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Birds

THE BIRDS
OF
EASTERN NORTH AMERICA;
WITH
ORIGINAL DESCRIPTIONS
OF ALL THE SPECIES WHICH OCCUR
EAST OF THE MISSISSIPPI RIVER,
BETWEEN THE
Arctic Circle and the Gulf of Mexico,
WITH FULL NOTES UPON THEIR HABITS, ETC.,
BY
C. J. MAYNARD;

REVISED EDITION.

NEWTONVILLE, MASS.:
C. J. MAYNARD.

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P R E F A C E .

The first edition of the *Birds of Eastern North America* has been exhausted for some time, but owing to circumstances, I have not been enabled to prepare a second edition, containing the necessary revisions and additional matter, until the present time.

Much of the original text has been preserved intact, but considerable change has been made in some of it. The main difference between this and the former edition, aside from repaging the entire work, beginning with the *Water Birds*, is in the extensive additions, not only in number of species, which are considerable, but in new matter that pertains to descriptions, habits, etc., of species already enumerated. These embody much of the results of my studies among the birds of Florida, the Bahamas, and other of the West Indies, made during several recent expeditions, undertaken for this purpose. During this time especial attention has been paid to *Water Birds*, and many new facts concerning them have been noted.

I have not considered it expedient, for several reasons, to change the nomenclature, but in an appendix will be found a concordance of my names and those given in the *Check List*, last edition, of the American Ornithologist's Union.

The additional species and much of the new matter, will be found, as a rule, at the end of the orders, or in some cases at the end of families, thus although some of the newly added species and sub-species are given under their proper general headings, they are often misplaced systematically, but a reference to the index will at once reveal the absence or presence of a given species or sub-species.

C. J. M.

NEWTONVILLE, MASS., MAY, 1889.

S E C O N D P R E F A C E.

The first two parts of the present edition of this work, were issued in May, 1889. The following year two or three additional parts were distributed to subscribers, but it was not until October, 1894, that I began to print the bulk of the book, and part forty, with the concluding index, was issued December 24th, 1895.

I wish to thank my many subscribers, one and all, for their kind patience during this unavoidably irregular method of issuing the parts.

Believing, as I do, that our avian nomenclature is still in an unsettled, and in a great measure transitional, condition, I have not considered it advisable to give a concordance of my names and those of the American Ornithologist's Union which I have mentioned on the preceding page.

C. J. M.

NEWTONVILLE, MASS., JANUARY 10, 1896.

BIRDS

OF

EASTERN NORTH AMERICA.

SUB-CLASS I. NATATORES. WEB-FOOTED BIRDS.

FEET, PALMATE, THAT IS, THE ANTERIOR, AND SOMETIMES THE POSTERIOR, TOES ARE CONNECTED BY MORE OR LESS PROMINANT WEBS.

Birds characterized by the above peculiarity, spend a greater portion of their time on the water or near it, and their food consists, in a great measure, of aquatic animals and plants.

The group is, however, not natural, for there is no absolute division between it and the next sub-class. In it are some highly specialized families that possess osteological characters which indicate that if their remote ancestral origin was ever the same the connecting forms have long been lost. For example, although the Man-of-war and the Albatross are remarkably strong flying birds, having many habits in common, yet they are as widely different in structure as almost any two species of birds can very well be, while neither have scarcely anything in common with the short-winged, weakly flying Grebes.



FIG. 1. Head of MURRE, URIA TROILE.

ORDER I. PYGOPODES. DIVING BIRDS.

Wings, not very long. Tail, short. Tibia, inclosed within skin of body. Anterior toes, fully webbed, or lobed. Hind toe, short and elevated.

The bill is variable in form, being either pointed or flattened laterally. Sternum, at least, twice as long as wide, but with keel low, rarely equalling in height one half its width. Marginal indentations, two or four. Coracoids, short, about equalling width of sternum. Furcula, short, rather rounded, and well arched. Sterno-trachealis, present, and there is a small bronchialis, but no other laryngeal muscles. Sexes, similar.

FAMILY I. COLYMBIDÆ. THE LOONS.

Bill, about as long as head and pointed. Legs and feet, long. Toes, fully webbed. Members of this family have the neck rather long. The legs are placed very far back in the body, so that the birds cannot stand in a perpendicular position with ease; and there is quite a long, bony process at basal extremity of tibia, which greatly assists in swimming, at which art these birds are very expert. The young are covered with down at birth and enter the water at once. Sternum, long with two marginal indentations.

GENUS I. COLYMBUS. THE LOONS.

GEN. CH. Similar to those given under Family heading. There are three species within our limits.

COLYMBUS TORQUATUS.

Great Loon.

Colymbus torquatus Brun. Orn. Bor.; 1764.

DESCRIPTION.

SP. CH. Size, very large. Form, robust. Color. *Adult.* Upper parts, sides and flanks, brownish-black, spotted with rounded marks of white which become larger on back, and linear near neck. Head and neck black, glossed with greenish and purple, with elevated lines of white in crescent-shaped spots on throat and sides of neck. White beneath, with band across base of tail and tips of under coverts, dusky spotted with white. Iris, ruby-red, bill, black, and feet, greenish. *Young,* brownish above with the feathers edged with lighter, and white below, with iris, brown, bill, bluish. *Nestlings.* A specimen kindly sent me by Mr. J. C. Mead is dark sooty-brown throughout, lightest on neck and gradually changing to white beneath. Bill and feet, black.

OBSERVATIONS.

Known by the large size. Distributed, in summer, from Maine, northward; wintering from Massachusetts to Florida.

DIMENSIONS.

Average measurements of specimens from North America. Length, 32.00; stretch, 50.50; wing, 12.55; tail, 3.50; bill, 2.75; tarsus, 2.65. Longest specimen, 36.00; greatest extent of wing, 52.00; longest wing, 13.10; tail, 4.00; bill, 3.00; tarsus, 2.80. Shortest specimen, 28.00; smallest extent of wing, 49.00; shortest wing, 12.00; tail, 3.00; bill, 2.50; tarsus, 2.50.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground near water, composed of grass, weeds, etc. *Eggs,* two or three in number, rather pointed oval in form, deep greenish-brown in color, spotted and blotched with very dark-brown. Dimensions from 2.15 x 3.50 to 2.35 x 3.85.

HABITS.

The Great Loons are very abundant in Chesapeake Bay in winter, especially during storms, but many fly out to sea in pleasant weather; then as soon as there is an indication of a change, back they come into land-locked waters. Just before bad weather, they sound their loud, peculiarly long-drawn cry which has a singular effect, especially when heard at night on the open ocean, and when sailors hear this note, they say that the Loons are crying for wind. The flight of these birds is steady and rapid, while their power of swimming and diving has become proverbial. The Loons breed on inland ponds and lakes, from Massachusetts, northward, and the nests are placed on low islands, marshy shores, or occasionally on banks, though at no great distance from the water. The eggs are deposited

the second or third week in June, and, as I am informed by Mr. J. C. Mead, the young may be seen in company with their parents, by the first of August, not only swimming but diving well, even at this early age. Mr. Mead also states that the adults are extremely solicitous for the safety of their offspring, and if their young chance to be captured, they will follow the boat, crying loudly, and often remaining about the spot where the despoiler left the water, for some days. The Great Loons are migratory and I have shot them in Middle Florida, but they are not common so far south.

COLYMBUS SEPTENTRIONALIS.

Red-throated Loon.

Colymbus septentrionalis LINN., Syst. Nat., I; 1766, 220.

DESCRIPTION.

SP. CH. Form, robust. Size, medium. COLOR. *Adult*. Sides and upper parts, brownish-black, thickly spotted with oval marks of white and the tail is tipped with it. Top of head, greenish-black narrowly streaked with white. Sides of head and throat, bluish-ash, with a large triangular patch of chestnut on latter. Beneath, white. Bill, black, iris, ruby-red, and feet, greenish. *Young*, ashy-brown above, each feather having two subterminal spots of white. White beneath, occasionally tinged with ashy on throat. Iris, brown; bill, bluish.

OBSERVATIONS.

Known in adult stage by the red throat; in young by the subterminal spotting to feathers above. Distributed in summer, from Labrador, northward. Winters from Grand Menan, southward.

DIMENSIONS.

Average measurements of specimens. Length, 25.50; stretch, 42.00; wing, 11.30; tail, 2.25; bill, 1.87; tarsus, 2.88. Longest specimen, 27.00; greatest extent of wing, 13.00; longest wing, 11.65; tail, 2.55; bill, 2.00; tarsus, 3.00. Shortest specimen, 24.00; smallest extent of wing, 11.00; shortest wing, 11.00; tail, 1.95; bill, 1.75; tarsus, 2.75.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground near water, composed of grass, weeds, etc. *Eggs*, two or three in number, pointed oval in form, deep greenish-brown in color, spotted and blotched with very dark-brown. Dimensions from 1.75 x 2.65 to 1.90 x 3.00.

HABITS.

I procured a pair of adult Red-throated Loons at the Magdalen Islands in June, but did not see any more, nor do I think that they usually breed there. These Loons are, however, very abundant in the coast waters of Massachusetts and southward, in autumn and winter, behaving much like the larger species. I do not think that either of these Loons when adult, assume a winter dress different from that worn in summer, but that the birds found with us are merely immature specimens, for I have met with the present species in full spring dress, in December. These birds are not very common in the interior but are occasionally found on small ponds. None of the Loons can rise from the ground, nor from shallow water, nor from deep water, if it be only a few yards in diameter, as they are obliged to swim rapidly for some distance, before flying, in order to gain headway.

COLYMBUS ARCTICUS.

Black-throated Loon.

Colymbus Arcticus Linn., Syst. Nat., I; 1766, 221.

DESCRIPTION.

SP. CH. Form, robust. Size, medium. COLOR. *Adult*. Chin, throat, and neck in front, black with purplish reflections, becoming ashy-blue above, and separated from the black by a series of white lines. Body above and sides, black. Crescent of short lines on throat, spots in bands on back and upper wing coverts, streaks on sides of breast, and under parts, white. Line across base of tail beneath and lower coverts, dusky. Iris, ruby-red, bill, black, and feet, slaty. *Young*, very dark-brown above, the feathers having broad ashy-gray margins. Side of head, ashy very finely streaked with brown. Beneath white becoming ashy on neck. Sides of body and tips of lower tail coverts, dusky. Bill, bluish and iris, brown.

OBSERVATIONS.

Recognized in the adult stage by the black throat, and in young, by the broad, bluish-gray margin to feathers above. Distributed in summer throughout the Arctic Regions, wandering southward in winter. DIMENSIONS. Length, 29.00; stretch, 39.50; wing, 12.00; tail, 2.75; bill, 2.15; tarsus, 2.90.

RED-NECKED GREBE.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground near water, composed of grass, weeds, etc. *Eggs*, two or three in number, pointed oval in form, deep greenish-brown in color, spotted and blotched with very dark-brown. Dimensions from 1.90 x 2.90 to 2.00 x 3.00.

HABITS.

From reading Audubon's account of the Black-throated Loon, one would expect it to occur, at least, occasionally on our coast, but according to my experience, such is not a fact at present, for although I have examined hundreds of Loons in the flesh and in collections, and seen thousands living, I have yet to met with a single specimen taken on our coast, and it is with some hesitation that I admit it among our birds. It may, however, reach our western borders from the Arctic region, where it is not at all rare.

FAMILY II. PODICIPIDÆ. THE GREBES.

Bill, equal in length to head or shorter, and pointed. *Legs and feet*, long, with toes lobed.

Members of this family have the neck rather short. The legs are placed far back in the body, so that the birds cannot stand in a perpendicular position with ease. Tail, rudimentary. Sternum, short and wide, with four marginal indentations. The young are covered with down at birth and enter the water as soon as hatched.

GENUS I. PODICEPS. THE CRESTED GREBES.

GEN. CH. *Bill*, rather strong and usually shorter than head and not curved at tip. *Head*, ornamented with tufts and crests. Members of this genus are remarkable on account of the elongated feathers on head which are, however, only worn during the breeding season. There are three species within our limits.

PODICEPS GRISEIGENA.

Red-necked Grebe.

Podiceps griseigena Gray, Gen.; 1855.

DESCRIPTION.

SP. CH. Form, robust. Size, large. COLOR. *Adult*. Above, black, glossed with greenish, with feathers of back edged with whitish and becoming brown on wing coverts and primaries. Secondaries, white tipped with brown. Neck, excepting above, deep brownish-red extending interruptedly on to breast, with a broad patch of silvery-ash on throat that extends up on sides of head and is edged with lighter. Beneath, silky-white, each feather having central line and terminal spot of dusky. Iris, red; bill, black and feet, greenish. *Young*. Dark-brown above, with the feathers slightly edged with whitish. Edge of wing and patch on secondaries, white. Silky-white beneath, with neck all around tinged with ashy and reddish. Iris, yellow; bill, brown, yellow at base.

OBSERVATIONS.

Known by the large size and reddish neck. Occurs in summer throughout the Arctic Regions, wintering as far south as Pennsylvania.

DIMENSIONS.

Average measurements of specimens. Length, 19.62; stretch, 31.50; wing, 7.00; tail, 1.55; bill, 2.00; tarsus, 2.53. Longest specimen, 20.25; greatest extent of wing, 32.25; longest wing, 7.60; tail, 1.65; bill, 2.10; tarsus, 2.40. Shortest specimen, 19.00; smallest extent of wing, 29.95; shortest wing, 6.49; tail, 1.55; bill, 1.90; tarsus, 2.30.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground in marshy places, composed of grass, weeds, etc. *Eggs*, eight to ten in number, oval in form, yellowish-white in color, covered with a white calcareous deposit. Dimensions from 1.35 x 2.00 to 1.40 x 2.10.

HABITS.

The large Red-necked Grebes are found in autumn and winter, on the salt, land-locked waters of the coast of the New England and Middle States, and I have even seen them far out at sea, but they prefer the mouths of rivers. They are common as far south as Pennsylvania but occur to the Carolinas. These Grebes resemble the following species in general habits but breed in the Arctic Regions.

PODICEPS CORNUTUS.

Horned Grebe.

Podiceps cornutus LATR., Ind. Orn.; 1790.

DESCRIPTION.

SP. CH. Size, small. Form, slender. Head, furnished with elongated plumes. COLOR. *Adult.* Throat, crown, and upper parts, black, becoming brownish on latter where the feathers are edged with lighter. Stripe from base of bill to occiput through eye, front of neck, sides, and flanks, yellowish-chestnut, mixed with dusky on latter. Patch on secondaries, white. Silky-white beneath. Iris, yellow, bill, black, and feet, greenish. *In winter and Young.* Ashy-brown above and on sides. Silky-white beneath but lacks the black and chestnut; otherwise as in the summer adult.

OBSERVATIONS.

Known in adult stage by the red markings, and in young, by the small size, slender bill, and white throat and front of neck. Distributed in summer throughout the North-west and North. Winters in the South.

DIMENSIONS.

Average measurements of specimens. Length, 14.25; stretch, 21.55; wing, 4.65; tail, 1.35; bill, .93; tarsus, 1.75. Longest specimen, 15.25; greatest extent of wing, 25.10; longest wing, 5.75; tail, 1.45; bill, .95; tarsus, 1.85. Shortest specimen, 13.25; smallest extent of wing, 24.15; shortest wing, 4.55; tail, 1.25; bill, .90; tarsus, 1.70.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in marshes or on floating debris, composed of grass, weeds, etc. *Eggs*, four to six in number, elliptical in form, yellowish-white in color. Dimensions from 1.15 x 1.70 to 1.20 x 1.75.

HABITS.

The pretty, little Horned Grebes are very common in the mouths of our New England rivers which empty into the sea, in autumn, when on their way south, but are rare here in spring; yet in April, they are very abundant in the Susquehanna River, in Pennsylvania, when they are in full plumage. Like all members of the Family, these Grebes possess the power of diving with remarkable quickness, and can remain under water for a great length of time, or will project the bill above the surface, the body remaining concealed. According to writers, they breed in the North-west and North, about the last week in June, nesting like the succeeding species.

GENUS II. PODILYMBUS. THE THICK-BILLED GREBES.

Gen. Ch. *Bill, strong, much shorter than head, and curved at tip. Head, without crest.* Members of this genus have the wings very short. We have but one species within our limits.

PODILYMBUS PODICEPS.

Pied-billed Grebe.

Podilymbus podiceps LAW., B. N. A.; 1858, 898.

DESCRIPTION.

SP. CH. Form, robust. Size, medium. COLOR. *Adult.* Upper parts, breast, and sides, brown, darkest on crown and two latter where it is mixed with the silky-white of the lower surface. Sides of head and neck in front, reddish-ash, with a broad patch of black on throat. Secondaries, tipped with white. Iris, brown, feet and bill, greenish, the latter crossed midway by a broad band of black. *In winter and Young.* Similar, but tipped with reddish and lacks the black of throat, which is replaced by white, and band on bill. *Nestlings.* Blackish above, marked with red on head and streaked with white on neck and body. White beneath.

OBSERVATIONS.

Recognized by the short, thick bill and brown breast. Distributed in summer from Pennsylvania, northward; wintering in the South.

DIMENSIONS.

Average measurements of specimens. Length, 13.75; stretch, 23.50; wing, 5.25; tail, 1.40; bill, .85; tarsus, 1.49. Longest specimen, 14.50; greatest extent of wing, 24.00; longest wing, 5.50; tail, 1.60; bill, .95; tarsus, 1.58. Shortest specimen, 13.00; smallest extent of wing, 23.00; shortest wing, 5.00; tail, 1.50; bill, .75; tarsus, 1.42.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in marshes or on floating debris, composed of grass, weeds, etc. *Eggs*, four to six in number, elliptical in form, yellowish-white in color. Dimensions from 1.15 x 1.65 to 1.25 x 1.85.

HABITS.

The Pied-billed Grebe is one of the best known species of the genus, as it is remark-

ably common, especially during migrations, throughout our section. They winter from the Carolinas, southward, but are particularly common in Florida at this season, where, perhaps, a few remain to breed. As do all the members of the family, the Pied-billed Grebe places its nest on a mass of floating debris in some quiet, reedy cove of a pond or river, depositing the eggs early in June. The young follow their parents as soon as hatched and are cared for by them with great assiduity. All the Grebes possess the power of inflating the space between the skin and body, and thus they can ride lightly on the water, or by contracting the skin and feathers, are enabled to sink slowly beneath the surface, often swimming with only the head exposed; or they will remain hidden in the reeds, with the bill alone projecting. This Grebe migrates with the other species in September and October.

FAMILY III. ALCIDÆ. THE AUKS, PUFFINS, ETC.

Bill, usually short and more or less compressed. Legs, short, with toes fully webbed. Members of this family have the neck quite short. The legs are placed far back in the body, yet the birds can generally stand in a perpendicular position with ease. Sternum, long and narrow, with two marginal indentations. The outer covering of the bill is moulted in some species. The young are covered with down at birth but do not enter the water until fully fledged, being fed by the parents by regurgitation.

GENUS I. ALCA. THE AUKS.

GEN. CH. *Bill, shorter than head, feathered at base, compressed, but not as high as long.* The bill is ridged transversely. There is but one species within our limits.

ALCA TORDA.

Razor-billed Auk.

Alca torda LINN., Syst. Nat., 1; 1766, 210.

DESCRIPTION.

SP. CH. Form, rather slender. Size, medium. COLOR. *Adult.* Head, upper neck, and upper parts, sooty-brown, lightest anteriorly. Very narrow line from bill to eye, tip of secondaries, and beneath, white. Iris and feet, brown, bill, black, crossed with a curved line of white. *In winter.* Similar, but white beneath to bill. *Young,* similar to the winter adult, but with bill weaker.

OBSERVATIONS.

Known by the peculiar bill and white line in front of eye. Distributed, in summer, from Maine, northward; wintering from Massachusetts to Florida.

DIMENSIONS.

Average measurements of specimens from North America. Length, 17.00; stretch, 26.00; wing, 7.65; tail, 3.35; bill, 1.45; tarsus, 1.15. Longest specimen, 18.00; greatest extent of wing, 27.00; longest wing, 7.75; tail, 3.50; bill, 1.30; tarsus, 1.25. Shortest specimen, 15.00; smallest extent of wing, 25.00; shortest wing, 7.20; tail, 3.25; bill, 1.40; tarsus, 1.00.

DESCRIPTION OF NESTS AND EGGS.

Eggs, placed in holes of cliffs, one or two in number, rather oval in form, white in color, spotted and blotched with very dark-brown and umber. Dimensions from 2.10 x 3.10 to 2.15 x 3.15.

HABITS.

The southernmost locality from which I have ever received eggs of the Razor-billed Auk, is a cluster of rocks, about twenty miles from Grand Menan, but the favorite breeding ground of the species, is further north, and I found them very abundant on the Magdalen Islands. Here, they place their eggs in holes of rocky cliffs or beneath slabs on the surface. On Bird Rock, where the Razor-bills abound, they were quite tame, allowing me to approach within a few feet of them as they sat on the rocks, but they always managed to elude my grasp, even when incubating, and each bird usually deposits but one egg, though I have occasionally found two.

When living, these Auks are particularly trim and elegantly formed birds, for they sit upright, resting upon the tarsi, and keep themselves very clean with the feathers perfectly smooth and glossy. The Razor-bills are inclined to be quarrelsome birds, especially with other species, and they would seldom allow a Puffin or Murre to alight very near them, opening their bills at the intruder, and disclosing the bright orange mouth. The eyes of the Razor-bills, when examined carefully, are peculiar, as the edge of the iris, next the pupil, is scalloped, not perfectly circular as ordinarily. The Razor-billed Auks not only dive but swim well, and ride lightly on the water. The eggs are deposited during the last week in July, and the birds migrate southward late in October.

GENUS II. MORMON. THE PUFFINS.

Bill, shorter than head, much compressed, and higher than long. The bill is crossed by several ridges. There is but a single species within our limits.

MORMON ARCTICA.

Common Puffin.

Mormon Arctica LL., Prod.; 1811.

DESCRIPTION.

Sr. Cu. Form, robust. Size, small. Color. *Adult.* Broad collar around neck, upper parts, and sides, brownish-black, lightest on latter and crown. Sides of head and chin, ashy. White beneath. Iris, brown; bill, bluish, with ridges orange, and feet, coral-red. *Young.* similar, but the bill is small, without prominent ridges, and is dusky. Ashy of sides of head, obscured with dusky.

OBSERVATIONS.

Known by the compressed, triangular bill and small size. Distributed in summer from the Gall of St. Lawrence, northward; wintering from Grand Menan, southward.

DIMENSIONS.

Average measurements of specimens. Length, 13.35; stretch, 23.50; wing, 6.35; tail, 1.95; bill, 1.85; tarsus, 1.05. Longest specimen, 13.75; greatest extent of wing, 21.00; longest wing, 6.50; tail, 2.00; bill, 2.00; tarsus, 1.10. Shortest specimen, 13.00; smallest extent of wing, 23.00; shortest wing, 6.25; tail, 1.90; bill, 1.75; tarsus, 1.00.

DESCRIPTION OF NESTS AND EGGS.

Eggs, placed in burrows, one in number, oval in form, white in color, occasionally mottled with greenish. Dimensions from 1.60 x 2.30 to 1.70 x 2.80.

HABITS.

I found these odd, little Puffins nesting on the face of the high cliffs on Bryon Island, but on Bird Rock, they dug their burrows on the surface, often excavating beneath a flat slab of limestone, with which a portion of the rock was strewed. The burrows were about six inches in diameter, usually turned either to the right or left, and were from two to six feet long; but the terminus which was slightly enlarged, was never very far from the surface. The single egg was placed in this chamber and was always covered by either the male or female Puffin, which bravely resisted my efforts to remove the egg, biting fiercely; and as these birds are endowed with the same tenacity of purpose which characterizes a snapping turtle, I would frequently withdraw my hand with a Puffin attached to one finger. When brought to the surface, however, and allowed to escape, they would mount into air, and darting downward, would fly out to sea; but if held in the hand, would struggle constantly, uttering a croaking sound.

The Puffins are quite unsuspecting, and during foggy mornings, when all the species which inhabit the Rock, are much tamer than at other times, they would permit me to approach very near them. Indeed I have often seated myself upon a rock on the breeding ground, when several of the little red-beaked fellows would alight within three or four feet of me, and I could thus observe their habits very closely. They fly with exceeding swiftness, but when about to settle, the speed is checked, the feet which in air are held hori-

zontal with the tail, are brought straight forward and spread out; then the bird perches upon the Rock. When down, they assumed a perpendicular position, resting upon the feet, not touching the tarsi, and after regarding me attentively for a moment, would gape once or twice, and then proceed leisurely to arrange their feathers. The eyelids of the Puffins are provided with a singular appendage which gives the birds the appearance of wearing glasses, thus producing a quizzical expression while they were scrutinizing me.

They are of affectionate disposition, and I have frequently seen two of them rubbing their bills together or playfully pecking each other. They are also very peaceful; indeed, I never saw them quarrel with other birds or among themselves, and when an individual attempted to alight on a shelf of the rock, which was so crowded with his fellows, that it seemed impossible for him to find space on which to settle, they would endeavor to make room for him, and would often permit him to stand upon their backs until he had obtained a footing. The Puffins subsist upon small fishes which they catch by diving and swimming beneath the surface of the water.

GENUS III. MERGULUS. THE LITTLE AUKS.

Gen. Ch. *Bill, strong, much shorter than head, and with upper mandible curved at tip. Wings, short. Members of this genus are very small in size and the bill is not compressed. We have but one species within our limits.*

MERGULUS ALLE.

Little Auk.

Mergulus alle Vieill., Anal; 1816.

DESCRIPTION.

Sp. Ch. Form, robust. Size, small. Color. *Adult.* Head and neck all around, and upper parts, black, glossed with bluish. Tips of secondaries and scapularies, and lower surface, white. Lower wing coverts, dusky. Iris, brown; bill and feet, black. *In winter.* Similar, but the white beneath extends to bill, and is dusky on sides of neck and throat. *Young.* Similar to winter adult, but lacks the dusky on sides of neck and throat.

OBSERVATIONS.

Recognized by the short, thick bill and small size. Distributed in summer from Labrador, northward; wintering off the coast from Massachusetts, southward.

DIMENSIONS.

Average measurements of specimens. Length, 8.00; stretch, 16.50; wing, 4.25; tail, 1.55; bill, .63; tarsus, .92. Longest specimen, 9.00; greatest extent of wing, 17.00; longest wing, 4.50; tail, 1.60; bill, .65; tarsus, .95. Shortest specimen, 7.00; smallest extent of wing, 16.00; shortest wing, 4.00; tail, 1.50; bill, .60; tarsus, .90.

DESCRIPTION OF NESTS AND EGGS.

Eggs, placed on shelves of rocky cliffs, one in number, pyriform in shape, bluish-white in color. Dimensions from 1.25 x 1.60 to 1.30 x 1.85.

HABITS.

The Little Auks, or Dovekies, come to us from the North, late in autumn, and during severe storms, are frequently driven inland for some distance. At such times, they may be found on ponds and rivers, or even in small pools left by the rain, and are quite helpless, being apparently in an exhausted condition; insomuch so that they can be easily captured, but specimens which I have possessed, although quite gentle, have always refused all food and soon died. The Little Auks appear to be incapable of standing upright without making a strenuous effort, moving along a level surface without the aid of the wings, or rising from it, but in order to take flight, are obliged to launch out from some elevated situation or rise from the water. A specimen of the Little Auk once flew within a few yards of me, when I was on Indian River, Florida, but this is much south of their usual range.

GENUS IV. URIA. THE GUILLEMOTS.

GEN. CH. *Bill, rather slender, usually shorter than head, pointed at tip, and not much compressed.* The bill is not ridged and only slightly curved at tip of upper mandible. There are two species within our limits.

URIA GRYLLE.

Black Guillemot.

Uria grylle Brun., Orn. Bor; 1764, 28.

DESCRIPTION.

SP. CH. Form, robust. Size, small. COLOR. *Adult.* Sooty-black throughout, with patch on wing, which is rarely crossed by a black band, under wing coverts, and axillaries, white. Iris, brown; bill, black; feet, coral-red.

Winter adult. Wings and tail as in summer; remainder of plumage, white, more or less mottled with black above and in a collar around neck. *Young,* quite similar but darker above and with white of wing and beneath mottled with dusky. *Nestlings* are covered with a sooty-black down.

OBSERVATIONS.

Known by the small size and dark colors in summer; white mottlings above in winter. Occurs in summer from Maine, northward, wintering from Grand Menan, southward.

DIMENSIONS.

Average measurements of specimens. Length, 12.50; stretch, 23.50; wing, 5.25; tail, 1.95; bill, 1.35; tarsus, 1.25. Longest specimen, 13.00; greatest extent of wing, 21.00; longest wing, 6.35; tail, 2.00; bill, 1.40; tarsus, 1.30. Shortest specimen, 12.00; smallest extent of wing, 23.00; shortest wing, 5.50; tail, 1.90; bill, 1.30; tarsus, 1.20.

DESCRIPTION OF NESTS AND EGGS.

Eggs, placed in holes of cliffs, three or four in number, oval in form, white, creamy, or greenish in color, spotted and blotched with very dark-brown and amber. Dimensions from 1.55 x 2.25 to 1.65 x 2.40.

HABITS.

I found the Little Black Guillemots very common on Grand Menan, nesting in fissures of the high cliffs on the northern end of the island. Here the eggs were fresh as late as the thirteenth of July, but this was owing to the fact that the birds had been robbed, for I found young, as well as fresh eggs, the last week in June, on the Magdalens; yet it is safe to say, that these birds, even if not molested, lay from the middle of June until the first week in July. The eggs are deposited on the naked rock or earth and are constantly covered by the male or female. When the entrances of their holes are approached, the birds scramble out and take wing, then they will fly distractedly about, uttering a mournful whistle, besides which they emit a chuckling note. The Black Guillemots sit lightly on the water and, like the larger species, dive with ease, remaining under the surface for a great length of time. They have the habit, shared with many aquatic birds, of dipping the bill into the water when excited. They migrate southward in November.

URIA TROILE.

Murre.

Uria troile LATH., Ind. Orn. II; 1790, 796.

DESCRIPTION.

SP. CH. Form, rather slender. Size, large. COLOR. *Adult.* Head and neck all around, upper parts, and sides, sooty-brown. Tips of secondaries, and under parts, white. Iris and feet, brown; bill, black.

In winter, and Young. Similar, but beneath, white to bill, with throat occasionally dusky. *Nestlings.* Black throughout, sprinkled with yellowish-white.

OBSERVATIONS.

Known by the large size and pure white beneath. Distributed in summer from Gulf of St. Lawrence, northward. Winters from Maine to Florida.

DIMENSIONS

Average measurements of specimens. Length, 17.50; stretch, 29.50; wing, 7.25; tail, 2.25; bill, 1.60; tarsus, 1.45. Longest specimen, 18.00; greatest extent of wing, 30.00; longest wing, 8.00; tail, 2.50; bill, 1.75; tarsus, 1.55. Shortest specimen, 17.00; smallest extent of wing, 29.00; shortest wing, 7.50; tail, 2.00; bill, 1.65; tarsus, 1.40.

DESCRIPTION OF NESTS AND EGGS.

Eggs. placed on shelves of rocky cliffs, one in number, pyriform in shape, varying from white, through blue, to green in color, spotted and blotched with dark-brown and amber. Dimensions from 1.75 x 2.90 to 2.15 x 3.50.

HABITS.

I did not find the Murres on any of the Magdalen Islands, excepting Bird Rock, but they were remarkably abundant there, thousands nesting on the rocky shelves, sitting side by side on the narrow parapets, and, although often crowded together, never making the least attempt to quarrel. When we descended the cliffs and approached the ledges on which the Murres were nesting, they would crowd together or press against the wall behind them; as we went nearer, the birds would bow the head forward until the bill almost touched the surface upon which they stood, and utter a curious, guttural note which sounded almost exactly like the syllable *murre*. This operation was repeated frequently, until at last the males would fly, leaving the females with the eggs or young. When we were within a few feet of them, the poor birds would turn their heads right and left, open their mouths to pant for breath, shrink as far from us as they could without exposing their charges, in fact, evincing by every movement, extreme fear. If taken in the hand, they never attempted to defend themselves, but simply gazed at us piteously with their beautiful, almond shaped eyes, or cast imploring glances at their helpless charge left unprotected. The Murres migrate southward in November and I have seen them off the coast of Northern Florida.

My readers will naturally wonder how we succeeded in getting away from this lonely islet, for we had not been on the Rock more than forty-eight hours, when, having collected quite a supply of birds and eggs, we became anxious to leave, that we might take proper care of our specimens. We therefore asked the light-keeper what signals he used when he wanted assistance from vessels. He replied, that he raised the British flag at half-mast. Thus we kept this signal flying whenever it was possible for a boat to land, but it was not until the ninth day, that we perceived signs on any of the fishing vessels, which indicated that they had observed our call for aid. On this day there had been a slight breeze from the west, bringing several small schooners down from Bryon. We waited patiently until one of the vessels came within hailing distance, when with the flag still half-mast, we gathered together on that side of the rock and discharged our guns simultaneously, at the same time displaying a red flag. All this, at last, produced the desired effect and they came to anchor. A boat was lowered, and after some delay, we boarded the vessel with our specimens. We did not leave the locality, however, until nearly night, and the last view I had of the island, was by the light of the setting sun, when the huge, rocky bastion stood out in strong relief against the western sky, with a circling coronet of Gannets over it, forming a picture which will never be effaced from my memory.

URIA LOMVIA.
Brunnich's Guillemot.

URIA LOMVIA LINN., Syst. Nat., 1, 1766.

DESCRIPTION.

SP. CH. Form, rather slender. Size, large. Bill, pointed, and the basal portion of the upper mandible is greatly thickened.

COLOR. ADULT. Head and neck all around, upper parts and sides, sooty black. Tips of secondaries and under parts, white. Iris and feet, brown, the latter yellowish on the inside. Bill, black, with the thickened portion at base of cutting edge of upper mandible, yellowish.

WINTER ADULT. Similar to the summer dress, but with the central portion of the throat, often to the chin, more or less mixed with white.

YOUNG IN WINTER. Similar to the winter adult, but with the white of the lower neck greatly extended, and reaching nearly to the eyes.

OBSERVATIONS.

Distinguished at once from the preceding species, by the darker color above, (sooty black, not brown,) which prevails in all stages, excepting, perhaps, in the downy young; and in fully grown birds, by the swollen, light colored or yellowish basal portion of the cutting edge of the upper mandible. Breeds from the Gulf of St. Lawrence, northward; ranges south in winter, at least to New Jersey.

DIMENSIONS.

Measurements of specimens. Length, 18.50 to 19.00; stretch, 29.50 to 30.00; wing, 7.25 to 8.80; tail, 2.00 to 2.50; bill, 1.70 to 1.75; tarsus 1.40 to 1.65.

DESCRIPTION OF NESTS AND EGGS.

Eggs, placed on rocky cliffs, one in number, pyriform in shape, varying from white to bluish green in color, spotted, blotched, and lined, with brown and black. Dimensions, from 1.75 x 2.90 to 2.15 x 3.45.

HABITS.

During my visit to Bird Rock in 1873, as recorded in the preceding articles, I found Brunnich's Guillemot not at all common; in fact, it was difficult to procure specimens then. Subsequent collections from the same place, show that the state of affairs has become quite different, the Murre now being the most rare and the present species the most numerous. In breeding habits, this species does not appear to differ from the other two Guillemots with which it associates. In migration, however, these birds vary somewhat, Brunnich's Guillemots being found on our coast at that time, while the Murres are very rare, and it is possible that they remain further north.

URIA RINGVIA.

Ringed Guillemot.

URIA RINGVIA BRUN., Orn. Bor., 1, 1764, 764.

Fig. 2, page, 12, head of adult in summer.

DESCRIPTION.

SP. CH. Form, rather slender. Size, large. Bill, pointed, but the base of the cutting edge of the upper mandible is not swollen.

COLOR. ADULT. Head and neck all around, upper parts and sides, sooty brown. Tips of secondaries, under parts, and ring around eye, extending in a line back from it, white.

WINTER ADULT. Similar to the summer adult, but the white beneath is more extended, encroaching on the throat and sides of the head.

YOUNG. Similar to the winter adult, but the white of the lower neck is more extended. The downy young of both the Ringed and Brunnich's Guillemots are indistinguishable from these of the Murre.

OBSERVATIONS.

Distinguished at once from the Murre and Brunnich's Guillemots by the conspicuous white ring around the eye. Compare head of Ringed Guillemot, Fig. 2, on this page, with head of Murre, Fig. 1, page 1. Occurs only on the American coast, from the Gulf of St. Lawrence, northward; wintering a little southward.

DIMENSIONS.

Measurements of specimens. Length, 1700 to 1800; stretch, 2900 to 3000; wing, 750 to 800; tail, 200 to 250; bill, 165 to 180; tarsus, 140 to 155.

DESCRIPTION OF NESTS AND EGGS.

Eggs, placed on the shelves of rocky cliffs, one in number, pyriform in shape, varying from white to bluish green in color, spotted and lined with brownish black. Dimensions, from 1.75 x 2.00 to 2.00 x 3.00.

HABITS.

I found the peculiarly marked Ringed Guillemot breeding on Bird Rock the first week in July, 1873. They were far from common, there being only about twenty-five pairs on the rock, but as they were in every case mated, I have always considered that this was conclusive evidence of their claim to specific rank. They are, however, closely allied to the Murre, which they resemble in habit.

Since the above was written, I learn from the Auk for April, 1889, that my views concerning the specific rank of the Ringed Guillemot are confirmed by Dr. Louis B. Bishop, who visited Bird Rock in 1888. Dr. Bishop in his interesting account of the birds of Great Bird Rock, in speaking of *Uria ringvia* says: "About a dozen specimens * * * * were breeding on the cliffs of Great Bird Rock. As far as we were able to judge from the limited time at our disposal, they were in pairs, and seemed to be entitled to the rank of a distinct species." The diminution of specimens from some fifty to twelve, in fifteen years, probably represents the proportionate decrease of all the species of birds that occur on the rock.



FIG. 2. Head of RINGED GUILLEMOT, *URIA RINGVIA*.

URIA MANDTII.**Mandt's Guillemot.**

URIA MANDTII LICHT., Verz., 1823, 88.

DESCRIPTION.

SP. CU. Size, small. Form, about that of the Black Guillemot. COLOR. ADULT. Sooty black throughout, with a large oval patch of pure white on the wing, the feathers of it being white to the base, and which is never encroached upon by the black. Iris, brown; bill, black; feet, coral red.

WINTER ADULT. Wings as in the summer adult, but white elsewhere, mixed with black on the back.

YOUNG. Similar to the winter adult, but the lower parts are indistinctly barred with dusky, and the white feathers of the wing patch are each tipped with blackish. The upper wing coverts are also mottled with white. DOWNY YOUNG, sooty brown throughout, but lighter beneath.

OBSERVATIONS.

Recognized by the small size and dark colors. Known from the Black Guillemot, by the feathers of the wing patch being white to the base, and these are never encroached upon by the black of the wing. Breeds from the coast of Labrador, northward, wintering as far south as New Jersey. Occurs also in the northern Pacific.

DIMENSIONS.

Measurements of specimens. Length, 12.50 to 13.50; stretch, 23.00 to 24.00; wing, 6.25 to 7.20; tail, 1.90 to 2.00; bill, 1.00 to 1.20; tarsus 1.20 to 1.30.

DESCRIPTION OF NESTS AND EGGS.

Eggs, placed in holes of cliffs, three or four in number, oval in form, varying from creamy to greenish in color, spotted and blotched with brown and umber. Dimensions: 1.30x2.35 to 1.36x2.38.

HABITS.

Mr. M. Abbot Frazar obtained Mandt's Guillemot breeding on the coast of Labrador in June, 1886. Mr. Frazar informs me that he noticed nothing at all peculiar in their habits as compared with the Black Guillemot with which they associated. The species was not common so far south, and only four specimens were obtained.

MORMON CIRRHATA.**Tufted Puffin.**

MORMON CIRRHATA BON., Syn., 1828, 429.

DESCRIPTION.

SP. CU. Form, robust. Size, large. Bill, large and heavy, longer than the head; upper mandible crossed by three ridges and depressions; lower, plain; basal, deciduous portion of both mandibles, wide, occupying two thirds its width. Eyelids, without any horny appendage. Sides of head, provided with a large tuft of elongated, drooping, silky feathers. Sexes, similar.

COLOR. ADULT IN SUMMER. Sooty black throughout, becoming grayish below, where it is sometimes mottled with whitish. Triangular patch on sides of head, with the apex pointing backward, white. Elongated feathers on head, yellowish. Terminal two thirds of bill, bright red; basal third, greenish yellow. Naked space around eye and feet, red. Iris, white.

ADULT IN WINTER. Similar to the summer dress, but the sides of the head are dusky, lighter in the space occupied by the elongated plumes, these being absent. The horny basal portion of the bill has been moulted and has been replaced by a soft, dusky colored skin.

YOUNG. Similar to the winter adult, but the bill has no grooves and is darker in color. Rudiments of elongated tufts, brownish. DOWNY YOUNG, uniform dusky throughout, and the bill is quite slender in form and also dusky in color.

OBSERVATIONS.

Known at once, in all stages, by the large size and heavy, long bill with its ungrooved lower mandible. Breeds on the islands and coasts of the Northern Pacific; migrating southward in winter to Southern California. Accidental in the Kennebec River, (Audubon) and in the Bay of Fundy, (Verrill).

