe, constructs no nest whatever. At least, on the Anderson River, where he found it tolerably abundant, it was found to invariably lay its eggs on a ledge of rock or shale, without making use of any accessory lining or protection, always availing itself of the most inaccessible ledges. He was of the opinion that they do not breed to the northward of the 68th parallel. They were also to be found nesting in occasional pairs along the lime and sandstone banks of the Mackenzie, where early in August, for several successive years, he noticed the young of the season fully fledged, though still attended by the parent birds.

In subsequent notes, Mr. MacFarlane repeats his observations that this species constructs no nest, merely laying its eggs on a ledge of shale or other rock. Both parents were invariably seen about the spot. In some instances the eggs found were much larger than in others.

Mr. Dall mentions shooting a pair near Nuk'koh, on the Yukon River, that had a nest on a dead spruce. The young, on the 1st of June, were nearly ready to fly. It was not a common species, but was found from Nulato to Sitka and Kodiak.

In regard to general characteristics of this Falcon, they do not apparently differ in any essential respects from those of the better-known *Falco communis* of the Old World. It flies with immense rapidity, rarely sails in the manner of other Hawks, and then only for brief periods and when disappointed in some attempt upon its prey. In such cases, Mr. Audubon states, it merely rises in a broad spiral circuit, in order to reconnoitre a space below. It then flies swiftly off in quest of plunder. These flights are made in the manner of the Wild Pigeon. When it perceives its object, it increases the flappings of its wings, and pursues its victim with a surprising rapidity. It turns, and winds, and follows every change of motion of the object of pursuit with instantaneous quickness. Occasionally it seizes a bird too heavy to be managed, and if this be over the water it drops it, if the distance to land be too great, and flies off in pursuit of another. Mr. Audubon has known one of this species to come at the report of a gun, and carry off a Teal not thirty steps distant

from the sportsman who had killed it. This daring conduct is a characteristic trait.

This bird is noted for its predatory attacks upon water-fowl, but it does not confine itself to such prey. In the interior, Richardson states that it preys upon the Wild Pigeon, and upon smaller birds. In one instance Audubon has known one to follow a tame Pigeon to its house, entering it at one hole and instantly flying out at the other. The same writer states that he has seen this bird feeding on dead fish that had floated to the banks of the Mississippi. Occasionally it alights on the dead branch of a tree in the neighborhood of marshy ground, and watches, apparently surveying, piece by piece, every portion of the territory. As soon as it perceives a suitable victim, it darts upon it like an arrow. While feeding, it is said to be very cleanly, tearing the flesh, after removing the feathers, into small pieces, and swallowing them one by one.

The European species, as is well known, was once largely trained for the chase, and even to this day is occasionally used for this purpose; its docility in confinement, and its wonderful powers of flight, rendering it an efficient assistant to the huntsman. We have no reason to doubt that our own bird might be made equally serviceable.

Excepting during the breeding-season, it is a solitary bird. It mates early in February, and even earlier in the winter. Early in the fall the families separate, and each bird seems to keep to itself until the period of reproduction returns.

In confinement, birds of this family become quite tame, can be trained to habits of wonderful docility and obedience, and evince even an affection for the one who cares for their wants.

This species appears to nest almost exclusively on cliffs, and rarely, if ever, to make any nests in other situations. In a few rare and exceptional cases this Falcon has been known to construct a nest in trees. Mr. Ord speaks of its thus nesting among the cedar swamps of New Jersey; but this fact has been discredited, and there has been no recent evidence of its thus breeding in that State. Mr. Dall found its nest in a tree in Alaska, but makes no mention of its peculiarities.