DIMENSIONS.

Measurements of specimens. Length, 14.40 to 15.60; wing, 7.50 to 8.00; tail, 2.00 to 2.50; bill, 1.65 to 1.80; tarsus, 1.40 to 1.55.

DESCRIPTION OF NESTS AND EGGS.

Eggs, placed at the extremity of burrows, one in number, oval in form, white in color, often marked around the large end with spots and streaks of lavender. Dimensions, from 1.75 x 2.90 to 2.00 x 3.00.

HABITS.

The Tufted Puffin breeds on the islands and coasts of the North Pacific the second week in July, and according to authors, does not appear to differ in general habit from our Common Puffin. The occurrence of this species on our coast is purely accidental, two specimens having been taken, at quite wide intervals, as above mentioned, many years ago, but there is no recent record of its appearance here.

MORMON ARCTICA GLACIALIS.**Large-billed Puffin.**

MORMON GLACIALIS NAUM., Isis, 1822, 782.

DESCRIPTION.

SUB. SP. CH. Size, larger than that of the Common Puffin and the bill is proportionately larger, measuring — average — 2.15 in length by 1.70 at base, against 1.85 by 1.49 in *M. arctica*. The colors are precisely the same as in the Common Puffin.

OBSERVATIONS.

Recognized by the large size and larger bill, but is closely allied to *M. arctica*. Occurs on the coasts and islands of the Arctic Ocean, but perhaps wintering further south, along the American coast.

DIMENSIONS.

Measurements of specimens. Length, 14.00 to 14.75; stretch, 25.00 to 26.00; wing, 7.00 to 7.30; tail, 2.00 to 2.25; bill, 2.10 to 2.20; tarsus 1.10 to 1.25.

DESCRIPTION OF NESTS AND EGGS.

Eggs, placed in burrows, one in number, oval in form, white in color, sometimes spotted on the larger end with lilac. Dimensions; 1.80 x 2.63 to 1.85 x 2.65.

HABITS.

I do not think that a single authenticated specimen of the Large-billed Puffin has ever been taken on our New England coast. Audubon was probably mistaken in saying that it occurred here; at all events, he figures, for this, quite a different species; the Horned Puffin, which certainly does not occur. The Large-billed Puffin breeds in Iceland, Greenland, and on the coasts of the Arctic Ocean, but the extent of its southward range along the American coast in winter, does not appear to be well known.

ORDER XVII. LONGIPENNES. LONG-WINGED BIRDS.

Wings, very long. Tail, short. Legs, moderately long with anterior toes webbed. Hind toe, short and elevated.

The bill is variable in form, either curved, pointed, or laterally flattened. Sternum, longer than wide, with keel equalling one half its width or higher. Marginal indentations, four or absent. Coracoids, longer than width of sternum. Furcula, well arched and approximating closely to tip of keel which is projected forward. Sterno-trachealis, present. There is a small bronchialis but no other laryngeal muscles. Oesophagus, straight without dilatation. Proventriculus, not very large, with glands arranged in a zonular band. Stomach, rather muscular. Cæca, short. Sexes, similar.

FAMILY I. LARIDÆ. THE GULLS AND TERNS.

Bill, generally shorter than head, curved, pointed, or flattened laterally. Hind toe, usually present. Marginal indentations, four. Keel, not perforated.

Members of this family are closely feathered, possess the power of swimming, and also move with ease upon the ground. The young are covered with down at birth and run as soon as hatched, but are fed by the parents until able to fly.

GENUS I. STERNA. THE TERNS.

GEN. CH. *Bill, about as long as head, and pointed. Toes, webbed nearly, or quite, to tips. Legs, short. Tail, long and deeply forked.*

Members of this genus are generally very light in color. Sexes, similar. There are ten species within our limits.

STERNA ANGLICA.

Marsh Tern.

Sterna anglica MONT. Orn. Diet. Sup., 1813.

DESCRIPTION.

SP. CH. Form, robust. Size, large. Bill, short and rather thick. COLOR. *Adult.* Above, pale bluish-ash. Outer webs of primaries, hoary, inner, ashy-gray, becoming lighter toward base. Outer tail feathers, nearly white. Top of head to lower eyelid and occiput, black. Line at base of upper mandible and under parts, pure white. Iris, brown, bill and feet, black. *In winter*, the anterior portion of head becomes more or less white.

OBSERVATIONS.

Known by the large size, thick black bill and feet, nearly white outer tail feathers, and hoary primaries. Distributed, in summer, from New Jersey, southward. Rare in New England. Winters south of the United States.

DIMENSIONS.

Average measurements of specimens from North America. Length, 13.75; stretch, 34.00; wing, 11.15; tail, 5.25; bill, 1.30; tarsus, 1.25. Longest specimen, 14.50; greatest extent of wing, 35.00; longest wing, 12.50; tail, 5.50; bill, 1.40; tarsus, 1.30. Shortest specimen, 13.00; smallest extent of wing, 33.00; shortest wing, 11.75; tail, 5.00; bill, 1.20; tarsus, 1.20.

DESCRIPTION OF NESTS AND EGGS.

Eggs, placed on the ground in sandy places, three or four in number, oval in form, and varying from yellowish-buff to greenish in color, spotted and blotched with yellowish-brown and lilac. Dimensions from 1.30 x 1.75 to 1.40 x 1.80.

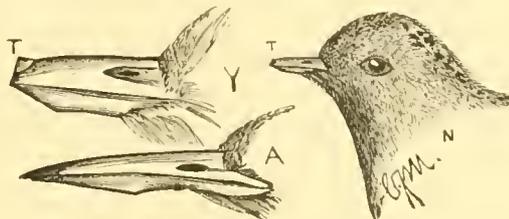


FIG. 3. LEAST TERN, *STERNA ANTILLARUM*: A, bill of adult; N, head of downy young; Y, bill of same enlarged to show the egg tooth T, possessed by all newly hatched birds, and is used to break the egg shell.

HABITS.

Terns! What a multitude of pleasant memories is conjured up at the sight of this short word, for these graceful birds have always been special favorites of mine and I have spent many delightful hours along our shores, studying their habits. The Marsh Tern is far from being very common anywhere, for although I have shot it in Massachusetts and Florida, it is rare in both States. It breeds, however, in the intermediate districts, nesting on the islands off the coast of Virginia, late in June, depositing the eggs on sand hills. The flight of this Tern is rather heavy and its cries are harsh, but it does not differ essentially in habit from many other members of the genus.

STERNA CASPIA.

Caspian Tern.

Sterna caspia PALL., Nov. Com. Petr.; 1770, 582.

DESCRIPTION.

SP. CH. Form, robust. Size, large. Bill, stout. COLOR. *Adult.* Above, pale bluish-ash with primaries dark-slaty on inner webs. Tail and coverts, ashy-white. Top of head and occiput, black, glossed with greenish. Beneath, white. Bill, red, iris, brown, and feet, black. *In winter, and Young.* Similar but paler, and the top of head is more or less white.

OBSERVATIONS.

Known by the large size, ashy-gray inner webs of primaries, and red bill. Distributed, in summer, along our entire coast; winters from Massachusetts, southward.

DIMENSIONS.

Average measurements of specimens from North America. Length, 21.50; stretch, 50.50; wing, 16.39; tail, 5.50; bill, 2.63; tarsus, 1.63. Longest specimen, 22.00; greatest extent of wing, 51.00; longest wing, 16.75; tail, 6.00; bill, 2.75; tarsus, 1.75. Shortest specimen, 21.00; smallest extent of wing, 50.00; shortest wing, 16.00; tail, 5.00; bill, 2.50; tarsus, 1.50.

DESCRIPTION OF NESTS AND EGGS.

Eggs, placed on the ground, three or four in number, oval in form, and varying from white to greenish-buff in color, spotted and blotched with brown and lilac of varying shades. Dimensions from 1.85 x 2.70 to 1.90 x 2.75.

HABITS.

The large and handsome Caspian Tern is, perhaps, the least agile on the wing of any of the genus, moving in a similar manner to that of some of the smaller Gulls, but in habits it closely resembles its other relatives and the note is extremely harsh. Formerly, the Caspian Tern was supposed to breed only in the North but recently it has been found nesting, though not in any numbers, on the islands off the coast of Virginia and further south. It is possible that this bird occurs in Florida in summer but I have never met with specimens there, although I have killed many of the succeeding species, which they closely resemble, in the State.

STERNA REGIA.

Royal Tern.

Sterna regia GAMB., Proc. Ac. Nat. Sc. Phil., 1848, 228.

DESCRIPTION.

SP. CH. Form, robust. Size, large. Bill, stout. COLOR. *Adult.* Pale bluish-ash above, with primaries darker on outer webs and on a narrow line next the shaft of inner, the remainder of which being white. Tail and coverts, ashy-white. Top of head and occiput, black, glossed with greenish. White beneath, tinged with rosy. Iris, brown, feet, black, bill, red. *Winter adult and Young.* Similar but paler, the primaries are overwashed with hoary, and the crown is partly white.

OBSERVATIONS.

Easily recognized by the large size, red bill, and nearly white inner webs to primaries. Distributed, in summer, from New Jersey, southward. Winters in Florida. Rare as far north as Massachusetts.

DIMENSIONS.

Average measurements of specimens from Florida. Length, 19.88; stretch, 43.50; wing, 14.00; tail, 6.12; bill, 2.58; tarsus, 1.30. Longest specimen, 20.50; greatest extent of wing, 44.50; longest wing, 14.50; tail, 7.00; bill, 2.90; tarsus, 1.40. Shortest specimen, 19.25; smallest extent of wing, 42.50; shortest wing, 13.50; tail, 5.25; bill, 2.25; tarsus, 1.20.

DESCRIPTION OF NESTS AND EGGS.

Eggs, placed on the ground in sandy places, two to three in number, rather pyriform in shape, varying from white to greenish-buff in color, spotted and blotched irregularly with brown, amber, and lilac of varying shades, and having an occasional tinge of yellowish. Dimensions from 1.70 x 2.70 to 1.75 x 2.75.

HABITS.

The Royal Terns are common on the larger lakes and rivers throughout the interior of Florida, as well as on the coast, during winter, but as spring approaches, they retire to the sea-shore to breed. The eggs are deposited about the first of June and are placed on the naked sand. These birds are very shy at all times; even when breeding, they will instantly leave the immediate vicinity when it is approached, but like all other Terns, they are always attracted by the cries of a wounded comrade, and at such times, appear to lose all fear, for if repeatedly fired at, the survivors will continue to hover about, uttering piercing cries. The Royal Terns gather by thousands on the sand bars among the keys, at low tide, but rise at high water to fish, at which craft they are very expert, diving downward with the speed of an arrow to secure their prey. Mr. Brewster and myself secured two birds which were evidently breeding, at Nantucket, about the first of July, some five or six years ago, but this is beyond their usual range.

STERNA CANTIACA.

Sandwich Tern.

Sterna cantiaa Gm., Syst. Nat., I: 1788, 606.

DESCRIPTION.

SP. CH. Form, slender. Size, rather large. COLOR. *Adult*. Above light pearly blue, with the four first primaries dusky-gray on outer webs, and in a narrow line next the shaft on inner, the remainder of which is white. Tail and coverts, and under parts, white. Crown, occiput and nape, black. Bill, black, with terminal fourth, yellow, iris, brown, and feet, black. *Winter adult and Young*. Similar but paler, with more or less white on top of head.

OBSERVATIONS.

Known by the white tail and yellow terminal fourth to slender, black bill. Distributed as a constant resident in southern Florida. Accidental, in summer, as far north as Massachusetts.

DIMENSIONS.

Average measurements of specimens from Florida. Length, 15.39; stretch, 33.38; wing, 12.25; tail, 5.75; bill, 2.12; tarsus, 1.05. Longest specimen, 15.75; greatest extent of wing, 33.75; longest wing, 12.50; tail, 6.00; bill, 2.25; tarsus, 1.10. Shortest specimen, 15.00; smallest extent of wing, 33.00; shortest wing, 12.00; tail, 5.50; bill, 2.00; tarsus, 1.00.

DESCRIPTION OF NESTS AND EGGS.

Eggs, placed on the ground in sandy places, two or three in number, rather oval in form, varying from white to buff in color, spotted and blotched with brown, amber, bluish, and reddish. Dimensions from 1.25 x 2.00 to 1.30 x 2.15.

HABITS.

I found the beautiful Sandwich Terns common all winter among the Florida Keys and they were not at all shy; consequently, I procured as many as I wanted. They breed on a small, sandy key off Cape Sable, late in June, placing the eggs on the naked ground. I have seen specimens of the Sandwich Tern, which were taken on Cape Cod, but consider the species very rare so far north.

STERNA FLUVIATILIS.

Common Tern.

Sterna fluviatilis NAUM., Isis; 1819.

DESCRIPTION.

SP. CH. Size, medium. Form, rather slender. Bill, slender. COLOR. *Adult*. Back and wings, ashy-blue, with primaries dusky on outer webs and white on inner two thirds of inner. Rump, upper coverts, and tail, white, with outer webs of last, ashy, which becomes dusky on extreme outer webs. Crown and occiput sooty-black. Beneath, pale ashy-blue, becoming white on under wing and tail coverts. Iris, brown, feet, red, bill, red, dusky at tip. *In winter*, similar, but paler, with crown more or less white. *Young*, similar to winter adult, but are tinged with yellowish above where the feathers are edged with whitish; rump and upper tail coverts, bluish; shoulders, dusky. White beneath; bill, black.

OBSERVATIONS.

Known from the closely allied *Forsteri*, by the dark color of the outer webs of outer tail feathers, and from adult *macroura* by the black tip to bill and longer tarsus. See other species for further comparison. Distributed, in summer, from Virginia to the far North. Winters, south of the United States.

DIMENSIONS.

Average measurements of specimens from North America. Length, 11.60; stretch, 30.20; wing, 10.40; tail, 6.25; bill, 1.42; tarsus, .80. Longest specimen, 15.60; greatest extent of wing, 31.90; longest wing, 11.50; tail, 7.00; bill, 1.55; tarsus, .90. Shortest specimen, 13.60; smallest extent of wing, 28.50; shortest wing, 9.35; tail, 5.52; bill, 1.30; tarsus, .75.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground in sandy places, composed of grass, sea-weeds, etc. *Eggs*, from three to four in number, oval in form, varying from white, through green, to deep brown in color, spotted and blotched irregularly with brown, amber, and lilac of varying shades. Dimensions from 1.05 x 1.10 to 1.25 x 1.82.

HABITS.

The Common Terns are by far the most abundant species on our coast, north of Virginia, and extend their range into the far North. I found them very abundant on the Magdalen Islands, breeding, not only on the sand-bars, but also on the grassy tops of isolated rocks, two hundred feet high, with precipitous sides, and which had become detached from the cliffs on the western shores of Grindstone Island, but which were only separated from the shore by a chasm of a few yards in width. As the eggs of these Terns are much sought after for food by fishermen and others, it is probable that they were driven to these nearly inaccessible places by constant persecution. When nesting, these Terns are not remarkably shy, and if the breeding ground is approached, all the birds will rise and fly to meet the intruder, uttering their loud, shrill notes which sound like *te-arr te-arr*; then will hover over the head of the invader, often but a short distance from him, or will make frantic dives at him, passing within a few feet of his head. If a shot be fired at them, every bird will dash downward and, for a moment, become silent, only, however, to resume their cries with greater vehemence. They gather around a wounded or dead companion, especially if it chance to fall into the water, hovering directly over it, and displaying by their cries, the most profound sympathy for its misfortunes. These Terns, when unmolested, breed about the middle of June, and the young make their appearance during the first week in July, running as soon as hatched, but are cared for by the parents until able to fly well, which occurs in August. The young are easily tamed, and I once possessed one that displayed considerable intelligence. It fed readily on small fish and grew to be a fine, large bird, when it was accidentally killed.

STERNA FORSTERI.

Forster's Tern.

Sterna Forsteri NUTT., Man. Orn., II; 1834, 274.

DESCRIPTION.

Sp. Cu. Form, rather slender. Size, medium. COLOR. *Adult*. Above, bluish-ash. Outer webs of primaries, hoary, inner, dusky next the shaft. Rump and outer web of outer tail feather, white. Crown and occiput, deep black. White beneath. Iris, brown, feet, yellow, and bill, black, yellow at extreme tip. *Winter adult*. Similar, but the forehead and entire top of head with hind neck are whitish, leaving a black patch around and behind eye.

OBSERVATIONS.

Birds in winter dress were formerly considered a species and called *Havelli*. Known by the black bill, yellow feet, and white outer web to outer tail feathers which is always the reverse with the Common Tern. Distributed in summer throughout the West. Winters in Florida. Rare along the New England coast in autumn.

DIMENSIONS.

Average measurements of specimens from North America. Length, 11.50; stretch, 34.50; wing, 10.75; tail, 5.35; bill, 1.99; tarsus, 1.45. Longest specimen, 15.00; greatest extent of wing, 37.00; longest wing, 11.50; tail, 4.65; bill, 2.10; tarsus, 1.90. Shortest specimen, 11.00; smallest extent of wing, 32.00; shortest wing, 10.05; tail, 3.05; bill, 1.88; tarsus, 1.02.

DESCRIPTION OF NESTS AND EGGS.

Eggs, placed on the ground in sandy places, three or four in number, oval in form, varying from nearly pure white, through green, to deep-brown in color, spotted and blotched irregularly with brown, amber, and lilac of varying shades. Dimensions from 1.05 x 1.40 to 1.25 x 1.80.

HABITS.

Forster's Tern is very common in Florida in winter, frequenting the inland waters as well as the coast. They are then in the dress which was formerly known as Havell's Tern, but they moult in April, assuming the black head of the summer plumage. In spring, they gather on the sand-bars of Indian River, in great numbers, in company with other members of the genus. The notes have some resemblance to those of the preceding species, but are easily recognized, being somewhat harsher. Forster's Terns breed on the Great Lakes of the interior but are occasionally found on the New England coast in autumn.

STERNA MACROURA.

Arctic Tern.

Sterna macroura NAUM., Isis, 1819.

DESCRIPTION.

Sp. Ch. Form, rather slender. Size, medium. Bill, slender. Bottom of feet, roughened. Color. *Adult*. Rather dark ashy-blue throughout, becoming lighter on throat. Under portion of wings, rump, and tail, white, the last having some of the outer webs dusky. Primaries, dusky, white on two thirds of inner webs. Top of head to lower eyelid and occiput, black. Iris, brown. bill and feet, coral-red. *In winter*, the anterior portion of head becomes more or less white. *Young*. Similar to winter adult but with shoulders dusky, back obscurely banded with dusky and reddish, and white beneath. Bill, black, and feet, yellow.

OBSERVATIONS.

The young with the white forehead and dusky shoulders which were hatched late and which apparently failed to moult the following spring have been described as *Sterna Portlandica*. Known in the adult stage by the medium size and slender red bill and the young, by the abruptly white rump, short tarsus and roughened feet. Distributed, in summer, from Virginia to the Gulf of St. Lawrence. Winters south of the United States.

DIMENSIONS.

Average measurements of specimens. Length, 14.25; stretch, 27.95; wing, 10.88; tail, 6.85; bill, 1.30; tarsus, .65. Longest specimens, 17.00; greatest extent of wing, 32.15; longest wing, 11.75; tail, 8.30; bill, 1.36; tarsus, .71. Shortest specimen, 11.50; smallest extent of wing, 23.75; shortest wing, 10.00; tail, 6.00; bill, 1.25; tarsus, .60.

DESCRIPTION OF NESTS AND EGGS.

Eggs, placed on the ground in sandy places, three or four in number, oval in form, varying from nearly pure white to deep brown in color, spotted and blotched irregularly with brown, amber, and lilac of varying shades. Dimensions from 1.05 x 1.40 to 1.25 x 1.80.

HABITS.

I think the name, Arctic Tern, has been misapplied to the present species, for as far as my observations extend, it is not nearly as northern in distribution, at least on our side of the Atlantic, as the Common Tern. Thus, I found these birds rare on the Magdalens, where the others were abundant, and collections that I have examined, from Labrador and northward, contained nothing but Common, although almost invariably labeled as Arctic. The Arctic Terns breed along the coast of New England, almost always placing the eggs on the naked sand, and appear especially fond of sand-bars that are entirely destitute of vegetation. In habits and time of breeding, they closely resemble the Common Tern, and the notes of the two species are nearly alike.

STERNA DOUGALLI.

Roseate Tern.

Sterna Dougalli MONT., Orn. Diet. Sup., 1813.

DESCRIPTION.

Sp. Ch. Form, slender. Size, medium. Bill, long and slender. Color. *Adult*. Above, pale ashy-blue, lightest on neck and tail. Outer tail feathers, white. Primaries, dusky on outer webs and on inner next the shaft. Beneath,

STERNA ANTILLARUM.

white strongly tinged with rosy. Iris, brown, feet, orange, bill, black, orange at base. *In winter, and Young.* Similar but paler, and the top of head is more or less white.

OBSERVATIONS.

Known by the slender form, black bill, and wholly white outer tail feathers. Nestlings of this and of the three preceding species are indistinguishable, being yellowish above mottled with black, and white beneath. Distributed, in summer, from Massachusetts, southward. Rare as far north as Maine. Winters south of the United States.

DIMENSIONS.

Average measurements of specimens from North America. Length, 15.15; stretch, 28.50; wing, 9.60; tail, 6.05; bill, 1.48; tarsus, .70. Longest specimen, 16.25; greatest extent of wing, 33.19; longest wing, 10.33; tail, 7.39; bill, 1.55; tarsus, .80. Shortest specimen, 11.00; smallest extent of wing, 26.60; shortest wing, 8.90; tail, 4.80; bill, 1.49; tarsus, .60.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground in sandy places, composed of sticks, sea-weeds, etc. *Eggs*, from three to four in number, oval in form, varying from white, through green, to deep brown in color, spotted and blotched irregularly with brown, amber, and lilac of varying shades. Dimensions from 1.05 x 1.40 to 1.25 x 1.82.

HABITS.

The flight of the Roseate Terns is exceedingly graceful, and I know of no finer sight than a group of these lovely birds, moving along over the green water, pausing now and then to hover for a moment, that they may peer into the depths below. Gazing upon their perfectly symmetrical forms and elegant evolutions, one can scarcely consider them birds, but rather, as beautiful Nereids of the sea, which have left their native element, to sport for a time in the delightful summer air. The Roseate Tern is one among our birds, that I never care to shoot, for aside from a dislike to destroy a being so lovely, the delicate tints of the plumage are so evanescent and so easily soiled, and there is such a marked difference between cabinet specimens, no matter how carefully prepared, and the living birds, that the contrast is absolutely painful. The notes of the Roseate Terns are quite harsh, sounding, when the birds are excited, like *hojet, hojet*, ending with a kind of prolonged cry. They lay about the same time as the other Terns, and their principal breeding ground on our coast is on Muskeget, a small, sandy island with a slightly rolling surface, on which nothing larger in the way of vegetation grows, than a few dwarf plum bushes. In the hollows, however, is a somewhat luxuriant crop of ivy and beach grass, among which the Roseate Terns build their nests of sticks. They are very solicitous for the safety of their young and in general habits resemble the preceding species.

STERNA ANTILLARUM.

Least Tern.

Sterna antillarum LESS., Des. Mam. et Ois; 1818, 256.

DESCRIPTION.

SP. CH. Form, slender. Size, very small. Bill, long and slender. COLOR. *Adult.* Above, light pearly blue with two or three first primaries sooty-black, white on inner webs of inner. Outer webs of outer tail feather, white. Crown and occiput, deep black. Lunate spot on forehead and under parts, white. Bill, yellow, with terminal fourth, black, iris, brown, and feet, yellow. *Winter adult and Young.* Similar but white of forehead more extended. Bill, black.

OBSERVATIONS.

Known by the small size and white lunet on the forehead. Distributed, in summer, from Massachusetts, southward. Winters south of the United States.

DIMENSIONS.

Average measurements of specimens from North America. Length, 8.88; stretch, 19.40; wing, 6.65; tail, 2.95; bill, 1.11; tarsus, .70. Longest specimen, 9.25; greatest extent of wing, 19.75; longest wing, 7.00; tail, 3.15; bill, 1.16; tarsus, .75. Shortest specimen, 8.50; smallest extent of wing, 19.00; shortest wing, 6.30; tail, 2.75; bill, 1.06; tarsus, .65.

DESCRIPTION OF NESTS AND EGGS.

Eggs, placed on the ground in sandy places, three or four in number, rather oval in form, varying from white to buff in color, spotted and blotched irregularly with brown, amber, and lilac of varying shades, and having an occasional tinge of yellowish. Dimensions from .75 x 1.00 to .90 x 1.30.

HABITS.

The Least Terns differ somewhat in flight from the larger species, moving with a rather jerking motion which is not very graceful. Their notes are shrill, quite short, and abruptly given, especially when the birds are disturbed. They place the eggs on the naked sand, preferring, as breeding places, sandy beaches which are without a vestige of grass or other vegetation. I procured eggs of the Least Tern on the Florida Keys, early in May but these birds do not nest on our New England coast until about the tenth of July. They are expert at fishing, catching young mackerel and other small fish, and may frequently be seen carrying their prey crosswise in their beaks, as they fly to their breeding grounds. In being solicitous for the safety of their eggs, and in hovering about a dead or wounded companion, they do not differ from other Terns, and may, like them, be decoyed within shooting distance by waving a white handkerchief, at the same time imitating their cries.

STERNA FULIGINOSA.

Sooty Tern.

Sterna fuliginosa Gm., Syst. Nat., I; 1788, 605.

DESCRIPTION.

SP. CU. Size, large. Form, slender. Bill, rather slender. COLOR. *Adult.* Above, black. Lunate spot on top of head, outer webs of the tail and basal half of inner, and under parts, white. Iris, brown, bill and feet, black. *Young.* Brownish throughout, paler beneath, with the feathers more or less edged with white and rufous.

OBSERVATIONS.

Known by the large size, dark color above, and white lunet on head. Distributed as a constant resident on the Florida Keys and Bahamas. Accidental further north.

DIMENSIONS.

Average measurements of specimens from Florida. Length, 16.00; stretch, 34.00; wing, 11.50; tail, 7.25; bill, 1.62; tarsus, 1.05. Longest specimen, 17.00; greatest extent of wing, 35.00; longest wing, 12.00; tail, 7.50; bill, 1.75; tarsus, 1.10. Shortest specimen, 15.00; smallest extent of wing, 33.00; shortest wing, 11.00; tail, 7.00; bill, 1.50; tarsus, 1.00.

DESCRIPTION OF NESTS AND EGGS.

Eggs, placed on the ground in sandy places, only one in number, oval in form, pinkish white in color, spotted and blotched with reddish-brown and lilac. Dimensions from 1.45 x 1.95 to 1.50 x 2.00.

HABITS.

The Sooty Terns are now only found in any numbers on the small islands which lie to the southward of Key West and which are known as the Dry Tortugas. Here they breed on Bird Key which is about four miles from Fort Jefferson, depositing their eggs early in May. The birds are extremely tame when nesting, insomuch so, that they may be killed with sticks or even caught with the hand, and they deposit the eggs on the naked sand. There were thousands of these birds on this little key, in 1874, but as the soldiers of Fort Jefferson had been in the habit of taking the eggs regularly every other day, but few or no young were raised. The officer who had command of the post, prohibited shooting the birds on the island, but the continual robbing of the eggs must ultimately drive the Sooty Terns from this breeding ground. It is difficult to find a nesting site of either Terns or Gulls, from Grand Menan to Florida, where the birds are not subject to systematic pillage, not by scientific collectors but by fishermen and others, who simply want the eggs as an article of diet, with which they could dispense without the slightest inconvenience; and as I have had occasion to remark many times before, in other places, unless the General Government interposes stringent laws for the protection of this class of birds, there will not be one left, where there are thousands now, but where there were once millions.

SHORT-TAILED TERN.

GENUS II. HYDROCHELIDON. THE BLACK TERNS.

GEN. CH. *Bill, about as long as head and pointed. Toes, not webbed to tips. Legs, short. Tail, short and not deeply forked.*

Members of this genus are generally very dark in color. Sexes, similar. There is but one species within our limits.

HYDROCHELIDON NIGRA.

Short-tailed Tern.

Sterna nigra LINN., Syst. Nat.; 1766, 227.

DESCRIPTION.

SP. CH. *Form, slender. Size, small. Color. Adult.* Under portion, head, and neck, sooty-black, becoming dark ashy-gray above, and hoary on primaries. Under wing coverts, ashy-blue, and under tail coverts, white. Iris, brown, bill and feet, black. *Young.* Posterior portion of the head and patch around eye, dusky. Remainder of plumage, ashy-blue, tinged with reddish above and becoming white on forehead, throat, ring around neck, and central under parts.

OBSERVATIONS.

Known by the small size, short tail, and dark colors. Distributed, in summer, throughout the West. Winters south of the United States. Not uncommon on the coast of Massachusetts in autumn.

DIMENSIONS.

Average measurements of specimens from North America. Length, 9.50; stretch, 23.50; wing, 8.39; tail, 3.50; bill, 1.12; tarsus, .55. Longest specimen, 10.00; greatest extent of wing, 21.00; longest wing, 8.75; tail, 4.00; bill, 1.25; tarsus, .60. Shortest specimen, 9.00; smallest extent of wing, 23.00; shortest wing, 8.00; tail, 3.00; bill, 1.05; tarsus, .50.

DESCRIPTION OF NESTS AND EGGS.

Eggs, placed on the ground, three or four in number, pyriform in shape, and varying from brown to greenish in color spotted and blotched with brown and lilac of varying shades. Dimensions from .90 x 1.25 to 1.00 x 1.40.

HABITS.

The Short-tailed Terns breed on the marshes in the vicinity of the Great Lakes, and on the bodies of water throughout the West, but are not very uncommon along our New England coast, late in August, at which time all Terns are inclined to wander. These birds, although fond of fish, live largely upon insects and are very expert at catching them. In manner of flight, they resemble the Least Tern.

GENUS III. ANOUS. THE NODDYS.

GEN. CH. *Bill, longer than head, curved, and pointed. Toes, webbed to tips. Feet, large. Legs, short. Tail, long and rounded.*

Members of this genus are very dark in color. Sexes, similar. There is but one species within our limits.

ANOUS STOLIDUS.

Noddy Tern.

Anous stolidus GY., List Gen.; 1841, 100.

DESCRIPTION.

SP. CH. *Form, slender. Size, large. Color. Adult.* Sooty-brown throughout, becoming darker on wings, tail, and patch before eye. Crown, yellowish-white becoming ashy posteriorly. Iris and feet, brown, bill, black.

OBSERVATIONS.

Easily recognized by the uniform dark colors and whitish crown. Constantly resident on Florida Keys and Bahamas.

DIMENSIONS.

Average measurements of specimens from Florida. Length, 15.50; stretch, 30.60; wing, 10.25; tail, 5.55; bill, 1.62; tarsus, .98. Longest specimen, 16.00; greatest extent of wing, 31.10; longest wing, 10.55; tail, 6.05; bill, 1.75; tarsus, 1.05. Shortest specimen, 13.00; smallest extent of wing, 30.00; shortest wing, 10.05; tail, 4.95; bill, 1.52; tarsus, .93.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in trees, composed of sticks. *Eggs,* only one in number, oval in form, ashy-yellow in color, spotted and blotched with pale reddish-brown and lilac. Dimensions from 1.42 x 1.80 to 1.52 x 2.00.

HABITS.

The Noddy Tern is only found regularly on the west side of the Gulf Stream, on the extreme southern Florida Keys, and breeds on Bird Key at the Dry Tortugas, in company

with the Sooty Terns, but always places the nest in trees, and like the other species, is so tame that the eggs may be removed from beneath the bird without causing it to leave the nest. The eggs are deposited early in May.

GENUS IV. RHYNCHOPS. THE SKIMMERS.

Bill, broad at base, much compressed laterally, with the lower mandible extending considerably beyond upper. Legs and wings, long.

Members of this genus are remarkable on account of the peculiarly constructed bill, the elongated under mandible of which has numerous oblique ridges along its sides. Tail, short and forked. There is but one species within our limits.

RHYNCHOPS NIGRA.

Black Skimmer.

Rhynchops nigra LINN., Syst. Nat., I, 1766, 228.

DESCRIPTION.

SP. CH. Form, robust. Size, large. COLOR. *Adult.* Above sooty-black, with tips of secondaries, forehead, outer webs of tail feathers, and entire under parts, white. Bill, black, yellow at base, iris, brown, and feet, yellow.

OBSERVATIONS.

Known by the peculiar bill. Distributed, in summer, from New Jersey, southward. Rare further north. Winters in Florida.

DIMENSIONS.

Average measurements of specimens. Length, 17.52; stretch, 41.95; wing, 14.75; tail, 5.25; bill, 3.72; tarsus, 1.35. Longest specimen, 20.10; greatest extent of wing, 44.95; longest wing, 15.52; tail, 6.12; bill, 4.52; tarsus, 1.53. Shortest specimen, 14.95; smallest extent of wing, 39.98; shortest wing, 14.05; tail, 4.38; bill, 2.88; tarsus, 1.20.

DESCRIPTION OF NESTS AND EGGS.

Eggs, placed on the ground in sandy places, two or three in number, oval in form, yellowish-white in color, spotted and blotched rather coarsely with brown, amber, and lilac of varying shades. Dimensions from 1.35 x 1.65 to 1.40 x 1.98.

HABITS.

One night, late in December, after a long and stormy voyage from the cold, frozen North, I was leaning over the rail of a steamer which was lying at Fernandina, Florida, enjoying the summer-like warmth of the air, and watching the play of the moonlight on the water, when I was almost startled by hearing a harsh note, sounding like the bark of a young dog. Turning quickly in the direction of the sound, I saw several shadowy forms moving swiftly along the surface of the water, but they quickly disappeared in the surrounding gloom, yet the singular note came to my ears several times from the distance. What these mysterious birds were, I knew not at the time, but later, discovered that the note I then heard, was produced by the Black Skimmers, and I found that the habit of flying by night in order to feed, was regular; in fact, the species is almost wholly nocturnal in winter. I have, however, frequently seen them on cloudy days, skimming along in the usual way, with the elongated under mandible beneath the water. They generally move in small companies and fly up rivers or creeks. During the day, they gather in large flocks on sand-bars to rest, but are exceedingly wild and very difficult to approach. They breed late, about June first in Florida, but not until the last of the month, further north. The handsomely marked eggs are deposited on the naked sand.

GENUS V. LARUS. THE GULLS.

GEN. CH. *Bill, shorter than head, usually strong, somewhat curved. Legs, long, toes webbed to tips, while the tail is either rounded, square, or emarginate.*

Members of this genus are usually large in size and light in color. We have eight species within our limits.

LARUS GLAUCUS.

Glaucous Gull.

Larus glaucus BRUN., Orn. Bor.; 1761, 44.

DESCRIPTION.

SP. CH. Form, robust. Size, very large. COLOR. *Adult.* Back and upper portion of wings, very light pearly-blue.

LARUS LEUCOPTERUS.

Primaries and remainder of plumage, white. Bill, yellow, iris, white, and feet, pinkish. *In winter*, similar but streaked on head and neck with ashy-brown. *Young*. Similar to winter adult but streaked and spotted with ashy-brown.

OBSERVATIONS.

Recognized by the large size and white primaries. Distributed, in summer, throughout the Arctic Regions, wandering as far south as Massachusetts in winter. DIMENSIONS. Length, 30·00; stretch, 62·00; wing, 18·50; tail, 8·75; bill, 3·00; tarsus, 3·00.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on rocky cliffs, composed of sticks, sea-weeds, etc. *Eggs*, three or four in number, oval in form, varying from bluish-white to dark brownish-yellow in color, spotted, blotched, and sprinkled with brown and lilac of varying shades. Dimensions from 2·18 x 2·95 to 2·25 x 3·00.

HABITS.

The large and handsome Glaucous Gull is extremely rare on our New England coast in winter, but is occasionally taken as far south as Massachusetts, both in the adult and immature plumages. I learned, however, when on the Magdalen Islands, that it is quite common there in winter. This bird has much the same habits as those of the larger Gulls.

LARUS LEUCOPTERUS.

White-winged Gull.

Larus leucopterus FAB., Prodr. Isl. Orn., 1820, 91.

DESCRIPTION.

SP. CH. Size, medium. Form, robust. COLOR. *Adult*. Back and upper part of wings, pale pearly-blue, with primaries and remainder of plumage, white. Iris, white, bill, greenish-yellow, and feet, pinkish. *Winter adult*. Similar but with head and neck narrowly streaked with dusky. *Young*. Pale yellowish-brown throughout, faintly mottled with darker, and with primaries dusky at tips. Bill, dusky.

OBSERVATIONS.

Known by the medium size and pale color. Distributed, in summer, throughout the Arctic Regions. Winters from Massachusetts, northward. DIMENSIONS. Length, 24·15; stretch, 52·00; wing, 16·75; tail, 6·55; bill, 1·96; tarsus, 2·55.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on rocky cliffs, composed of sticks, sea-weeds, etc. *Eggs*, from three to four in number, oval in form, deep brownish-yellow in color, spotted and blotched with rather round marks of brown and lilac of varying shades. Dimensions from 1·85 x 2·70 to 2·00 x 2·76.

HABITS.

On the thirty-first day of January, 1880, an immature White-winged Gull was brought to me by the Bangs Brothers for identification. It was killed while flying over the Mill-dam, in Boston, near Charles River, and another was seen at the same time. This is the only specimen of this rare bird that I ever saw in the flesh, and consider it of very uncommon occurrence as far south as Massachusetts, as it breeds in the Arctic Regions.

LARUS MARINUS.

Great Black-backed Gull.

Larus marinus LINN., Syst. Nat., I; 1766, 225.

DESCRIPTION.

SP. CH. Size, very large. Form, robust. COLOR. *Adult*. Back and wings, dark-slaty, becoming black on primaries, which with secondaries and tertiaries are broadly tipped with white. Remainder of plumage, white. Iris, yellowish-white, bill, yellow, with a vermilion spot near tip of under mandible, and feet, pinkish. *Winter adult*. Similar but with head and neck streaked with dusky. *Young*. Ashy-brown throughout, more or less mottled with white. Primaries and tail, dusky. Bill, black.

OBSERVATIONS.

Known by the large size and dark colors above, in adult, and rather pale colors in young. Distributed in summer from Bay of Fundy, northward. Winters from Maine to Florida.

DIMENSIONS.

Average measurements of specimens from North America. Length, 30·50; stretch, 65·00; wing, 19·20; tail, 8·48; bill, 2·38; tarsus, 2·87. Longest specimen, 31·00; greatest extent of wing, 66·00; longest wing, 20·25; tail, 9·05; bill, 2·52; tarsus, 3·05. Shortest specimen, 30·00, smallest extent of wing, 64·00; shortest wing, 17·88; tail, 7·98; bill, 2·25; tarsus, 2·75.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on rocky cliffs, composed of sticks, sea-weeds etc. *Eggs*, three or four in number, oval in form, varying from bluish-white to deep yellowish-brown in color, spotted and blotched with reddish-brown and lilac of varying shades. Dimensions from 2.20 x 2.95 to 2.30 x 3.00.

HABITS.

The Great Black-backed Gulls are quite common along our northern coast, becoming rare, however, to the southward, but occur quite to Florida. Of all shy birds, these large Gulls are the shyest, it being difficult to walk within rifle range, especially of mature birds. They are fond of haunting sand-bars that are left exposed by the falling tide, but will rise at high water to fish. These Gulls, like many other species, are fond of the various species of echinoderms, or sea urchins, as well as mollusks, and in order to break them open, will fly with their booty to a great height, then let it fall upon the rocks below. The notes of the Great Black-backs are not only harsh but loud, and are uttered most frequently, during storms, when their wild cries, coming to the ear amid the sounds of shrieking winds and dashing breakers, produce a singularly weird effect, though in perfect keeping with the fury of the elements. The southernmost breeding grounds of the Black-backs, is a little, rocky island in the Bay of Fundy, the top of which is so high as to be almost inaccessible. Perce Rock, in Gaspé Basin, is another resort for them, but I do not know of any more this side of Labrador.

LARUS ARGENTATUS.

Herring Gull.

Larus argentatus Brunn., Orn. Bor.; 1764, 44.

DESCRIPTION.

SP. CH. Form, robust. Size, large. COLOR. *Adult*. Back and entire wings, light pearly blue. Primaries, tipped with white which is preceded and banded with black. Secondaries and tertiaries also tipped with white. Iris, yellowish-white, bill, yellow, with a vermilion spot near tip of under mandible, and feet, pinkish. *In winter*. Similar but the head and neck are streaked with dusky. *Young*, dark ashy-brown throughout, more or less mottled with white. Bill, black.

OBSERVATIONS.

Known in the adult stage by the large size and white tipped primaries which are black banded, and young by the dark colors. Distributed, in summer, from Massachusetts, northward. Winters from Maine to Florida.

DIMENSIONS.

Average measurements of specimens. Length, 24.25; stretch, 56.50; wing, 17.00; tail, 6.50; bill, 2.38; tarsus, 2.13. Longest specimen, 26.00; greatest extent of wing, 59.00; longest wing, 18.00; tail, 7.00; bill, 2.75; tarsus, 2.25. Shortest specimen, 22.50; smallest extent of wing, 54.00; shortest wing, 16.00; tail, 6.00; bill, 2.05; tarsus, 2.05.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground, on rocky cliffs, and in trees, composed of sticks, sea-weeds, etc. *Eggs*, three or four in number, oval in form, varying from bluish-white to deep yellowish-brown in color, spotted and blotched with brown and lilac of varying shades. Dimensions from 1.80 x 2.70 to 2.05 x 2.90.

HABITS.

The Herring Gulls are the most abundant of all the genus on our shores, frequenting every harbor and river mouth along the entire coast, and gathering by thousands on the sand-bars to rest, or during storms, resorting to the flats. Their notes are not quite as harsh as those of the preceding species, but resemble them somewhat. Herring Gulls are very shy, and even when breeding, take good care to keep out of gun shot, although they display considerable solicitude for the safety of their eggs. It is probable that these birds formerly nested on the coast of Massachusetts, north of Cape Ann, but now they do not breed nearer than the coast of Maine. The eggs are deposited about the first of June, and the nests are placed on rocky cliffs, in marshes, or in trees. The habit of building their

domiciles in the last named situation, is due to the constant persecution to which the birds are subjected. Another peculiarity which is observable in the history of these Gulls, is that they are retreating from the coast to breed in the interior, where they are not as liable to be molested. Some of these Gulls, mostly immature birds, linger about the northern coast of Massachusetts all summer.

LARUS DELAWARENSIS.

Ring-billed Gull.

Larus Delawarensis Ord., Gath. Geog., II; 1815, 319.

DESCRIPTION.

SP. CH. Form, robust. Size, medium. COLOR. *Adult.* Back and entire wings, very light pearly-blue. Primaries, very broadly tipped with black, first quill broadly banded, second spotted and others, with secondaries and tertiaries, tipped with white. Remainder of plumage, also white. Bill, greenish, crossed near tip with a band of dark-brown, iris, yellow, and feet, greenish. *In winter.* Similar, but with head and neck spotted with dusky. *Young,* ashy-brown throughout, darkest above, mottled with lighter. Primaries, black. Tail, white with subterminal band of black.

OBSERVATIONS.

Easily recognized by the ring around bill. Distributed, in summer, from Labrador and the Great Lakes, northward. Winters from Chesapeake Bay, southward.

DIMENSIONS.

Average measurements of specimens from North America. Length, 19.50; stretch, 49.00; wing, 14.53; tail, 5.50; bill, 1.62; tarsus, 2.12. Longest specimen, 29.00; greatest extent of wing, 59.20; longest wing, 15.12; tail, 6.00; bill, 1.75; tarsus, 2.25. Shortest specimen, 19.00; smallest extent of wing, 48.00; shortest wing, 11.00; tail, 5.00; bill, 1.50; tarsus, 2.00.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground or on cliffs, composed of sticks, etc. *Eggs,* three or four in number, oval in form, varying from bluish-white to dark-brown in color, spotted and blotched with brown and lilac of varying shades. Dimensions from 1.60 x 2.75 to 1.75 x 2.80.

HABITS.

I found the Ring-billed Gulls more abundant in the Gulf of Mexico, during winter, than I ever saw them elsewhere, but they occur on the east coast of Florida at this season, and also further north in autumn, though they are never very common in Massachusetts. These Gulls which resemble the Laughing Gull in general habits, breed along the borders of the Great Lakes, in Labrador, and northward.

LARUS ATRICILLA.

Laughing Gull.

Larus atricilla Linn., Syst. Nat., I, 1766, 225.

DESCRIPTION.

SP. CH. Form, robust. Size, medium. COLOR. *Adult.* Back and wings, slaty-blue, becoming black toward terminal portion of primaries, which with secondaries are tipped with white. Remainder of plumage, white, strongly tinged with rosy beneath. Iris and feet, brown, bill, dark purplish-lake. *In winter, and Young.* Similar, but lacks the dark head which is replaced by white mottled with ashy.

OBSERVATIONS.

Known by the dark head, rosy tint, and slaty-blue color above. Distributed, in summer, from Maine, southward, winters in Florida.

DIMENSIONS.

Average measurements of specimens. Length, 16.25; stretch, 41.50; wing, 12.50; tail, 5.45; bill, 1.62; tarsus, 1.88. Longest specimen, 17.00; greatest extent of wing, 42.50; longest wing, 13.00; tail, 5.90; bill, 1.75; tarsus, 2.00. Shortest specimen, 15.50; smallest extent of wing, 40.50; shortest wing, 12.00; tail, 5.00; bill, 1.52; tarsus, 1.75.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground in sandy places, composed of grass, weeds, etc. *Eggs,* three or four in number, oval in form, varying from bluish-white to ashy-green in color, spotted and blotched with brown, umber, and lilac of varying shades. Dimensions from 1.52 x 2.60 to 1.65 x 2.30.

HABITS.

The notes of Gulls are loud and startling, but those of the Laughing are the most singular of them all, for their cries, especially when the birds are excited, sound like loud

peals of prolonged, derisive laughter. These Gulls now breed in one or two localities on the southern coast of Maine, on Muskeget island, and southward, depositing the eggs early in July. On Muskeget, the nests are placed in the depressions among the ivy, and the eggs are often concealed by the overhanging leaves. When I first visited this islet, about fifteen years ago, there were some fifty pairs breeding there, but now, only a quarter part of this number resort to the island. When the nests are approached, the Laughing Gulls silently leave them, and rising, circle at a great height, uttering their oddly sounding notes, or will occasionally plunge downward toward the intruder. The Gulls migrate early in September, with the Terns.

LARUS PHILADELPHIA.

Bonaparte's Gull.

Sterna Philadelphia Ord. Guth., Geog., II; 1815, 319.

DESCRIPTION.

Sp. Cu. Form, slender. Size, small. Color. *Adult.* Back and wings, bluish-ash, with greater portion of two first, and outer webs of two next, primaries, white. Outer webs of first and terminal portion of all, tipped with white. Head, sooty-black. Half ring around back of eye and remainder of plumage, white. Iris, brown, bill, black, and feet, yellow. *In winter*, lacks the black head and there is a spot of dusky back of ear coverts. *Young.* similar to winter adult, but with a line through wings, tips of secondaries, outer portion of three first primaries, and subterminal band on tail, dusky.

OBSERVATIONS.

Known by the small size and colors as described. Distributed in summer from the Great Lakes, northward. Winters in Florida.

DIMENSIONS.

Average measurements of specimens. Length, 13.52; stretch, 31.10; wing, 9.65; tail, 4.52; bill, 1.12; tarsus, 1.38. Longest specimen, 14.00; greatest extent of wing, 32.95; longest wing, 10.25; tail, 5.05; bill, 1.25; tarsus, 1.53. Shortest specimen, 12.95; smallest extent of wing, 29.98; shortest wing, 8.98; tail, 4.05; bill, .98; tarsus, 1.25.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground or rocky cliffs and composed of sea-weeds, etc. *Eggs*, three or four in number, oval in form, varying from greenish to brown in color, spotted and blotched with brown, amber and lilac of varying shades. Dimensions from 1.12 x 1.38 to 1.15 x 1.45.

HABITS.

The pretty, little Bonaparte's Gulls come to us on the coast of New England, in numbers, only in autumn, usually late in August. They are fond of flying in small companies, along the beaches, low down, just over the water, when they somewhat resemble Terns. I found them quite common on Indian River, Florida, in winter, where they have much the same habits as further north. They breed on the Great Lakes, in Labrador, and northward.

LARUS TRIDACTYLUS.

Kittiwake Gull.

Larus tridactylus LINN., Syst. Nat., I; 1766, 224.

DESCRIPTION.

Sp. Cu. Form, robust. Size, medium. Tail, slightly forked. Hind toe, very short. Color. *Adult.* Back and entire wing, rather dark ashy-blue, becoming lighter toward terminal portion of primaries which have the outer webs of first, tips of three outer, and subterminal band on next two, black. Remainder of plumage, white. Iris, brown, bill, yellow and feet, black. *In winter*, similar but with posterior portion of head and upper neck overwashed with ashy-blue. *Young*, similar to winter adult but with an indistinct collar on back of neck, line through wing, outer two thirds of four or five outer primaries, tip of tail, and bill, black.

OBSERVATIONS.

Known by the very short hind toe, slightly forked tail and yellow bill. Distributed in summer from the Gulf of St. Lawrence, northward, wintering from Massachusetts, southward.

DIMENSIONS.

Average measurements. Length, 16.55; stretch, 36.53; wing, 12.55; tail, 5.56; bill, 1.45; tarsus, 1.25. Longest specimen, 17.12; greatest extent of wing, 37.15; longest wing, 13.12; tail, 5.95; bill, 1.50; tarsus, 1.33. Shortest specimen, 16.00; smallest extent of wing, 36.15; shortest wing, 12.05; tail, 4.95; bill, 1.40; tarsus, 1.25.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on rocky cliffs, composed of sea-weeds, etc. *Eggs*, two or three in number, oval in form, yellowish-buff in color, spotted and blotched with rounded marks of brown and lilac of varying shades. Dimensions from 1.60 x 2.20 to 1.70 x 2.25.

HABITS.

The southernmost breeding ground of the Kittiwake Gull, with which I am acquainted, is Bird Rock, where a few pairs make their homes, placing their nests in the most inaccessible portions of the rock. The eggs are deposited about the middle of June, and both birds sit persistently on them until they are hatched. Like other members of the genus, the Kittiwakes are particularly active and noisy during severe storms, and when the huge breakers were dashing against Bird Rock, with a fury which sent the salt spray flying over the top of the island, producing a continuous thunder, the loud *kittiwake, wake, wake, waker* of the Gulls, came distinctly to the ear, as they flew high over the storm-tossed waves. Many Kittiwakes pass the winter in Massachusetts, frequenting the harbors along the coast.

GENUS VI. XEMA. THE FORK-TAILED GULLS.

GEN. CH. *Bill, shorter than head and slender. Tail, forked. Hind toe, short.* Members of this genus are remarkable on account of the forked tail. There is but one species within our limits.

XEMA SABINI.

Fork-tailed Gull.

Xema sabini LEACH., App. Ross's Voy., 1819.

DESCRIPTION.

SP. CH. Size, small. Form, slender. COLOR. *Adult.* Head, back and upper part of wings, slaty-blue. Ring around neck, edge of wings, spurious quill, and first five primaries, black. Tips of tertiaries, greater part of upper wing coverts, and remainder of plumage, white. Bill, black to angle and then yellow to tip. Feet, black. *Young.* Upper parts, slaty-gray with the feathers tipped with white. The under parts and tail are white, the latter having a subterminal band of black. Wings, similar to adult but with white more restricted. Bill, dusky.

OBSERVATIONS.

Known by the small size and forked tail. Distributed in summer throughout the Arctic Regions. Wandering in winter as far south as Massachusetts. DIMENSIONS. Length, 13.75; stretch, 33.00; wing, 10.75; tail, 5.00; bill, 1.00; tarsus, 1.25.

DESCRIPTION OF NESTS AND EGGS.

Eggs, placed on the ground in sandy places, two in number, oval in form, deep greenish-brown in color, obscurely spotted and blotched with darker. Dimensions from 1.05 x 1.45 to 1.10 x 1.50.

HABITS.

Although the Fork-tailed Gull has been taken on the coast of Massachusetts several times, it is extremely rare and only reaches us in winter, as it breeds in the Arctic Regions, where it is said to nest like the Terns and to have similar habits.

GENUS VII. PAGOPHILA THE WHITE GULLS.

GEN. CH. *Bill, shorter than head and very stout. Tail, square. Feet, large and legs stout.* Members of this genus are very light in color. We have but one species within our limits.

PAGOPHILA EBURNEA.

Ivory Gull.

Pagophila eburnea KAUP., Sk. Ent. Eur. Thier., 1829, 69.

DESCRIPTION.

SP. CH. Size, medium. Form, robust. COLOR. *Adult.* White throughout, with shafts of primaries pale yellowish. *Young.* Similar but mottled with dusky on head, neck, and tips of primaries and tail.

OBSERVATIONS.

Recognized by the stout bill and white color. Distributed throughout the Arctic Regions, wandering a little southward in winter. DIMENSIONS. Length, 19.50; stretch, 41.00; wing, 13.50; tail, 6.25; bill, 1.40; tarsus, 1.45.

HABITS.

The handsome Ivory Gull is an exceedingly rare visitor, even to the coast of New-

foundland and Labrador, and never, so far as I can learn, extending its range to our New England shores. This Gull is described as inhabiting the open ocean and feeding upon the blubber of whales, walruses, etc., keeping on the edge of the ice in winter, which thus limits its southern range.

GENUS VIII. STERCORARIUS. THE SKUAS.

GEN. CH. *Bill, strong and curved at tip, with nostrils linear. Central tail feathers, projecting. Tarsus and feet, stout.* Members of this genus are usually dark in color. There are three species within our limits.

STERCORARIUS POMATORHINUS.

Pomarine Skua.

Stercorarius pomatorhinus VIEILL., Nov. Diet.: 1819, 158.

DESCRIPTION.

SP. CH. Form, robust. Size, large. Bill, stout. Central tail feathers, rounded at tip and projecting about three inches. Color. *Adult.* Above and on under tail coverts, dark-brown. Beneath, white. Sides of neck, pale yellow. Iris, brown, bill, greenish, and feet, black. *Young.* Sooty-brown throughout, sometimes quite dark, but generally with the feathers edged with whitish and rufous. Central tail feathers, short.

OBSERVATIONS.

In some intermediate stages of plumage, there is a band of spots, of greater or less width, across breast. Known by the large size, the wing being at least one inch longer than that of the preceding species, and the rounded tips to elongated central tail feathers. Distributed in summer throughout the Arctic Regions; wintering as far south as New Jersey. DIMENSIONS. Length, 20.00; stretch, 48.00; wing, 13.50; tail, 8.50; bill, 1.75; tarsus, 2.00.

HABITS.

The Pomarine Skua breeds in high, northern latitudes, only coming south during autumn and winter. Like all the Skuas, they are parasitical in habit, pursuing Gulls and Terns in order to force them to drop their prey, which is snatched up by the Skuas before it reaches the water. The Pomarine Skuas are very shy birds and keep well out to sea.

STERCORARIUS CREPIDATUS.

Richardson's Skua.

Stercorarius crepidatus VEILL., Nov. Dic.: 1819, 155.

DESCRIPTION.

SP. CH. Form, robust. Size, rather small. Bill, rather slender. Central tail feathers, acutely pointed at tip and projecting about four inches. COLOR. *Adult.* Above and under tail coverts, dark sooty-brown with a slaty tinge, and becoming bluish on wings and tail. Sides of neck, pale yellow. White beneath. Iris, brown, bill, yellowish and feet, black. *Young.* Dusky brown throughout, sometimes very dark but usually with the feathers edged with whitish and rufous. The central tail feathers are short. DIMENSIONS; length, 21.00; stretch, 45.00; wing, 12.00; tail, 8.50; bill, 1.30; tarsus, 1.75.

OBSERVATIONS.

Known from the preceding species by the smaller size, the wing measuring only about twelve inches in length; and from the succeeding, when adult, by the shorter central tail feathers; and in young by the shaft of all the primaries being mostly white. This species passes through many variations between the young and adult.

DESCRIPTION OF NESTS AND EGGS.

Eggs, placed on the ground, two or three in number, oval in form, deep yellowish or greenish-brown in color, spotted and blotched with brown and umber of varying shades. Dimensions from 1.55 x 2.12 to 1.60 x 2.35.

HABITS.

Richardson's Skua is much more common than any of the genus which occur with us, frequenting the bays and harbor mouths, where it may often be seen in pursuit of Gulls, a habit which has earned for it the name of Gull Chaser. Although very shy when with us in autumn, Mr. Howard Saunders writes me, that he found them so tame on their breeding grounds on the Shetlands, that they frequently struck his head in their downward swoops.

STERCORARIUS BUFFONI.

Buffon's Skua.

Stercorarius Buffoni COUES., Pr. Phil. Acad.; 1863, 136.

DESCRIPTION.

SP. CH. Form, rather slender. Size, small. Central tail feathers, long and slender, projecting from eight to ten inch-

es. COLOR. *Adult.* Above, dark slaty-blue. White beneath to breast, then gradually becoming dusky until the under tail coverts are as dark as back. Sides of head and neck all around, pale yellow. Shafts of primaries, brown, excepting the first two which are white. Iris, brown, bill, greenish, and feet, black. *Young.* smoky-brown throughout, mottled with ashy, and the central tail feathers only project slightly.

OBSERVATIONS.

Known by the long central tail feathers, which are acuminate even in the young, small size, and white shafts to two outer primaries. Distributed, in summer, throughout the Arctic Regions, wandering as far south as Massachusetts in winter. DIMENSIONS. Length, 20.00; stretch, 40.00; wing, 12.00; tail, 12.00; bill, 1.15; tarsus, 1.55.

DESCRIPTION OF NESTS AND EGGS.

Eggs, placed on the ground, two or three in number, rather pointed oval in form, deep yellowish-brown in color, spotted, blotched, and lined with reddish-brown and number of varying shades. Dimensions from 1.50 x 2.15 to 1.56 x 2.25.

HABITS.

Buffon's Skua is by far the rarest of the three species of the genus, which are of regular occurrence with us, as it appears to spend the greater portion of its time far out to sea. On account of the peculiar, long tail, this species is called Whip-tail by sailors.

FAMILY II. PROCELLARIDÆ. THE PETRELS.

Bill, generally shorter than head and strongly curved at tip. *Nostrils*, tubular. *Hind toe*, present or absent. *Marginal indentations*, four or absent. *Keel*, usually perforated. *Primaries*, long and secondaries, short.

Members of this family are closely feathered, fly remarkably well, and possess the power of swimming, but do not move with ease upon the ground. The bill is made up of several parts. The young are covered with down at birth, but are helpless and are fed by the parents until able to fly.

GENUS I. PROCELLARIA. THE FULMARS.

Gen. Ch. *Bill*, strong, rather short, and somewhat compressed near tip. *Tarsus*, short and strong. *Toes*, fully webbed and with a spur in place of the hind toe. *Tail*, rounded. Members of this genus are generally large and of varying color. There are two species within our limits.

PROCELLARIA GLACIALIS.

Fulmar Petrel.

Procellaria glacialis LINN., Syst. Nat., I; 1766, 213.

DESCRIPTION.

SP. CH. Form, robust. Size, medium. COLOR. *Adult.* Back and wings, pale bluish-ash, becoming brownish on primaries. Remainder of plumage, white, strongly tinged with ashy on tail. Iris, bill, and feet, yellow.

OBSERVATIONS.

Easily recognized by the pure white head. Occurs in the Northern Atlantic. DIMENSIONS. Length, 19.95; stretch, 32.00; wing, 13.00; tail, 4.25; bill, 1.85; tarsus, 2.00.

DESCRIPTION OF NESTS AND EGGS.

Eggs, placed in holes of rocky cliffs, one in number, elliptical in form, pure white in color, with the shell very brittle. Dimensions from 2.00 x 2.75 to 2.05 x 2.80.

HABITS.

The Fulmar Petrels are found far out to sea, often accompanying whaling ships, for they are fond of feeding upon blubber. They breed in holes of rocky cliffs, in the far North, and the young are at first fed by regurgitation, upon oil, with which the stomachs of the adults are so filled, that they vomit it upon the slightest provocation, and thus are extremely disagreeable birds to handle.

PROCELLARIA HÆSITATA.

Black-capped Fulmar.

Procellaria hesitata KUNL. Mon. Proc. Beit. Zool.; 1820, 142.

DESCRIPTION.

SP. CH. Form, slender. Size, small. COLOR. *Adult.* Back, wings, terminal half of tail, a few of its upper coverts,

and spot on top of head, dark-brown. Remainder of plumage, white. Bill, black, iris, brown, feet, pinkish. *Young*, similar, but with white of head more extended.

OBSERVATIONS.

Known by the white head and dark crown. Occurs off the Atlantic Coast from New York, southward. Dimensions; length, 16.00; stretch, 39.00; wing, 12.00; tail, 5.45; bill, 1.50; tarsus, 1.50.

HABITS.

The Black-capped Fulmar inhabits the Southern Atlantic but does not appear to be very common, though specimens are occasionally taken off the coast. Its habits are similar to those of the preceding species.

GENUS II. THALASSIDROMA. THE STORMY PETRELS.

GEN. CH. *Bill, not stout but short. Tail, forked.* Members of this genus are small in size and rather dark in color. Legs, long with feet as in preceding. We have three species within our limits.

THALASSIDROMA LEUCORRHOA.

Leach's Petrel.

Thalassidroma leucorrhoea VIEILL., Nov. Dic., 1819.

DESCRIPTION.

SP. CH. Form, robust. Size, medium. COLOR. *Adult.* Sooty-brown throughout, darkest on wings and tail, and ashy in a line through wing. The upper tail coverts and base of lower are white. Iris, brown; bill, feet and webs, black.

OBSERVATIONS.

Nestlings are covered with black down. Known by the longish bill, short legs, and black webs to feet. Distributed, in summer, from the coast of Maine, northward. Winters off the coast of the Southern States.

DIMENSIONS.

Average measurements of specimens from North America. Length, 8.45; stretch, 18.50; wing, 6.25; tail, 3.25; bill, .72; tarsus, 1.02. Longest specimen, 8.99; greatest extent of wing, 14.00; longest wing, 6.59; tail, 3.50; bill, .75; tarsus, 1.05. Shortest specimen, 8.00; smallest extent of wing, 18.00; shortest wing, 6.00; tail, 3.00; bill, .70; tarsus, 1.00.

DESCRIPTION OF NESTS AND EGGS.

Eggs, placed in burrows, one in number, elliptical in form, chalky-white in color, with the shell brittle, dotted finely on larger end, often in a ring, with purplish-red and lilac. Dimensions from .90 x 1.25 to 1.00 x 1.35.

HABITS.

On the fifteenth of July, some years ago, in company with some ornithological friends, I stood on a small, low island, just off Grand Menan. As this spot of land contained only some two or three acres, we could see over its entire surface, and to all appearances, there was not a living thing on it, larger than a beetle; yet really, it was tenanted by hundreds of interesting birds, and a closer inspection soon disclosed their whereabouts. Walking toward the middle of the island, we distinctly perceived the peculiar, oily odor which is so characteristic of Petrels of all species, and looking down among the little hummocks at our feet, we observed numerous holes among the somewhat luxuriant growth of grass, each of which was the entrance to a burrow of a Leach's Petrel. The holes were about four inches in diameter and of varying depths, from six inches to four feet, straight or crooked, some with two or even three entrances, and all had been drilled in the peculiar soil, which consisted of a light, black loam, by the birds. The extremity of the burrows was slightly enlarged and the single egg was placed in it, frequently on a little dried grass. It was rare to find an egg which did not have a bird over it, while in a few holes, there were two birds, but then there were never any eggs. Usually the birds would bite quite fiercely and struggle when they were being removed, then, almost as soon as they saw daylight, up would come about two tea-spoonfuls of clear, yellow oil, filling the air with its peculiar odor. If the birds were placed on the ground, they would run away and conceal themselves among the grass; if thrown in air, would mount upward, though invariably disgorging the oil before going far, circle about the spot a few times, then fly out to sea. If not forcibly re-

moved, they would never attempt to leave the burrows, and when first brought out, appeared very stupid, for they could often be thrown from hand to hand like balls, without flying. When one nest was being disturbed, the Petrels in neighboring burrows, of which there were often eight or ten within a few square yards, kept up a constant squeaking like mice. At this time, the eggs were in an advance stage of incubation, but I found fresh ones on the southern end of Bryon Island, the first of July, a year later. Here Leach's Petrels were nesting in burrows on the face of a sandy bank, in a similar manner to that practiced by Bank Swallows. When not breeding, these Petrels are found on the open ocean, running lightly over the waves, with extended wings, like other allied species.

THALASSIDROMA WILSONI.

Wilson's Petrel.

Thalassidroma Wilsoni Bon. Syn., 1828.

DESCRIPTION.

Sp. Cn. Size, medium. Form, slender. Color. *Adult.* Dark sooty-brown throughout, becoming blackish on primaries and tail and ashy in a line through wings. Upper tail coverts, basal third of under, and base of tail, white. Iris, brown, bill and feet, black with webs yellow, excepting at margin.

OBSERVATIONS.

Recognized by the short bill, long legs, and yellow webs to feet. Distributed in summer from the Gulf of St. Lawrence, northward, wintering off the Atlantic Coast.

DIMENSIONS.

Average measurements of specimens. Length, 7.25; stretch, 13.30; wing, 5.75; tail, 5.50; bill, .55; tarsus, 1.45. Longest specimen, 7.50; greatest extent of wing, 13.65; longest wing, 6.10; tail, 5.75; bill, .60; tarsus, 1.50. Shortest specimen, 7.00; smallest extent of wing, 12.95; shortest wing, 5.50; tail, 5.25; bill, .50; tarsus, 1.40.

DESCRIPTION OF NESTS AND EGGS.

Eggs. placed in burrows, one in number, elliptical in form, chalky white in color, occasionally spotted with purplish, sometimes in a ring around larger end. Dimensions from .80 x 1.10 to .85 x 1.15.

HABITS.

A portion of the surface of the Magdalen Islands, is covered with a thick growth of low, scrubby spruces and hemlocks which often approach quite near the edge of the high cliffs that form a large part of the coast. There was a dwarf forest of this description, on the western side of Bryon Island, which grew so near the brink of a cliff, some two hundred feet high, that there was only about twenty feet between the margin of the wood and edge of the precipice. There were, however, some small, straggling spruces growing in this intervening section, and under these, I was informed, Wilson's Petrels, or Long-legged Mother Cary's Chickens as they were there called, made their burrows. I visited the place repeatedly in search of their nests, but although I could perceive the unmistakable odor of Petrels, I was not fortunate enough to find a hole. It is probable that I was too early and that the burrows were not dug until later, although it was the first week in July, when I made the last search. I found these birds very abundant in the neighboring waters of the Gulf, feeding on floating garbage. They were very tame, often coming so near the boats, that several were killed with oars. I have also met with this species off the coast in winter.

THALASSIROMA PELAGICA.

Stormy Petrel.

Thalassidroma pelagica Vig., Zool. Jour., II; 1825, 405.

DESCRIPTION.

Sp. Cn. Form, slender. Size, small. Color. *Adult.* Dusky-brown throughout, lighter beneath. Band on rump, base of upper and under tail coverts and tail, axillaries, and some under wing coverts, white. Iris, brown, bill and feet, black.

OBSERVATIONS.

Known by the white axillaries. Distributed off the Northern Atlantic Coast. DIMENSIONS. Length, 5.75; stretch 43.50; wing, 5.10; tail, 2.25; bill, .60; tarsus, .80.

DESCRIPTION OF NESTS AND EGGS.

Eggs, placed in holes of cliffs, one in number, elliptical in form, white in color, obscurely dotted with reddish on the larger end. Dimensions from .75 x 1.10 to .78 x 1.12.

HABITS.

The small Stormy Petrel is said by Audubon and others, to occur on the Banks of Newfoundland and off the coast, but I have never met with it, although it is doubtlessly occasionally found with us. This species breeds in a few localities on the islands north of Scotland, placing the eggs in holes of cliffs, and does not differ in general habits from other Petrels.

GENUS III. PUFFINUS THE SHEARWATERS.

GEN. CH. *Bill, about as long as head and strongly curved at the tip. Tail, short and rounded. Primaries, very wide.* Members of this genus are rather large and usually dark in color. There are three species within our limits.

PUFFINUS MAJOR.

Greater Shearwater.

Puffinus major Bon., Con. Avi.; 1855, 203.

DESCRIPTION.

SP. CH. Form, robust. Size, large. COLOR. *Adult.* Above, dark-brown becoming lighter on occiput and margin of feathers, and darker on primaries and tail. Inner webs of secondaries and beneath, white which nearly encircles neck. Lower tail coverts, ashy. Iris, brown; bill and feet, yellowish. *Young,* similar but with white overwashed with sooty.

OBSERVATIONS.

Known by the large size and dusky color above. Occurs off the coast. DIMENSIONS. Length, 20.00; stretch, 45.00; wing, 13.25; tail, 5.00; bill, 2.25; tarsus, 2.25.

HABITS.

The Greater Shearwaters appear to be quite common on the Banks of Newfoundland and northward, especially in autumn, when they migrate southward. They have all the light, graceful movements of the smaller Petrels, and swim, as well as dive, with ease. They accompany the fishing vessels to feed upon the offal, and are called Hagdons by sailors. The Greater Shearwaters breed far north.

PUFFINUS BOREALIS.

Cory's Shearwater.

PUFFINUS BOREALIS CORY, Bull. Nutt. Orn. Club, Vol. VII, April, 1881.

Plate II, fig 1: head of adult.

DESCRIPTION.

SP. CH. Form, robust. Size, large. COLOR. *ADULT.* Above, ashy, becoming brown on back, where the feathers are edged with lighter. Wings and tail, dark-brown. Sides of head and neck, ashy like the back, but gradually become white beneath, and the remainder of the lower portions are white. The sides and under tail coverts are slightly mottled with ash, and the flanks are ash. The upper tail coverts are ash, banded with white at the tips, and some of the feathers are edged with white. Iris, brown. Bill, yellow, crossed near the tip with a dark band. Feet, yellow, darker externally. Sexes, similar.

OBSERVATIONS.

The following comparative description will give a better idea of this fine species, as distinguished from the Greater Shearwater. The bill of Cory's Shearwater is almost entirely yellow, being dusky only in a band across both mandibles and on the top of the upper; whereas that of the Greater is nearly or wholly bluish. The size of the bill of *P. borealis* is larger, exceeding 2.00 in length and .80 in depth at the nostrils.

that of major being seldom, if ever, as long, and only about .50 in depth. The size of borealis is larger; the wing equalling or exceeding 14.00 in length, while in major, it seldom if ever exceeds 13.50, and is usually shorter than this. The feet of the two species are about the same size, but those of borealis are decidedly lighter in color. In general coloration, borealis is much more ashy above, especially anteriorly, the feathers of the head and upper part of the back, being so light as to present a strong contrast with the wings. In perfectly adult specimens of major, the lower neck behind and upper back are nearly as ashy as in borealis, but lower down on the back, this color is confined to the edges of the feathers, producing a scaly appearance in marked contrast with the dark brown of the central portion of each feather, but in borealis, the color is uniform ashy. The under parts of borealis, even the under wing and tail coverts and axillaries, excepting a slight ashy tinge on the former, sides of the former, and on the shafts of the feathers of the latter, are pure silky white, whereas major is marked with dusky in a central line along the abdomen, in spots on the axillaries, on the wing coverts beneath, along the sides, especially anteriorly, and on the central portion of the under tail coverts. One of the most noticeable differences, however, between the two species may be seen in the ashy markings of the sides of the head and neck. This in borealis extends down on the lower jaw for some distance, thence in a nearly straight line to a point just back of where the bend of the wing touches the body. There is no distinct line of demarkation between the ashy and the white, but both colors gradually blend together. In major the dark color of the upper part of the head does not encroach on the lower jaw but ends in an abrupt line about .40 below the eye. From thence it extends backwards in a straight line to the back of the head, beyond which the white of the lower part of the neck encroaches in a triangular patch on either side. These patches nearly meet behind the neck in young birds, but in adult specimens this dusky area between is wider. The dark line of demarkation beyond this triangular patch down to the sides, is not as well defined as above, but still does not intergrade with the white as completely as in borealis. The patch in front of the eye and around it, is decidedly dusky, in quite strong contrast with the ashy of the sides of the head. Thus it will be seen that Cory's Shearwater is quite distinct from the Greater Shearwater; its nearest ally is, however, *P. kuhlii*, an Old World species, but borealis is paler than this.

HABITS.

This fine Shearwater was first discovered by Mr. Charles B. Cory off the coast of Chatham, Mass., in the autumn of 1880, and it has been found in other years since that time, but always in the fall or late summer, sometimes in considerable numbers, as in the autumn of 1886, when a great many were taken by the United States Fish Commission. As far as observed, during its short stay on our coast, Cory's Shearwater does not appear to differ in general habit from the Greater, with which it associates. Where this Shearwater spends the greater portion of the year and where it breeds remains unknown.

PUFFINUS STRICKLANDI.

Sooty Shearwater.

PUFFINUS STRICKLANDI RIDGWAY, Water Birds N. A., II, 1884: 390.

Plate II, 1, head of adult taken at Chatham, Mass.

DESCRIPTION.

SP. CH. Form. robust. The size is large. The general proportions are about the same as those of *P. major*.

COLOR. Adult. Dark sooty brown throughout, becoming blackish on the wings and tail, paler and grayish below, usually with some whitish on the under wings coverts. Bill, dark brown. Feet, dark brown outwardly, paler inwardly. Iris, brown.

DIMENSIONS.

Length, 48.00 to 49.00; stretch, 40.00 to 42.00; wing, 12.00 to 12.75; tail, 4.00 to 4.50; bill, 2.00 to 2.25; tarsus, 2.35 to 2.40.

OBSERVATIONS.

Variation consists of the greater or less amount of light color beneath but this is doubtless due to age. Readily distinguished from the Greater Shearwater by the uniform sooty color.

HABITS.

The Sooty Shearwaters inhabit the North Atlantic in summer, coming south in early autumn, often reaching Massachusetts in August, where they are found off the coast in company with the two preceding species. I have seen this and the Greater Shearwater at sea, in June, only about fifty miles north of the Bahamas.

PUFFINUS AUDUBONI.**Audubon's Shearwater.**

PUFFINUS AUDUBONI FINSCH, P. Z. S.; 1872, 111.

Plate II, 2, head of adult taken on the Bahamas in spring. FIG. 4, young in down.

DESCRIPTION.

SP. CU. Form, rather slender. Size, not large. Bill, rather slender, strongly curved at the tip, with the nostrils not prominent. Trachea, much flattened near the mouth, but becoming gradually rounded lower down; length to bronchial tubes, 3.90. Bronchials, .90 long and the tympaniform membranes extend their entire length. Os transversale, present, but there is no semiluna membrane. Sterno trachealis, quite well developed, and there is a thin, strap-like broncho trachealis, extending from the 8th ring of the trachea to the 4th half ring of the bronchials. Esophagus, straight, slightly dilated at the lower termination; 3.50 long. Proventriculus, very large, the gland surface measuring 3.10 by 1.25; the glands are variable in number, but are much more numerous near the upper opening, becoming fewer towards the stomach, near which there are scarcely any on the lower side, while they are very scattering above. Stomach, very small, .65 x .55 x .40; walls, thin, and both they and the lining membrane are soft. Duodenum, short, 2.00, enclosing a very small pancreas. Intestines, 17.00 long, and there are small, globular cæca. Spleen, small and cylindrical. Heart, quite large, .95 x .70, and rather flattened. Liver, variable, but the right lobe is usually much larger than the left, and the gall sack is large.

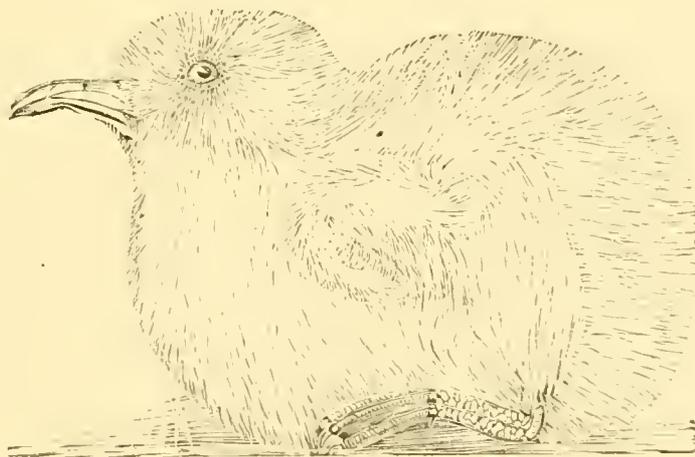


FIG. 4, AUDUBON'S SHEARWATER, PUFFINUS AUDUBONI; newly hatched downy young, one day old, taken on Green Key, Bahamas, April 5th 1884.

COLOR. Adult. Above, sooty brown, lightest anteriorly; there is no abrupt line of demarkation, but the dark above fades into the white of the lower surface on a line with the eye and encroaches on it in a patch just below the bend of the wing, and slightly on the under wing coverts. Lower surface, white, excepting terminal portion of upper tail coverts which are sooty brown. Iris, brown. Bill, very dark brown. Feet, brown externally, orange internally.

Downy young. Above, light reddish brown, becoming paler below, with a patch of white beneath that is wide on the throat, narrows on the breast, then widens and divides into two branches on the abdomen. Feet, nearly wholly orange, being only slightly dusky externally, and the bill is orange at the base. Sexes, similar in all stages.

OBSERVATIONS.

In something over one hundred specimens examined by me I find but little variation, and that mainly consists in the greater or less amount of sooty brown on the under tail coverts, and the dusky occasionally extends below the eye, thus the lower eyelid is not always white. This is the smallest of our Shearwaters, and may thus readily be distinguished from them all, excepting the Manx, *P. puffinus*, but even this is larger, the wing being some two inches longer, and the color above is decidedly blackish, not brownish as in the present species. Occurs in spring and summer on the Bahamas and southward, through the islands of the Caribbean Sea, breeding throughout this region, in suitable locations; wandering in autumn over a more widely spread section of ocean, then occasionally reaching our coast, casually as far north as New Jersey. In winter disappearing from Bahaman waters.

DIMENSIONS.

Length, 11.00 to 12.00; stretch, 26.00 to 27.00; wing, 7.50 to 8.00; tail, 3.50 to 3.75; bill, 1.25 to 1.35; tarsus, 1.35 to 1.50.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed beneath rocks, composed of bits of sticks, shells, and debris, collected in the vicinity, but in no great quantity, and sometimes the egg is deposited on the naked soil or rock.

Eggs, one in number, elliptical in form, pale salmon in color when fresh, fading to white when incubated, or some time after being blown. Dimensions, from 1.20 x 1.85 to 1.25 x 2.00.

HABITS.

Some five or six miles northeast of New Providence, Bahamas, one of a group of small islets, lies Green Key. It is about a half a mile long by some quarter of a mile in width, and is crescent shaped, thus forming a small harbor, the shores of which are low and bordered by a sandy beach. The outer curve of the crescent, to the westward and northward, which overlooks the open waters of the channel, are elevated. In fact, in many places, especially toward the southern extremity, there are cliffs, thirty or forty feet high, that rise abruptly from the sea, forming a wall, against which the waves beat continuously and impetuously. All along the broken places in the cliffs, where the land slopes more gradually to the water, are scattered pieces of coral rock of varying form and size, from fragments of a few pounds to huge masses that would outweigh tons. These lie heaped together in a long row just as they were left by the waves in some long past period before the land was elevated as much as it is at present.

In company with Mrs Maynard, I landed on this island on the morning of April 3d, 1884, having come from Nassau in a little craft that found a safe anchorage in the small harbor which lay within the horns of the crescent. Leaving our man to put our things ashore we passed around the northern end of the key, and had not gone far when we came suddenly upon the entrance of a cave. The opening was in the solid wall of a low cliff that rose abruptly from the sea, and was about six feet wide by four or five high.

Spottie, my dog, at once ran into this opening and we followed; swinging around the jagged rocks that formed the walls of the entrance. we found that the floor sloped upward at a considerable angle. Looking toward the top of the elevation, I saw the dog chase a Shearwater from the nest, or rather the egg, for there was very little nest, the egg being deposited in a slight depression of the scanty soil that barely covered the rocks. The bird defended herself for a moment against the dog by biting at her, but finally scrambled through an orifice near by and flew off over the water. Almost immediately after, I found three or four more nests placed behind angles of rocks, and easily captured the birds.

Leaving the cave, we came upon the rows of scattered pieces of rocks; here my dog began to find the birds beneath the stones, where they occupied cavities, indicating the spot where they were hidden by putting her nose to the ground and persistently wagging her tail, or by giving a scratch or two on the rock with her paw, and whenever she pointed out a place in this manner we were sure to find a bird and egg there. Usually there were nests and these were composed of fine bits of sticks, shells, and other rubbish; they were placed in all sorts of positions beneath the pieces of rock, or occasionally in crevices beneath the solid rock, but this latter named situation was rarely chosen. Some nests were within six inches of the outside, while others were far beyond the reach of my arm beneath large slabs. Some had entrances toward the sea, some toward the land, and some had two or three modes of ingress and exit. Exceptions to this rule of nesting beneath rocks were, first, in the cave already mentioned, but although we found several caves similar to the first, there were no nests in them; second, a nest placed in a cylindrical hole in the rock, bored perpendicularly, and which had an orifice top and bottom, both of which were so small that I could not remove the bird through them, and third, two nests that Spottie came across, built beneath a peculiar creeping shrub that grew in abundance on the rocks, especially toward the southern end of the island.

In the case of the two nests last mentioned, when the dog came up to one of them the bird began an outcry and scrambling off the egg, made its way through the thick brush with difficulty, reached the edge of the cliff, then launched out over the water, flying in a perfectly straight line until it disappeared in the distance. In the other case I captured the bird. In many instances the birds would bite severely when I put my hand into the holes to take them off the nests. Some simply retreated a little off the egg and pressed themselves against the rock; others escaped through another entrance, if there chanced to be one, or retreated further beneath the rock. Some uttered harsh cries when I took them in my hand, at the same time biting savagely, and all would resist to the utmost in their power when roughly handled.