The eggs of this species are of a rounded-oval shape, and range from 2.00 to 2.22 inches in length, and from 1.60 to 1.90 in width. Five eggs, from Anderson River, have an average size of 2.09 by 1.65 inches. An egg from Mount Tom, Mass., is larger than any other I have seen, measuring 2.22 inches in length by 1.70 in breadth, and differs in the brighter coloring and a larger proportion of red in its markings. The ground is a deep cream-color, but is rarely visible, being generally so entirely overlaid by markings as nowhere to appear. In many the ground-color appears to have a reddish tinge, probably due to the brown markings which so nearly conceal it. In others, nothing appears but a deep coating of dark ferruginous or chocolate-brown, not homogeneous, but of varying depth of coloring, and here and there deepening into almost blackness. In one egg, from Anderson River, the cream-colored ground is very apparent, and

only sparingly marked with blotches of a light brown, with a shading of bronze. An egg from the cabinet of Mr. Dickinson, of Springfield, taken on Mount Tom, Massachusetts, is boldly blotched with markings of a bright chestnut-brown, varying greatly in its shadings.

***Subgenus* ÆSALON, Kaup**

Æsalon, Kaup, 1829. (Type, *Falco æsalon*, Gmelin, = *F. lithofalco*, Gm.)

Hypotriorchis, Auct. *nec* Boie, 1826, the type of which is *Falco subbuteo*, Linn.

Dendrofalco, Gray, 1840. (Type, *F. æsalon*, Gmel.)

This subgenus contains, apparently, but the single species *F. lithofalco*, which is found nearly throughout the Northern Hemisphere, and in different climatic regions is modified into geographical races. Of these, North America possesses three, and Europe one; they may be distinguished as follows:—

Species and Races

F. lithofalco. Second and third quills longest; first usually shorter than, occasionally equal to, or rarely longer than, the fourth. *Adult female, and young of both sexes.* Above brownish, varying from pale earth-brown, or umber, to nearly black,

plain, or with obscure transverse spotting of lighter; tail with five to eight lighter bands, which, however, are sometimes obsolete, except the terminal one. Beneath ochraceous-white, longitudinally striped with brown or dusky over the whole surface. *Adult male* (except in var. *suckleyi* and *richardsoni*?). Above plumbeous-blue, with darker shaft-streaks; tail with more or less distinct bands of black, and paler tip. Beneath much as in the female and young, but stripes usually narrower and more reddish. Wing, 7.20–9.00; tail, 4.90–6.30; culmen, .45–.60; tarsus, 1.30–1.60; middle toe, 1.15–1.51.

a. Adult male plumbeous-blue above; sexes very unlike in adult dress. Female and young without transverse spotting on upper parts.

Adult male. Tail deep plumbeous, tipped with ash, with six transverse series of dusky spots (which do not touch the shaft nor edge of the feathers) anterior to the subterminal zone, the black of which extends forward along the edge of the feather. Inner web of the longest primary with ten transverse spots of white. Streaks on the cheeks enlarged and blended, forming a conspicuous “mustache.” Pectoral markings linear black. The ochraceous wash deepest across the nape and breast, and along the sides, and very pale on the tibiae. *Adult female.* Above brownish-plumbeous, the feathers becoming paler toward their margins, and with conspicuous black shaft-streaks. Tail with eight (three concealed) narrow bands of pale fulvous-ashy; longest primary with ten light spots on inner web. Outer webs of primaries with a few spots of ochraceous. *Young.* Similar

to the ♀ *adult*, but with a more rusty cast to the plumage, and with more or less distinct transverse spots of paler on the upper parts. Wing, 7.60–9.00; tail, 5.10–6.30; culmen, .45–.55; tarsus, 1.35–1.47; middle toe, 1.15–1.35. *Hab.* Europe ... var. *lithofalco*.⁵⁸

Adult male. Tail light ash, tipped with white, and crossed by three or four nearly continuous narrow bands of black (extending over both webs, and crossing the shaft), anterior to the broad subterminal zone, the black of which does not run forward along the edge of the feathers. Inner web of longest primary with seven to nine transverse spots of white. Streaks on the cheeks sparse and fine, not condensed into a “mustache.” Pectoral markings broad clear brown. Ochraceous wash weak across the nape and breast, and along sides, and very deep on the tibiae. *Adult female.* Above plumbeous-umber, without rusty margins to the feathers, and without conspicuous black shaft-streaks. Tail with only five (one concealed) narrow bands of pale ochraceous; outer