When they emerged from the hole, they scrambled off into the bushes where they endeavored to hide. In moving, these Shearwaters use both wings and feet, and by their joint aid, manage to progress quite rapidly, but none of them are capable of rising from the ground without having an elevation from which to launch out. At twilight the birds appear to be a little more lively, and one that Spottie drove off the nest that did not contain an egg, moved much more quickly than those started in full daylight, at which time they seem dazed; this individual bird managed to outmaneuver the dog, all

of whose efforts to stop it were in vain; it fairly rushed through the bushes, and reaching the edge of the cliff, darted outward and alighted on the water some distance from the shore.

In all cases a bird was sitting on the egg, both sexes being represented, but singularly enough the males were in the majority; out of sixty-two birds taken thirty-eight being males. With the exceptions mentioned below, there was always only one bird and only one egg; once I found two eggs in a single nest, one beneath the bird which was a male, and one just beyond him, the first was warm, the second cold, while both were fresh; once I found two birds together, a male and female, sitting side by side beneath a small piece of rock, evidently mating, for in this instance there was no egg. A few of the eggs were fresh but the greater number were in an advanced state of incubation, in fact, one hatched the next day after we got back to Nassau, and I thus secured a fine specimen of the downy young. This is figured on page 35.

The eggs when fresh, have the texture of shell seen in those of owls, and are decidedly salmon colored even after the contents are removed, giving the impression that they are very fragile, but they are really as tough as those of the domestic pigeon. As incubation advances the shells lose the delicate colors and become polished, when they somewhat resemble those of some of the ducks.

On the night of the day that we landed on Green Key we remained on the western side of the island until nine o'clock, waiting for the Shearwaters which were out on the sea to come in, for like most of the members of this family, this species is nocturnal in habit, only passing to and from their breeding ground at night. It is probable that the new comers assume the duties of incubation while the mates go out to sea to feed; hence while they are sitting, each one remains without food for twenty-four hours. This hypothesis was, in a measure, confirmed by an examination of the stomachs of the birds which were nearly empty, containing nothing but a little oily matter and some granular objects that resembled the eggs of some marine animal. On the night of which I have spoken we did not see a single Shearwater while waiting. At this time, however, the moon was shining quite brightly; later, about twelve o'clock, when the moon had gone down, after we had got back to our temporary camp, I heard the peculiar notes of the birds quite frequently as they came flying over head, passing within a few yards of us.

The notes are always hurriedly given, and judging by the sound, are always made when the birds are moving rapidly through the air. The notes consist of four syllables, "que-re-a-var," accented on the second and fourth, but mainly on the second, with the last prolonged. This song is uttered in a mellow tone, occasionally, however, a certain harshness would enter into it that in a few cases predominated, overcoming the mellowness. The cries of Audubon's Shearwater have been described as being mournful. To be sure the key in which they are given is low, being about the same as that in which owls hoot, yet the song of this Shearwater never impressed me as being mournful. I have frequently listened to their notes as my vessel lay at anchor off some lonely, outlying key, always by night, and the mellow wildness of their cadence seems to me to be in too perfect harmony with the pulsations of the surf upon the rocks, with the sighing of the wind through the cordage, and with the many delightfully mysterious sounds

that come from the sea, to be mournful, unless, indeed, one is inclined to regard all of the similar sounds produced by Nature, as mournful.

We found the Pinlicos, as Audubon's Shearwater is called throughout the Bahamas, common during the first week in April, on a group of little, rocky islets, known as the Washerwoman Keys, that lie just to the eastward of the southern end of Andros Island. At this time, nearly all of the nests were occupied by young birds which were, when very small, accompanied by the adult bird, but when two or three days old were alone. The young birds when first discovered would lie close to the ground in order to make themselves less conspicuous, but upon being removed from the nest would soon lose all fear and sit upright on their tarsi. Strangely enough, when taken in the hand they appear to be afraid of falling. In progressing along a level surface they use their feet, wings and beak. Some of the young were at least half grown when we found them, and we endeavored to rear them, feeding them on bits of meat and fish, but in spite of every care they died one after the other, none surviving over a week after capture. Although enabled to stand more cold than the young of Cory's Gannet, or probably the young of any of the Tropical Gannets, they are as susceptible to the heat as are the nestlings of these species: one that was accidentally exposed to the sun, about noon, died in a few moments. These young Shearwaters have a pretty, quavering note which strongly resembles that of a young Turkey.

Audubon's Shearwaters feed in blue water, quite off soundings, and remain there during the day, either sitting on the water or flying low down over it, and when on the wing move swiftly. I have never seen them dive when flying, thus judge they take their prey when swimming, either on the surface of the water or beneath it. In addition to the food already mentioned, I also found the jaws of a small species of squid in their stomachs.

These Shearwaters appear to be generally distributed throughout the West Indies, but are confined to particular islands when breeding. Thus I have found them on Green Key near New Providence, but not on the Green Key that lies to the eastward of the southern extremity of the Tongue of Ocean, directly on the edge of the bank, and in fact, so close is this island to blue water, that one finds himself off soundings when within fifty yards of the west end; yet they breed on the Washerwomen, that are similarly situated on the opposite side of the Tongue of Ocean, but a little to the southward. They do not nest on Andros, but we found them on the Ship Channel Keys, near the open Atlantic. I have looked in vain for the Pinlicos on Rum Key, Watlings, Long Island, and Inagua, of the Bahamas, also on the two northern of the Caymans, nor could I learn from the inhabitants that they ever occurred on any of these islands. When breeding, these Shearwaters do not wander far from their nesting places, and in coming north in June, we did not see them long after losing sight of Abaco, the last ones being about thirty miles from land.

Beyond all doubt, Audubon's Shearwaters leave the Bahamas in winter, as I did not see them during a trip from Great Bahama to Nassau, that carried me directly across one of their feeding grounds. Nor did I find them on the Tongue of Ocean, another of their summer resorts, in December, nor about the Ship Channel Keys in January.

PUFFINUS PUFFINUS.**Manx Shearwater.**

PUFFINUS PUFFINUS LICHT., Nomencl. Mus. Berol.: 1854, 100.

DESCRIPTION.

Sp. Ch. Size, rather small. Tarsus, longer than in Audubon's Shearwater but the tail is a little shorter.

Color. Adult. Above, blackish, this color extending below the eye. Beneath, white, including under wing and tail coverts. Iris, brown. Bill, greenish black. Feet, dusky on outer side, orange on inner.

Downy young. Brownish gray above, gradually becoming paler beneath. The feet are nearly wholly dusky.

OBSERVATIONS.

This species is known from all of the other Shearwaters by the small size, excepting from Audubon's, the Manx being larger than this, with absolutely and proportionately longer tarsus and shorter tail. Occurs, during the breeding season, on the eastern side of the northern Atlantic, migrating southward in autumn and winter to the Mediterranean Sea; casual off the North American coast.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in holes in rocks, very little material being used. Eggs, one in number, elliptical in form, white in color. Dimensions, from 1.75 x 2.42 to 1.81 x 2.45.

DIMENSIONS.

Length, 13.00 to 15.00; stretch, 32.00 to 33.00; wing, 9.00 to 9.50; tail, 2.90 to 3.10; bill, 1.35 to 1.50; tarsus, 1.75 to 1.80.

HABITS.

The summer home of the Manx Shearwater is from the Shetland Islands, northward. It is, however, confined to the eastern side of the Atlantic during this season, the only known exception to this rule being a single instance in which the species was found nesting on the Bermudas. During the season when all birds wander most, more especially water birds, that time immediately preceding fall migration, when a venturesome spirit appears to possess the aquatic avian mind, the Manx Shearwaters are occasionally found off our coast.

ÆSTRELATA SCALARIS.**Plumbeous Petrel.**

ÆSTRELATA SCALARIS BREWSTER, Auk, Jan., 1887.

DESCRIPTION.

Sp. Ch. Size, smaller than that of the Black-capped Petrel. Form, slender. Color, plumbeous with throat, upper breast, and under tail coverts, white. Dimensions: wing, 9.88; tail 3.85; bill, 1.03; tarsus, 1.37.

HABITS.

I have above briefly characterized a species of Petrel recently described by Mr William Brewster, the type of which, the only specimen in existence, was taken in a ploughed field in Livingstone County, New York, in April, 1880. At first this bird was supposed

to be Peal's Petrel, of which there is also only one specimen known, but Mr. Brewster has considered them different, as above stated. It will be hazardous to conjecture, even, from whence came a bird that is so evidently a straggler, thus we must be content to leave the discovery of its habitat to future investigation.

BULWERIA BULWERI.

Bulwer's Petrel.

PROCELLARIA BULWERI JARD & SELBY, Ill. Orn., Vol. II; tab. 65.

DESCRIPTION.

SP. CH. Size, rather small. Tail, graduated, the outer feathers being less than one third as long as the two middle, the difference being about 1:60. Bill, short, with the nail of the upper mandible strongly curved.

COLOR. Adult. Sooty brown throughout, darkest above, with the greater wing coverts paler, and the lesser wing coverts and quills, nearly black.

OBSERVATIONS.

Known by the uniform dark colors and graduated tail. Distributed throughout the eastern portion of the Middle Atlantic, mainly in the vicinity of the Canaries and Maderia, were it breeds, but is accidental on the Bermadas and near the coast of Greenland.

DIMENSIONS.

Length, 9.00 to 10.00; stretch, 30.00 to 31.00; wing, 7.70 to 8.00; tail, 4.50 to 4.75; bill, .85 to 1.00; tarsus, .90 to 1.00.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in burrows, very little material being used. Eggs, one in number, oblong oval in form, white in color. Dimensions, from 1.17 x 1.59 to 1.20 x 1.76.

HABITS.

Bulwer's Petrel, although a well known species in the oceanic avi-fauna of the Eastern Middle Atlantic, is a mere wanderer to any portion of our coast, and aside from the Bermudian record, its claim to a place in our fauna rests upon its occurrence in Greenland, as noted by Newton, see Man. Nat. Hist. Greenl.; 1875, 108.

PELAGODROMA MARINA.

White-faced Petrel.

PELAGODROMA MARINA LATH., Ind. Ornith., II; 1790.

DESCRIPTION.

SP. CH. Size, small. Form, slender. Tarsus and toes, long, with the tibia denuded for an inch or more. Bill, nearly as long as the head and slender. Tail, very long and nearly square, or slightly forked.

COLOR. Upper portions, including crown and broad stripe behind eye, plumbeous slate, ashy on upper tail coverts, and blackish on wings and tail. Forehead, superciliary stripe, and under parts, pure white.

OBSERVATIONS.

Known by the long legs and toes, long slender bill, white under parts and forehead. Occurs in the Southern Ocean. Accidental off the coast of Massachusetts.

STERNA ANÆTHETUS.

DIMENSIONS.

Length, 7.50 to 8.00; stretch, 25.00 to 26.00; wing, 6.00 to 6.50; tail, 3.00 to 3.30; bill, .65 to .70; tarsus, 1.50 to 1.60.

HABITS.

The White-faced Petrel is another straggler to our coast from Tropical waters. It is probable that this species resembles other members of the family in habit, frequenting the open ocean almost constantly, only visiting the land to breed; its nesting place, however, appears to be unknown.

STERNA ANÆTHETUS.

Bridled Tern.

STERNA ANÆTHETUS SCOP., Del. Faun. et Flor. Ins.; II, 1786.

DESCRIPTION.

SP. CH. Size, rather large. Form, slender. Bill, long, slender, and pointed. Webs of toes, especially the inner, considerably incised. Tail, deeply forked.

Color. Adult. Above, plumbeous ashy, blackening on wings, becoming gradually white on upper neck and lighter on tail, the outer feathers of which are white, excepting a small space of plumbeous on terminal third of outer web; basal portion of other tail feathers, decreasing in amount toward the center, also white. Crown, to line of lower eyelid, black. Crescent on forehead, the horns of which extend back of eye for a little more than its width, entire under parts, including under wing and tail coverts, the basal portion of wing feathers, extending along in a central line on primaries, and along the inner margin of inner web on secondaries, white. Iris, brown. Bill and feet, black.

DIMENSIONS.

Largest specimen. Wing, 10.75; tail, 5.25; bill, 1.60; tarsus, .80. Smallest specimen. Wing, 10.50; tail, 5.00; bill, 1.56; tarsus, .75.

OBSERVATIONS.

This species somewhat resembles the Sooty Tern, but differs in being decidedly plumbeous above, not sooty black, in having a whitish collar about the neck, and in having the horns of the white crescent on the forehead extending back of the eye, not stopping in front of it, as in the Sooty; besides which, the Bridled is a smaller and more slender bird. Distributed, in summer, throughout American Tropical waters, northward to the Bahamas; migrating southward in winter; wandering casually to Florida.

DESCRIPTION OF NESTS AND EGGS.

Eggs, one in number, placed beneath rocks, on the naked surface of the ground, without a vestige of a nest, varying from oval to elliptical in form, creamy in color, spotted and blotched, either finely or coarsely, or both, with yellowish brown and umber, while some of the spots are overlaid with shell, producing a paler shade. Dimensions, from 1.75 x 1.25 to 1.80 x 1.30.

HABITS.

Scattered throughout the Bahamas, among the larger islands, are little rocky keys, either destitute of vegetation or covered with a sparse growth of bushes or with a more luxuriant crop of cacti. Whenever these islets are surrounded with deep water, whether at a remote distance from the larger islands or not, they are occupied by the Sooty, Bridled, and Noddy Terns as breeding grounds. As I had an excellent opportunity of observing these three species of Terns during the nesting season, I shall give some account of the habits of them all.

During my cruise among the smaller, out lying keys of the Bahama Islands, in company with Mrs. Maynard, we first met with the Sooty Terns on Washerwoman Keys, off the southern end of Andros, and on the eighth of May, found them breeding. The eggs here were fresh, but later in the season, we found them on the Ship Channel Keys, June eighth and ninth, when incubation was considerably advanced, in fact, many were on the point of hatching, and in all cases, the number deposited was one. The nests were placed on the ground, often beneath bushes or cacti, but in some instances, on the naked rock. The material used in constructing the nests consisted of dried sea weeds and loose debris picked up by the birds on the keys. The amount used was variable, sometimes quite an elaborate domicile being made, but at other times, only a few sticks interposed between the eggs and the ground, while occasionally, the eggs lay upon the bare rock.

The ordinary notes of the Sooty Tern are extremely harsh, sounding like "Quank, quank," but when disturbed on their breeding grounds, they utter a double note like "Qu-ank." They also, at such times, emit a snarling sound, when all the Terns on the key will dive downward, and darting outward, fly over the surface of the water a short distance, scattering in every direction, but will immediately return, and gathering over the intruder, commence their noisy cries, continuing until another one of them chances to give this peculiar sound, when off they will go again, repeating the maneuver over and over again, as long as the object of their aversion remains on the key.

They are very bold in defending their nests, especially when the eggs contain embryos, and at such times, the occupants, whether male or female, will raise their wings when approached, open their beak, and strike at the venturesome hand that is endeavoring to rob them of their treasure. Of course they are then easily captured, when they will fight bravely for freedom.

We first met with the Bridled Terns on April 22d, on a small key that lies just outside of Middle Bight, Andros. Here was a small colony consisting of a half dozen pairs that exhibited considerable solicitude when we approached the northern portion of the island. None of the birds were breeding here, although they were evidently preparing to do so, as they were sitting about on the loose rocks and showed great reluctance at being forced to leave.

On May 6th, on middle Grassy Key, we found a large colony that was on the point of nesting; indeed the nests, or rather what answers for such, a mere hole scratched in the scanty soil, were already prepared beneath the rocks that lined the portion of the key which lay along the deep water of the Tongue of Ocean to the eastward. But it was not until we had proceeded some fifty miles to the southward, to the extreme southernmost of the Washerwoman Keys, a little rocky islet, containing only a few acres of land, that I found the first egg of the Bridled Tern. This was on May 9th, and it was placed beneath a large boulder, so far under, in fact, that it was with difficulty that I reached it. Later that day, we came to a large colony of Bridled Terns that was nesting on another of the Washerwomen, and secured several eggs. All of these eggs were fresh, and all were placed beneath rocks. Later in the month, we found eggs of this species in an advanced state of incubation, on the Ship Channel Keys. In all cases, the egg was

single and placed beneath a rock, and beyond doubt, this is the normal number and usual method of nesting.

The flight of the Bridled Tern is much more easy than that of the Sooty, which has a rather jerky manner of making its way through the air, the wings of the Bridled being moved in long, graceful sweeps; this is especially noticeable when they are chasing each other through the air, as is practiced by all species of Terns during the breeding season. The notes of the Bridled Tern are more shrill than those of the Sooty, sounding like "Kill-lock, kill-lock." They also utter an occasional croaking note as they fly past the intruder, and give a snarling sound, when they all dive as do the Sooties, but they are never as solicitous for the safety of their eggs, seldom even hovering over the nest when disturbed.

On all of the keys frequented by the Sooty Terns were large colonies of Noddies. These birds were very peculiar, being utterly different from any other species of Tern that I ever saw, behaving more like doves than like any member of the gull family with which I am acquainted. They sit on the rocks billing and cooing, and the peculiar manner in which the head is held, beak down, heightens the resemblance to doves. They seldom fly high, but go swooping over the water with a flight which resembles that of a Night Hawk much more than that of a Tern. They also fly in this same manner when disturbed while breeding, sailing, however, as they approach one, uttering a croaking sound which is the only note that I ever heard them give. They often alight on the rocks in large flocks and appear to prefer sitting to flying; yet they fly well and swiftly but never to any great height above the water.

The Noddy Tern usually constructs a nest for the single egg but not always, as I have found their eggs on the naked soil beneath bushes, or on the tops of isolated rocks, and occasionally in cavities beneath rocks. Nests are also placed in all of these situations as well as on the tops of low bushes or on the cacti that so abounds on these desolate keys. Noddies are the most fearless of all the species of Terns, but I saw only one that made any attempt at defending the egg, and she simply raised her wings over her back and uttered the croaking note, but did not attempt to bite.

There appears to be considerable difference in the observations of authors in regard to the number of eggs deposited by these three species now under consideration, especially the Noddy and Sooty. In the former edition of this Work, and in the foregoing articles on these species, I state that the eggs are three. In so doing, I gave the number reported to me as found by my men on the Tortugas, many years ago, and Audubon gives the same. Terns have been persistently robbed by the inhabitants of the Bahamas for many years, and this may account for the diminution of the number of eggs on these islands as well as elsewhere in the West Indies, but however this may be, it is certain that only one egg is now deposited, at least in the section that I visited.

STERNA TRUDEAUI.**Trudeau's Tern.**

STERNA TRUDEAUI AUD. Orn. Biog.

DESCRIPTION.

SP. CH. Size, a little larger than that of Forster's Tern but the form is similar, the tail being deeply forked.

COLOR. Adult in Summer. Head, under portion of wings, and under tail coverts, white. There is a dusky line on the sides of head, entirely surrounding eye and extending over ear coverts. Remainder of plumage, pearl gray, lightest on wing quills. Bill, black, yellow at base and tip.

Winter adult. Similar to the summer dress, but white beneath, and the bill is more dusky.

OBSERVATIONS.

Readily distinguished by the wholly white crown and dusky stripe on the side of head. Occurs on the Atlantic coast of South America; accidental on our coast.

DIMENSIONS.

Length, 15.00 to 16.00; wing, 9.50 to 10.00; tail, 4.90 to 5.70; bill, 1.50 to 1.70; tarsus, .90 to .95.

HABITS.

The only claim that this species has to a place in our fauna, rests upon a specimen, (the type) taken many years ago, by Audubon, on the coast of New Jersey.

LARUS ARGENTATUS SMITHSONIANUS.**American Herring Gull.**

LARUS SMITHSONIANUS COLES, Pr. Ac. Nat. Sc. Philad., 1862, p. 296.

DESCRIPTION.

In the article on the Herring Gull, in the first edition of this work, I did not separate the American sub-species from the European, as is now almost universally done by authors on this side of the Atlantic. I now think that the American birds differ sufficiently from the European to warrant separation. The description given on page 25 applies to the American sub-species. The European Herring Gull differs from the American in having the white near the ends of the outer primaries extending to the extreme tip, without being interrupted by a black band, as in the American bird, or if there is a band, it is not continuous. The average size of both forms appears to be similar. Gulls with the wing markings of European birds are most certainly occasionally taken on our coast, but whether such specimens are stragglers from the eastern side of the Atlantic, or whether they are only examples of American birds which show an approach toward the allied form on the other side of the water, through presagement or reversion — depending on which form may be the original stock — is a matter difficult to determine.

LARUS CANUS.**Mew Gull.**

LARUS CANUS LINN. Syst. Nat., I. 1766, p. 224.

DESCRIPTION.

SP. CH. Size, medium. Form, rather slender, about that of *L. delawarensis* but the bill is not quite so stout.

COLOR. Adult. Back and wings pearl gray, darker than in the Herring Gull. Remainder of plumage, white. Quills, broadly tipped and banded, subterminally, with black. Iris, white. Bill and feet,

greenish. In winter the head and neck are striped with dusky. Young, head and neck, whitish, striped with grayish. Above, ashy brown, with the feathers margined with white. Beneath, white, mottled and spotted with brown. Tail on terminal half dusky, tipped with white; basal half, white.

OBSERVATIONS.

Known from its nearest ally, the Ring-billed Gull, by the absence of the dark band on bill and darker back. In the younger stage by the white—not gray nor bluish—basal portions of the tail. Occurs in the Northern portions of the Eastern Hemisphere; accidental in Labrador.

DIMENSIONS.

Length, 17:00 to 18:00; stretch, 48:00 to 49:00; wing, 14:00 to 15:00; tail, 5:00 to 5:60; bill, 1:30 to 1:50; tarsus, 1:90 to 2:25.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground or on cliffs, composed of sticks, etc. Eggs, three or four in number, oval in form, varying from pale to dark greenish in color, spotted and blotched with brown. Dimensions, from 1:55x2:25 to 1:60x2:30.

HABITS.

According to authors, the Mew Gull does not differ essentially in habit from the Ring-bill. Its only claim to a place in our fauna is one (perhaps questionable) instance of its occurrence in Labrador.

LARUS AFFINIS.**Siberian Gull.**

LARUS AFFINIS REINHART, Vidensk. Meddel., 1853, p. 78.

DESCRIPTION.

SP. CH. Size, rather large. Form, robust, similar to that of the Herring Gull, but the bill is large and stout.

COLOR. Adult. Mantle, deep plumbeous, darker even than in *L. marinus*. Remainder of plumage, white. There is a distinct gray wedge on the inner web of the second primary, and all of the quills have a sub-terminal band of black.

OBSERVATIONS.

Known from our dark-backed Gulls by the presence of the gray wedge on the inner web of the second primary. Habitat, Northern Asia; accidental in Greenland.

DIMENSIONS.

Length, 20:00 to 21:00; wing, 16:50, to 17:00; tail, 5:00 to 5:50; bill, 2:00 to 2:15; tarsus, 2:00 to 2:72.

HABITS.

Although the type of this species was taken in Greenland no other specimen has since been recorded from this side of the Atlantic.

LARUS KUMLIENI.**Kumlien's Gull.**

LARUS KUMLIENI BREWSTER, Bull. Nat. Orn. Club, 1883.

DESCRIPTION.

SP. CH. Size, medium, about that of the White-winged Gull, which it also resembles in form.

COLOR. Adult. Back and upper part of wings, pale pearl gray. Primaries—excepting 2d quill which is pearl gray with a clearly defined sub-terminal band, also gray—and remainder of plumage, white. Iris, white. Bill, greenish yellow. Feet, pinkish.

OBSERVATIONS.

Quite similar to *L. leucopterus*, but differs in having the clearly defined sub-terminal bands on the primaries. Breeds on the American coast of the North Atlantic, migrating south in winter as far as New York, where it is rare, however.

DIMENSIONS.

Length, 23.00 to 24.00; wing, 15.00 to 17.00; tail, 6.50 to 7.00; bill, 1.60 to 1.80; tarsus, 2.20 to 2.40.

HABITS.

Kunnein's Gull is one of our rare, though probably constant, winter visitors. It is a recently described species, its identity being discovered by Mr. William Brewster, and its habits are but little known.

LARUS FRANKLINI.

Franklin's Gull.

LARUS FRANKLINI SW. & RICH. F. *Bor. Am., Birds*, 1831, p. 421.

DESCRIPTION.

SP. CH. Size, medium. Form, rather slender, about that of *L. atricilla* but the size is smaller.

COLOR. Adult. Back and wings dark plumbeous. Head dark plumbeous black, with a white spot on each eyelid. Primaries, bluish gray, broadly tipped with white; the five outer quills having a sub-terminal band of black; shafts, white. Tail, white, with the middle feathers tipped with bluish. Beneath, white, strongly tinted (in life) with rosaceous. Bill, bright red. Iris, brown.

Winter adult. Similar to the spring dress, but the head is white, tinged with dusky around the eyes, on ear coverts, and occiput. The bill and feet are duller red.

Young. Above, including top and sides of head, excepting forehead and lores, grayish brown, with the longer scapularies bordered with buff. Rump, white, bluish gray in the center. Primaries, dusky, tipped with white. Upper tail coverts and lower parts, white.

OBSERVATIONS.

Known in the adult stage from the Laughing Gull by the smaller size, purer red bills, darker colors of the mantle, and white spot on the eyelids. Young birds may be distinguished by the length of the tarsus, which is equal to the middle toe with claw, or shorter; whereas in *L. atricilla* the tarsus is always longer than the middle toe with claw. Distributed, during the breeding season, from Iowa northward; migrating southward, mainly west of the Mississippi, as far south as Peru; accidental in the West Indies.

DIMENSIONS.

Length, 13.50 to 15.00; wing, 11.00 to 11.50; tail, 4.50 to 5.00; bill, 1.25 to 1.40; tarsus, 1.50 to 1.65.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground in marshy places, composed of sticks, grass, etc. Eggs, two or three in number, oval in form, pale grayish green, light drab, or olive, in color, rather obscurely spotted and blotched with dark brown. Dimensions, 1.45 x 2.00 to 1.50 x 2.25.

HABITS.

In habit this species does not appear to differ greatly from other marsh-breeding Gulls. It is of rare occurrence east of the Mississippi River, only stragglers appearing within our limits during migration.

LARUS MINUTUS.**Little Gull.**

LARUS MINUTUS PALLUS, Reise., Russ. Reichs., III; App., No. 35, p. 702, 1771.

DESCRIPTION.

SP. CH. Size, very small, somewhat less than that of *L. philadelphia*, but the form is similar.

COLOR. Adult in summer. Head, black. Mantle, pale pearl gray. Primaries, also pearl gray tipped with white and usually without black markings.

Winter Adult. Similar to the summer dress, but the head is white with the occiput tinged with gray, and there is a dusky spot on the ear coverts.

Young. Forehead, lores, cheeks, tail, and under parts, white. Above, blackish, with feathers, excepting on head and neck, banded with pale buff.

OBSERVATIONS.

Distinguished from Bonaparte's Gull by the smaller size and absence of black markings on the primaries. Inhabits in summer the interior of northern Europe, migrating southward in winter to northern Africa; accidental on the Bermudas and on Long Island.

DIMENSIONS.

Length, 10.40 to 11.50; wing, 8.65, to 9.00; tail, 3.75 to 4.00; bill, .85 to .90; tarsus, .90 to 1.00.

HABITS.

This diminutive, hooded Gull breeds on the marshes of Russia. It claims a place in our fauna on account of its accidental occurrence on the Bermudas, and once, recently, on Long Island, as recorded by Mr. Dutcher in the "Auk", vol. V, April, 1888, p. 171.

RHODOSTETHIA ROSEA.**Ross's Gull.**

RHODOSTETHIA ROSEA, MACGILL., Wern. Soc. Trans. V. No. XIII, p. 249, 1862

DESCRIPTION.

SP. CH. Size, rather small. Bill, short. Tail graduated, the outer feathers being from .75 to 1.52 shorter than the middle.

COLOR. Adult. Mantle, and under surface of wings, pale pearl gray, with the secondaries and inner primaries broadly tipped with pinkish white, and the outer web of first primary is mostly black. Remainder of plumage, white, strongly tinged with pinkish. There is a narrow, black collar encircling the middle of the neck.

Winter adult. Similar to the summer plumage, but the black collar is absent, there is a blackish spot in front of eye, and the top of head is tinged with dusky.

Young. Similar to the adult summer dress, with the collar present, but the wings are more or less tinged with blackish, and some of the tail feathers are tipped with black. Younger. Collar, absent, and the upper parts are heavily marked with blackish, and the breast and neck beneath, are banded with dusky.

OBSERVATIONS.

Known from all other Gulls by the graduated tail. Distributed in summer through the Arctic region, migrating southward in winter to Northern Asia, northern Alaska, and Greenland.

DIMENSIONS.

Length, 11.50 to 14.00; wing, 9.50 to 10.50; tail, 4.00 to 4.50; bill, .65 to .75; tarsus, 1.20 to 1.25.

HABITS.

Ross's Gull is one of the few species of birds which resides constantly in the Arctic Regions, for only stragglers ever cross the Arctic Circle, even in Winter. It does not appear to be a generally distributed species and consequently is very rare in collections.

MEGALESTRIS SKUA.

Skua Gull.

LESTRIS SKUA BRUNN., Orn. Ber., 1761.

DESCRIPTION.

SP. CH. Size, large. Form, robust. Bill, stout. Tail, rounded: middle feathers not especially elongated.

COLOR. Adult. Brown throughout, with the scapularies, interseapularies, and wing coverts striped centrally with cinnamon. Neck and lower parts, also streaked with pale cinnamon. There is a whitish patch at the base of the primaries. Iris, brown. Bill, yellowish. Feet, black.

Young. Similar to the adult, but more conspicuously streaked with yellowish cinnamon, especially on the head and neck. Downy young. Grayish brown throughout, darkest on the lower surface of the body.

OBSERVATIONS.

There is a dark phase of plumage in which there are no cinnamon markings. Known from all other species of Skuas by the large size and rounded tail, without elongated central feathers. Occurs while breeding on the coast and islands of the eastern side of the North Atlantic, migrating southward to Spain; stragglers only reach the North American coast.

DIMENSIONS.

Length, 22.00 to 23.00; wing, 16.00 to 17.00; tail, 6.00 to 6.50; bill, 2.00 to 2.50; tarsus, 2.10 to 2.75.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground, composed of sticks, grass, etc. Eggs, two or three in number, oval in form, olive in color, spotted and blotched with dark brown. Dimensions, 1.90 x 2.70 to 1.95 x 2.75.

HABITS.

The great Skua Gull breeds on the lonely heaths of the Shetlands, and even here it is rather shy, but when on the open ocean, where it spends a greater portion of its time, it is exceedingly difficult to approach.

ORDER XVI. STEGANOPODES. PELICANS, ETC.

Toes, including posterior, connected by a membrane. Throat, provided with an extensible gular sac. Marginal indentations, two, open. Keel, short and low, while the furcula is joined firmly to its tip.

Members of this order are remarkable on account of the totipalmate feet and extensible sac on throat which is always present, and in some species, enormously developed. External nostrils, very minute. The anatomical structure is also peculiar but somewhat variable, the most constant character being the form of the furcula, as given, and the fact that it is always joined firmly to tip of keel. Sterno-trachealis, present; other laryngeal muscles, absent or weak. Sexes, generally similar. For further description, see family characters.

FAMILY I. SULIDÆ. THE GANNETS.

Bill, about as long as head, quite thick at base, and pointed. Gular sac, quite small. Sternum, twice as long as wide. Coracoids, about one half as long as sternum.

The œsophagus is straight. Proventriculus, large and wide, with the glands arranged in a very wide, zonular band. Stomach, rather small and not muscular. Cœca, quite small. Keel, projected forward and occupies only about one half the length of the sternum. Furcula, quite verticle in position. Posterior margin of sternum, deeply indented in which are two small scallops. Tail, long and pointed.

GENUS I. SULA. THE GANNETS

GEN. CH. Similar to those given under Family heading. Sexes, similar. There are two species within our limits.

SULA BASSANA.

Gannet.

Sula bassana BRASS., Orn. 1760.

DESCRIPTION.

SP. CH. Form, robust. Size, large. Color. *Adult.* White throughout, becoming buffy-yellow on head and hind neck. Primaries and exterior wing, dark-brown. Bill, bluish, iris, bluish-white, feet, brownish lined with greenish-blue, and naked space about head, dark-blaish. *Young.* Dark-brown above, each feather terminating with a triangular patch of white. Beneath, ashy-white mottled with dusky.

OBSERVATIONS.

Known by the large size, pointed bill, and general white colors. Distributed in summer from the Gulf of St. Lawrence, northward; wintering from Florida to the Carolinas.

DIMENSIONS.

Average measurements of specimens from North America. Length, 39.25; stretch, 73.50; wing, 18.50; tail, 9.50; bill, 3.75; tarsus, 2.13. Longest specimen, 40.50; greatest extent of wing, 75.00; longest wing, 19.50; tail, 10.00; bill, 4.00; tarsus, 2.25. Shortest specimen, 38.00; smallest extent of wing, 72.00; shortest wing, 17.50; tail, 9.00; bill, 3.50; tarsus, 2.00.

DESCRIPTION OF NESTS AND EGGS.

Nests. placed on rocky cliffs, composed of sea-weeds. *Eggs,* one or two in number, oval in form, and greenish-blue in color, covered with a calcareous deposit. Dimensions from 1.80 x 3.00 to 2.10 x 3.30.

HABITS.

Twelve miles to the northward of the Magdalen group, is a little islet known as Bird Rock, while about half a mile to the south-west, is a rather smaller rock, called the Little Bird, and a chain of submerged reefs extend between the two. As there is a strong current sweeping across this hidden ledge at certain times, the place is considered very dangerous by the rather timid fishermen who sail from the neighboring ports. One day in June, 1872, I stood on the northern end of Bryon Island and gazed with longing eyes at a little white spot, twelve miles away, which I knew was the celebrated Bird Rock, but owing to the disreputable name which these rocks have justly acquired among fishermen, it was not until several days later, that in company with two friends, I found myself on board a little schooner, bound for the spot whereon I had fixed my desires. We started early in the morning but it was three o'clock in the afternoon before we reached the place, for the wind was light. In spite of this, however, there was quite a surf dashing up the cliffs, which so alarmed our timid captain that he would not allow the schooner to go very near, but anchored a quarter of a mile away.

The fog through which we had hitherto been sailing, scaled off at this moment, disclosing to our gaze one of the grandest sights that we ever beheld, for directly in front of us, rose a huge, rocky bastion, the precipitous sides of which were occupied by myriads of Awks, Guillemots, and Puffins, thousands of snowy plumaged Gannets floated in air over the high cliffs, while the water below was thickly dotted with various species. After this display, we were exceedingly anxious to land, but our skipper took his time, yet at last, we stood on a sandy beach, at the foot of the perfectly perpendicular cliffs which rose a hundred and fifty feet over our heads; thus we would have had the utmost difficulty in

reaching the top, had it not been for the kindness of the keepers of the light that had been placed on the top of the island some three years previous. They having noticed our arrival, had lowered a bucket which was suspended by a crane, and we stepping into it, slowly ascended, swinging back and forth as we went upward, until we reached a narrow shelf, some thirty feet from the top, on which we stepped, climbed a ladder, and found ourselves on top of Bird Rock, which although only about an acre in area, furnished ground enough to fully occupy my attention for some time, as shortly after our arrival the sea rose, and our not very courageous captain, fearing for the safety of his ship, weighed anchor, sailed away, and left us on this lonely islet, where we were obliged to remain ten days.

Among the most noticeable birds on the rock, were the Gannets, and they occupied a considerable space on the north-west side of the upper portion. Here the soil was completely denuded of vegetation and the bulky nests which were composed of sea-weed, were placed in long rows, about a foot apart, reminding one strongly of hills of corn. This regularity was due to the fact, that the Gannets are quarrelsome birds and will not permit another to approach within striking distance when they are sitting. Early in the morning, when all the birds were on the nests, they presented a singular appearance, for there was fully a quarter of an acre of Gannets. They were remarkably unsuspecting, allowing one to approach within a few feet of them, but when fairly startled, they would all scramble helter-skelter, to the edge of the cliff, when they would launch out into the air, with loud cries. The hideous din made by this living cataract as it poured down from above, startled those which nested on the shelves of the cliffs beneath, causing them to take wing, thus increasing their numbers to such an extent, that when we reached the edge of the precipice, there were, at least, ten thousand Gannets before us, flying high over the surging waves. A sight like this is rarely seen and strongly reminded one of a snow storm, when the countless flakes whirl in wild confusion. At first, the birds hovered directly about the island but quickly assumed a systematic method of flight, which I afterward observed was constantly practiced by them. They would approach the rock, coming so near that we could almost feel the wind caused by their huge wings, and curving outward, would describe an immense circle of half a mile or more in diameter; as each followed its neighbor in this singular course, the whole soon formed a huge wheel which whirled swiftly around for some time, when the birds would disperse.

We found that the Gannets of Bird Rock deposited one, or rarely two, eggs, pure white at first, but these soon became soiled, as the birds are far from being neat. When disturbed, every bird would disgorge some fish before flying away, and thus the ground was strewed with the half digested contents of their stomachs, which, when the hot sun shone on it, soon gave out an intolerable stench. The Gannets were always repairing their nests and frequently one would come flying in with a mass of dripping sea-weed which it had taken from the water, and pitching heavily upon the shelf, would arrange it on its nest. But no sooner had the bird placed it in a satisfactory manner, when perhaps it would be seized by some neighbor that had been watching the operation and now endeavored to appropriate the material for its own use. The theft although boldly perpetrated, was not always successfully accomplished, for the victim of this outrage would stoutly contest the prize by striking out fiercely with its powerful bill, often causing the plunderer to relinquish its booty. A violent struggle would then ensue, during which many blows would

be rapidly exchanged, while each vociferously proclaimed its rights. The noise of the strife frequently attracted the attention of the birds which were in the immediate vicinity, and sometimes a third, or even a fourth, evidently mates of the contesting parties, would join in the fray, until two, locking bills, would pull and tug for a time, then, losing their footing, roll over and over, for the shelf was an inclined plane, until reaching the edge of the cliff, they would go down still clinging to each other. When falling, they seldom endeavored to spread their wings, but striking violently upon some projecting rock, would bound off and drop half stunned into the water far beneath. The Murres were breeding in close proximity to this place and if one chanced to approach to near the irritable Gannets, it was seized by the neck and unceremoniously dropped over the precipice.

I found that the Gannets which occupied the rocky shelves, were quite bold and when I endeavored to make my way along the slippery ledges, supported by a rope, they would attempt to dispute my passage, striking out fiercely at me with their strong bills. The young Gannets, of which there were several on the shelves, are naked when hatched and very helpless, being fed by regurgitation. Fishes are taken into the stomach of the parent and reduced into a perfectly transparent fluid which is somewhat gelatinous, and which is ejected in small quantities into the mouths of the offspring; then when a little older they eat half digested fish. Mackerel appeared to form the principal diet of the Gannets while I remained in the Gulf of St Lawrence, and the birds capture these agile fishes by flying over the water to the height of fifty feet or more, then diving when they perceive one in the proper position to secure, often becoming submerged for some minutes after the plunge. Their prey which is swallowed whole and often living, is frequently very large, and I have seen mackerel at least eighteen inches long, lying upon the rocks where they had been disgorged. Although the Gannets are heavy birds, they ride lightly upon the water, as they are provided with large air-cells that are situated along their sides, between the skin and body, and can be inflated at will. Bird Rock is the southernmost breeding ground of this species on our coast and probably the largest, for I estimated that there were, at least, twenty thousand Gannets nesting on the great and lesser rocks. They winter along the coast from New Jersey to the Gulf of Mexico.

SULA FIBER.

Booby Gannet.

Sula fiber Law., Birds, N. A.; 1858, 872.

DESCRIPTION.

SP. CH. Form, rather robust. Size, not large. COLOR. *Adult*. The head and neck all around and upper parts, dark-brown, tinged with ashy. White below. Iris, white, bill, naked space about head, and feet, yellow. *Young*, ashy-brown throughout, lighter beneath.

OBSERVATIONS.

Easily recognized by the small size, and brown, unspotted upper parts. Occurs on the coast of Florida. Constantly resident on the Bahamas. Accidental as far north as Massachusetts.

DIMENSIONS.

Average measurements of specimens. Length, 30.50; stretch, 41.00; wing, 15.75; tail, 8.25; bill, 3.75; tarsus, 1.60. Longest specimen, 31.00; greatest extent of wing, 42.00; longest wing, 16.50; tail, 8.50; bill, 3.90; tarsus, 1.72. Shortest specimen, 29.00; smallest extent of wing, 40.00; shortest wing, 15.00; tail, 8.00; bill, 3.60; tarsus, 1.48.

DESCRIPTION OF NESTS AND EGGS.

Eggs, usually placed on the naked ground or rock, one or two in number, oval in form, greenish-blue in color. Dimensions from 1.50 x 2.15 to 1.58 x 2.65.

HABITS.

The Booby Gannets occur on the coast of Florida in considerable numbers but do not now breed anywhere on the west side of the Gulf Stream, though they nest abundantly on the Bahamas. Those that I have seen on the Florida coast, had similar habits to those of the preceding species. These Gannets have been taken on one or two occasions as far north as Massachusetts but this is much beyond their usual range.

FAMILY II. PELECANIDÆ. THE PELICANS.

Bill, excessively elongated and hooked at tip. Gular sac, very large. Sternum, but little longer than wide. Coracoids, at least as long as sternum.