⁵⁸ *Falco* (*Æsalon*) *lithofalco*, var. *lithofalco* (Gmelin). *Accipiter lithofalco*, Briss. Orn. I, 1760, 349. *Falco lithofalco*, Gmel. S. N. 1789, 278. *Æsalon lithofalco*, Kaup. Ueb. Falk. Mus. Senck. 258. *Falco regulus*, Gmel. S. N. 1798, 285. *Accipiter æsalon*, Briss. Orn. I, 1760, 382. *Falco æsalon*, Gmelin, S. N. 1789, 284.—Yarrell, Hist. Brit. B., ed. 1871, 74. *Hypotriorchis æsalon*, Gray, Gen. 1844, Sp. 10. *Falco intermixtus*, Daud. Tr. Orn. II, 1800, 141. *Falco emerillus*, Savigny, Descr. Egypt, Pt. I, 1809, 100. *Falco sibiricus*, Shaw, Zoöl. VII, 1812, 207. *Falco cæsius*, Meyer, Taschen. deutsch. Vög. I, 1810. *Falco subæsalon*, Brehm, Vög. Deutsch. I, 1831, 67. *Hab.* Europe and Western Asia; Iceland. *List of Specimens examined*.—National Museum, 8; Boston Society, 4; Cambridge Museum, 3; New York Museum, 2; Philadelphia Academy, 3. Total, 20. *Measurements*.—♂. Wing, 7.60–8.00; tail, 5.10–5.30; culmen, .45–.50; tarsus, 1.35–1.45; middle toe, 1.15; specimens, 10. ♀. Wing, 8.60–9.00; tail, 6.00–6.30; culmen, .52–.55; tarsus, 1.45–1.47; middle toe, 1.20–1.25; specimens, 10.

webs of primaries without ochraceous spots; inner web of outer primary with eight spots of white. *Young*. Like the adult female, but darker. Wing, 7.90–8.25; tail, 5.15–5.25; tarsus, 1.00; middle toe, 1.25. *Hab*. Entire continent of North America; West Indies ... var. *columbarius*.

b. Adult male not bluish? sexes similar? upper parts with lighter transverse spots.

Adult. Above light grayish-umber, or earth-brown, with more or less distinct lighter transverse spots; secondaries crossed by three bands of ochraceous spots, and outer webs of inner primaries usually with spots of the same. Tail invariably with six complete and continuous narrow bands of dull white. Beneath white, with broad longitudinal markings of light brown, these finer and hair-like on the tibiae and cheeks, where they are sparse and scattered, not forming a “mustache.” Top of the head much lighter than the back. *Young*. Similar, but much tinged with rusty above, all the white portions inclining to pale ochraceous. Wing, 7.70–9.00; tail, 5.00–6.30; culmen, .50–.60; tarsus, 1.40–1.65; middle toe, 1.20–1.51. Second and third quills longest; first equal to fourth, slightly shorter, or sometimes slightly longer. *Hab*. Interior plains of North America, between the Mississippi River and the Rocky Mountains, from the Arctic regions to Texas ... var. (?) *richardsoni*.

c. Adult male not bluish? sexes similar? upper parts without transverse spots, and tail without lighter bands, except at the tip.

Above plain brownish-black; the tail narrowly tipped with whitish, but without other markings; inner webs of the

primaries without lighter spots. Beneath pale ochraceous broadly striped with sooty-black. Wing, 7.35–8.50; tail, 5.25–5.75; culmen, .50–.55; tarsus, 1.30–1.62; middle toe, 1.25–1.35. *Hab.* Northwest coast region from Oregon to Sitka ... var. *suckleyi*.

Falco (Æsalon) lithofalco (Gmelin)

Var. columbarius, Linnæus

PIGEON HAWK; AMERICAN MERLIN

Falco columbarius, Linn. Syst. Nat. 1766, p. 128.—Gmel. Syst. Nat. 1789, p. 281.—Lath. Ind. Orn. I, 44, 1790; Syn. I, 101, sp. 86; Supp. I, 27, 1802; Gen. Hist. I, 278, 1821.—Daud. Tr. Orn. II, 83, 1800.—Shaw. Zoöl. VII, 188, 1812.—Wils. Am. Orn. pl. xv, fig. 3, 1808.—Jard. (Wils.) Am. Orn. I, p. 254, 1808.—James. (Wils.) Am. Orn. I, 61.—Brew. (Wils.) Am. Orn. I, 683, 1852.—Rich. Faun. Bor. Am. II, 35, 1831.—Aud. Syn. B. A. p. 16, 1839; Orn. Biog. I, 466.—Bonap. Ann. Lyc. N. Y. II, 28; Isis, 1832, p. 1136; Eur. & N. Am. B. p. 4, 1838.—Nutt. Man. I, 60, 1833.—Cuv. Règ. An. (ed. 2), I, 322, 1829.—Less. Tr. Orn. p. 92, 1831.—Forst. Phil. Trans.

LXII, 382, 1772.—Swains. Classif. B. II, p. 212, 1837.
 —Jard. Ann. Nat. Hist. XVIII, 118.—Gosse, B. Jam. p. 17, 1847.—Sagra, Hist. Nat. Cuba Ois. p. 23.—Wedderb. Jard. Cont. Orn. 1849, p. 81.—Hurdis, Jard. Cont. Orn. 1850, p. 6.—De Kay, Zoöl. N. Y. II, 15, pl. iv, f. 9, 1844.
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 —Newb. P. R. Rept. VI, 74, 1857.—Cass. B. N. Am. p. 9, 1858.—Cooper & Suck. P. R. R. Rept. XII, 1860, 142.
 —Coues, Pr. A. N. S. Phil. 1866, 6.—Brewer, Oölogy, 12. *Lithofalco columbarius*, Bonap. Consp. Av. p. 26, 1850. *Æsalon columbarius*, Kaup, Monog. Falc. Cont. Orn. p. 54, 1850.—Gray, Hand List, I, 21, 1869. *Falco obscurus*, Gmel. Syst. Nat. p. 281, 1789.—Lath. Ind. Orn. p. 44, 1790; Syn. Supp. I, 38, 1802; Gen. Hist. I, 272, 1821.—Daud. Tr. Orn. II, p. 123, 1800. *Falco intermixtus*, Daud. Tr. Orn. II, p. 141, 1800.—Lath. Gen. Hist. I, 136, 1821. *F. temerarius*, Aud. B. Am. pls. lxxv, xcii, 1831; Orn. Biog. I, 380, 1831. *F. auduboni*, Blackw. Res. Zoöl. 1840. *Accipiter palumbarius*, Catesb. Carol. I, pl. iii, 1754.

Sp. Char. *Adult male*. Above cinereous, varying in shade, but generally of a slaty-bluish cast; each feather with a distinct shaft-streak of black, these lines most conspicuous on the head

above. Tail with a very broad subterminal band of black, about one inch in width; there are indications of three other bands, their continuity and distinction varying with the individual, but generally quite conspicuous, and each about half the width of the terminal one; the subterminal black band is succeeded by a terminal one of white, of about three-sixteenths of an inch in width, sometimes broader; on the lateral feathers the black bands are always conspicuous, being in form of transverse oblong spots, crossing the shaft, but less extended on the outer web, which is often immaculate except at the end, the broad terminal band always extending to the edge of the feather. Primaries dusky-black, margined terminally more or less distinctly with whitish (sometimes fading on the edge only); on the inner web is a series of about eight transverse oval spots of white, and generally corresponding to these are indications of bluish-ashy spots on the outer web. Beneath white, this purest on the throat, which is immaculate: there is generally a more or less strong tinge of fulvous beneath, this always prevalent on the tibiæ, and on a distinct collar extending round the nape, interrupting the blue above; the tibiæ frequently incline to ochraceous-rufous. Lateral portions of the head with fine streaks of dusky, these thickest on upper edge of the ear-coverts, leaving a distinct whitish superciliary streak, those of opposite sides meeting on the forehead. Breast, upper part of the abdomen, sides, and flanks, with longitudinal stripes of umber, each with a shaft-streak of black; on the flanks their shape is modified, here