The œsophagus is straight and very wide. Proventriculus, large with glands arranged in a zonular band, the internal surface of which is either rugose or in ridges. Stomach small and not muscular. Cœca, moderately well developed. Sternum, well arched, with the central posterior margin projected, and indented on either side with two wide scallops. Keel projecting forward very slightly and occupies a little more than one half the length of the sternum. Coracoids at least as long as sternum. Tail, short and rounded. Head, erected.

GENUS I. PELECANUS. THE PELICANS.

GEN. CH. Similar to those given under family heading. Members of this genus are remarkable on account of the long bill and enormous gular sac. Sexes, similar. There are two species within our limits.

PELECANUS ERYTHORRHYNCHUS.

White Pelican.

Pelecanus erythrorhynchus Gm., Syst. Nat., I; 1788, 571.

DESCRIPTION.

SP. CH. Form, robust. Size, very large. Bill, with a central elevation on terminal half. Color. *Adult*. Pure white with primaries and nearly all of secondaries, black. Center of scapularies and tail feathers, deep salmon. Spot on breast and wing coverts, pale straw. Iris, white, bill, yellow strongly tinged with red, feet, orange, naked space about head and gular sac, yellow. *Young*, similar to adult; the bright markings are paler and there is no central elevation on bill.

OBSERVATIONS.

Known by the peculiar form and white color. After moulting in autumn the back of the head becomes quite gray, the central elevation of bill falls off and the iris is brown. This stage of plumage, however, is exceedingly transient, but the iris remains brown until the following spring. Distributed, in summer, throughout Western North America from Utah, northward; rare in Florida at this season. Winters in the South. Accidental on the Northern Atlantic coast.

DIMENSIONS.

Average measurements of specimens from North America. Length, 65.50; stretch, 102.50; wing, 21.38; tail, 6.50; bill, 11.00; tarsus, 4.63. Longest specimen, 70.00; greatest extent of wing, 105.25; longest wing, 21.75; tail, 7.10; bill, 11.55; tarsus, 4.75. Shortest specimen, 61.15; smallest extent of wing, 109.00; shortest wing, 21.00; tail, 6.25; bill, 13.50; tarsus, 4.50.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground near the water, composed of sticks, weeds, etc. *Eggs*, one or two in number, oval in form, and white in color, covered with a calcareous deposit. Dimensions from 2.20 x 3.15 to 2.35 x 3.20.

HABITS.

I found the magnificent birds, which form the subject of the present sketch, quite common on Indian River in winter, but they only occupied the limited section of country which lies between the Hanlover Canal and Merritt's Island. The White Pelicans were, however, remarkably abundant on the Gulf coast about Cedar Keys, but did not occur in any numbers much south of this point. When feeding, these fine Pelicans swim along the water and capture their prey by thrusting their long bill, and occasionally the entire head, beneath the surface of the water, then the bill is raised, the pouch contracted, forcing the

water from among the fishes which are swallowed at once. During calm weather, they feed in the open waters of the Gulf but when high winds occur, they visit the more quiet lagoons and bayous among the flats. After satisfying their hunger, they will sit for a time on the outer sand-bars or reefs, often gathering by thousands, but will shortly rise in small companies, flying in wedge-shaped flocks, or in ranks like Geese or Swans, but move with alternate flapping and sailing and thus rise to a great height, when they will circle about an hour or more on motionless wings, not, however, in regular order but crossing and re-crossing one another in eccentric gyrations. Later in the day, they return to roost, passing the night on the reefs. They are very shy at all times, equally so at night, for they can see during the hours of darkness nearly or quite as well as Owls, and when approached will rise and fly to the nearest reef. The only way in which I was successful in obtaining a shot at them, was by sailing, when, as they always rise into the wind, I would sometimes manage to secure one. These birds, in spite of their large size, are exceedingly gentle in disposition and easily tamed, and one that I brought north, he having been slightly wounded in the wing, remained with me for three years, when he died. This bird never attempted to injure any thing, even permitting young chickens to run about him, and as they walked over his huge feet, he merely glanced down at them to see what they were doing. Johnny, as he was called, was very intelligent and always knew those who were kind to him, recognizing them with a grunt, his only note, while he would frequently take their hands in his long bill and gently squeeze them. He allowed every one who came to see him, to caress him, and was always ready to receive company. Johnny ate not only fish but meat, and the quantity which he devoured was surprising, for he often consumed six or eight pounds at a meal. Not that he was a glutton, for when he was satisfied, no temptation would induce him to take another morsel. His favorite method of eating was to have his food thrown to him, when he would catch it in his beak, slip it into his pouch, then he would wait until I grasped him by the bill, when I would raise it and shake his head until the food passed downward into his stomach. No confinement whatever was necessary for Johnny as he never showed the slightest propensity to wander, excepting in autumn, when, having some idea of migrating, he would waddle away from the house a few hundred yards, then, evidently surprised to find himself on strange ground, would raise his head, gaze about him distractedly, when perceiving his home, would spread his long wings and come back, half running and half flying. This performance would be repeated several times in a season, but always terminated as related. My bird had many quaint, interesting habits and during his short life among us made many friends who will long remember Johnny Pelican. The late Captain Dummitt informed me, that upon one occasion, the White Pelicans bred in considerable numbers on a small island, in the lagoon just south of Mosquito Inlet, but this is unusual and they have never repeated it, the species generally migrating northward in April to nest on the inland waters of the North-west.

PELECANUS FUSCUS.

Brown Pelican.

Pelecanus fuscus LINS., Syst. Nat., I, 1766, 215.

DESCRIPTION.

St. Cr. Form, robust. Size, large. Bill, without central elevation. Color. *Adult.* Head and stripe on neck adjoining gular sac, white, the former strongly tinged with yellow. Remainder of neck, dark chestnut-brown. Above, hoary, with the feathers more or less edged with dark-brown. Beneath, sooty-black, with the feathers of sides, flanks, axillaries,

and under wing and tail coverts, centrally streaked with white. Patch on breast, pale straw color. Iris, white, bill, hoary with edges of lower mandible and tip of upper, red. Naked space about head, and gular sac, greenish-brown. Feet, slaty-blue. *Young*. Similar, but lacks the brown on neck, and the colors throughout are much paler.

OBSERVATIONS.

Known by the comparatively small size and dark colors. In winter the brown of the neck is replaced by white and the iris is brown. Distributed as a constant resident in Florida. Rare as far north as Massachusetts.

DIMENSIONS.

Average measurements of specimens from Florida. Length, 48.25; stretch, 79.25; wing, 20.25; tail, 6.43; bill, 12.00; tarsus, 1.50. Longest specimen, 54.00; greatest extent of wing, 85.00; longest wing, 21.00; tail, 7.00; bill, 12.50; tarsus, 3.00. Shortest specimen, 41.50; smallest extent of wing, 73.50; shortest wing, 19.50; tail, 5.25; bill, 11.50; tarsus, 2.00.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground or in trees, composed of sticks, lined with weeds, grass, etc. *Eggs*, two in number, oval form, and white in color, covered with a white calcareous deposit. Dimensions from 1.80 x 2.80 to 2.45 x 3.10.

HABITS.

The Brown Pelicans are exceedingly abundant in Florida, not only on the coast, but among the Keys and in the salt water lagoons. Their method of fishing is quite different from that practiced by the preceding species, for they fly along some ten feet over the water, then when they perceive a school of fish, will drop awkwardly among them, seizing as many as they can, after which the water is forced from the pouch and the prey swallowed. If the fishes which they are catching, chance to be small, some will escape, and the Laughing Gulls, taking advantage of this fact, will alight with half-spread wings, on the huge heads of the Pelicans, in order to catch the escaping prey. The good-natured Pelicans appear to take this act as a matter of course, for I never saw one attempt to attack a Gull when it was so engaged. Unlike the White Pelicans, the Brown do not soar after feeding but sit quietly on the sand bars or perch on the mangroves until the meal is digested, and when thus resting, the bill is held quite perpendicularly as is the custom with other Pelicans. When flying, these large birds move in ranks by alternate flapping and sailing, all the members of a flock acting in concert.

When breeding, the Brown Pelicans select particular localities and will return to them year after year to nest, gathering for this purpose from miles around. Thus I know of but one breeding ground on the east coast of Florida, that is Pelican Island in Indian River, near the inlet, where thousands congregate, and one or two on the west coast in about the same latitude; but, singularly, those on the east side of the peninsula deposit their eggs early in March, at least a month sooner than those on the west. The bulky nests are placed on the ground or in trees, and the birds are so unsuspecting when sitting, that they may be easily captured. These breeding places are always in a filthy condition.

FAMILY III. GRACULIDÆ. THE CORMORANTS.

Bill, shorter than head and hooked at tip. *Gular sac*, small. *Sternum*, considerably longer than wide. *Coracoids*, not as long as sternum. *Keel*, projected well forward.

The œsophagus is straight and somewhat dilated. Proventriculus, rather large, with the glands arranged in an irregular, zonular band. Stomach, quite large but not muscular. Cœca, very small. Sternum, quite well arched, with the central posterior margin, indented, but having a wide, shallow scallop on either side. Keel occupies only about one half the length of sternum. Furcula, quite long, at first ascending perpendicularly, then bent backward to tip of keel. Tail, rather long, rounded, and stiffened. Head, crested.

GENUS I. GRACULUS. THE CORMORANTS.

GEN. CH. Resemble those given under Family heading. Bill, hooked at tip. Sexes, similar. There are two species within our limits.

GRACULUS DILOPHUS.

Black Cormorant.

Graculus dilophus GRAY, Gen. Birds; 1845.

DESCRIPTION.

SP. CH. Form, rather slender. Size, medium. Narrow line of filamentous feathers behind eye, elongated. COLOR. *Adult.* Black throughout, with greenish reflections, becoming ashy-brown on center of feathers of body above, glossed with purplish. Iris, pale green, eyelids, blue, spotted with white, naked space about head, orange, bill, black, banded with blue and white, feet, black. *Young and nestlings.* Dark brown throughout.

OBSERVATIONS.

Under the present heading is described both the formerly called *dilophus et Floridanus*, the former is stated to have whitish feathers over the eye, but this is not constant and I consider it only a northern form of the species which is so common in the South. Known by the general dark colors. Distributed in summer from the Gulf of Mexico, northward; wintering in Florida.

DIMENSIONS.

Average measurements of specimens from North America. Length, 26.38; stretch, 48.00; wing, 11.50; tail, 6.10; bill, 2.50; tarsus, 2.32. Longest specimen, 31.00; greatest extent of wing, 53.00; longest wing, 12.00; tail, 7.00; bill, 3.00; tarsus, 2.55. Shortest specimen, 21.75; smallest extent of wing, 43.00; shortest wing, 11.00; tail, 5.15; bill, 2.00; tarsus, 2.10.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on trees or rocky cliffs, composed of sticks, sea-weeds, etc. *Eggs*, three or four in number, oval in form, and greenish-blue in color, covered with a calcareous deposit. Dimensions from 1.35 x 2.25 to 1.50 x 2.50.

HABITS.

The collector in Florida soon learns the position of every buoy or stake that stands in the water for they are generally ornamented by a Cormorant, but these wary birds know how to take care of themselves and it is seldom that one can be approached near enough to be shot. Even while nesting, they are very shy, and whenever a rookery is approached, all the birds rise, circle about in confusion for a short time, then retreat a few hundred yards and settle down in a compact body on the water, nor will they return until they are sure that the intruder has departed. I found the newly deposited eggs of the Black Cormorants on the Florida Keys, about the twentieth of March, and the birds continued to lay from that time until the middle of April. Late in May, the black, downy young are nearly fully grown but still remain in the nest as they are comparatively helpless, being unable to fly, and are regularly fed by the parents. When approached at this season, however, they display all the wariness of the old birds, for after disgorging the contents of their stomachs, as is the custom with the young of many fish eating birds when disturbed, they will drop from the nests or limbs on which they perch, into the water, for the base of the trees in which their homes are placed, are nearly always submerged, after which it is almost impossible to secure one as they dive and swim both beneath and on the surface with the greatest ease. The Cormorants move with a steady, prolonged flight, during which the mouth is held open as if for air. If shot at, when flying, and not injured or alarmed by a sudden shout, they will very frequently drop into the water, diving as soon as they strike it. When wounded, they are exceedingly fierce, biting with such force that it is dangerous to attempt to capture one; in fact, I have seen them seize an oar and not relinquish their hold until lifted quite out of the water. In leaving a perch, it is noticeable that the Cormorants fly downward, almost to the water, then rise again to pursue their course. I found the Black Cormorants breeding on Shagg Rock, named from the local appellation of

these birds, off Grindstone Island in the Gulf of St. Lawrence, the last week in June. The nests were placed on rocky cliffs, a hundred feet from the water, and contained not only fresh eggs but also newly hatched young, the latter being naked but black, and as shiny as if polished with boot blacking. The adults were extremely shy, instantly leaving the immediate vicinity when I ascended the rock.

GRACULUS CARBO.

Common Cormorant.

Graculus carbo GY., Gen. Birds, 1845.

DESCRIPTION.

SP. CH. Form, robust. Size, large. COLOR. *Adult*. Black throughout, glossed with green, becoming ashy-brown on center of feathers of body above, tinged with bronze. Broad line around gular sac, filamentous feathers distributed over head and neck, and patch on flanks, white. Iris, green, naked space about head, greenish-brown, gular sac, orange, and feet, black. *Young*. Similar, but lack the white filamentous feathers and are paler.

OBSERVATIONS.

Known by the large size and white markings. Distributed, in summer, from Gulf of St. Lawrence, northward, wintering along the coast as far south as New Jersey.

DIMENSIONS.

Average measurements of specimens from North America. Length, 38.50; stretch, 61.60; wing, 14.50; tail, 6.50; bill, 3.25; tarsus, 2.25. Longest specimen, 40.00; greatest extent of wing, 62.60; longest wing, 15.00; tail, 7.00; bill, 3.50; tarsus, 2.50. Shortest specimen, 37.00; smallest extent of wing, 69.00; shortest wing, 14.00; tail, 6.00; bill, 3.00; tarsus, 2.00.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on rocky cliffs, composed of sticks, sea-weeds, etc. *Eggs*, three or four in number, oval in form, and bluish-green in color, covered with a white calcareous deposit. Dimensions from 1.65 x 2.60 to 1.75 x 2.65.

HABITS.

I have never met with the Common Cormorant living, and in spite of the name, consider it much rarer than the preceding. I have often met with the Black Cormorants along our coast during migrations but never saw a specimen of the larger species among them. The Common Cormorants breed on the coast of Labrador and according to fishermen and others whom I have questioned concerning these birds, who were familiar with them, they do not differ much in habit from the Black when it is found in the North.

FAMILY IV. PLOTIDÆ. THE DARTERS.

Bill, longer than head, straight, slender, and pointed at tip. *Gular sac*, very small. *Sternum*, longer than wide. *Coracoids*, equal in length to sternum.

The œsophagus is straight and wide. Proventriculus glands, arranged in a globular sac on lower side of œsophagus. Stomach, quite muscular. Cœca, very small. Sternum, well arched, with the central posterior margin indented and having a wide, deep scallop on either side. Keel, projecting forward very slightly and occupies two thirds the length of the sternum. Tail, long and rounded. Head, small, with neck long.

GENUS I. PLOTUS. THE ANHINGAS.

GEN. CH. Similar to those given under family heading. Members of this genus are remarkable on account of the long tail, the central feathers of which are corrugated. Sexes, not similar. There is but one species within our limits.

PLOTUS ANHINGA.

Snake Bird.

Plotus anhinga LINN., Syst. Nat., 1, 1766, 580

DESCRIPTION.

SP. CH. Form, slender. Size, large. COLOR. *Adult male*. Black throughout, glossed with greenish and violet, becoming brownish on wings and tail. Upper back, scapularies, and wing coverts, streaked and spotted with ashy white, and the greater wing coverts are edged with it. Tail, tipped with ashy-yellow, and head is provided with long, filamentous feathers of ashy-white. Bill, dusky-yellow, feet, brownish-orange, iris, red. *Adult female*. Similar to male but the head, neck, and breast, are ashy-yellow which becomes brownish above. *Young*. Similar to adult female but lack the

filamentous feathers of head and neck, white markings, and corrugations of tail feathers. *Nestlings*. Are covered with a yellowish down.

OBSERVATIONS.

Easily recognized by the peculiar form and color. Distributed, in summer, from the Carolinas, southward. Winters in Florida.

DIMENSIONS.

Average measurements of specimens from Florida. Length, 34.50; stretch, 41.25; wing, 12.75; tail, 10.08; bill, 2.95; tarsus, 1.48. Longest specimen, 35.75; greatest extent of wing, 46.00; longest wing, 13.75; tail, 10.75; bill, 3.10; tarsus, 1.70. Shortest specimen, 33.25; smallest extent of wing, 42.00; shortest wing, 11.75; tail, 9.40; bill, 2.65; tarsus, 1.25.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in trees, composed of sticks. *Eggs*, three to five in number, oval in form, and bluish-white in color, covered with a white calcareous deposit. Dimensions from 1.10 x 2.15 to 1.25 x 2.25.

HABITS.

The Snake Birds, Anhingas, or Water Turkeys, as they are termed in various localities, are among the most singular and interesting birds found in Florida, for they possess habits which characterize several species, besides many which are peculiar to themselves. They perch on trees like Cormorants but spread their wings in the sun when sitting, like Vultures, and if fired at with a rifle, when at a distance, will not move. A near shot, however, whether it hits or not, always sends them tumbling end over end into the water, when they will instantly disappear, diving and remaining under the surface as readily as Grebes, which birds they also resemble in possessing the power of moving with the body submerged and the head, and often the entire neck, above the surface. When thus engaged, the greatly elongated neck is twisted about in a manner which strongly reminds one of the writhing of a serpent; hence the name of Snake Bird which is most often applied to them. After eating, the Anhingas soar on motionless wings, high in air, like Pelicans, and often gather in flocks at such times, but when sitting, it is rare to find more than three or four together and they usually associate in pairs. During the breeding season, however, they congregate in rookeries, often in company with other birds, and I have found them nesting with the White and Night Herons. The domiciles are placed in trees, are rather bulky, being about eighteen inches in diameter, deeply hollowed, and occasionally lined with the downy catkins of the willow. The eggs, which are usually four but occasionally five in number, are deposited about the middle of March. When their homes are approached, the Snake Birds silently leave them but appear quite solicitous for the safety of their eggs, as they will circle about, uttering a loud, grunting sound, their only note, often coming within gun shot, but like all members of the present order, are very difficult to kill.

Chief Tiger brought me a young Anhinga, about half grown, from the Everglades, about the middle of April. It possessed much more intelligence than one would suppose, for it became very tame, fed readily, was not inclined to wander, and found its way every night to its perch in the corner of a room, not attempting to roost outside. This bird was very gentle in disposition; so much so, that it would never attempt to defend itself against the attacks of a White Heron which I kept at the same time, and from which the Anhinga at last received an injury which proved fatal.

FAMILY V. TACHYPETIDÆ. THE FRIGATE BIRDS.

Bill, longer than head wide, strong, and hooked at tip. *Gular sac*, small. *Sternum*, much wider than long. *Coracoids*, considerably longer than sternum. *Keel*, not projected forward.

The œsophagus is straight and somewhat dilated. Proventriculus, rather large, with the glands arranged in a zonular band. Stomach, quite small but not muscular. Cœca, small. Sternum, deeply arched, with the central posterior margin, indented, but having a wide, very shallow scallop on either side. Keel, high, well arched, and occupies the entire length of sternum. Furcula, long, lying almost horizontal to coracoids and joined firmly to them. Head, crested. Legs and neck, short. Tail and wings, long.

GENUS I. TACHYPETES. THE FORK-TAILED FRIGATE BIRDS.

GEN. CH. Similar to those given under Family heading. Tail, deeply forked. Sexes, not similar. There is but one species within our limits.

TACHYPETES AQUILUS.

Man-of-war Bird.

Tachypetes aquilus VIEILL., Gal. des Ois.; 1825, 274.

DESCRIPTION.

SE. CH. Form, robust. Size, large. COLOR. *Adult male*. Black throughout, with green and purple reflections, especially on body. Naked space about head and bill, black, iris, brown, gular sac and feet, orange. *Adult female*. Similar, but the sides of head and broad patch on breast are white, and the plumage is not as lustrous.

OBSERVATIONS.

Known by the deeply forked tail and dark colors. Constantly resident on the coast of Florida and on the Bahamas. Accidental as far north as Nova Scotia.

DIMENSIONS.

Average measurements of specimens from Florida. Length, 39.50; stretch, 85.00, wing, 21.50, tail, 17.50; bill, 5.25; tarsus, .75. Longest specimen, 41.00; greatest extent of wing, 86.00; longest wing, 25.00, tail, 18.00; bill, 5.50; tarsus, .80. Shortest specimen, 38.00, smallest extent of wing, 81.00; shortest wing, 21.00; tail, 17.00; bill, 5.00; tarsus, .75.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground or in trees, composed of sticks. *Eggs*, one or two in number, rather elliptical in form, and greenish-white in color, covered with a white calcareous deposit. Dimensions from 2.00 x 2.50 to 2.41 x 2.85.

HABITS.

The noble birds which we now have in hand, are among the most noticeable that are found in southern localities, for their majestic flight causes even the most casual observer to gaze upon them with admiration. The Man-of-war, or Frigate, Birds are somewhat parasitical in habit and may frequently be seen in pursuit of Terns and Gulls which have recently captured a fish, when they display a variety of aerial evolutions that are extremely graceful. They easily outstrip the object of their pursuit, causing it to drop its prey, when, diving downward, the Frigate seizes the fish before it reaches the water, and devours it. These birds are highly gregarious, associating in flocks consisting of many thousands, and will often gather in large numbers on the mangroves, for, in spite of the small size of their feet, they perch well. The Man-of-war Birds are extremely shy, and although I found many among the interior keys, was not able to procure specimens until I discovered the fact that they are quite stupid at night; indeed, they return to roost long before sundown and can be approached quite readily at twilight, at which time if disturbed, they fly low, appearing quite confused. They breed late, about the first of June, placing the huge nests on mangroves, at no great distance from the water. Thousands gather to breed in one rookery, of which I know of but two in Florida, one near Cedar Keys and one on one of the interior keys, quite difficult of access, in the vicinity of Cape Sable.

The Man-of-war Birds do not, as a rule, extend their range further north than Middle Florida but occasionally wander above this point. I once possessed a fine male which was killed in October, 1876, at Halifax, Nova Scotia, and a letter, just received from Mr.

John R. Beath of Philadelphia, informs me that he mounted a specimen of the Frigate Bird which was taken at Cape May Court House, in the spring of 1877. It is difficult to find words which will convey an idea of the magnificent flight of these fine birds, but a glance at the sternum as described under Family heading, will give some impression of the bony frame-work which is intended to support the birds in their untiring journey through the air; and thus armed against the forces of nature, nothing can daunt them. I have seen them, when the wind blew high, circling with motionless wings and calmly breasting the rising gale. The storm bursts and the waves are lashed into fury by the raging hurricane; great trees on the neighboring land, which have stood the blasts of a hundred years, totter and fall; while the spray flies in clouds from the now mountainous breakers; even then, when all else bows to the relentless Storm King, the noble Frigate Bird does not deign to alight, but with a few strokes of his strong pinions, moves majestically into the very teeth of the driving elements, or plunging downward, will sail as grandly above the tempestuous billows, as the Swallow skims over the surface of the summer lake, showing that in the Man-of-war Bird, the power of flight is developed in the highest degree.

FAMILY VI. PHÆTONIDÆ. THE TROPIC BIRDS.

Bill, about equal in length to head, strong, and pointed at tip. Gular sac, absent. Sternum, longer than wide. Keel, projecting forward considerably.

The œsophagus is wide and somewhat dilated. Proventriculus, large with glands arranged in a zonular band. Stomach, small and not muscular. Cœca, very small. Sternum, arched, with the central posterior margin concave. Keel, high. Furcula, short and lying nearly perpendicularly. Head, not crested. Legs and neck, very short.

GENUS I. PHÆTON. THE LONG-TAILED TROPIC BIRDS.

GEN. CH. Resemble those given under Family heading. Tail, wedge-shaped, with central feathers excessively elongated. Sexes, similar. There is but one species within our limits.

PHÆTON FLAVIROSTRIS.

Yellow-billed Tropic Bird.

Phæton flavirostris Bvt., Bull. Sc. Acad. Imp. St. Pet. I, 1837, 319.

DESCRIPTION.

Sr. CH. Form, slender. Size, medium. COLOR. *Adult.* White throughout with a satiny gloss, tinged with pale salmon which becomes deeper on elongated central tail feathers, the shafts of which are black. Curved patch on side of head, one on scapularies and secondaries, passing backward in a line along wing coverts, and spot near terminal portion of primaries, purplish-black. The feathers of flanks are centrally streaked with dusky. Bill, tarsi and base of feet, orange, remainder of latter, black, iris, brown. *Young.* Similar but paler, and the central tail feathers are not as long.

OBSERVATIONS.

Known by the elongated central tail feathers and orange bill. Constantly resident on the Bermuda and Bahama Islands. Rare on the Florida coast. Accidental in the Northern Atlantic States.

DIMENSIONS.

Average measurements of specimens. Length, 30.75; stretch, 37.00; wing, 11.25; tail, 19.25; bill, 2.10; tarsus, 1.08. Longest specimen, 32.00; greatest extent of wing, 38.00; longest wing, 11.50; tail, 21.00; bill, 2.25; tarsus, 1.25. Shortest specimen, 29.50; smallest extent of wing, 36.00; shortest wing, 11.00; tail, 18.50; bill, 2.00; tarsus, .90.

DESCRIPTION OF NESTS AND EGGS.

Eggs, usually placed in holes of rocks, one in number, rather oval in form, chalky-white in color, usually very thickly spotted with reddish-chocolate of varying shades. Dimensions from 1.50 x 2.15 to 1.60 x 2.25.

HABITS.

Some years ago, when sailing along the Gulf of Mexico, not far from the Florida Keys, in little steamer, early in November, I observed a Tropic Bird flying high in air. The bird was pursuing the same course that we were and remained in sight for several hours.

this was the only living specimen that I had the good fortune to meet with for many years. In all of my journeying among the keys and along the coasts of Florida, I did not see another. Upon my visit to the Bahamas in 1883 and 1884, I fully expected to find this species, but was disappointed, as, although I constantly kept a lookout for it, not a Tropic Bird did I see in all of the many hundreds of miles that we travelled among the islands; but singularly, after losing sight of Abaco, when on our way north, one of this species, suddenly made its appearance, coming from the direction of the island, and hovered about our vessel, for a few moments, flying within a few yards of us, as we sat near the stern; so close, in fact, did this erratic wanderer of the sea approach us, that I could see even the color of his eyes, and note the exact shade of salmon on his long tail feathers. He remained but a short time, much to my regret, and departed, steering straight back toward Abaco. During a second trip among the Bahamas, in 1887, as I was returning from Andros to New Providence, I saw two Tropic Birds, flying high in air, bound eastward, and uttering loud screams as they flew. I looked in vain, for this species, on my way through the outer, or easternmost islands, in January of 1888, southward bound to Inagua, nor did I meet with it on that island. My next sight at the Tropic Birds, was while lying at anchor, off the west end of Hayti, on March third, of that same year. Here were high cliffs, rising abruptly from the sea to the height of several hundred feet, and about these cliffs, the Tropic Birds were flying. When leaving this point, I did not observe any at sea, nor about the island of Jamaica, although I journeyed the entire length of the island. On a voyage from Jamaica to Cayman Brae, later in April, I did not observe any of these birds, until well under the eastern end of the key. Here, too, are cliffs rising out of the sea, to a height of some eighty feet, and about these rocks, were soaring numerous Gannets, (probably Cory's) and among them, a large number of Tropic Birds. I ascertained afterward, that they bred not only in these cliffs, but also on the cliffs that rise from a strip of lowland, on the northern side of the island, and also near the eastern end. Some few also nested on lower cliffs, on the opposite, southern, side, but scatteringly. As I lived at the western end of Cayman Brae, during my stay on the island, I did not have an opportunity of visiting the main breeding place, but saw something of the birds on the southern side of the key, and also observed them on the northern side, from the water. I was less inclined to make the journey, from one end of the key to the other, which, although only twelve miles distant, was only to be approached by land over a rough road, with no means of conveyance, on account of having been informed by the inhabitants, that I could find the Tropic Birds breeding on the eastern end of Little Cayman, an adjacent key on a low cliff. Much to my disappointment, however, I found upon visiting this point quite late in April, that the birds had abandoned the locality, and not a solitary Tropic Bird did I see on this island. Upon leaving the Caymans in May I lost sight of these birds, and in voyaging from thence through the West Indies, northward, I did not see them again.

From these observations, I can state with confidence, that the Yellow-billed Tropic Birds do not, as a rule, wander far from their breeding grounds, at any season of the year, only stragglers departing from this custom. When upon the wing, the Tropic Bird does not resemble a Tern nor any species of Gull, as might, perhaps, be expected.

SULA CORYI.

SULA CORYI.
Cory's Gannet.

Sula coryi Mayn. Contributions to Science Vol. I, March 4th, 1889.

DESCRIPTION.

SP. CH. Color, similar to that of the Common Gannet, *Sula bassana*, but the form and size are those of the Red-faced Gannet, *Sula piscator*. Form, rather slender. Size, small. Bill, quite smooth. The gular sac is not prominent nor much wrinkled. The feet are rather slender: the tarsus about half the length of the middle toe and claw. The claw of the middle toe is pectinated, the notches being irregular. Wings, long, narrow and pointed. Tail, pointed, the two central feathers being one-fourth longer than the next pair, then the graduation is about .75, but the other is not quite one-half as long as the middle.

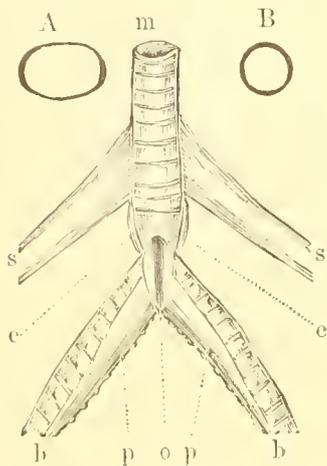


FIG. 14.

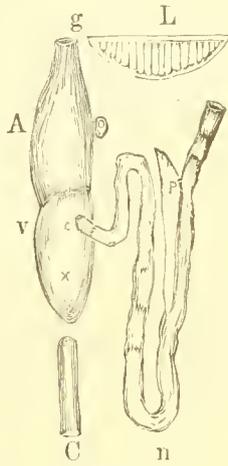


FIG. 15.

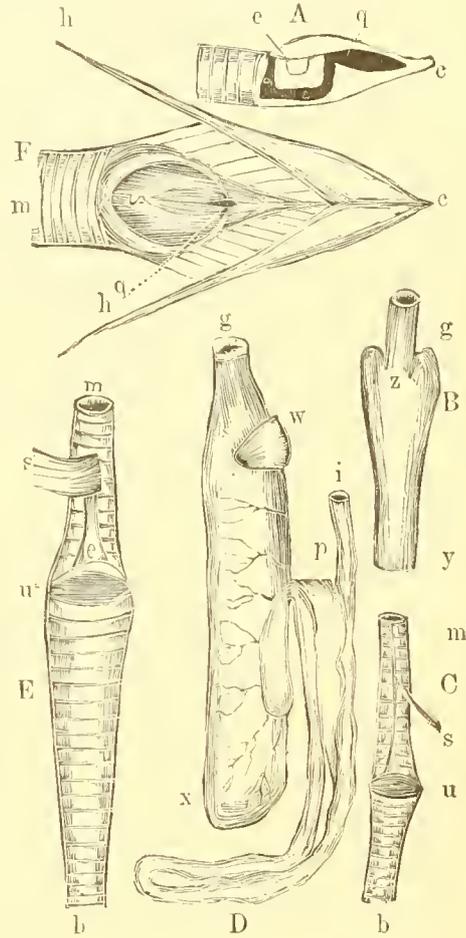


FIG. 17.

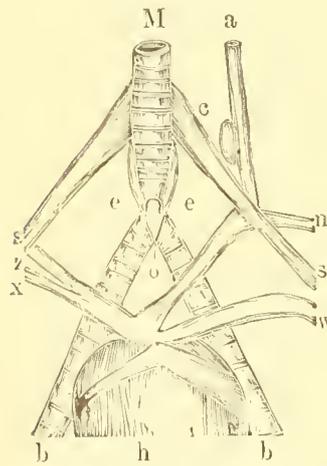


FIG. 18.



FIG. 16.

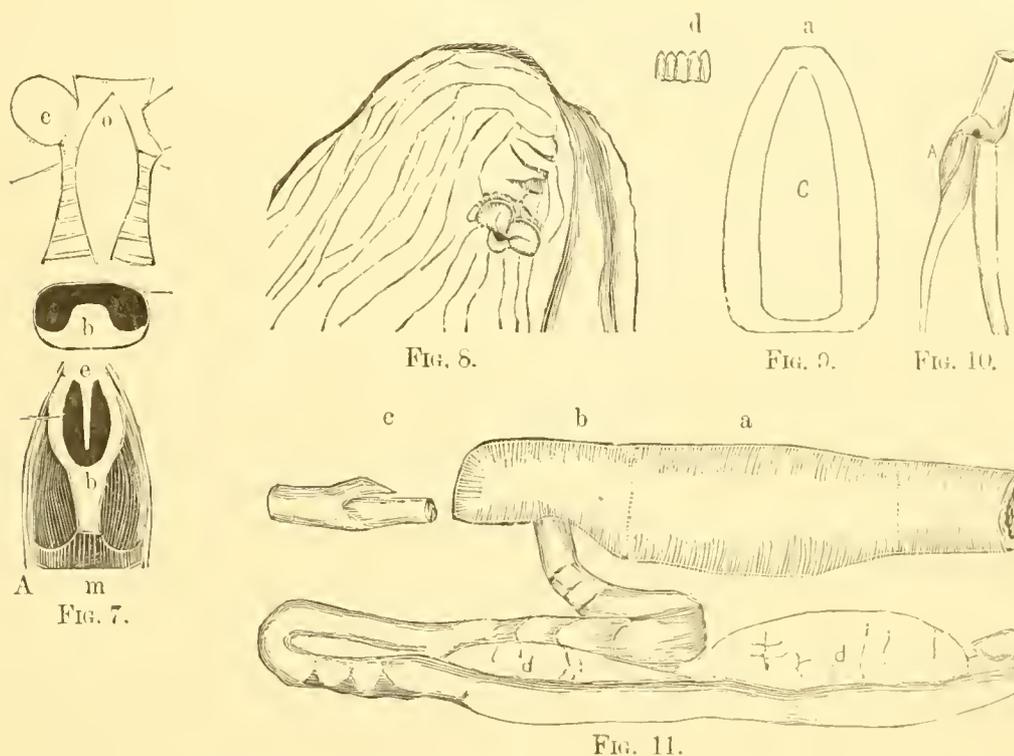
The oesophagus of Cory's Gannet is dilatible, and is 10.50 long, and opens into a wide proventriculus, .90 in diameter for its entire length, see Fig. 15, C, where is given a cut about one half life size. The glands are numerous and lie in longitudinal ridges. They are cylindrical in form, (see ib. C, where is given a figure of one greatly enlarged) but are of unequal length on account of the convex form of the ridges, see ib. L, where is given a life size section of one of the ridges.

The trachea of Cory's Gannet is much flattened at the superior larynx, see Fig. 14, A, where is given a section at the first ring, but becomes smaller as it descends, see ib. B, where is given a section of the trachea at the junction of the sterno trachealis, and thus there is no dilatation of the trachea.

The sterno tracheal muscles are very large, see Fig. 14 s s, Fig. 18 s s, and Fig. 17 E, s.

The sterno trachealis, Fig. 6, A, s s, is well developed and there is a thin strip of a bronchialis arising at the base of the lower side of the sterno trachealis and extending over the two upper laryngeal half rings, see Fig. 6, B. Below these muscles, and adhering to the sides of the larynx are two singular hemispherical bodies, yellowish white in color, see Fig. 6, A, c c, where a view of the lower side is given.

These organs have been considered by some authors as the rudiments of a second pair of thyroid glands. I am inclined, however, to think them the shrunken thymus glands only, as they contain an oily matter, especially as the thymus glands are enormously developed in the young gannets. The question can be easily settled by examining the young of the Common Gannet when a few days old, and later, in order to note the gradual diminution of the thymus. It is quite possible that it may have an attachment to this portion of the larynx from the first, but what function it can have thus attached is difficult to determine: at all events, it appears to be unique in this gannet as no other species of bird, either in this genus or in any other, which has come under my notice has anything like it.



This gland is not attached to the larynx by its entire base, but adheres only along its upper side, see Fig. 6, C, where I have given a view of the left side of the larynx with the gland removed: the shaded portion at c, shows the points of adhesion. Beneath the gland, and partly covered by it, is a vibrating membrane, lying between the third and fourth bones of the larynx, see Fig. 6, C, u, where there is an outside view of the vibrating surface, and E, u, where is given an inside view, c, being the gland. On the lower side of the glands, is an open orifice that extends over the membrane, back to the point of attachment of the gland to the larynx, Fig. 6, A, r r. At B, e, is given a side view of the gland.

The bronchial tubes are long, Fig. 7, A, b b, and are composed of about twenty-three half rings. They diverge at the junction with the larynx, at a considerable angle: see Fig. 7, C, o, where is given a view of the upper portion of the larynx, the other parts being lettered as in the other figures. Below, the division is concealed by the lower bone of the larynx, Fig. 6, A, t. At their junction with the larynx, the bronchial tubes are narrow, Fig. 7, C, d, but rapidly become wider, Fig. 7, d, and Fig. 6, A, b b.

On the inside of the tubes at the extreme end, are wide tympaniform membranes, that continue about the same width, and occupy very nearly the entire inside of the bronchials, for about six half rings, at a point near *c*, Fig. 7. Then they suddenly narrow to a slight division between the bronchial rings, and so continue to the lungs; Fig. 6, D, *p*, being the wide portion of the wide tympaniform, and *e*, the narrow.

At the point where the tympaniforms narrow a membranous muscle begins, stretching across from tube to tube, and adhering to them along the lower edge of the narrow tympaniforms, Fig. 6, A, *a*, *b*, *b*.

The muscle is thin, but is strengthened by two ridges of thick fiber, Fig. 6, A. The function of this muscle is to draw downward the upper portions of the tubes, and thus render tense the wider portions of the tympaniforms.

The upper portions of the tympaniforms have their beginning in the acute angle of the bronchial tubes, Fig. 7, *o*, where a diagrammatic section is given; they are attached to an *os transversale*, seen in the unshaded portion, Fig. 6, D, between *p* and *i*, and this bone bears a very narrow semi-lunar membrane, so narrow, in fact, as to be nearly or wholly functionless, see Fig. 6, D, *i*.

The thyroid glands are rather better developed than in the majority of birds, especially on the left, Fig. 10, A, which is attached to the carotid artery, Fig. 10, by its upper portion, Fig. 10, and is considerably elongated, and on its upper portion is a second division of the gland, yellowish in color and adhering closely to the larger portion, Fig. 10, A.

The oesophagus is dilated to a great degree; it is 19.00 long; there are prominent folds of the mucous membrane, running longitudinally the entire length of the interior, and these merge into the wide proventriculus, without any constriction.

The proventriculus, Fig. 11, *a*, is wide, measuring 1.50 in diameter and is about 4.00 long, with the glands of the secreting surface arranged in a peculiar manner, these being divided into two sections, both triangular in form, the upper 3.50 by 2.00, and the lower smaller, and proportionately narrower, about 3.00 by 1.00. See Fig. 9, *a*, being a diagram of the upper, and *e* of the lower, cluster of glands, about one-fourth the size of life. The glands are simple and cylindrical in form, see *d*, where is given a life size cut of a cluster.

The stomach, Fig. 11, *b*, is continued from the proventriculus without any constriction, but it becomes narrower a little back of the junction. Thus it is a mere sac, 2.00 long by 1.00 wide; the walls are thin, and are lined with a soft mucous membrane much wrinkled. Near pyloric opening these wrinkles become enlarged into folds, two of which overlie the orifice, see Fig. 8, where is shown the opening, and the folds which overlie it. The intestine is provided with a sphincter muscle, just within the entrance, by which the orifice may be completely closed.

The intestine emerges from the stomach about one-half its length, Fig. 11, thus the terminal portion becomes the cul-de-sac, *b*. The intestine pushes outward for about 1.00 then turns upward to form the fold of the duodenum.

The pancreas, Fig. 11, *d d*, is 4.75 in length, long enough to reach the entire length of the fold, but as it begins about 2.90 from its termination, it extends some distance along the intestine.

The intestines are 64.00 long, and are not large in diameter, measuring only about .50. The coeca, Fig. 11, *c*, are very small, but the blind ends are detached from the intestines and are pointed. One is larger than the other.

The spleen is a pyramidal-shaped body, lying between the intestines and the anterior portion of the proventriculus.

The gamet from which this dissection was made was evidently an aged specimen; it being a female with the ovaries nearly depleted, there being about a hundred and forty ruptured capsules, among which are interspersed a comparatively few ova. As a ruptured capsule indicates most surely that an egg has been deposited, it is reasonable to suppose that this gamet had laid something like one hundred and forty eggs, and as there is but one egg laid in a season, this would give an approximate great age to the bird, even if we allow for occasional accident to an egg, when a second specimen would be deposited that season.

Fig. 12 is a drawing of a young of the Common Gannet, life size, about two days old, and is one of the specimens of which I have spoken on page 52. It will be seen that there are very few feathers on the bird, yet on the young of Cory's Gannet, *Sula coryi*, a tropical species, the feathers are comparatively developed. See Fig. 13, where I have given a cut of Cory's Gannet about two days old. The adult of the Common

Gannet is a bird full of life and vigor, and this character is also strongly exhibited by the young, even at a very early age, thus as remarked elsewhere, I found that when newly hatched they were so hardy as to withstand the cold of a rainy night without shelter, reviving when warmth was applied to them. On the other hand as related at length in Vol. I of Contributions to Science, I found that the adults of Cory's Gannet were weakly, and that the young were so very tender that they could not withstand a few degrees of cold, whereas exposure for a few moments to the rays of the sun was also detrimental to them, specimens dying very quickly when placed in the full glare of the sunlight.

What better illustration can we have of the care that Nature, our common mother, exercises over her offsprings than this? Operating through her mysterious laws, she hastens to supply the debilitated gannet under the burning tropical sun with a warm covering of down, while the more hardy gannet of the boreal clime must endure the cold, simply because it can do so without absolutely perishing. In the north a survival of the fittest has produced a hardy, long-enduring species, by simply withholding clothing at a critical period of the bird's life; thus allowing the weaklings to perish that the species may survive. In the south, an opposite law has attained a similar result; species have been evolved and perpetuated by the weakening of offsprings, and consequently of adults.

FIG. 12



YOUNG OF THE COMMON GANNET, *SULA BASSANA*. two days old, taken on Bird Rock, Gulf of St. Lawrence, July 4th., 1873.

NOTES ON *SULA FIBER*, BOOBY GANNET. The trachea is simple, without dilatation, and is rounded for at least the lower half, but is slightly enlarged at the inferior larynx.

The sterno trachealis is comparatively slender and has its origin about .50 above the larynx, see Fig. 11 C, s, m being the trachea and b the bronchial tube. There is a thin, strap-like, bronchialis muscle arising

some distance above the junction of the sterno-trachealis with the trachea, and passing below it, adheres to the first tracheal half ring, see Fig. 14, u. Below this muscle, and rendered tense by it is a laryngeal vibrating surface, see Fig. 14, u.

The bronchial tubes are composed of twenty or more half rings and adhere together at their laryngeal junction, for the space occupied by five half rings. Below this are small tympaniform membranes.

The oesophagus of the Booby Gannet is dilated, and opens into a wide proventriculus which is 1.80 long and which emerges into the stomach without any constriction. See Fig. 14, where is given the stomach and adjacent organs, about two thirds life size; the proventriculus begins at a point just below g, where is given

FIG. 13.



YOUNG OF CORY'S GANNET, *SULA CORYI*, two days old, taken on Little Cayman, April 20, 1888.

a small portion of the gullet, and extends to a point about opposite p. The proventriculus at its junction with the stomach, is .70 in diameter. The glands are placed in five longitudinal ridges, and are simple and cylindrical in form.

The stomach is a cylindrical sack with soft, thin walls and lined with a soft mucous membrane that is raised in five ridges, continuous with those of the proventriculus. Its length is equal to that of the proventriculus.

The intestine emerges from the stomach at a point about one half its length from the terminal end which thus becomes a cul-de-sac, see Fig. 14, x; it passes upward for 1.00, then bends downward for 2.85, again bending upward, forms part of the duodenum which measures about 3.00 in length.

The pancreas occupies less than one half of this fold, the upper; see ib. p. Its length is 1.70.

The intestines are not long, and there are slightly developed caeca, ib. B, z, where it is represented as being life size. g, being the intestine and y, the rectum.

NOTES ON SULA BASSANA; COMMON GANNET. The following are additional notes on the anatomical structure of the Common Gannet.

The tongue is peculiar, being, in fact, one of the most singular that I have ever seen. It is short, about .50 long, thick and fleshy, rounded at the tip, slightly contracted in the middle, and bifid at the posterior portion. Fig. 5. A, e. But the most noticeable feature is its elevated position, seen in a side view, at B c.

The bone that supports it, the basi-hyal, is bent downward and the tongue is thus raised above the plane of the muscles about once its thickness. The whole strikingly resembles a moccasin-clad foot, having a bifid heel. Other bones of the tongue are well developed, and the thyro-hyal, Fig. 5 A, h, h, are surrounded by powerful muscles. It is therefore probable that, although the tongue adheres below to the skin of the gula sac, it is retractable, and hence not quite functionless, as this organ must be in the Pelicans.

The superior larynx is situated at some distance from the base of the tongue, 1.40, and the entrance to the trachea, which is a slit .60 long, Fig. 5. A, q, is closed by strong muscles, s s. Within the entrance,

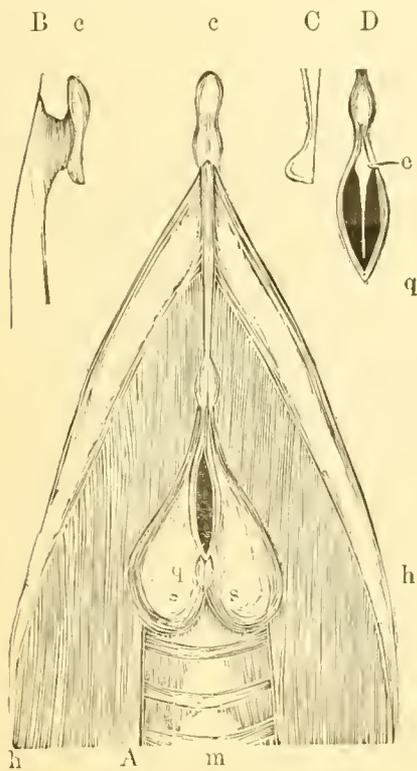


FIG. 5.

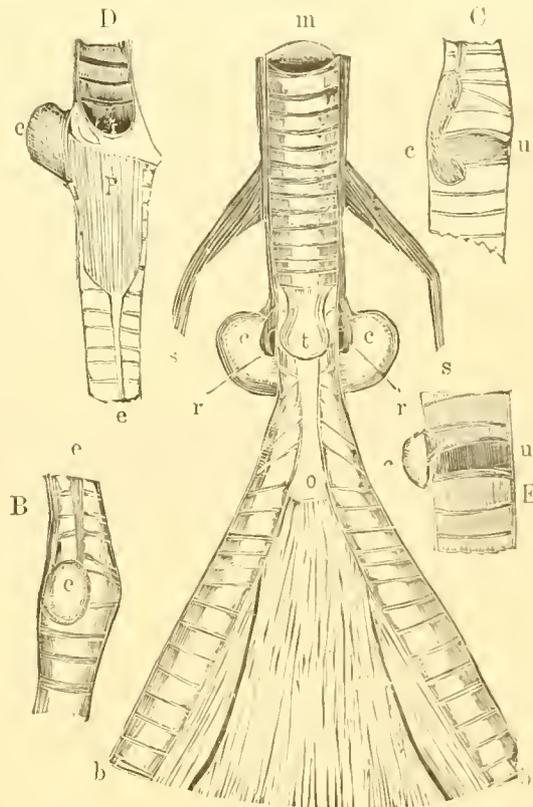


FIG. 6

A

extending backward, is a thin cartilaginous bone or septum, against which the lips of the muscles, that guard the entrance, close: see Fig. 5, D, where is given a view of the tracheal orifice, q, open, and within it is the septum, e, while at D is a side view of it base upward, the free end being widest.

The whole structure is supported by a Y shaped bone which extends forward from the first tracheal ring, Fig. 6, A, b, as seen from below: m being the first tracheal ring, and e, the lower side of the septum, the intervening portion of the trachea being removed, while Fig. 7 b, shows a section across the lower portion of the larynx, where it is about .75 wide, see Fig. 7, A, m, being the first tracheal ring, and e the lower side of the septum, the intervening portion of the trachea being removed: while at Fig. 7, A, is shown a section across the lower portion of the larynx, e, being the base of the Y-shaped bone.

The trachea is flattened at the superior larynx, where it is about .75 wide: see Fig. 5, A, m, but as it descends, it becomes gradually rounded and narrower, and is without dilation or special enlargement anywhere. It measures 11.50 to the inferior larynx.

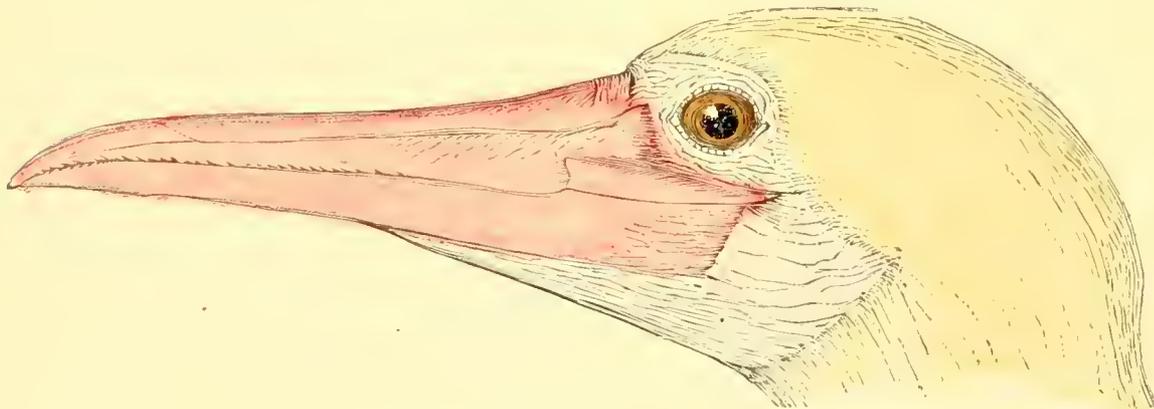
The bronchialis is represented by thin, strap-like muscles, seen in Fig. 14, e e, Fig. 18, e e, and Fig. 17 E, e. These muscles extend from the base of the sterno trachealis to the first laryngeal half ring, and their function is to render tense the laryngeal vibrating membrane seen at n, Fig. 17, E.

The tympaniform membranes, Fig. 14, p p, are long and wide, occupying the entire length and width of the bronchial tubes, the outside one of which is given in Fig. 17, E, b, and there is a much less prominent membranous muscle connecting the tubes than in *Sula bassana*.

The os transversale is present, but there is not even the rudiments of a semiluna membrane, as seen in the Common Gannet, while there is a shield-like projection of the larynx over the lower side of the division of the bronchial tubes, compare to, Fig. 6, A, with o, Figs. 14 and 18; nor do the tubes narrow as much at the laryngeal termination as in *Sula bassana*; see Fig. 7, O, and compare with Fig. 18, o c c. The larger vibrating surface of the tympaniform membranes of Cory's Gannet, compared with that of the Common Gannet, the laryngeal vibrating membranes being the same, and counting out the mere rudiment of the semiluna seen in the Common Gannet, as this is without doubt functionless, should give to this species a greater power of voice. In fact, such is the case, and I have heard Cory's Gannet give more notes than I ever heard the Common Gannet utter, but the cries of both are very harsh and discordant.

In Cory's Gannet, as remarked, there is no indication whatever, of the singular gland which I have called the thymus, adhering to the larynx, but there is a rudimentary thyroid present attached to the single carotid artery. This is a small elliptical body, about .25 long and lies on the inside of the carotid, the left of which only is developed; see Fig. 18, a being the carotid artery, c, the thyroid gland, h, the heart, n, w, x, and z, other arteries. The thyroid is quite likely functionless, or nearly so; I judge this to be a fact

FIG. 19.



HEAD OF CORY'S GANNET, *SULA CORYI*, adult male in white phase of plumage; taken on Little Cayman, May 2d, 1888; type.

as the gland is of such a small size. In a young Great Blue Heron, but fully grown, that I have recently dissected, I found two thyroids one adhering to each carotid artery, but the left thyroid was nearly twice the size of the right, and in it I found some well developed, cylindrical glands, each of which was fastened by its inner, terminal extremity to the outside of a small vessel, not a branch of the carotid, that passed through the gland. The right thyroid in this bird also had a small blood vessel passing through it, but I could find no developed glands.

In the only specimen of the Booby Gannet that has come into my hands to dissect, I find that I have made no notes nor drawings of the appearance of the tongue nor superior larynx. It may be possible that these organs were missing from the body that was kindly given to me by the Bangs Brothers of Boston, who obtained the bird, a young male, in the Quincy Market, where they were informed that it was taken on Cape Cod.

COLOR. ADULT. WHITE PHASE. Primaries, first row of coverts, spurious wing, exposed portion of secondaries, and middle wing coverts, dark brown, remainder of plumage tinged with creamy, which on top of

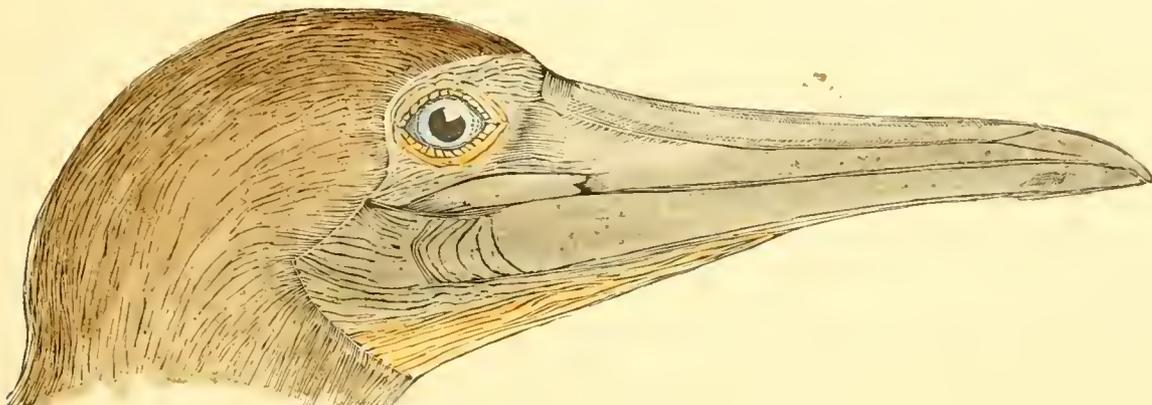
the head and upper tail coverts become nearly orange. Outer portion of wing feathers, hoary. Bill, purplish blue, more decidedly purple at base. Feet and gular sac, bluish, with the latter purple at base. Iris brown. Feet, crimson lake. These are the colors in life, but the gular sac dries yellowish, and the other parts become paler. Sexes, similar in all stages.

BROWN PHASE. Slaty brown tinged with creamy or yellowish, especially on head and neck, excepting rump, upper and under tail coverts, and tail, which are white, and many specimens have the lower back also white. Wings, naked parts, and iris, as in the adult.

OCCASIONAL PLUMAGE. Similar to Adult on head, neck and below, but the upper portions are mottled irregularly with slaty brown, and the outer portion of the tail is brownish. This is an unusual plumage.

FIRST PLUMAGE. Sooty brown throughout, darkest on wings and tail, with the feathers hoary outwardly on the former, lightest below, and some of the feathers above are margined with yellow. Feet, very pale yellow.

FIG. 20.

HEAD OF CORY'S GANNET, *SULA CORYI*, young in first feathers, taken on Little Cayman, May 2d, 1888.

NESTLINGS. Pure white with the down very thick and long. The wings and tail feathers appear long before the others, then follow the scapularies, then the feathers of the back, then those of the body, while the head and neck are covered last, and the bird has assumed the first plumage above described.

DIMENSIONS.

Wing, 14.25 to 15.00; tail, 9.00 to 9.50; bill, culman, 3.15 to 3.43; depth at base, 1.00 to 1.19; tarsus, 1.20 to 1.40.

OBSERVATIONS.

The fact that any species of gannet should exhibit two phases of plumage seems to be quite new to science, yet I am forced to this conclusion by my careful observations of this species of gannet made on Little Cayman in April 1888. Here was a gannetry containing something like 10,000 birds, and as they were exceedingly tame I had a most excellent opportunity of examining them. The mixed plumage of which I have spoken is peculiar, and the Common Gannet appears to have a similar phase of dress, which is, in both species, worn for life, as are doubtless the brown and white phases in the present species. The only positively known habitat of this species is the island of Little Cayman and probably Cayman Brae also. It is extremely probable, however, that this species occasionally finds its way to our southern coast.

DESCRIPTION OF NESTS AND EGGS.

NESTS, placed on trees or bushes, composed of sticks loosely arranged like those of herons, flat on top, and about twelve inches wide.

EGGS, one in number, oval yellowish-green in color, covered with a white calcareous deposit. Dimensions, 1.50 x 2.30 to 1.65 x 2.30.

HABITS.

I found Cory's Gannet abundant on the Island of Little Cayman in April and May 1888. This is a small key lying about one hundred and fifty miles south of Cuba, and about the same distance north-west of Jamaica. Here was an extensive gannetry on the south side of the island, extending from a point about a mile from the west end of the island along the shore about a mile, and I estimated that there were at least 10,000 pairs of gannets breeding here.

The birds were exceedingly tame, insomuch so that they would allow me to take them in my hands. The eggs are laid by the first of January, as I was informed by a resident of Little Cayman, thus at the time of my visit, the nests, which were placed on trees at an average height of ten feet from the ground, were nearly all tenanted by a young bird. At first the young are naked, or nearly so, but rapidly acquire a thick coating of long snowy white down which is retained until the birds are nearly as large as their parents.

The young are fed by regurgitation, and remain in the nests till they have assumed in a great measure the brown dress; they then perch on the branches, and remain on them for some time, in many cases until forced to leave them by the parents.

As mentioned, under an account of the Habits of the man-of-war Bird, these gannets suffer much from the persecutions of those avian pirates of the sea, and although the gannets are safe from attack just as soon as they reach a point over the land, they never hasten to reach such a haven by coming directly over the island, but invariably skirt the key until opposite the rookery, when they enter it.

There was another large colony of gannets, probably of this species, breeding at the east end of Cayman Brac where they were nesting on cliffs, I did not have an opportunity however, of visiting the place.

Although Cory's Gannet does not wander much, there is little doubt but that it is found on our coast occasionally. In Vol. I of Contributions to Science I have given an extended account of this species.

NOTES ON TACHYPETES AQUILLUS, MAN-OF-WAR BIRD. The tongue is short and triangular, shorter than the width, with the point slightly raised. The superior larynx is quite well developed but exhibits no marked feature.

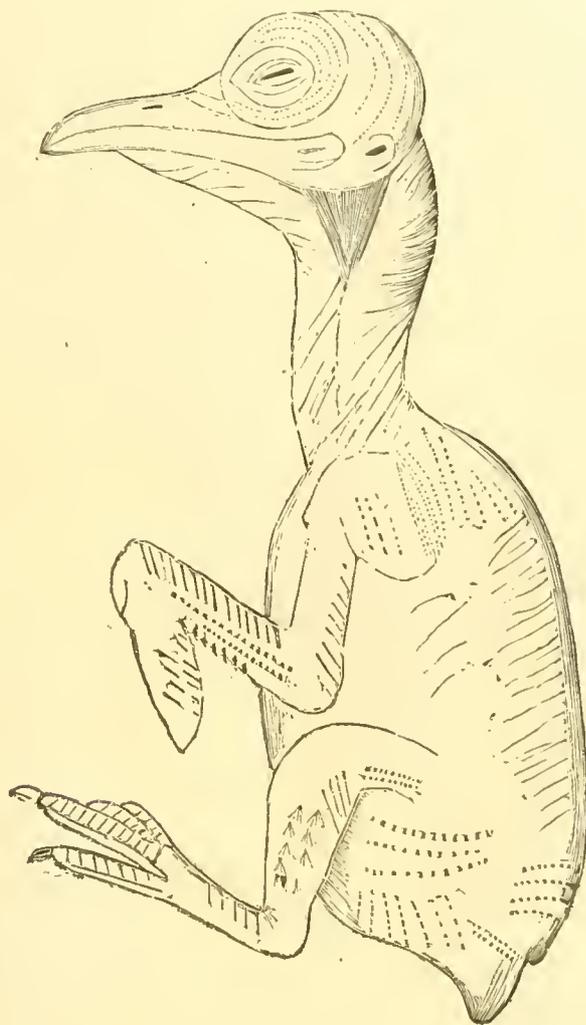
The trachea is 6.75 long, nearly straight and much flattened near mouth, but becomes rounded near lower larynx.

The sterno trachealis has its origin about .30 above the inferior larynx, and there is a single bronchialis, extending from this to the upper half rings. The tympaniforms are much exposed on the upper side of the bronchial tubes; are as wide as the tube at the bronchial division, but narrow greatly toward the lungs. Half rings, twenty. Os transversale, well developed, but has no semiluna membrane.

The heart is, short, thick and oval, 1.40 by 1.25. Both lobes of the liver are about equal in size. Oesophagus 8.65 long, and very extensible, and has eight prominent ridges, which continue into the wide proventriculus as angular glandular tracts, 1.30 long. Glands, numerous, simple, oval, .30 long. Stomach, continuous with proventriculus, small 1.00 long, but is furnished with a pyloric lobe nearly as large as itself 1.00 by .60. Duodenum 3.00 long, pancreas occupying half its length. Spleen, elliptical.

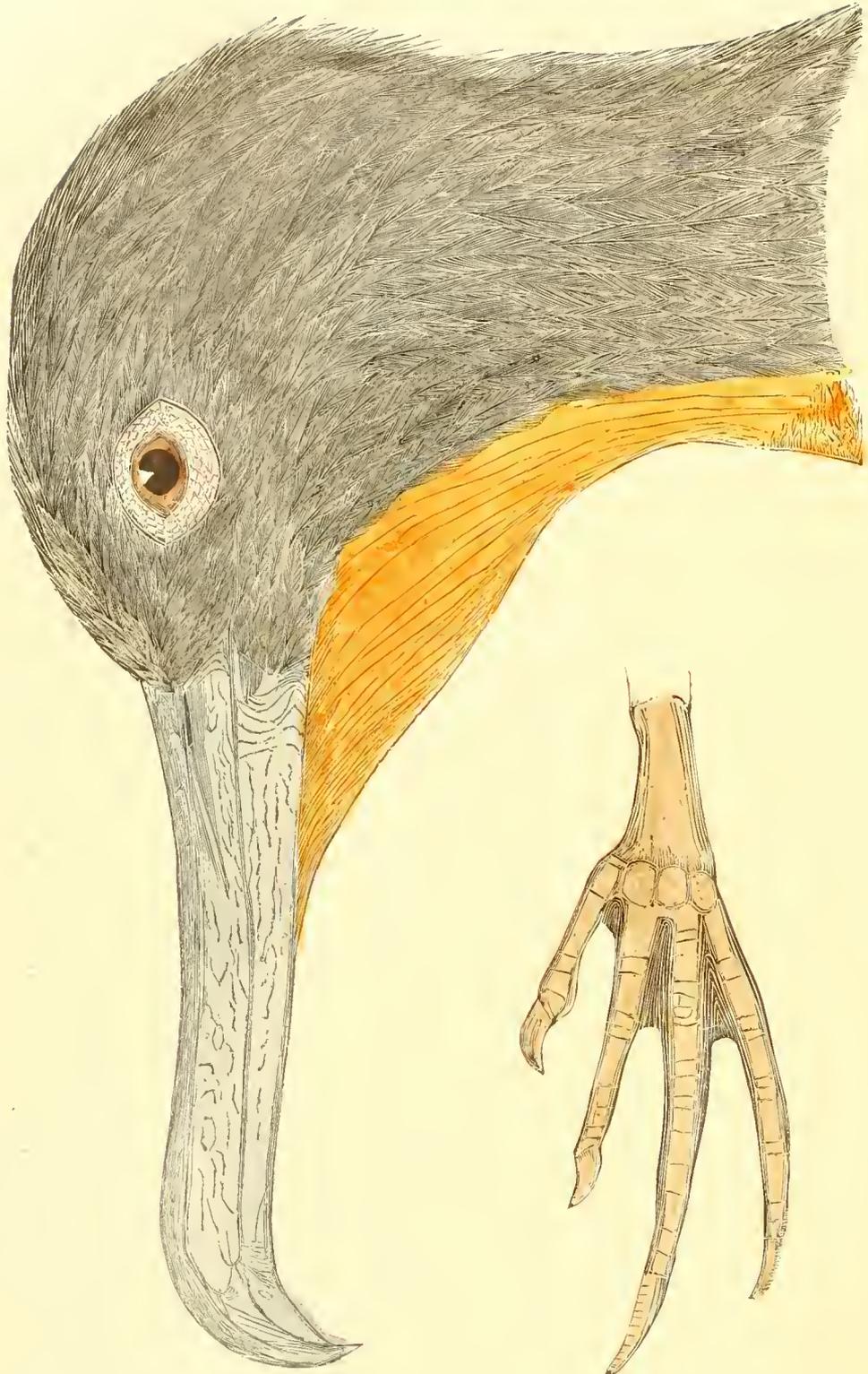
NESTLINGS, when newly hatched are naked, and dull bluish in color throughout. When about ten days old are thickly covered with white down, and simultaneously the dark brown scapular and interseapular feathers appear. In a month the wing quills appear, and the tail feathers bud, then the other feathers follow.

FIG. 21.



MAN-OF-WAR. Young, two days old, from Little Cayman, April 22, 1888.

HABITS. I found quite a large breeding place of the Man-of-wars on Little Cayman. The stick built nests, which were small for the size of the birds, were placed on mangroves and although on April 22, most of the nests contained young, I succeeded in finding four nests which contained an addled egg each, and upon each of which a female was sitting. All other nests contained a single young bird, which, when newly hatched, was carefully guarded by the male. When such a nest was approached the old bird would rise on his feet, still keeping over his progeny, and repeatedly bow his head, occasionally touching his offspring with his bill. I could easily catch him in my hands before he would leave. When forced to go, he would fly a short distance, but would quickly return and settle lightly on the nest or on the branches near it. When captured both sexes de-



MAN-OF-WAR. Head and foot of adult male from Little Cayman, April 22, 1888.

fended themselves very ably with their powerful bill and wings. Young birds are very helpless, and do not leave the nest as soon as do the young gannets. When taken in the hand they utter a stammering cry that so nearly resembles the efforts of an uneducated dumb child to articulate, as to appeal strongly to the sympathies. The Man-of-wars on the Caymans live wholly by plundering the gannets.

ORDER XVI. LAMELLIROSTRES. DUCKS, GEESE, ETC.

Anterior toes, connected by a membrane. Posterior toe, present, and more or less elevated above the level of the anterior toes. Keel, very low, rarely exceeding in height one half the width of the sternum. Marginal indentations, two, open or inclosed. Bill, provided with lamellæ.

This order includes the Flamingos, Swans, Geese, Ducks, etc., all of which are widely distributed throughout the world. The body is compact and thickly covered with feathers which are uniformly distributed over its surface. The legs are usually short but occasionally greatly lengthened. The young are covered with down and usually run at birth. One of the chief characteristics may be seen in the lamellæ of the bill, which are horny, tooth-like projections growing from the sides of one or both mandibles.

FAMILY I. PHŒNICOPTERIDÆ. THE FLAMINGOS.

Legs and neck, excessively elongated. Bill, abruptly bent in the middle, more or less pointed. Marginal indentations, open.

Members of this family are remarkable on account of their long legs and neck, and all are residents of the Tropics.

GENUS I. PHŒNICOPTERUS. THE FLAMINGOS.

Generic Characters are similar to those given under the Family heading. The œsophagus is dilated into a crop near the lower portion. Stomach, muscular. Intestines, very long and quite wide, with cœca rather long. Sexes, similar. There is but one species within our limits.

PHŒNICOPTERUS RUBER.

Scarlet Flamingo.

Phœnicopterus ruber LINN., Syst. Nat. I.; 1766, 230

DESCRIPTION.

Sp. Cn. Form, rather slender. Size, large. Color. *Adult.* Bright red throughout, darkest on wings. Primaries, black. Iris, blue, feet, red, and bill, yellow, with terminal portion, black. *Young.* Similar but paler.

OBSERVATIONS.

Readily known by the bright colors and peculiar form as described. Distributed, as a constant resident, on the Bahamas and southward. Rare on the Florida Keys.

DIMENSIONS.

Average measurements of specimens from Florida. Length, 45·00; stretch, 65·25; wing, 16·00; tail, 6·15; bill, 5·85; tarsus, 11·85. Longest specimen, 48·00; greatest extent of wing, 66·00; longest wing, 16·50; tail, 6·70; bill, 6·00; tarsus, 12·20. Shortest specimen, 43·00; smallest extent of wing, 64·50; shortest wing, 15·50; tail, 5·60; bill, 5·70; tarsus, 11·50.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground in marshy places, composed of mud. *Eggs*, two in number, oval in form, bluish in color, covered with a white calcareous deposit. Dimensions from 2·00 x 3·25 to 2·10 x 3·50.

HABITS.

Although the Flamingos are common residents on the Bahamas, they are very rare now on the Florida Keys. In fact, they have never been abundant there, nor could I learn that they ever bred on these islands, all the inhabitants asserting that formerly, as well as at present, these fine birds only appeared on the West side of the Gulf Stream during summer, after they had reared their young on the Bahamas. They remain on the Florida Keys, however, until after they have moulted. The feathers of the Flamingos fall off in large quantities, as in all members of the present order, even the wing quills being dropped, and nearly all are shed at one time; thus the birds are then unable to fly and consequently are comparatively helpless. At this time, they resort to the mud flats among the interior keys, where they can feed in comparative safety; but at high tide, they are forced to take refuge on the small islands, and then are sometimes surprised by the wreckers who taking advantage of the fact that they cannot rise, easily capture them.

I have never seen a Flamingo in Florida but the members of one of my expeditions, were more fortunate, as they saw a flock of seven specimens come in from across the Gulf Stream, and alight on a mud flat. By placing a tame White Pelican in the bow of a little skiff and concealing themselves behind him, two of the men managed to approach within long gun-shot of these wary birds, when, by a single discharge of a large gun with which they were provided, they killed six, only one escaping.

FAMILY II. ANATIDÆ. THE SWANS, DUCKS, GEESE, ETC.

Legs, short. Neck, variable. Bill, straight, usually wide but occasionally narrow and rather pointed. Marginal indentations, open or inclosed.

Members of this family can be easily recognized by the peculiarly robust form, and characters given above. The species are distributed throughout the world. The anatomical characters are somewhat variable. The cœca, however, are present and very long.

GENUS I. CYGNUS. THE SWANS.

GEN. CH. *Neck, very long. Bill, at least as long as head, high at base, and wide at tip. Tail feathers, twenty or more. Hind toe, short and rounded.*

The stomach is very muscular. Cœca, long. The trachea is peculiar, somewhat resembling that of the Cranes, as it enters the sternum in a similar manner. Sexes, similar. There are two species within our limits.

CYGNUS AMERICANUS.

Whistling Swan.

Cygnus Americanus SHARP., Doughty's Cab. N. II., 1; 1830, 185.

DESCRIPTION.

SP. CH. Form, robust. Size, very large. Bill, about as long as head, broad and high at base with nostrils situated in the center. COLOR. *Adult.* Pure white throughout. Iris, brown; feet and bill, black, the latter with a yellowish spot in front of eye. *Young.* Similar to the adult but overwashed with bluish-ash and reddish.

OBSERVATIONS.

Readily known by the height of bill at base, the orange spot on its side, and centrally situated nostrils. Distributed in summer throughout the Arctic Regions, wintering from the Carolinas to New Jersey. Very rare during the migration, in New England.

DIMENSIONS.

Average measurements of specimens from North America. Length, 54.50; stretch, 82.00; wing, 22.60; tail, 7.25; bill, 4.25; tarsus, 4.25. Longest specimen, 55.00; greatest extent of wing, 84.00; longest wing, 23.00; tail, 7.50; bill, 4.50; tarsus, 4.50. Shortest specimen, 53.00; smallest extent of wing, 80.00; shortest wing, 21.00; tail, 7.00; bill, 4.00; tarsus, 3.95.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground in marshy places, composed of grass, weeds, etc. *Eggs*, six to ten in number, oval in form, and dirty white in color. Dimensions from 2.50 x 4.00 to 2.75 x 4.50.

HABITS.

Some years ago, in April, I was walking along a street in Baltimore, Maryland, when glancing upward, I saw a wedge-shaped flock of large, white birds, high in air, passing northward, and at once recognized them as being Swans, the first that I had ever seen undomesticated, and they were probably on their way to their breeding grounds in the far North. Later, however, when on the yacht, *Nina*, I found Swans common in November, in Chesapeake Bay. The notes of the Swans are harsh and loud but are easily recognized.

CYGNUS BUCCINATOR.

Trumpeter Swan.

Cygnus buccinator RICH. F. Bor. Am., II; 1831, 464.

DESCRIPTION.

Sp. CH. Form, robust. Size, very large. Bill, longer than head, broad, but not very high at base, with nostrils situated in basal portion. Color. *Adult*. Pure white throughout. Iris, brown. Bill and feet, black. *Young*. Similar, but tinged with pale bluish-ash and reddish.

OBSERVATIONS.

Readily known by the very large size, comparatively low base of black bill, and basal situation of nostrils. Distributed, as a summer resident, throughout Arctic America. Winters from New Jersey to the Carolinas. Rare in New England during the migrations.

DIMENSIONS.

Average measurements of specimens from North America. Length, 55.25; stretch, 85.00; wing, 22.50; tail, 7.75; bill, 4.25; tarsus, 4.15. Longest specimen, 58.50; greatest extent of wing, 90.00; longest wing, 23.00; tail, 8.00; bill, 5.00; tarsus, 4.60. Shortest specimen, 52.00; smallest extent of wing, 80.00; shortest wing, 21.00; tail, 7.50; bill, 4.50; tarsus, 4.25.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground in marshy places, composed of grass, weeds, etc. *Eggs*, from six to ten in number, oval in form, and dirty-white in color. Dimensions from 2.50 x 4.03 to 2.76 x 4.50.

HABITS.

The habits of this and the preceding species are so well known, that I shall not attempt to enlarge upon them, as I can add nothing new to that which has already been written. I presume that I saw this species on Chesapeake Bay but as all the Swans are very shy, I did not get near enough to identify them. Both species are exceedingly rare in New England, passing to their northern breeding grounds, through the interior of the country, thus avoiding the coast north of New Jersey.

GENUS II. ANSER. LONG-BILLED GEESE.

GEN. CH. Bill, about as long as head, generally bright in color. Hind toe, rather long. Marginal indentations, open and wide.

Members of this genus are variable in color, but are conspicuously marked with white. The trachea is straight and without dilatation. Sexes, similar. There are two species within our limits.

ANSER HYPERBOREUS.

Snow Goose.

Anser hyperboreus PALL., Spie. Zool., VI; 1767, 80.

DESCRIPTION.

Sp. CH. Form, robust. Size, medium. Color. *Adult*. Pure white; primaries bluish-gray at base and black at tip. Iris, brown. Bill and legs, red. *Young*. Similar, but tinged with yellowish and rufous.

OBSERVATIONS.

Readily known by the white color, and black tipplings to the primaries. Distributed, in summer, throughout Arctic America. Winters in the West. Rare in New England during the migrations.

DIMENSIONS.

Average measurements of specimens from North America. Length, 28.50; stretch, 58.50; wing, 15.55; tail, 5.65; bill, 2.05; tarsus, 2.95. Longest specimen, 31.00; greatest extent of wing, 62.00; longest wing, 17.00; tail, 5.80; bill, 2.10; tarsus, 3.12. Shortest specimen, 26.00; smallest extent of wing, 55.00; shortest wing, 14.00; tail, 5.50; bill, 2.00; tarsus, 2.80.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground in marshy places, composed of grass, weeds, etc. *Eggs*, from five to eight in number, elliptical in form, yellowish-white in color. Dimensions from 1.90 x 2.80 to 2.00 x 3.00.

HABITS.

The Snow Goose is exceedingly rare in the section east of the Mississippi, south of Canada, and I have never seen a specimen living. It is, however, abundant in the West during winter, when it is described as having similar habits to those of other Geese. It breeds in the far North.

ANSER ALBIFRONS.

White-fronted Goose.

Anser albifrons BECHST., Naturg. IV, 898.

DESCRIPTION.

SP. CH. Size, large. Form, robust. COLOR. *Adult*. Above and on sides, bluish-gray, becoming brownish on head and neck. Forehead, upper tail coverts, and under portions, excepting neck, white, becoming grayish anteriorly, where it is irregularly blotched with black. Wings ashy-gray, becoming dark-brown on secondaries and tips of primaries; the greater coverts, tipped with white. Tail feathers, brown, also tipped with white. Axillaries and under surface of wings, plumbeous. Iris, brown; bill and feet, red. *Young*. Similar but paler, and less spotted beneath.

OBSERVATIONS.

Known by the white forehead and spotted breast. Distributed, in summer, throughout Arctic America, wintering in the West. Rare in New England during the migrations.

DIMENSIONS.

Average measurements of specimens from North America. Length, 29.00; stretch, 59.00; wing, 16.20; tail, 5.35; bill, 1.95; tarsus, 2.65. Longest specimen, 29.75; greatest extent of wing, 59.85; longest wing, 16.45; tail, 5.55; bill, 2.05; tarsus, 2.85. Shortest specimen, 28.00; smallest extent of wing, 58.25; shortest wing, 15.95; tail, 5.15; bill, 1.85; tarsus, 2.40.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground in marshy places, composed of weeds, grass, etc. *Eggs*, six to ten in number, elliptical in form, yellowish-white in color. Dimensions from 2.05 x 2.95 to 2.10 x 3.20.

HABITS.

Like the Snow Goose, the White-front is seldom seen in New England or southward but is very abundant in the West, where numbers are shot every season, and from which point they are sent into our markets during cold weather. Like nearly all members of the present order, these birds are also migratory, breeding in the far North. Both this and the preceding species are occasionally taken by gunners on the coast of North Carolina.

GENUS III. BERNICLA. SHORT-BILLED GEESE.

GEN. CH. Bill, not quite as long as head and black in color. Hind toe, quite short. Marginal indentations, very wide and open.

Members of this genus are very dark in color, with few or no conspicuous marks of white. Trachea, straight, without dilatation. Sexes, similar. There are two species within our limits.

BERNICLA CANADENSIS.

Canada Goose.

Bernicla canadensis BOIE., Isis: 1826, 921.

DESCRIPTION.

SP. CH. Form, robust. Size, large. Tail feathers, from fourteen to twenty. COLOR. *Adult*. General color, smoky-brown becoming paler beneath, with edges of feathers becoming lighter. Head, neck, rump, tips of primaries, and tail

black. Patch on throat, extending up on sides of head, upper tail coverts, posterior portions below, back of tibia, white. Iris, brown; feet and bill, black. *Young*. Similar to the adult but paler.

OBSERVATIONS.

Readily known by the large size, absence of any conspicuous white markings on lower neck and colors as described. Distributed, in summer, from Canada, northward; wintering from New Jersey, southward.

DIMENSIONS.

Average measurements of specimens from North America. Length, 35.00; stretch, 62.70; wing, 17.62; tail, 6.10; bill, 2.50; tarsus, 3.72. Longest specimen, 38.00; greatest extent of wing, 65.50; longest wing, 19.25; tail, 7.00; bill, 2.80; tarsus, 4.10. Shortest specimen, 32.00; smallest extent of wing, 59.90; shortest wing, 16.00; tail, 5.20; bill, 2.25; tarsus, 3.35.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground in marshy places, composed of sticks, weeds, etc. *Eggs*, six to ten in number, elliptical in form, and dirty-white in color. Dimensions from 2.25 x 3.40 to 2.35 x 3.50.

HABITS.

For upward of two hundred years, the exploits of the Canada Geese have been so repeatedly recorded both in story and in song, that it is extremely difficult to write anything new concerning them. Yet their migrations to and from their northern breeding grounds, always prove interesting to the inhabitants, over whose heads they pass semi-annually, the most casual observer, never failing to glance upward, when he hears their sonorous honks, to note the wedge-shaped flock, or long line, of large birds, hurrying onward with more than railroad speed, toward their destination. The wild Geese have learned wisdom by long experience, and now seldom alight on our east coast in numbers; thus it sounds marvelous to hear the stories of the vast multitudes which formally gathered along our shores. These Geese are, with us, the shyest of birds when in flocks, yet when one becomes separated from the main body, it appears bewildered and apparently loses all fear of man. Once, when I was a boy, a single Goose, evidently lost, sailed several times around our meadow, in Newtonville, in which I was standing, once or twice passing within ten or twelve feet of my head. Some years later, on the day before Christmas, I was informed by a neighbor, that there was a large bird in his meadow, and taking my gun, I walked within thirty yards of a large, male, wild Goose which was standing in an open field, and shot it. A few years ago, I surprised one in a field near the sea-shore, late in November, and walked within a few yards of it before it flew. Just previous to all these occasions, a thick fog had prevailed, during which the Geese had evidently lost their reckoning. The Canada Geese are abundant in southern waters during winter, from the Carolinas to Northern Florida, for although they are so rare on the east coast of this latter named State, that I never saw one there, yet I have found them very common about Cedar Keys, where, however, they are as shy as they are in the North.

It is highly probable, that before the general settlement of New England, the Canada Geese bred from Massachusetts, northward, but now they are confined to the wilder portions of Canada, Labrador, and the adjacent islands, and so on to the North Pole. When I was on the Magdalen Islands, certain inaccessible tracts of marshes, already described, were pointed out to me as breeding grounds of the Geese, but I scarcely think that these birds can occur in any numbers there, in summer, as I did not see a single specimen during my visit. In habits, both this and the succeeding species behave much like the domesticated birds.