taking the form of spots running in chain-like series; tibiae with narrower and darker streaks; lower tail-coverts with narrow central streaks like those on the tibiae. Frequently there is a strong bluish shade on flanks and lower tail-coverts, sometimes replacing the brown of the spots on the former, and clouding in a similar form the latter. Length, 11.00; extent, 23.75; wing, 7.75.

Adult female. Pattern of coloration as in the male, but the colors different. The blue above replaced by dark umber-brown with a plumbeous cast, and showing more or less distinct darker shaft-lines; these on the head above very broad, giving a streaked appearance; white spots on inner webs of primaries more ochraceous than in the male. Tail dark plumbeous-brown, shading into blackish toward end, with five rather narrow ochraceous or soiled white bars, the first of which is concealed by the upper coverts, the last terminal. White beneath, less tinged with reddish than in the male, the tibiae not different from the other portions; markings beneath as in the male.

Juv. Above plumbeous-brown, tinged with fulvous on head, and more or less washed with the same on the rump; frequently the feathers of the back, rump, scapulars, and wings pass into a reddish tinge at the edge; this color is, however, always prevalent on the head, which is conspicuously streaked with dusky. Tail plumbeous-dusky, darker terminally, with five regular light bars, those toward the base ashy, as they approach the end becoming more ochraceous; these bars are more continuous and regular than in the adult female, and are even conspicuous on the middle

feathers. Primaries dusky, passing on edge (terminally) into lighter; spots on the inner webs broader than in the female, and pinkish-ochre; outer webs with less conspicuous corresponding spots of the same. Beneath soft ochraceous; spots as in adult female, but less sharply defined; tibiæ not darker than abdomen.

Hab. Entire continent of North America, south to Venezuela and Ecuador; West India Islands.

Localities: Ecuador (high regions in winter, Scl. P. Z. S. 1858, 451); Cuba (Cab. Jour. II, lxxxiii, Gundlach, Sept. 1865, 225); Tobago (Jard. Ann. Mag. 116); S. Texas (Dresser, Ibis, 1865, 323, breeding?); W. Arizona (Coues, Pr. A. N. S. 1866, 42); Costa Rica (Lawr. IX, 134); Venezuela (Scl. & Salv. 1869, 252).

LIST OF SPECIMENS EXAMINED

National Museum, 42; Boston Society, 11; Philadelphia Academy, 10; Museum Comp. Zoöl., 7; New York Museum, 3; G. N. Lawrence, 2; R. Ridgway, 4. Total, 79.

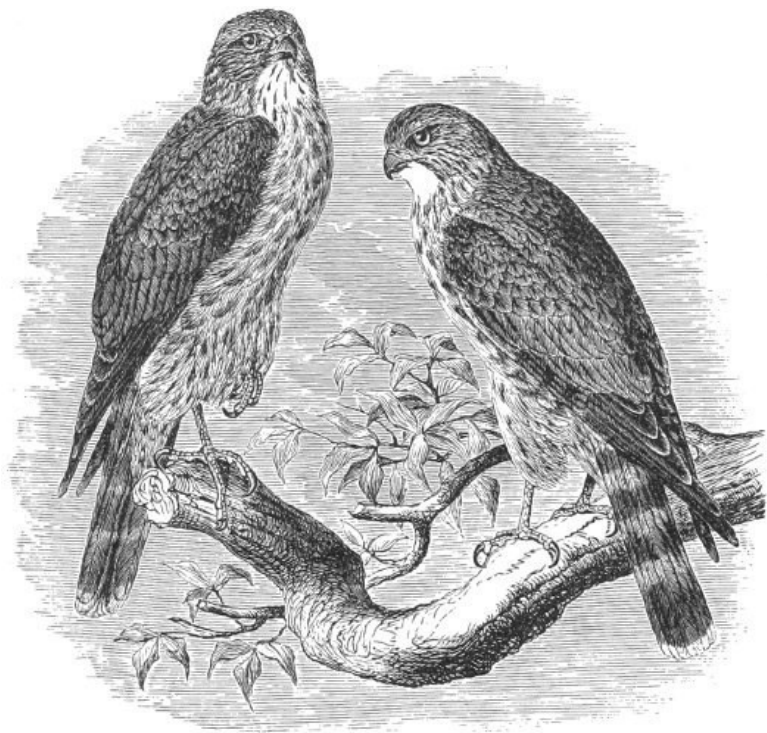
Measurements.

<i>Sex.</i>	<i>Wing.</i>	<i>Tail.</i>	<i>Culmen.</i>	<i>Tarsus.</i>	<i>Middle Toe.</i>	<i>Specimens.</i>
♂	7.20–7.90	4.90–5.50	.48–.50	1.30–1.40	1.15–1.25	34
♀	8.00–8.55	5.50–6.00	.55–.60	1.55–1.60	1.35–0.00	32

The plumage of the adult male, which is not as often seen as that of the younger stages and adult female, is represented in the

Smithsonian Collection by fifteen specimens, from various parts of North America. Of these, an example from Jamaica exhibits the purest shades of color, though agreeing closely with some specimens from the interior of the United States; the cinereous above being very fine, and of a light bluish cast. The upper tail-coverts are tipped with white; the tail is a quarter of an inch longer than in any North American specimen, one half-inch longer than the average; the wing, however, is about the same.

A specimen from Santa Clara, California (4,475, Dr. J. G. Cooper), like most of those from the Pacific coast, has the cinereous very dark above, while beneath the ochraceous is everywhere prevalent; the flanks are strongly tinged with blue; the black bars of the tail are much broken and irregular. A specimen from Jamaica (24,309, Spanish Town; W. T. March), however, is even darker than this one, the stripes beneath being almost pure black; on the tail black prevails, although the bands are very regular. Nos. 27,061, Fort Good Hope, British America, 43,136, Fort Yukon, Alaska, and 51,305, Mazatlan, Mexico, have the streaks beneath narrow and linear; the ochraceous confined to the tibiae, which are of a deep shade of this color.



Falco columbarius.

A specimen from Nicaragua (No. 40,957, Chinandega) is like North American examples, but the reddish tinge beneath is scarcely discernible, and confined to the tibiae, which are but faintly ochraceous; the markings beneath are broad and deep umber, the black shaft-streak distinct.

In the adult female there is as little variation as in the male in plumage, the shade of brown above varying slightly, also the yellowish tinge beneath; the bars on the tail differ in continuity and tint in various specimens, although they are always five in number,—the first concealed by the coverts, the last terminal. In 19,382, Fort Simpson, British America, and 2,706, Yukon, R. Am. (probably very old birds), the light bars are continuous and pale dull ashy.

The young vary about the same as adults. Nos. 19,381, Big Island, Great Slave Lake; 5,483, Petaluma, California; and 3,760, Racine, Wisconsin,—are young males moulting, scattered feathers appearing on the upper parts indicating the future blue plumage.