BERNICLA BRENTA.**Brant Goose.***Bernicla brenta* STEPH., Shaw's Zool. XII.: 1824, 46.

DESCRIPTION.

SP. CH. Form, robust. Size, not very large. COLOR. *Adult.* Body, grayish-ash, darkest on rump, becoming lighter beneath, with the edges of the feathers slightly paler. Wings, brown. Head, neck, and body anterior to wings, primaries, and tail, black. Streaks of white in crescent-shaped mark on neck, and under portions back of tibia, white. Iris, brown, bill and feet, black. *Young.* Similar but paler.

OBSERVATIONS.

Readily known by the small size, dark colors, and crescent-shaped streakings on the neck. Distributed, in summer, throughout the Arctic Regions; wintering from New Jersey to the Carolinas.

DIMENSIONS.

Average measurements of specimens from North America. Length, 27.10; stretch, 42.00; wing, 13.75; tail, 3.90; bill, 1.35; tarsus, 2.30. Longest specimen, 30.50; greatest extent of wing, 41.00; longest wing, 14.50; tail, 4.00; bill, 1.40; tarsus, 2.40. Shortest specimen, 23.75; smallest extent of wing, 40.00; shortest wing, 13.00; tail, 3.75; bill, 1.25; tarsus, 2.25.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground in marshy places, composed of sticks, weeds, etc. *Eggs*, six to ten in number, elliptical in form, and dirty-white in color. Dimensions from 1.84 x 2.75 to 1.90 x 2.90.

HABITS.

The Brant Geese, unlike the Canada, appear to prefer the coast to the interior when migrating, insomuch so that they will seldom pass over any large tract of land, but will follow the sinuosities of the shore, nearly always keeping over the water. These fine birds are particular favorites with sportsmen, and many are shot from points of land which make out into the sea, by building blinds, in which the sportsmen conceal themselves, while the wary Brant are induced to alight near, by using decoys of the same species. Mr. W. B. Dowse who has frequently shot over these decoys, informs me that they become quite tame and very intelligent, not only endeavoring to induce their wild brethren to alight near them, but when a number are gathered about them, they will move to one side, in order to give their master an opportunity to shoot the wild Brant. I never saw a Brant Goose in Florida and think they seldom get as far south. In time of migration and in general habits, these birds resemble the Canada Geese.

GENUS IV. ANAS. THE FRESH WATER DUCKS.

GEN. CH. *Bill*, wide, flattened, not swollen nor very high at base, nor expanded at tip. *Legs*, rather short. *Marginal indentations*, nearly closed in adult.

The trachea is without dilatation but the larynx, in the male, is provided with a bony frame-work and is much expanded. Stomach, muscular. Sexes, not similar. There are two species within our limits.

ANAS BOSCHAS.**Mallard Duck.***Anas boschas* LINN. Syst., Nat. I; 1766, 205.

DESCRIPTION.

SP. CH. Form, robust. Size, large. Tips of upper tail coverts, turned upward in males. COLOR. *Adult male.* Head, and upper neck all around, deep iridescent green, glossed with violet. Beneath this color is a narrow ring of white, that is followed by rich chestnut-brown which extends backward, beneath, to upper breast, where it is somewhat paler. Lower hind neck, and back, reddish-brown, finely banded with whitish, but becoming rapidly darker on the posterior back, and quite black on rump, until it ends in the velvety upper tail coverts which show greenish reflections. Scapularies, reddish-brown, more or less finely banded with white, but becoming chestnut on the outer webs which are banded with dark-brown. Tertiaries, hoary, edged with whitish. Secondaries and primaries, brown, the former rather broadly tipped with white. Speculum, dark-blue, with violet reflections, and surrounded by a band of black. Wing coverts, reddish-

brown, the greater being tipped with black, preceded by a white band. Tail, brown, with the feathers spotted and edged with white. Under surface, not described, excepting the under wing coverts which are black with greenish reflections, creamy-white, finely banded everywhere, excepting on under wing coverts and axillaries, but more prominently on sides, with brown. Tips of feathers of flanks, white. Iris, brown; feet, reddish-orange, bill, greenish-brown.

Adult female. General color, dark-brown, with feathers edged and streaked with yellowish-rufous which predominates below and which is tinged on breast, sides, flanks, and under tail coverts with chestnut. Otherwise similar to the adult male. *Young*. Similar to the adult female but paler.

OBSERVATIONS.

The male may be known by the green head, and the female by the predominating white on tail. Distributed, in summer, throughout the West and North; wintering in the South. Not very common in New England during migrations.

DIMENSIONS.

Average measurements of specimens from North America. Length, 23.50; stretch, 55.50; wing, 11.00; tail, 3.80; bill, 2.25; tarsus, 1.75. Longest specimen, 25.00; greatest extent of wing, 28.75; longest wing, 11.50; tail, 4.00; bill, 2.30; tarsus, 1.90. Shortest specimen, 22.00; smallest extent of wing, 22.25; shortest wing, 10.50; tail, 3.60; bill, 2.15; tarsus, 1.60.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground in marshy places, composed of weeds, grass, etc. *Eggs*, six to ten in number, elliptical in form, greenish-brown in color. Dimensions from 1.40 x 2.25 to 1.70 x 2.35.

HABITS.

Although I have occasionally taken specimens of the Mallard Duck in New England, they are far from being common here. I have also found them, in winter, in Florida, but never very abundant, nor do I think that any breed in the State, the great strong-hold of the species, appearing to be in the West. Those which I observed in Florida, were quite tame, insomuch so that I have walked within a few feet of them, as they sat in the small pools on the marshes, and shot them, as they rose, with dust shot. Although usually a river Duck, those that I have seen, both North and South, were in pools on salt marshes, or in creeks in which the tide rose and fell. In general habits, the Mallards closely resemble the following species but are, however, more often domesticated, and those which have been bred in this condition for many years, retain the plumage of the original birds so well, that it is often impossible to detect any difference, and they readily become feral, associating with wild Ducks.

ANAS OBSCURA.

Black Duck.

Anas obscura Gm., Syst. Nat. I; 1788, 541.

DESCRIPTION.

Sp. CII Size, large. Form, robust. Color. *Adult male*. Dark-brown throughout streaked on head, neck, and abdomen with pale reddish-yellow; and feathers of remainder of body, especially below, edged with yellowish. Under wing coverts, axillaries, and tips of secondaries, white. Speculum, green with violet reflections, surrounded by black. Feet, greenish-yellow. Iris, brown. Bill, greenish-brown. *Adult female and Young*. Similar, but paler. *Nestlings*. Above, including stripe behind eye, yellowish-brown, with several spots of buffy-yellow. Beneath, pale buffy-yellow.

OBSERVATIONS.

Readily known by the universally dark colors. Florida specimens are not only smaller in size but are lighter in color than Northern birds, the number of tail feathers is less, and there are longitudinal streaks above of yellowish in males. Distributed, in summer, throughout Eastern North America, from Labrador to Texas; winters from Massachusetts, south.

DIMENSIONS.

Average measurements of specimens from North America. Length, 22.50; stretch, 35.80; wing, 10.50; tail, 3.35; bill, 1.90; tarsus, 1.85. Longest specimen, 24.00; greatest extent of wing, 37.50; longest wing, 11.00; tail, 3.50; bill, 2.10; tarsus, 2.15. Shortest specimen, 21.00; smallest extent of wing, 34.00; shortest wing, 10.00; tail, 3.12; bill, 1.75; tarsus, 1.60.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground in marshy places, composed of grass, weeds, etc. *Eggs*, six to ten in number, elliptical in form, and greenish-brown in color. Dimensions from 1.40 x 2.25 to 1.75 x 2.35.

HABITS.

The Black Ducks are, perhaps, the most abundant of the River Ducks in our section, and I have always found them common and breeding, in suitable localities, wherever I have been, between the Gulfs of St. Lawrence and Mexico. In the North, however, these birds are migratory, for although specimens occur quite commonly in Massachusetts all winter, they are birds which breed further north, and are noticeably larger than those which live with us in summer, and which have retreated further south during cold weather. In Central Florida, I discovered a local race which is very yellow in color, and which is constantly resident in the State, where they are remarkably abundant. I found them breeding on Indian River, the nests being placed on the drier portions of the marshes, in grass which was about eighteen inches high. The eggs were deposited during the first and second weeks of April; then about the first of May, I would frequently see flocks of little downy ducklings, following the female, but unless I took care to conceal myself, I did not enjoy watching these little families long, for as soon as the parent became aware of my presence, she would emit a chuckling note, when away they would scamper, helter-skelter, into the nearest grass, where it was impossible, upon the most careful search, to discover a single young. I once surprised a brood, when they were some distance from any place of shelter, for they had ventured out upon the mud of a creek, at low tide, and I chanced to come out of the high grass, just in front of them. The old Duck appeared to comprehend the situation at once, for she came directly toward me, driving her brood before her, hoping to engage my attention by a display of bravery, while the young escaped into the sheltering vegetation behind me; but placing my gun on the ground, I stooped down and grasped two of the little fellows, as they were running past. The diminutive ducklings uttered shrill cries when they were captured, which drove their parent nearly frantic, for regardless of possible consequences, she dashed about in front of me, with ruffled feathers and half closed wings, often coming within a foot of me, at the same time, quacking loudly. This out-cry attracted the attention of the drake, but he did not approach very near, merely circling about, some fifty yards distant, quacking softly. Leaving the old female to care for the remainder of the brood, I carried my captives into camp and placed them in a box, the sides of which were about a foot and a half high, but young as they were, they managed to escape.

On the Magdalen Islands, the Black Ducks deposit their eggs during the last of May or first week in June. When in company with Mr. Wm. L. Breeze, near the first of July, I discovered a brood of about a dozen young, my attention being attracted to them, by a whistling sound which they made. They were sitting huddled together, in the top of a small spruce which was lying prostrate over a small stream that flowed through a little ravine. The old Duck was absent, and by making a sudden dash at them, I managed to capture three, before they were aware of our presence. The rest dropped into the shallow water, some diving, others creeping into holes, while some sought shelter beneath the roots or overhanging moss; in short, they managed to conceal themselves so effectually, that we only succeeded in finding one which we took out of the water from beneath a stone.

Wild Black Ducks are frequently reared by the inhabitants on the Magdalen Islands, and readily mix with the domesticated race which, however, evidently originated from

this species; and those I captured, I resigned to the care of an old lady who had a brood of domestic birds, but from some unaccountable cause, they soon died.

GENUS V. DAFILA. THE SPRIG-TAILED DUCKS.

GEN. CH. *Bill, long, narrow, not much flattened, swollen, nor high at base, and slightly widened at tip. Neck, long and thin. Legs, short. Marginal indentations, closed in adults.*

The trachea is slightly dilated, and the larynx of the male is expanded and provided with a bony frame-work. The stomach is muscular. Sexes, not similar. There is but one species within our limits.

DAFILA ACUTA.

Pin-tail Duck.

Dafila acuta JENYNS, Man.; 1835, 232.

DESCRIPTION.

SP. CH. Form, rather slender. Size, medium. COLOR. *Adult male.* Head, throat, and small portion of upper neck, dark-brown, with feathers edged with lighter and showing slight green and violet reflections on posterior portions. Two lines of white extend along sides of neck, nearly uniting on back, and between these is a patch of black which has greenish reflections, but this gradually becomes brown on back which is finely barred with white, and extends to the central tail coverts that are edged with white. Scapularies and tertiaries, black, edged or streaked with brown which on former is banded with white. Primaries and secondaries, brown, the latter broadly tipped with white that is preceded by a reddish tinge on two or three outer. Speculum, greenish, with violet reflections, and surrounded by a band of black. Wing coverts, ashy-brown, with the greater tipped with reddish-brown. Sides of upper tail coverts, central tail, and under tail coverts, black, with a line on the sides of latter, white; remainder of tail, brown, edged and spotted with white. Beneath, creamy-white, finely and faintly banded on posterior portions, and more noticeably on sides and flanks, with dark-brown. Under wing coverts, ashy-brown, banded and spotted with white. Iris and feet, dark-brown; bill black, bluish on sides.

Adult female. Above and on sides, flanks, and under wing coverts, dark-brown, with feathers edged, streaked, banded, and spotted with yellowish-white and rufous. Beneath, yellowish-white, spotted on head, neck, and under tail coverts, with dusky. Secondaries, tipped with white. Speculum, grayish. Middle tail feathers, not greatly elongated. Otherwise similar to male. *Young.* Similar to adult female, and males occur in transitional stages between this and adult.

OBSERVATIONS.

The male may be recognized by the greatly elongated central tail feathers, and colors as described. Female, by the narrow bill and grayish speculum. Distributed, in summer, throughout Arctic America. Winters in the South.

DIMENSIONS.

Average measurements of specimens from North America. Length, 21.75; stretch, 31.00; wing, 9.95; tail, 6.00; bill, 2.12; tarsus, 1.60. Longest specimen, 23.50; greatest extent of wing, 35.00; longest wing, 10.25; tail, 8.00; bill, 2.25; tarsus, 1.75. Shortest specimen, 21.00; smallest extent of wing, 33.00; shortest wing, 9.75; tail, 4.00; bill, 2.00; tarsus, 1.50.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground in marshy places, composed of grass, weeds, etc. *Eggs*, from six to ten in number, elliptical in form, and greenish-brown in color. Dimensions from 1.50 x 2.10 to 1.55 x 2.30.

HABITS.

The Pintail Ducks are not common in New England nor in any of the Northern States, east of the Mississippi, although some are to be found here every year. They appear to be particularly fond of the creeks that make out from the salt water, where they feed in company with the Black Ducks. The Pintails are more common in the Southern States but the great winter resort of the species is in Florida; here they are not only exceedingly abundant but very tame. On one occasion, while I was making my way down Indian River, numbers of these Ducks were passing over my head southward. They flew in straggling flocks, consisting of from twenty to some hundreds of specimens, and one company followed another so closely, that there was an almost unbroken line. They continued to move in this manner all the morning; thus many thousands of individuals must have past us. Shortly after noon, they began to alight along the beaches in such numbers that they fairly covered the ground, and were so unsuspecting that my assistant, who had left the boat some time previous, walked within a few yards of them, and killed three or four

with a single discharge of a light gun which was merely loaded with a small charge of dust shot. This occurred in early March and the birds were evidently gathering, preparatory to migrating northward, for in a few days they had all disappeared. The Pintails breed in the North and North-west.

GENUS VI. CHAULELASMUS. THE GRAY DUCKS.

GEN. CH. *Bill, about as long as head, not wide nor flattened, slightly expanded at tip, but not swollen nor high at base. Legs, short. Neck, not very long. Marginal indentations, nearly closed in adult.*

The trachea is slightly dilated near the larynx, which in the male, is provided with a bony frame-work and is expanded. Stomach, muscular. Sexes, not similar. There is but one species within our limits.

CHAULELASMUS STREPERUS.

Gadwall Duck.

Chaulelasmus streperus GRAY; 1838.

DESCRIPTION.

SP. CH. Form, robust. Size, large. COLOR. *Adult male.* Head and neck, yellowish-white, becoming reddish on crown and spotted with dusky. Lower neck, back, and upper breast, dark-brown, finely banded with white. Outer scapularies and sides, black, narrowly barred with white. Longest tertiaries, hoary, and inner scapularies, tinged with reddish. Middle wing coverts, chestnut; greater, black. Speculum, white, bordered externally with hoary, internally with black. Flanks and upper tail coverts, black. Remainder of under portions, white, faintly banded on the abdomen with brownish. Iris, reddish-brown; bill, black; feet, yellowish-green.

Adult female. Dark brown throughout, tinged with ashy on head, neck, and greater wing coverts, streaked on first two with yellowish, and with the feathers of body and tail broadly margined with reddish. Otherwise similar to male.

OBSERVATIONS.

Readily known in all stages by the white speculum, and colors as described. Distributed, in summer, throughout the North-west and North; wintering in the South. Not common in New England.

DIMENSIONS.

Average measurements of specimens from North America. Length, 20.60; stretch, 33.00; wing, 9.00; tail, 3.50; bill, 2.10; tarsus, 1.10. Longest specimen, 21.75; greatest extent of wing, 35.00; longest wing, 10.00; tail, 4.00; bill, 2.20; tarsus, 1.80. Shortest specimen, 19.50; smallest extent of wing, 31.00; shortest wing, 8.00; tail, 3.00; bill, 2.00; tarsus, 1.64.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground in marshy places, composed of sticks, weeds, etc. *Eggs*, six to ten in number, elliptical in form, and creamy-buff in color. Dimensions from 1.45 x 2.00 to 1.50 x 2.05.

HABITS.

The Gadwall is one of the most uncommon of all the Ducks which occur in New England during the migrations, but is occasionally found in our markets in considerable numbers, being brought from the West, where it is common, and where it breeds. I have never met with this Duck in Florida, nor elsewhere on the eastern coast of the United States. The Gadwall resembles other members of the order in general habits.

GENUS VII. MARECA. THE WIDGEONS.

GEN. CH. *Bill, shorter than head, rather narrow, not flattened, widened at tip, swollen, nor high at base. Neck and legs, short. Marginal indentations, open.*

Trachea, not dilated, and the larynx in the male is expanded, and provided with a bony frame-work. Stomach, muscular. Central tail feathers and under tail coverts, slightly lengthened. Sexes, not similar. There are two species within our limits.

MARECA AMERICANA.

American Widgeon.

Mareca Americana STEPH. Shaw's Zool. XII.; 1824, 135.

DESCRIPTION.

SP. CH. Form, robust. Size, not very large. COLOR. *Adult male.* Head and neck all around, creamy-white, finely spotted and banded everywhere, excepting on crown, with dusky. Throat and broad band back of eye, nearly black, the latter glossed with green. Lower neck, scapularies, sides, and upper breast, chestnut-red, tinged with ashy; finely banded

on all but last, with dark-brown. Remainder of upper parts, dark-brown, finely banded on back with yellowish-white. Outer webs of scapularies, velvety-black margined with whitish. Greater upper wing coverts, and lower parts, and flanks, white, the first tipped with black. Under wing coverts and lesser upper coverts, ashy. Speculum and under tail coverts, black, the former ashy above and glossed anteriorly with greenish. Bill, bluish; feet, black, and iris, brown.

Adult female. Similar, but lacks the white crown and iridescence on head. The white of greater wing coverts is replaced by ashy and the barrings above are coarser. The under tail coverts are brown banded with white, and the other colors are paler. *Young.* Resemble the adult female.

OBSERVATIONS.

Known by the spotted head and neck and black and green speculum. Distributed in summer throughout the North and North-west; wintering from New Jersey, southward.

DIMENSIONS.

Average measurements of specimens from North America. Length, 19.75; stretch, 32.75; wing, 10.35; tail, 4.10; bill, 1.45; tarsus, 1.65. Longest specimen, 21.75; greatest extent of wing, 35.50; longest wing, 11.25; tail, 4.20; bill, 1.50; tarsus, 1.80. Shortest specimen, 17.76; smallest extent of wing, 30.00; shortest wing, 9.50; tail, 4.00; bill, 1.40; tarsus, 1.50.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground in marshy places, composed of sticks, weeds, etc. *Eggs*, six to ten in number, elliptical in form, and brownish-buff in color. Dimensions from 1.30 x 2.00 to 1.50 x 2.10.

HABITS.

The American Widgeons are not very common throughout the northern portion of the eastern section of North America during migrations, but occur in considerable numbers in the South in winter, and I have found them quite abundant in the mouths of the rivers that flow into the Gulf of Mexico on the west coast of Florida. Here they occurred in flocks, in company with the Scaup and other Ducks. They were, however, rather shy, when compared with other members of the order, but did not differ in general habits from most of the Ducks which inhabit rivers.

MARECA PENELOPE.

English Widgeon.

Mareca penelope BON., List, 1838.

DESCRIPTION.

SP. CH. Size, not very large. Form, robust. COLOR. *Adult male.* Top of head, yellowish-white. Sides of head and neck all around, chestnut-red, spotted irregularly and sparsely with black, excepting in front, where the ground color is nearly obscured with it, and the spots around eye show greenish reflections. Back and sides, dark-brown, finely banded with white. Upper tail coverts, whitish with ashy centers, the outer margined with black. Wings and tail, dark-brown, the latter edged with white. Lesser wing coverts, ashy; greater, white tipped with black. Outer webs of scapularies, black, edged with white. Speculum, black with greenish reflections on anterior portion. Axillaries and under wing coverts, ashy, banded with white. The upper breast and sides are chestnut-red tinged with ashy. The under tail coverts are black. Remainder of under parts, white. Iris, brown; bill and feet, bluish.

Adult female. General color above, reddish-brown, with the feathers edged with whitish and centrally spotted with dark-brown. Speculum, gray, surrounded, excepting below, with white. The under tail coverts are white, banded with brown. Otherwise similar to the adult male.

OBSERVATIONS.

The male may be known by the chestnut-red head and black and green speculum. The female, by the gray speculum and reddish-brown sides. Constant resident in Europe. Rare on the Eastern coast of the United States.

DIMENSIONS.

Average measurements of specimens. Length, 19.00; stretch, 33.50; wing, 10.00; tail, 4.25; bill, 1.55; tarsus, 1.56. Longest specimen, 20.00; greatest extent of wing, 31.00; longest wing, 10.50; tail, 4.50; bill, 1.60; tarsus, 1.65. Shortest specimen, 18.00; smallest extent of wing, 33.00; shortest wing, 9.50; tail, 4.00; bill, 1.50; tarsus, 1.53.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground in marshy places, composed of grass and weeds. *Eggs* from five to eight in number, oval in form, creamy-buff in color. Dimensions from 1.40 x 2.20 to 1.50 x 2.50.

HABITS.

The English Widgeon, a well-known European species, although formally considered as only accidental on our eastern coast, is really a regular visitant, some being taken ev-

ery season, especially in the sounds of North Carolina, and it is extremely probable that this bird is a migrant from the North, having bred on the American side of the Atlantic. According to authors, these Ducks resemble the American Widgeon in manner of feeding, etc., etc.

GENUS VIII. QUERQUEDULA. THE TEALS.

GEN. CH. *Bill, shorter than head, narrow, slightly widened at tip, but not much flattened, swollen, nor high at base. Marginal indentations, open.*

The trachea is straight and without dilatation. The larynx in males is slightly expanded and provided with a bony frame-work. Stomach, muscular. Sexes, not similar. There are four species within our limits.

QUERQUEDULA DISCORS.

Blue-winged Teal.

Querquedula discors STEPH., Shaw's Zool. XII; 1824, 149.

DESCRIPTION.

SP. CH. Form, slender. Size, small. COLOR. *Adult male.* Head, and neck all around, ashy-gray. Top of head, black. Crescent-shaped spot in front of eye, white. Back, brown, becoming greenish posteriorly, crossed anteriorly by two narrow bands of purplish. Outer webs of scapularies, blue, black, and green, streaked with reddish-buff. Wing coverts, blue with the outer, white. Speculum, black glossed with green, tipped with white posteriorly. The under parts are purplish-ash; each feather spotted with black which becomes more obsolete behind. The under wing coverts and axillaries are black. Bill, black, iris, brown and feet, yellowish.

Adult female. Brown throughout, with the feathers edged with whitish which becomes more prominent below. Throat, creamy. Wings as in male. *Young.* Similar to adult female but the wing markings are paler and lack the blue scapularies; while in the female the speculum is very pale.

OBSERVATIONS.

Readily known by the small size, blue wing coverts, and narrow bill. Distributed in summer throughout both America; wintering in the South.

DIMENSIONS.

Average measurements of specimens from North America. Length, 15.50; stretch, 24.00; wing, 7.20; tail, 3.20; bill, 1.62; tarsus, 1.35. Longest specimen, 16.00; greatest extent of wing, 25.00; longest wing, 7.50; tail, 3.50; bill, 1.75; tarsus, 1.50. Shortest specimen, 15.00; smallest extent of wing, 23.00; shortest wing, 6.90; tail, 2.90; bill, 1.50; tarsus, 1.25.

DESCRIPTION OF NESTS AND EGGS.

Nests. placed on the ground in marshy places, composed of grass, weeds, etc. *Eggs,* six to ten in number, elliptical in form, and brownish-buff in color. Dimensions from 1.30 x 1.90 to 1.35 x 1.95.

HABITS.

These little Ducks prefer those small ponds which are half filled with lily pads and other vegetation and which are so common in New England, as feeding places, and may often be found in them in September, at which time they are making their way toward the South. The Blue-winged Teals are one of the most unsuspecting of all the inland Ducks, and can be approached quite closely, especially when they first arrive from their northern breeding grounds; and as they have a peculiar habit of huddling together when slightly alarmed, the sportsman has an excellent opportunity of securing a number at a single shot, before they rise. Some years ago, when I was a small boy, and when these birds were much more abundant than at present, I remember seeing an old gentleman kill upward of twenty-five at a single discharge of one of those old muskets, known as a queen's arm. When passing southward, these Teals are much more common just before a storm, and like many other Ducks, are much more restless in unsettled weather. There are, perhaps, few birds which can move with greater rapidity than these little Teal, especially when coming down the wind before a strong gale. I have always found these birds very abundant in Florida in winter, where they frequent the pools on the marshes, or the mouths of narrow creeks. This species breeds in the West and, possibly, as far south as Florida.

QUERQUEDULA CAROLINENSIS.

Green-winged Teal.

Querquedula Carolinensis STEPH., Shaw's Zool., XII, 1821, 148.

DESCRIPTION.

SP. CH. Form, slender. Size, small. Color. *Adult male.* Head and neck, chestnut-red, dusky on forehead, with line back of eye, green showing violet reflections. Upper portions and sides, brown, finely banded on all but wings, with white. Crescent-shaped mark in front of wings, and tips of greater coverts, white, the latter tinged with reddish. Back of head, band on flanks, line on scapularies, and under portion of speculum, black, remainder of latter, green, followed posteriorly with a narrow band of white. Chin, black. Ring around neck white, finely banded with black. Remainder of under portions, white, becoming creamy on under tail coverts which have a central black line, finely banded with brown on abdomen, and becoming purplish on breast which is marked with round spots of brown. Iris, bill, and feet, brown.

Adult female. Dark-brown above, with the feathers edged with whitish. White beneath, with obscure brown spots on breast. Otherwise similar to male. *Young.* Similar to female, and males occur in all stages between this and adult.

OBSERVATIONS.

Readily known in all stages by the small size and black and white speculum. Distributed, in summer, from Maine, northward; wintering in the South.

DIMENSIONS.

Average measurements of specimens from North America. Length, 13.75; stretch, 22.25; wing, 6.65; tail, 2.65; bill, 1.60; tarsus, 1.10. Longest specimen, 15.00; greatest extent of wing, 21.50; longest wing, 6.80; tail, 2.80; bill, 1.70; tarsus, 1.20. Shortest specimen, 12.50; smallest extent of wing, 20.00; shortest wing, 6.50; tail, 2.50; bill, 1.50; tarsus, 1.00.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground in marshy places, composed of grass, weeds, etc. *Eggs,* from six to ten in number, elliptical in form, and pale brownish-buff in color. Dimensions from 1.25 x 1.85 to 1.30 x 1.90.

HABITS.

The Teal last mentioned, as related, haunts the fresh waters of the interior, whereas the present species, although not uncommon on ponds and rivers, appears to prefer the salt water, resorting to the mouths of narrow creeks in which the tide rises and falls. On the southern side of Amherst Island, one of the Magdalen group, are several salt water ponds which were formally lagoons, but which the shifting sand of the beaches have cut off from the water of the gulf. These miniature lakes are surrounded by a thick growth of trees, composed mainly of spruce and hemlock, which have been so dwarfed by the severe climate, that they rarely attain the height of ten feet. I was making my way along the border of one of these ponds, on the sixteenth of June, in company with my friend, Mr. Gilman Brown, when a female Green-winged Teal rose within a yard of our feet; and stepping forward, we discovered a nest containing eight greenish eggs which were placed in a depression of the sandy soil on a few twigs, and surrounded with a ring of gray down, thus presenting a very pretty appearance. The spot was concealed by the overhanging branches of a little spruce, and had the bird remained quiet, we should have passed without discovering her treasures. The female was quite shy, and after circling about a few times disappeared. The eggs were in an advanced state of incubation and would have been hatched in a short time. The Green-wings migrate through New England a little later than the preceding species.

GENUS IX. SPATULA. THE SPOON-BILLED DUCKS.

GEN. CH. *Bill,* much longer than head, narrow at base but not high, and much widened and flattened at tip. *Lamelle of upper mandible,* fine and greatly lengthened. *Marginal indentations,* open.

The trachea is straight, without dilatation, and the larynx of the male is expanded and provided with a bony framework. The stomach is muscular. Sexes, not similar. There is but one species within our limits.

SPATULA CLYPEATA.

SPATULA CLYPEATA.

Shoveller Duck.

Spatula clypeata BOIE., Isis; 1822, 564.

DESCRIPTION.

SP. CH. Form, rather slender. Size, not very large. COLOR. *Adult male.* Head and upper neck, green with violet and bluish reflections. Remainder of neck, upper breast, sides of back, tips of greater wing coverts, and under wing coverts, white. Back and upper tail coverts, brown, with the feathers edged with lighter and glossed with greenish, especially on the upper tail coverts, where the tints are darker. Tail, white, centrally streaked with brown. Under tail coverts, black, with green and violet reflections. The under parts not described, rich dark-chestnut, becoming lighter on the sides, flanks, and tibia, where the feathers are finely barred and spotted with black. Tertiaries, black on outer webs, streaked with white on inner, and edged with blue on two lower feathers. Wing coverts, blue tipped with white. Speculum, green, glossed with violet. Bill, black, iris, yellow, and feet, bright orange.

Adult female. General color throughout, pale yellowish with every feather streaked, spotted, and banded with dark-brown, the latter color predominating above. Wings as in the male, but the speculum is not as prominent and the blue of the coverts is edged and spotted with yellowish-rufous. The under wing coverts are white. *Young.* Similar to adult female.

OBSERVATIONS.

Easily recognized by the broad bill, blue wing coverts, and green speculum. Immature males present all gradations in plumage between young and adult. Distributed, in summer, from Texas to Alaska. Winters in the South. Not common in New England.

DIMENSIONS.

Average measurements of specimens from North America. Length, 19.50; stretch, 31.00; wing, 8.75; tail, 3.40; bill, 2.45; tarsus, 1.55. Longest specimen, 20.00; greatest extent of wing, 32.00; longest wing, 9.50; tail, 3.75; bill, 2.60; tarsus, 1.60. Shortest specimen, 19.00; smallest extent of wing, 30.00; shortest wing, 8.00; tail, 3.00; bill, 2.50; tarsus, 1.50.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground near the water, composed of sticks, weeds, etc. *Eggs*, six to ten in number, elliptical in form, and pale ashy-green in color. Dimensions from 1.45 x 2.05 to 1.50 x 2.10.

HABITS.

The Shovellers, although quite common in the West, are exceedingly rare in New England, but I found them very abundant in the shallow pools on the marshes of Salt Lake and Indian River, Florida. Here they fed in little groups, and as they were quite unsuspecting, could be easily approached and shot. I have also taken specimens at Key West in winter. These fine Ducks may possibly breed in Florida, as I have found them common there quite late in the season.

GENUS X. AIX. THE ARBOREAL DUCKS.

GEN. CH. *Bill*, narrow, rather high at base, and pointed at tip. *Head*, crested. *Neck*, not very short. *Marginal indentations*, open.

Trachea, not dilated, and the larynx in the male is expanded, and provided with a bony framework. Stomach, muscular. Tail feathers, slightly lengthened. Eyes, large. Sexes, not similar. There is but one species within our limits.

AIX SPONSA.

Wood Duck.

Aix sponsa BOIE., Isis; 1828, 329.

DESCRIPTION.

SP. CH. Form, slender. Size, medium. COLOR. *Adult male.* Top and sides of head, green glossed with violet and purplish. Narrow line over eye extending down on nape, also one below and back of eye, throat, and upper neck below encroaching on dark color above in two triangular patches, white. Above dark-brown glossed with violet and purple. Tips of secondaries, white. Outer edges of primaries, hoary. Lower neck and breast, chestnut-red tinged with purplish, darkest above, and marked anteriorly with triangular shaped spots of creamy. Crescent in front of wing, and under parts, white, becoming yellowish on sides which are finely banded with dark-brown, and marked posteriorly with coarser bands of black and white. The under wing coverts are spotted with brown. There is a spot of purplish tipped with lighter on flanks, and a patch of black, back of white crescent on sides. The under tail coverts are brown glossed with green. Bill, brown, purplish at base, with a V-shaped patch of white on upper mandible. Iris, ruby-red, and feet, brown.

Adult female. General markings as in the male, but with a white patch around eye, and lacks, in a great measure, the bright colors and iridescence which are replaced or obscured with ashy and brownish. *Young.* Similar to adult female but the breast is streaked with whitish. The males, however, are brighter than the females.

OBSERVATIONS.

Known in all stages by the iridescent colors of wings as described. Distributed, in summer, throughout Temperate North America; wintering in the South.

DIMENSIONS.

Average measurements of specimens from North America. Length, 18.00; stretch, 29.00; wing, 9.00; tail, 4.12; bill, 1.35; tarsus, 1.30. Longest specimen, 19.00; greatest extent of wing, 29.75; longest wing, 9.60; tail, 1.25; bill, 1.50; tarsus, 1.40. Shortest specimen, 17.00; smallest extent of wing, 28.00; shortest wing, 8.45; tail, 4.00; bill, 1.25; tarsus, 1.20.

DESCRIPTION OF NESTS AND EGGS.

Nests. placed in holes of trees, composed of grass, weeds, feathers, etc. *Eggs,* six to ten in number, elliptical in form, and pale brown in color. Dimensions from 1.05 x 1.55 to 1.15 x 1.65.

HABITS.

The beautiful Wood Ducks are among the best known of all the species which resort to our inland waters, for they are abundant in summer and breed from Maine to Florida, and it is a singular fact, that the eggs are deposited in the latter named State in May and June, nearly or quite as late as they are laid further north. The Wood Ducks almost invariably select a hole in a tree or stub in which to build, often some distance from the water and occasionally at a considerable height from the ground, and when a pair of these birds have selected a particular tree, they will return to it year after year. Mr. Will Perham called my attention to a section of a hollow log which he had fastened in the fork of a huge pine that stands near Tyng Pond, which he said was the nesting place of a certain pair of these Ducks, and also stated that they had used it for several years. As the young do not remain in the nest long after being hatched, they must be removed by the parents and carried to the water. These elegant birds are easily tamed, and even when in a state of nature, will readily associate with domesticated fowls, feeding with them through the entire summer. In autumn, the Wood Ducks often visit the woods in search of chestnuts and acorns. They migrate southward during October but occur in Florida all winter.

GENUS XI. FULIGULA. THE BAY DUCKS.

GEN. CH. *Bill,* longer than head, quite wide, somewhat flattened, and not expanded at tip. *Marginal indentations,* open.

The trachea is straight and without any special dilatation. The larynx in males is expanded and provided with a bony frame-work. Stomach, muscular. Sexes, not similar. There are five species within our limits.

FULIGULA MARILA.

Greater Black-head.

Fuligula marila STEPH., Shaw's Zool. XII; 1824, 197.

DESCRIPTION.

SP. CH. Form, robust. Size, large. COLOR. *Adult male.* Head, neck all around, upper parts, breast, sides, flanks, and under tail coverts, black, glossed with green and violet on head, becoming slightly brownish around middle of neck, finely banded with white across back. Remainder of under parts, white, faintly banded with black on abdomen. Black feathers of breast, slightly tipped with white, and those on shoulders are faintly spotted with it. Speculum, white. Bill, blue, with nail and feet, black. Iris, orange. *Adult female.* Similar, but the black is replaced by brown, and the barrings above are faintly indicated. The sides are brown and there is a whitish space around base of bill. *Young.* Resemble the adult female but are more reddish above.

OBSERVATIONS.

Known from the following species by the large size and decidedly greenish gloss to head; and from all others, by the broad blue bill and white speculum. Distributed in summer throughout Northern America; wintering from Massachusetts to the Carolinas.

DIMENSIONS.

Average measurements of specimens. Length, 19.00; stretch, 32.50; wing, 8.50; tail, 2.75; bill, 1.80; tarsus, 1.50. Longest specimen, 20.00; greatest extent of wing, 34.00; longest wing, 9.00; tail, 3.00; bill, 1.85; tarsus, 1.60. Shortest specimen, 18.00; smallest extent of wing, 30.00; shortest wing, 8.00; tail, 2.50; bill, 1.75; tarsus, 1.40.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground in marshy places, composed of sticks, weeds, etc. *Eggs*, from six to ten in number, elliptical in form, ashy-green in color. Dimensions from 1.70 x 2.35 to 1.75 x 2.50.

HABITS.

The Greater Black-heads, or Blue-bills as they are called by sportsmen, are very far from being common on the coast of Massachusetts, even in winter, but occur to the southward in considerable numbers. They closely resemble the succeeding in colors and habits but are really a distinct species. They are, however, rather more maritime than the Little Black-heads, yet are found on the lakes and rivers of the interior. They breed in the far North.

FULIGULA AFFINIS.

Little Black-head.

Fuligula affinis ERTON, Mon. Anat.; 1838, 157.

DESCRIPTION.

SP. CH. Form, robust. Size, small. COLOR. Excepting in being smaller, in having the head glossed with violet only, and in having no white sprinklings on shoulders, this species does not differ from the Greater Black-head, to which refer for further description.

OBSERVATIONS.

For comparison with other species see preceding. Distributed, in summer, throughout the North-west and North; wintering from New Jersey, southward.

DIMENSIONS.

Average measurements of specimens from North America. Length, 16.80; stretch, 29.00; wing, 7.50; tail, 2.55; bill, 1.35; tarsus, 1.30. Longest specimen, 17.25; greatest extent of wing, 29.50; longest wing, 7.75; tail, 2.75; bill, 1.75; tarsus, 1.50. Shortest specimen, 15.50; smallest extent of wing, 28.50; shortest wing, 7.30; tail, 2.35; bill, 1.05; tarsus, 1.10.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground in marshy places, composed of sticks, weeds, etc. *Eggs*, six to ten in number, elliptical in form, and ashy-green in color. Dimensions from 1.60 x 2.25 to 1.65 x 2.30.

HABITS.

The Little Black-heads or Scaups are quite common on the rivers and ponds of the Northern States, and congregate in great numbers on the inland waters of the South in winter, but are particularly abundant in Florida, fairly swarming on the St. John's and Indian Rivers. They are highly gregarious and gather in large compact flocks, especially at night, from which circumstance they are termed Raft Ducks. When disturbed at such times, they rise with a noise like thunder, fly a short distance, and settle down again. In the immediate vicinity of settlements they are shy, but I have always found them very unsuspecting in the wilder districts, where they would allow me to walk or row within a few yards of them. As their flesh is fishy and dry, I seldom shot them; thus they would gather in the little bay in front of our camp on Indian River in considerable numbers. Like all Ducks of this genus, they dive well, remaining a considerable time under water. The Scaups linger in the South until late in spring.

FULIGULA COLLARIS.

Ring-necked Duck.

Fuligula collaris BON. List; 1842.

DESCRIPTION.

SP. CH. Form, robust. Size, small. *Adult male*. Head and neck all around, excepting band in the middle which is

chestnut-red, upper portions, and anal region black, becoming brownish on wings. Secondaries, narrowly tipped with white. Speculum, pearly-gray. White beneath, finely mottled throughout, and banded on sides and flanks, with brown. Chin, white. Bill, black, crossed on upper mandible near tip with a line of blue, iris, orange, and feet, greenish-brown.

Adult female. The black is replaced with brown, the feathers are edged with lighter and under wing coverts are ashy; otherwise similar to male. *Young.* Similar to female, but more reddish above.

OBSERVATIONS.

Known in all stages by the broad bill and gray speculum. Distributed, in summer, throughout the Arctic Regions; wintering from the Carolinas, southward.

DIMENSIONS.

Average measurements of specimens from North America. Length, 16.25; stretch, 27.12; wing, 7.65; tail, 2.50; bill, 1.82; tarsus, 1.38. Longest specimen, 17.00; greatest extent of wing, 23.25; longest wing, 8.00; tail, 2.70; bill, 1.90; tarsus, 1.50. Shortest specimen, 15.50; smallest extent of wing, 26.00; shortest wing, 7.30; tail, 2.25; bill, 1.75; tarsus, 1.25.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground in marshy places, composed of grass, weeds, etc. *Eggs*, from six to ten in number, elliptical in form, and ashy-green in color. Dimensions from 1.60 x 2.25 to 1.65 x 2.30.

HABITS.

The Ring-necked Ducks are occasionally found on the ponds and rivers of the North, and I have found them not uncommon throughout the inland waters of the South, quite to Key West, but I never saw them abundant anywhere. They occur regularly, however, in the West. They have similar habits to those of the preceding species but do not gather in such large flocks, small companies being more frequently seen, and I have met with solitary individuals. These Ducks breed in the far North.

FULIGULA FERINA.

Red-head.

Fuligula ferina Bon., Syn., 1828, 392.

DESCRIPTION.