Var. suckleyi, Ridgway

BLACK MERLIN

Sp. Char. A miniature of *F. peregrinus*, var. *pealei*. Above, uniform fuliginous-black, the secondaries and tail-feathers very narrowly but sharply tipped with white, and the primaries passing into whitish on their terminal margin; nuchal region with concealed spotting of pale rusty or dingy whitish. Beneath, longitudinally striped with fuliginous-black, or dark sooty-

brown, and pale ochraceous; the former predominating on the breast, the latter prevailing on the throat and anal region. Sides and flanks nearly uniform dusky, with roundish white spots on both webs; lower tail-coverts with a broad sagittate spot of dusky on each feather. Lining of the wing fuliginous-dusky, with sparse, small roundish spots of white. Inner webs of primaries plain dusky, without spots, or else with them only faintly indicated. Tail plain dusky-black, narrowly tipped with white, and without any bands, or else with them only faintly indicated.

Male (No. 4,477, Shoalwater Bay, Washington Territory; J. G. Cooper). Wing, 7.35; tail, 5.25; culmen, .50; tarsus, 1.30; middle toe, 1.25.

Female (No. 5,832, Fort Steilacoom, Washington Territory, September, 1856; Dr. George Suckley). Wing, 8.50; tail, 5.70; culmen, .55; tarsus, 1.62; middle toe, 1.35.

Hab. Coast region of Northern California, Oregon, and Washington Territory (probably northward to Alaska). Puget Sound, Steilacoom, Yreka, California (Oct.), and Shoalwater Bay (*National Museum*).

The plumage of this race is the chief point wherein it differs from the other forms of the species; and in its peculiarities we find just what should be expected from the Oregon region, merely representing as it does the melanistic condition so frequently observable in birds from the northwest coast.

The upper parts are unicolored, being continuous blackish-

plumbeous from head to tail. The tail is tipped with white, but the bars are very faintly indicated, being in No. 4,499 altogether wanting, while in 21,333 they can scarcely be discovered, and only four are indicated; in the others there is the usual number, but they are very obsolete. In No. 4,499, the most extreme example, the spots on the inner webs of the primaries are also wanting; the sides of the head are very thickly streaked, the black predominating, leaving the superciliary stripe ill-defined; the throat is streaked, and the other dark markings beneath are so exaggerated that they cover all portions, and give the prevailing color; the under tail-coverts have broad central cordate black spots.

Another specimen from this region (4,476, Puget Sound) is similar, but the spots on primaries are conspicuous, as in examples of the typical style; indeed, except in the most extreme cases, these spots will always be found indicated, leading us to the unavoidable conclusion that the specimens in question represent merely the fuliginous condition of the common species; not the condition of *melanism*, but the peculiar darkened plumage characteristic of many birds of the northwest coast, the habitat of the present bird; it should then be considered as rather a geographical race, co-equal to the *Falco gyrfalco*, var. *labradora*, *F. peregrinus*, var. *pealei*, and other forms, and not confounded with the individual condition of *melanism*, as seen in certain species of *Buteones*.

LIST OF SPECIMENS EXAMINED

National Museum, 6.

Measurements.

Sex.	Wing.	Tail.	Culmen.	Tarsus.	Middle Toe.	Specimens.
♂	7.35–7.70	5.25–5.60	.48–.50	1.30–1.45	1.20–0.00	3
♀	8.25–8.50	5.70–5.80	.55–.60	1.50–1.60	1.35–1.40	3

Second quill longest; first quill equal to, a little shorter than, or a little longer than, the fourth.

Var. richardsoni, Ridgway

RICHARDSON'S MERLIN

Falco æsalon, Rich. & Swains. F. B. A. II, pl. xxv, 1831.
 —Nutt. Man. Orn. II, 558.—Coues, P. A. N. S. Philad.
 1866, p. 42 (in text). *Falco (Hypotriorchis) richardsoni*,
 Ridgway, P. A. N. S. Philad. Dec. 1870, 145. *Falco*
richardsoni, Coues, Key, 1872, p. 214.

Sp. Char. Adult male like the female and young? The known stages of plumage more like the adult female and young of var.

lithofalco (*F. æsalon*, Auct.) than like var. *columbarius*.

Adult male (Smithsonian, No. 5,171, mouth of the Vermilion River, near the Missouri, October 25, 1856; Lieutenant Warren, Dr. Hayden). Upper plumage dull earth-brown, each feather grayish-umber 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; outer webs of primaries with spots of the same, corresponding with those on 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 around the nape (interrupting the brown above),—and the 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 medial linear stripe of clear ochre-brown on each feather; these stripes broadest on the flanks; each stripe with a conspicuously 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 wing 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-formula, 2, 3—4, 1. Wing, 7.70; tail, 5.00; culmen, .50; tarsus, 1.30; middle toe, 1.25; outer, .85; inner, .70; posterior, .50.

Adult female (58,983, Berthoud's Pass, Rocky Mountains, Colorado Territory; Dr. F. V. Hayden, James Stevenson). 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 as in the male. Wing-formula, 3, 2—4—1. Wing, 9.00; tail, 6.10; culmen, .55; tarsus, 1.40; middle toe, 1.51.

Young male (40,516, Fort Rice, Dacotah, July 20, 1865; Brig.-Gen. Alfred Sully, U. S. A., S. M. Rothammer). Differing from the adult only in minute details. Upper surface with the rusty borders of the feathers more washed over the general surface; the rusty-ochraceous forms 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 (.40 of an inch), and almost cream-color in tint. 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.

Hab. Interior regions of North America, between the Mississippi Valley and the Rocky Mountains, from Texas to the Arctic regions.

LIST OF SPECIMENS EXAMINED

National Museum, 10; Museum Comp. Zoöl., 2; R. Ridgway, 3. Total, 15.

Measurements.

<i>Sex.</i>	<i>Wing.</i>	<i>Tail.</i>	<i>Culmen.</i>	<i>Tarsus.</i>	<i>Middle Toe.</i>	<i>Specimens.</i>
♂	7.75–8.60	5.70–6.00	.50–.60	1.42–1.55	1.20–1.30	8
♀	8.50–9.00	6.00–6.30	.55–.58	1.55–1.65	1.35–1.40	7

Since originally describing this bird, I have seen additional examples, and still consider it as an easily recognized race, not at all difficult to distinguish from *columbarius*. Now, however, I incline strongly to the theory that it represents merely the light form of the central prairie regions, of the common species; since its characters seem to be so analogous to those of the races of *Buteo borealis* and *Bubo virginianus* of the same country. It is doubtful whether some very light-colored adult males, supposed

to belong to *columbarius*, as restricted, should not in reality be referred to this race, as the adult plumage of the male. But having seen no adult males from the region inhabited by the present bird obtained in the breeding-season, I am still in doubt whether the present form ever assumes the blue plumage.

As regards the climatic or regional modifications experienced by the *Falco lithofalco* on the American continent, the following summary of facts expresses my present views upon the subject. First: examples identical in all respects, or at least presenting no variations beyond those of an individual character, may be found from very widely separated localities; but the theory of explanation is, that individuals of one race may become scattered during their migrations, or wander off from their breeding-places. Second: the Atlantic region, the region of the plains, and the region of the northwest coast, have each a peculiar race, characterized by features which are also distinctive of races of other birds of the same region, namely, very dark—the dark tints intensified, and their area extended—in the northwest coast region; very light—the light markings extended and multiplied—in the middle region; and intermediate in the Atlantic region.

Habits. The distribution of the well-known Pigeon Hawk is very nearly coextensive with the whole of North America. It is found in the breeding-season as far to the north as Fort Anderson, on the Anderson and McKenzie rivers, ranging even to the Arctic coast. Specimens were taken by Mr. Ross at Lapierre House and at Fort Good Hope. Several specimens were taken by Mr. Dall

at Nulato, where, he states, it is found all the year round. They were also taken by Bischoff at Kodiak. During the breeding-season it is found as far south as Nova Scotia, New Brunswick, and the northern portions of Maine, and probably Vermont and New York. It is abundant on the Pacific coast.

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