SP. CH. Form, rather robust. Size, quite large. Bill, not very high at base, nor produced backward on forehead. COLOR. *Adult male.* Head and neck, for more than half its length, brownish-red, glossed with violet. Remainder of neck, body in front of wing, lower back, and tail coverts, black. Back and under parts white, sprinkled above and on sides with black which about equals the white in proportion. Wing coverts, ashy sprinkled with whitish. Wings, brown. Speculum, bluish-ash, tipped with whitish, and with upper feathers margined with black. Bill, tipped with black, iris, orange, and feet, bluish. *Adult female.* General color throughout, brown, with the feathers edged with pale yellowish. The white markings above are faintly indicated, otherwise as in the male.

OBSERVATIONS.

Easily recognized by the clear red head, gray speculum, and short, blue bill which is not high at base nor produced back on forehead. Distributed, in summer, throughout the Arctic Regions. Winters from New Jersey to Florida.

DIMENSIONS.

Average measurements of specimens from North America. Length, 20.00; stretch, 32.25; wing, 8.50; tail, 2.62; bill, 1.87; tarsus, 1.62. Longest specimen, 21.00; greatest extent of wing, 33.00; longest wing, 9.50; tail, 2.75; bill, 2.00; tarsus, 1.75. Shortest specimen, 19.00; smallest extent of wing, 31.50; shortest wing, 7.50; tail, 2.50; bill, 1.75; tarsus, 1.50.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground near the water, composed of sticks, weeds, etc. *Eggs*, six to ten in number, elliptical in form, and creamy-white in color. Dimensions from 1.65 x 2.20 to 1.75 x 2.30.

HABITS.

The Red-heads are not common in New England or in Florida, but as every one knows, who is familiar with sporting matters, occur in great numbers in the intermediate section, especially in Chesapeake Bay and in the sounds of North Carolina, where they gather in large flocks, and where they have similar habits to those of the succeeding species.

FULIGULA VALLISNERIA.

Canvas-back Duck.

Fuligula vallisneria Bon., List, 1838.

DESCRIPTION.

SP. CH. Form, robust. Size, large. Bill, long and tapering, rather high at base, and produced back on forehead. COLOR. *Adult male.* Head and upper neck, chestnut-red, with top of former and region about base of bill, dusky. Re

BUCEPHALA CLANGULA.

mainder of neck, body anterior to shoulders, lower back and tail coverts, black. Under parts and back white, finely spotted on former and sides with black, but the white predominates. Wings and tail, brown. Speculum, bluish-ash, tipped with white, and edged above with black. Iris, red, bill black, and feet, blue.

Adult female. Brown throughout, becoming lighter below, with the feathers edged with yellowish. The white markings above are only faintly indicated. Otherwise as in the male.

OBSERVATIONS.

Known in all stages by the long bill which is high at base, and predominating white above which is the reverse in the preceding which see for further comparison. Distributed, in summer, throughout the North-west and North; wintering from New Jersey to Middle Florida.

DIMENSIONS.

Average measurements of specimens from Eastern North America. Length, 21.50; stretch, 32.00; wing, 9.76, tail 2.62; bill, 2.75; tarsus, 1.62. Longest specimen, 23.25; greatest extent of wing, 33.00; longest wing, 10.00; tail, 2.75; bill, 3.00; tarsus, 1.75. Shortest specimen, 20.35; smallest extent of wing, 31.00; shortest wing, 9.50; tail, 2.50; bill, 2.50; tarsus, 1.50.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground in marshy places, composed of sticks, weeds, etc. *Eggs*, six to ten in number, elliptical in form, and ash-green in color. Dimensions from 1.70 x 2.50 to 1.75 x 2.55.

HABITS.

The Canvas-backed Ducks, so well known to sportsmen and epicures, are found in our section most abundantly in the waters of the bays and sounds of the middle districts, and although like the preceding species, a few reach Florida, neither are ever found in the southern portion of the peninsula. The fine flavor which the flesh of these Ducks is said to possess, is probably due partly to the imagination of those who pay high prices for the privilege of eating it, but I must confess, however, that I never could see any difference between these birds, even when taken in the Chesapeake, and other Ducks; while those which I have obtained in Florida, have always been so dry and fishy, that they were utterly worthless. The Canvas-backs, in common with many others of the Bay Ducks, dive well, remaining under water for a long time. This species and the preceding are intimately associated throughout their entire distribution.

GENUS XI. BUCEPHALA. THE TREE DUCKS.

GEN. CH. *Bill*, shorter than head, very high at base, narrowing gradually toward tip and not flattened. *Neck*, short. *Marginal indentations*, closed.

The trachea is variable but the larynx of the male is expanded and provided with a bony frame-work. The stomach is very muscular. Sexes, not similar. There are three species within our limits.

BUCEPHALA CLANGULA.

Golden-eyed Duck.

Bucephala clangula COVES, Key; 1872, 290.

DESCRIPTION.

SP. CH. *Form*, robust. *Size*, large. *Trachea*, widely dilated in the center, where it is capable of expansion and contraction. *Bill*, long. *COLOR.* *Adult male.* Head, upper neck all around, and upper parts, black, glossed with green and violet. Round spot at base of bill, line through wing, and remainder of neck and under parts, white. Scapularies, lance-shaped, streaked and edged with white. *Tibia*, under wing coverts, and axillaries, brown. *Iris*, orange. *Bill*, black. *Feet*, yellow. *Adult female.* Similar, but the black is replaced by ash-brown which becomes grayish-white on neck below, and all the feathers are edged with whitish. *Young.* Resemble the adult female, but in males the round spot at the base of bill is sometimes faintly indicated.

OBSERVATIONS.

Known by the white circular spot at base of bill, lance-shaped scapularies, and greenish gloss on head. Distributed, in summer, from Northern New England, northward; wintering from Massachusetts, southward.

DIMENSIONS.

Average measurements of specimens from North America. Length, 20.00; stretch, 30.50; wing, 8.50; tail, 3.75; bill, 1.60; tarsus, 1.40. Longest specimen, 23.00; greatest extent of wing, 32.00; longest wing, 9.00; tail, 4.00; bill, 1.80; tarsus, 1.50. Shortest specimen, 18.75; smallest extent of wing, 29.00; shortest wing, 8.00; tail, 3.50; bill, 1.40; tarsus, 1.25.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in holes of trees, composed of grass, weeds, feathers, etc. *Eggs*, six to ten in number, spherical in form, and ashy-green in color. Dimensions from 1.75 x 2.35 to 1.80 x 2.40.

HABITS.

The Golden-eyes come to us late in autumn, remaining through the winter. They frequent the mouths of rivers which empty into the ocean, flying in to feed at low tide, then at high water, retreating into the bays, where, excepting during very severe storms, they pass the night. During winter, when the rivers are nearly always frozen over, these Ducks resort to the rifts, made in the ice by the eddying tide where the water is open. They are always shy birds, rising at the slightest indication of danger and flying out to sea, making as they go, a whistling noise with their wings, which is distinctly audible some distance, and which has given them the name of Whistle Wings among sportsmen. The Golden-eyed Ducks breed in Northern New England, nesting in holes of trees which stand along the borders of lakes and rivers.

BUCEPHALA ISLANDICA.

Barrow's Golden-eye.

Bucephala Islandica BAIRD, Birds N. A., 1858, 796.

DESCRIPTION.

SP. CH. Form, robust. Size, large. Larynx, dilated in center, where it is capable of extension and contraction. Bill, short. COLOR. *Adult male*. Head and upper neck all around, and upper parts, black glossed with violet. Triangular patch at base of upper mandible, line through wing, interrupted by a black band, lower neck, and under portion, white. Feathers of sides, tipped with black. Scapularies, rounded at tip, with a pointed projection on one or both sides, and a triangular spot on rounded tip is white. Axillaries, under wing coverts, and tibia, brown. Iris, orange, bill, black, and feet, yellow. *Adult female*. Brown above and on sides, darkest on head; white below. Otherwise similar to adult male.

OBSERVATIONS.

Known by the triangular patch at base of short bill and peculiar truncated scapularies. Distributed, in summer, in the far North; wintering from the Gulf of St. Lawrence to New York.

DIMENSIONS.

Average measurements of specimens. Length, 21.50; stretch, 31.50; wing, 9.00; tail, 3.75; bill, 1.45; tarsus, 1.50. Longest specimen, 22.00; greatest extent of wing, 33.00; longest wing, 9.50; tail, 4.00; bill, 1.50; tarsus, 1.60. Shortest specimen, 21.00; smallest extent of wing, 30.00; shortest wing, 8.50; tail, 3.50; bill, 1.40; tarsus, 1.40.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in holes of trees, composed of sticks, weeds, feathers, etc. *Eggs*, from six to ten in number, elliptical in form, ashy-green in color. Dimensions from 1.70 x 2.40 to 1.75 x 2.45.

HABITS.

Barrow's Golden-eye is an extremely rare bird on the coast; so rare, in fact, that I never met with a living specimen, but some are usually taken every season, for a few find their way into the Boston markets. Judging from published accounts, this species does not differ in habits from the preceding Duck.

BUCEPHALA ALBEOLA.

Buffle-head.

Bucephala albeola Bd., Birds N. A. 1858, 797.

DESCRIPTION.

SP. CH. Form, robust. Size, small. COLOR. *Adult male*. Head, upper neck and upper portions, black, becoming hoary on upper tail coverts, and glossed with green and violet on the two first. Triangular patch back of eye, broad line through wing, and under parts, white. Iris, brown, bill, black, feet, yellow. *Adult female*. Smoky brown above, becoming white below. There is a white patch on side of head and another small one on wing. *Young*. Similar to adult female but the white markings of the males are more extended.

HARLEQUIN DUCK.

OBSERVATIONS.

Known by the small size and white patch on side of head. Distributed, in summer, throughout Arctic America, wintering from Massachusetts, southward.

DIMENSIONS.

Average measurements of specimens from North America. Length, 14.00; stretch, 23.00; wing, 6.75; tail, 2.62; bill, 1.15; tarsus, 1.15. Longest specimen, 15.00; greatest extent of wing, 25.00; longest wing, 7.50; tail, 2.75; bill, 1.35; tarsus, 1.30. Shortest specimen, 12.95; smallest extent of wing, 21.05; shortest wing, 5.95; tail, 2.50; bill, 1.05; tarsus, 1.00.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in holes of trees, composed of weeds, grass, feathers, etc. Eggs, six to twelve in number, elliptical in form, and greenish-buff in color. Dimensions from 1.25 x 1.75 to 1.50 x 2.03.

HABITS.

The Buffle-heads are well known birds, both on the coast and in the waters of the interior, for they are abundant everywhere, especially in large rivers. They dive with great ease, slipping under water almost as readily and quickly as a Grebe, then will remain beneath the surface for a considerable time. The ease with which they disappear beneath this yielding element, has gained for them the name of Dippers and Spirit Ducks. They arrive from the North in October, pass to the south of us, and return in early spring on their way to their northern breeding grounds, where they nest, like other members of the genus, in trees.

GENUS XIII. HARELDA. THE SHORT-BILLED SEA DUCKS.

GEN. CH. *Bill, much shorter than head, rather high at base, rounded and somewhat pointed at tip. Marginal indentations, nearly, or quite, closed.*

The trachea is straight and without any special dilatation. The larynx in males is expanded and provided with a bony frame-work. Stomach, muscular. Sexes, not similar. There are two species within our limits.

HARELDA HISTRIONICA.

Harlequin Duck.

Anas histrionica LINN., Syst. Nat., I, 1758, 127.

DESCRIPTION.

SP. CH. Form, robust. Size, small. Color. *Adult male.* General color bluish-ash, palest on back and browner below. Patch on side of head and breast, roundish spot on side of occiput and neck, on middle wing coverts and on flanks, band on lower neck, tips of greater wing coverts, part of scapularies, and outer webs of tertiaries, white. Line behind eye and flanks, chestnut. Broad stripe on top of head, black. Speculum, purplish with violet reflections. Iris, brown, bill, greenish, and feet, bluish. *Adult female.* Ashy-brown throughout, mottled with ashy-white below, with a whitish spot in front of eye and one of pure white behind ear coverts. Wings and tail, brown. *Young.* Similar to the female, but the males show some markings of the adult.

OBSERVATIONS.

Known by the peculiar markings as described. Distributed in summer from the Gulf of St. Lawrence, northward, and in the Rocky Mountains; wintering from Massachusetts, northward, but rare south of this point.

DIMENSIONS.

Average measurements of specimens from North America. Length, 16.75; stretch, 25.50; wing, 6.50; tail, 3.25; bill, 1.63; tarsus, 1.35. Longest specimen, 17.50; greatest extent of wing, 27.00; longest wing, 8.00; tail, 3.50; bill, 1.75; tarsus, 1.50. Shortest specimen, 16.00; smallest extent of wing, 24.00; shortest wing, 7.00; tail, 2.95; bill, 1.50; tarsus, 1.25.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground near the water, composed of sticks, weeds, etc. Eggs, six to ten in number, elliptical in form, and greenish-yellow in color. Dimensions from 1.30 x 2.00 to 1.50 x 2.10.

HABITS.

The singularly marked, but beautiful, Harlequin Ducks occur on our coast as rare winter visitants, but are much more common further north, although they do not appear to be abundant anywhere at present. They were, however, quite common about Grand Menan, where they are called Lord and Lady Ducks, some years ago, and now some are taken there every season, but they are rapidly growing rare, even in that remote locality.

These birds breed on the borders of the rivers, and a sailor that I met on a coasting vessel, and who lived in Bay of Islands, Newfoundland, assured me that they bred in the vicinity of that port, as he had captured the downy young when on excursions in the interior of the island.

HARELDA GLACIALIS.

Long-tailed Duck.

Harelda glacialis "LEACH" Steph., Shaw's, Zool., XII, 1821, 175.

DESCRIPTION.

Sp. Ch. Form, rather robust. Size, quite large. Tail, very long, with middle feathers attenuated and pointed. COLOR. *Adult male in summer.* Head, neck, breast, upper parts, middle upper tail coverts and tail feathers, and under wing coverts, very dark-brown, darkest on back. Sides of head and body, bluish-ash. Patch behind eye, longitudinal streak on sides of occiput, under parts, and outer tail feathers, white. Feathers of upper back and scapularies, edged with chestnut. Iris, brown, bill, black, surrounded by a narrow ring of orange near tip, and feet, bluish. *In winter.* Head, neck, upper back, and breast, white with a patch of brown on sides of head below one of ashy. The top of head is creamy. Scapularies and tertiaries, ashy-blue. Otherwise as in summer. *Adult female.* Similar to the male, but lacks the long tail feathers, and the head and neck are dusky, with a whitish patch around eye and on side of neck behind.

OBSERVATIONS.

Easily recognized by the long tail and peculiar markings as described. Distributed in summer from Labrador, northward; wintering from Grand Menan to New Jersey.

DIMENSIONS.

Average measurements of specimens from North America. Length, 18.00; stretch, 28.12; wing, 8.70; tail, 5.25; bill, 1.15; tarsus, 1.25. Longest specimen, 21.10; greatest extent of wing, 30.25; longest wing, 9.15; tail, 7.50; bill, 1.30; tarsus, 1.42. Shortest specimen, 15.00; smallest extent of wing, 26.05; shortest wing, 7.95; tail, 3.05; bill, 1.05; tarsus, 1.12.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground in marshy places, composed of grass, weeds, etc., lined with down. *Eggs*, from six to ten in number, elliptical in form, and greenish-ash in color. Dimensions from 1.50 x 2.10 to 1.55 x 2.15.

HABITS.

The Long-tailed Ducks are fall and winter visitants to our coast. They are found off rocky shores, gathering about ledges to feed at low tide, then retreating to open water at full sea to rest. Very few of the Ducks have characteristic notes, but the present species forms a most decided exception to the rule, as any one can testify who has heard a drake Long-tail that has become separated from the flock, for like most Ducks, this species is gregarious, utter his cry. "*Ah-ah ah-er-lit*," he says, as distinctly as if spoken by a human being, but with an accent and tone so peculiar, that it must be heard in order to be appreciated. The notes are strong and loud, so loud, in fact, that other males feeding with the flock near the rocky cliffs, some distance away, hear and respond with "*er-lit ah-er-lit*." Then the straggler alighting with them, emits a few contented *ah-ahs*, while every Duck welcomes him with a like note, after which they vociferate together for some time, just as though they were gossiping, and this habit has caused them to receive the appellation of Old Squaws from gunners. The Long-tails depart in early spring, arriving on their breeding grounds in Labrador and northward as soon as the ice has left the rivers.

GENUS XIV. SOMATERIA. THE SEA DUCKS.

GEN. CH. *Bill*, about as long as head, rather high, more or less swollen at base, tapering gradually toward tip and not flattened. *Neck*, short. *Marginal indentations*, open.

The trachea is without special dilatation but the larynx of the male is expanded and provided with a bony framework. The stomach is very muscular. Sexes, not similar. There are three species within our limits.

SOMATERIA LABRADORIA.

Labrador Duck.

Anas Labradoria Gm., Syst. Nat., I, 1788, 557.

DESCRIPTION.

Sp. Ch. Form, robust. Size, medium. Bill, not much swollen at base. Color. *Adult male.* Elongated patch on

top of head and nape, ring around lower neck, broadening out on back from which proceeds a longitudinal band, becoming wider on back and rump, and under parts, black. Head, neck, transverse patch below black ring, sides of throat, scapularies which are tinged with bluish, and wings, excepting primaries which are plumbeous-black, white. Bill, bluish tipped with black, iris, reddish-brown, and feet, blue. *Adult female*. Ashy-gray throughout, becoming darker below, and the tertiaries are hoary, while the inner secondaries are margined internally with black.

OBSERVATIONS.

Known by the prominent black and white colors as described. Formally distributed in winter from New Jersey, northward, and bred in the far North. At present, very rare everywhere.

DIMENSIONS.

Average measurements of specimens from North America. Length, 22.00; stretch, 29.50; wing, 9.05; tail, 3.65; bill, 1.65; tarsus, 1.55. Longest specimen, 23.75; greatest extent of wing, 30.00; longest wing, 9.25; tail, 3.75; bill, 1.75; tarsus, 1.60. Shortest specimen, 20.00; smallest extent of wing, 29.30; shortest wing, 8.80; tail, 3.50; bill, 1.50; tarsus, 1.50.

HABITS.

The Labrador Duck has, within the last fifteen or twenty years, become so rare as to be considered nearly extinct. I saw a Duck in Plumb Island River, some five or six winters ago, which I was confident was this species, but was unable to procure it; and I never saw another, nor can I learn that any have been taken on our coast of late years. I hear upon good authority, however, that one was procured at Grand Menan, three years since, in winter. This latter named locality appears to have been the strong-hold of the species in the not very distant past, and numbers have been secured there. In habit, this Duck resembles other Sea Ducks, feeding largely upon mollusks which are procured by diving. At present, the Labrador Duck is a great desideratum in collections, there being but few specimens in the country.

SOMATERIA MOLISSIMA.

Eider Duck.

Somateria molissima LEACH, Flemming, Philos., Zool., 1822.

DESCRIPTION.

Sp. Cu. Form, robust. Size, large. Bill, slightly swollen at base and fleshy covering projects backward on either side. Tertiaries, curved outward. COLOR. *Adult male*. Head and neck all around, upper breast, and entire upper surface, white. Narrow margin at base of bill, forehead, and line through eye to nape, black, while the white behind and below the line, is glossed with emerald green. Beneath, black with the axillaries white. Primaries, very dark-brown. The white beneath and on the wings is overwashed with creamy. Bill and feet, greenish, iris, brown.

Adult female. Reddish-brown throughout, transversely banded everywhere, excepting on wings, with dark-brown. Tertiaries, tipped with white. *Young*. Similar to adult female.

OBSERVATIONS.

Known by the peculiar fleshy process projecting backward at base of bill, large size, and colors as described. Distributed in summer from Grand Menan, northward; wintering from New Jersey, northward.

DIMENSIONS.

Average measurements of specimens from Eastern North America. Length, 25.00; stretch, 40.50; wing, 11.49; tail, 4.25; bill, 2.40; tarsus, 1.62. Longest specimen, 26.25; greatest extent of wing, 42.00; longest wing, 11.50; tail, 4.50; bill, 2.50; tarsus, 1.75. Shortest specimen, 21.00; smallest extent of wing, 39.00; shortest wing, 11.25; tail, 4.00; bill, 2.25; tarsus, 1.50.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground near water, composed of sticks, weeds, down, etc. *Eggs*, six to ten in number, elliptical in form, and ashy-green in color. Dimensions from 1.98 x 2.82 to 2.10 x 3.20.

HABITS.

The well known Eider Ducks are found off our coast in winter in considerable numbers, especially in the waters of the sounds on the southern shore of Massachusetts. They feed principally upon mollusks, and being quite large birds, swallow good sized bivalves, several species of which I have frequently taken from their stomachs. I found these birds

breeding on some small islands off the coast of Grand Menan, late in June, but the eggs deposited then, were the second litter, the first being laid much earlier. The nests were placed among some loose boulders, a short distance above high water mark, and did not contain any more of the famous down than I have found in the nests of Black or other Ducks, but this may be partly accounted for, by the fact that they contained the second litter, and partly by the southern latitude, where the eggs would not require as warm a covering as further North.

SOMATERIA SPECTABILIS.

King Eider.

Somateria spectabilis LEACH., Fleming, Philos. Zool.; 1822.

DESCRIPTION.

SP. CH. Form, robust. Size, large. Bill, considerably swollen at base, and the fleshy covering projects backward on either side. Tertiaries, well curved outward. Color. *Adult male.* Top of head and nape, bluish-ash. Sides of head, pale bluish-green. Lower back and wings, very dark-brown glossed with greenish on secondaries. Throat, neck and around, and patch on wing and flanks, white, the first tinged with creamy. Narrow margin at base of bill, small space around eye, V-shaped mark on chin, and under portion, black, excepting the axillaries and middle under tail coverts which are white. Bill, pinkish, orange at base, iris, yellow, feet, dusky-orange. *Adult female.* General color yellowish-ash, becoming darker below, banded with dark-brown.

OBSERVATIONS.

Known by the swollen base of bill which gives the head a peculiar appearance, and colors as described. Distributed, in summer, from Labrador, northward, coming as far south as Massachusetts in winter, but very rare below Grand Menan.

DIMENSIONS.

Average measurements of specimens. Length, 22.50; stretch, 41.00; wing, 10.65; tail, 3.40; bill, 1.33; tarsus, 1.75. Longest specimen, 25.00; greatest extent of wing, 42.00; longest wing, 11.25; tail, 3.75; bill, 1.40; tarsus, 1.85. Shortest specimen, 20.00; smallest extent of wing, 40.00; shortest wing, 10.00; tail, 3.00; bill, 1.25; tarsus, 1.65.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground near the water, composed of sticks, lined with down. *Eggs*, from six to ten in number, elliptical in form, dirty green in color. Dimensions from 1.75 x 2.60 to 1.80 x 2.65.

HABITS.

The King Eiders are one of the rarest Sea Ducks which occur on our New England shores and they only appear in winter. They are, however, not uncommon about Grand Menan and I was informed by the inhabitants of the Magdalen Islands, that the King Ducks, as they were termed, were very common there in winter, and so tame that they could be killed with sticks. This species has similar habits to those of the preceding.

GENUS XV. ŒDEMA. THE BLACK SEA DUCKS.

GEN. CH. Bill, shorter than head, rather high and swollen at base, and somewhat rounded at tip. Marginal indentations, open.

The trachea is straight and without any special dilatation. The larynx in males is expanded and provided with a bony frame-work. Colors, black. Stomach, muscular. Sexes, not similar. There are three species within our limits.

ŒDEMA AMERICANA.

Scoter.

Œdemia Americana Sw., F. Bor. Am., II, 1832, 450.

DESCRIPTION.

SP. CH. Form, robust. Size, medium. Bill, rather short. Color. *Adult male.* Black throughout. Iris, brown, feet, greenish, and bill, black, orange on swollen portion. *Adult female.* Brown throughout, paler on sides of head and below where there are obscure spots of dusky. *Young.* Similar to the adult female.

OBSERVATIONS.

Known by the absence of any white and short bill with yellow base. Distributed in summer from Labrador, northward; wintering from Grand Menan to the Carolinas.

DIMENSIONS.

Average measurements of specimens from North America. Length, 19.25; stretch, 31.25; wing, 9.38; tail, 3.50; bill, 1.75; tarsus, 1.75. Longest specimen, 21.50; greatest extent of wing, 33.50; longest wing, 9.75; tail, 4.00; bill, 1.90; tarsus, 1.80. Shortest specimen, 17.00; smallest extent of wing, 29.00; shortest wing, 9.00; tail, 3.00; bill, 1.60; tarsus, 1.70.

DESCRIPTION OF NESTS AND EGGS

Nests, placed on the ground near the water, composed of sticks, weeds, down, etc. *Eggs*, six to ten in number rather oval in form, and pale yellowish in color. Dimensions from 1.60 x 2.00 to 1.65 x 2.05.

HABITS.

The Scoters are quite common on our coast in autumn and winter but are rather more abundant further south, and I saw large flocks of this species in the sounds and bays from New Jersey, southward, and also found them off the coast during calm weather. When a storm was approaching, however, they would all fly shoreward and take shelter in land-locked waters; thus a flight of Ducks to the westward always indicated bad weather. When in the Gulf of St. Lawrence, in July, I noticed great numbers of Scoters off the eastern side of the Magdalens, but these were mainly immature birds, the males being in the mixed dress between the young and adult, which often characterizes Ducks of the second year, so I judged that they were not breeding; in fact, those which I procured did not exhibit any indication of it.

CEDEmia PERSPICILLATA.

Surf Duck.

Anas perspicillata LINN., Syst. Nat., I, 1766, 201.

DESCRIPTION.

Sp. Cu. Form, robust. Size, large. Bill, very long. COLOR. *Adult male*. Black throughout, glossed with bluish, with a triangular white patch on top of head, and another on nape, the apex of each pointing in opposite directions. Iris, yellowish-white, feet, reddish-orange, bill, with square black patch at base of the upper mandible, margined with reddish-orange, in front of which is a bluish-white spot which is followed by reddish-orange that becomes dusky toward tip. Lower mandible, pinkish. *Adult female*. Brown throughout, darkest above, with patch at base of bill and on side of head, narrow line on ear coverts, and anterior portions, whitish. Bill, black. *Young*. Similar to adult female.

OBSERVATIONS.

Known in the adult stages by the two triangular patches on head, while the female and young may be distinguished by the long bill and absence of any decided white markings. Distributed in summer from Labrador, northward, wintering from Massachusetts to the Carolinas.

DIMENSIONS.

Average measurements of specimens from North America. Length, 19.50; stretch, 31.75; wing, 9.65; tail, 3.27; bill, 1.63; tarsus, 1.65. Longest specimen, 21.00; greatest extent of wing, 32.50; longest wing, 9.80; tail, 3.55; bill, 1.75; tarsus, 1.80. Shortest specimen, 18.00; smallest extent of wing, 31.00; shortest wing, 9.50; tail, 3.00; bill, 1.50; tarsus, 1.50.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground near water, composed of weeds, grass, feathers, etc. *Eggs*, six to twelve in number, elliptical in form, and greenish-buff in color. Dimensions from 1.60 x 2.25 to 1.65 x 2.30.

HABITS.

These Surf Ducks are also quite abundant off the coast and are, in common with the preceding and following species, termed Coots by gunners. All three species have the habit, shared with many other Ducks, of flying into the mouths of rivers in order to feed at low tide, then retreating to the open water to roost; and they will remain at sea all night, sitting in compact flocks. If, however, an easterly storm of long continuance occur, they will enter the land-locked waters for shelter, but the waves must run quite high before they are obliged to retreat; in fact, I have often seen them ride out a storm, when the breakers were lashed into foam by the driving wind and every billow had assumed a white cap. Then, when one of the great waves came sweeping on, they would float buoyantly upward, and, as it broke, would bow before it and emerge in safety behind the wall of seething water.

CEDEMIA FUSCA.

Velvet Duck.

Cedemia fusca Sw., F. Br. Am, II: 1831, 119.

DESCRIPTION.

Sr. Cu. Form, robust. Size, very large. Bill, long. Color. *Adult male.* Black throughout, with an elongated patch around eye and large speculum, white. Bill, red, black at base and on edges, iris, yellow, and feet, reddish-brown. *Adult female.* Brown throughout, darkest on back. Circular space at base of bill, elongated patch back of ear, and under parts, whitish, the latter mottled with dusky. Speculum, white. Bill, black. *Young.* Similar to adult female.

OBSERVATIONS.

Known by the dark colors and white speculum. Distributed in summer from Labrador, northward; wintering from Massachusetts to the Carolinas.

DIMENSIONS.

Average measurements of specimens from Eastern North America. Length, 20.68; stretch, 37.00; wing, 11.00, tail, 3.42; bill, 1.18; tarsus, 1.70. Longest specimen, 21.60; greatest extent of wing, 38.75; longest wing, 11.50; tail, 3.60; bill, 1.55; tarsus, 1.99. Shortest specimen, 19.75; smallest extent of wing, 35.25; shortest wing, 10.50; tail, 3.25; bill, 1.40; tarsus, 1.59.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground near the water, composed of sticks, weeds, down, etc. *Eggs*, six to ten in number, oval in form, and dirty-creamy in color. Dimensions from 1.80 x 2.60 to 1.85 x 2.65.

HABITS.

Among the most abundant of the order on our coast, are the Velvet Ducks, or White-winged Coots as they are called by sportsmen. They are much hunted, more for the excitement of the sport, however, than because of their value, for as they are nearly worthless for culinary purposes, the prices which they bring in the markets, will scarcely pay for the ammunition expended in killing them. As related, these birds fly into the mouths of rivers to feed and the gunners taking advantage of this fact, range themselves along the channel in the mouth of some stream, in boats, in order to shoot the birds as they fly past. This pastime, although exciting, especially when the birds fly thick, is not unattended with some risk to life, for as the men are obliged to pull up the anchor and row after the birds that fall, there is danger of being swept out to sea with the swiftly flowing, out-going tide which, at the mouths of some of our rivers, rushes seaward with a force, against which the powers of man often prove unequal, especially when a strong wind is blowing with the current. I have witnessed some hair-breadth escapes and was once fortunate enough to pick up a man who had lost control of his skiff, just as he was being swept into the breakers. Then, although we had only gone about two hundred yards from our anchorage to accomplish this, three of us were obliged to labor at the oars for two hours, before we regained the lost ground.

GENUS XVI. ERISMATURA. THE STIFF-TAILED DUCKS.

GEN. Cu. *Bill*, shorter than head, rather high at base, broad at tip, and slightly bent upward. *Tail*, stiffened, with coverts, short. *Neck*, short.

The trachea is slightly dilated near the middle but the larynx is without special expansion. The stomach is muscular. Sexes, not similar. There is but one species within our limits.

ERISMATURA RUBIDA.

Ruddy Duck.

Erismatura rubida Bon. List, 1838.

DESCRIPTION.

Sr. Cu. Form, rather robust. Size, not large. Top of head and nape, black. Sides of head below eyes and chin, white. Neck all around, upper parts, and flanks, chestnut-red. Beneath, grayish-white, tinged with brown and transversely banded with dusky. Wings and tail, dark-brown. Bill and feet, ash-blue, and iris, brown.

Adult female and winter male. Upper surface, dark reddish-brown, finely spotted and marked with wavy lines of dusky; throat, and line at base of bill, whitish. Otherwise as in male. *Young.* Similar, but paler.

OBSERVATIONS.

Known by the peculiar stiff tail feathers and short coverts. Distributed in summer from Massachusetts, northward, wintering in the South.

DIMENSIONS.

Average measurements of specimens from North America. Length, 15.10; stretch, 23.25; wing, 5.75; tail, 2.98; bill, 1.40; tarsus, 1.75. Longest specimen, 16.00; greatest extent of wing, 24.00; longest wing, 6.10; tail, 3.35; bill, 1.50; tarsus, 2.00. Shortest specimen, 14.20; smallest extent of wing, 22.50; shortest wing, 5.40; tail, 2.60; bill, 1.30; tarsus, 1.50.

HABITS.

On the marshes of Indian River, are little ponds, as I have before mentioned, varying from ten to fifty yards in diameter, and many Ducks gathered in them to feed, but by far the most common among them, was the little Ruddy. These birds were not only the most abundant but were also much tamer than any other; indeed, it was difficult to force a flock to leave a particular pond, even when shot at, as the survivors would merely rise, circle about a moment, and then settle down again. They are exceedingly difficult to kill, being very tenacious of life, and when wounded, dive with the greatest ease, remaining under water for a long time or, like other Ducks, will emerge in the overhanging grass on the edge of the water, into which they creep for shelter. I found the Ruddy Ducks also very common in Chesapeake Bay and they are not uncommon further north, in New England. Mr. Ruthven Deane received some young which were unable to fly, from Cape Cod some years since, thus it is probable that a few breed within the State, but the majority pass northward to deposit their eggs. I have always found these birds very fat and, contrary to the rule with other Ducks, when capture in Florida, proved excellent eating.

GENUS XVII. MERGUS. THE TOOTH-BILLED DUCKS.

GEN. CH. *Bill, longer than head, very slender, and furnished with horny lamellæ which point backward. Neck, quite long.*

Trachea, flattened and dilated in the middle, while the larynx of males is widely expanded and provided with a bony frame-work. Head, more or less crested. Sexes, not similar. There are three species within our limits.

MERGUS MERGANSER.

Merganser.

Mergus merganser LINN., Syst. Nat., I; 1766.

DESCRIPTION.

SP. CH. Form, robust. Size, very large. COLOR. *Adult male.* Head and upper neck all around, anterior back, scapulars and tertiaries, black, glossed with green on first two and with purplish on the three last. Remainder of back, upper tail coverts, and rump, bluish-ash, the last finely banded with white. Primaries and tail, dark-brown, with the latter hoary. Secondaries, greater wing coverts, lower neck and entire under parts, white, tinged with creamy on the two first and with deep salmon on the last. Upper secondaries, grayish at tip which becomes black on outer edges, while there is a black band on the white of wing. Iris, red, bill and feet, reddish-orange. *Adult female.* Head and upper neck, reddish-brown. Remainder of upper parts, breast, sides, and flanks, bluish-ash with the feathers, especially of breast, edged with whitish. Throat, patch on wing, and under parts not described, white, tinged with salmon. *Young,* similar to female.

OBSERVATIONS.

Easily recognized by the large size, white breast, and green gloss on head; the female by the deep red head and neck, while the line of demarkation between this color and remainder of body is sharply defined. Distributed, in summer, from Pennsylvania, northward; wintering in the South.

DIMENSIONS.

Average measurements of specimens from North America. Length, 23.75; stretch, 35.50; wing, 10.35; tail, 4.73; bill, 1.95; tarsus, 1.78. Longest specimen, 26.50; greatest extent of wing, 38.00; longest wing, 11.50; tail, 4.85; bill, 2.10; tarsus, 1.85. Shortest specimen, 21.00; smallest extent of wing, 33.00; shortest wing, 9.70; tail, 4.60; bill, 1.80; tarsus, 1.70.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in holes of trees, composed of grass, weeds, feathers, etc. *Eggs,* six to ten in number, oval in form and pale-buff in color. Dimensions from 1.80 x 2.80 to 1.70 x 2.50.

HABITS.

The Mergansers, or Shell-drakes, are more common in inland waters at all seasons

than elsewhere, and breed in holes of trees. I have never been fortunate enough to find one of their nests but observed the downy young following their parents, in the Susquehanna River late in June. A week or two after, I came upon two broods in the same stream and succeeded in securing several specimens, but the task was not easily accomplished, for although I was provided with a boat and accompanied by an assistant, the birds which were but about a quarter grown, managed to elude us for a long time. The adult female was present and always kept herself between us and her young which not only swam exceedingly fast but also dived with ease, remaining under water for some time; then if hard pushed, would raise their wings and flap along the water after the manner practiced by domestic Ducks under similar circumstances.

MERGUS SERRATOR.

Red-breasted Merganser.

Mergus serrator LINN., Syst. Nat., I, 1766, 208.

DESCRIPTION.

SP. CH. Form, rather slender. Size, medium. Occipital feathers, lanceolate and elongated. COLOR. *Adult male.* Head and upper neck all around, black, glossed with greenish. Lower neck, white. Above, and on sides and flanks, black with the two last and posterior portion above, finely banded with white. Greater wing coverts, secondaries, outer scapularies, and under parts not described, white, the last tinged with creamy. Two bands across white of wings and outer margin of upper secondaries, black. Iris, red, bill and feet, reddish-orange. *Adult female.* Head and upper neck all around, reddish-brown, becoming dusky on crown. Upper portions, sides, and flanks, bluish-ash, with edges of feathers, lighter. Wings, brown, with secondaries and greater coverts, white, banded with brown. White beneath, tinged with dusky on the breast. *Young.* Similar to adult female. *Nestlings.* Brown above, becoming reddish on head, and marked with patches of white; and there is a white line passing through eye. Beneath, white.

OBSERVATIONS.

Known in the adult stages by the reddish breast and small size, and the female may be distinguished by the indistinct line of demarkation between the color of lower neck and remainder of body. Nestlings of this and following species, are indistinguishable. Distributed, in summer, from Gulf of St. Lawrence, northward, wintering from Massachusetts, southward.

DIMENSIONS.

Average measurements of specimens from North America. Length, 21.63; stretch, 32.25; wing, 8.85; tail, 3.95; bill, 2.21; tarsus, 1.70. Longest specimen, 23.25; greatest extent of wing, 33.00; longest wing, 9.13; tail, 4.10; bill, 2.21; tarsus, 1.80. Shortest specimen, 20.00; smallest extent of wing, 31.00; shortest wing, 8.60; tail, 3.80; bill, 2.18; tarsus, 1.66.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground near water, composed of weeds, grass, feathers, etc. *Eggs*, six to twelve in number, oval in form, and greenish-brown in color. Dimensions from 1.70 x 2.50 to 1.75 x 2.60.

HABITS.

I found the Red-breasted Mergansers breeding on the Magdalen Islands about the middle of June, 1872. The nests were placed beneath the overhanging branches of some dwarfed spruces, about fifteen or twenty yards from some small ponds of fresh water which were, however, at no great distance from the shore. The trees were only about four feet high, flat in form, with the branches long, and as the lowest were but a foot from the ground, the birds were completely concealed. They also sit closely, not rising until nearly trodden upon, and therefore their eggs were not easy to find. When disturbed, the female would fly silently away, and I did not see the males at all; but a few weeks later, when the downy young were swimming in the neighboring ponds, both parent birds were present and exhibited considerable solicitude, flying distractedly about, often coming within a few yards of me. The Red-breasted Mergansers migrate southward in November, when they are abundant on our coast, feeding at such times, along the shores, and they are es-

pecially fond of swift tide-ways, where they display considerable agility in capturing small fishes, which constitute the principle portion of their food.

MERGUS CUCULLATUS.

Hooded Merganser.

Mergus cucullatus LINN., Syst. Nat., 1, 1766, 207.

DESCRIPTION.

SP. CH. Form, rather slender. Size, small. Head, provided with long hood or crest. COLOR. *Adult male.* Head and neck all around and upper parts, encroaching in a collar on lower neck, black with violet reflections on all but wings and tail which are brownish. Sides and flanks, chestnut-red finely banded with black. Remainder of under parts, triangular patch on side of head and crest, central stripe on tertiaries, outer margin of secondaries, and tips of greater wing coverts, white. Iris, orange, bill, black, and feet, dusky-orange. *Adult female.* Brown on head, neck, sides, and upper portions, and white beneath. *Young.* Similar to the adult female.

OBSERVATIONS.

Known by the peculiar crest and colors as described. Distributed in summer in suitable localities from Florida northward; wintering in the South.

DIMENSIONS.

Average measurements of specimens from North America. Length, 18.25; stretch, 26.50; wing, 7.20; tail, 3.98; bill, 1.60; tarsus, 1.30. Longest specimen, 19.25; greatest extent of wing, 27.50; longest wing, 7.90; tail, 4.55; bill, 1.70; tarsus, 1.10. Shortest specimen, 17.25; smallest extent of wing, 25.50; shortest wing, 6.50; tail, 3.40; bill, 1.50; tarsus, 1.20.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in holes of trees, composed of sticks, weeds, down, etc. *Eggs*, six to ten in number, rather spherical in form, and white in color. Dimensions from 1.70 x 2.10 to 1.75 x 2.15.

HABITS.

There are, perhaps, few Ducks which are more noticeable on the water than the Hooded Mergansers, especially when excited enough to raise the prominent crest, for when they are at rest or feeding, these feathers are laid flat. Like all members of the genus, they dive exceedingly well and swim under the water with ease. I found these fine Mergansers abundant on Indian River, Florida, in winter, and also on the St. John's, late in May, and thus concluded that they bred in the State, a hypothesis which was confirmed by Mr. Brewster who informs me that he saw the young there in company with their parents; hence it is probable that they breed throughout our eastern section in favorable localities, from Florida, northward, but their favorite nesting site appears to be the woods of Northern New England, where the eggs are placed in holes of trees.

NOTES ON THE SCARLET FLAMINGO, *PHOENICOPTERUS RUIER*. YOUNG. Brown throughout, with only a trace of scarlet, then as the bird grows older, after each successive moult, the scarlet plumage is gradually assumed, appearing on the neck and body first, then on the wings, which frequently have the central portions of the feathers of the upper coverts occupied by oval spots of brown, even after the remainder of the dress has become changed to scarlet.

Tongue, remarkably thick, being composed of soft fatty tissues, and lies in the cavity of the lower mandible. In form it is singular; the tip is pointed, and is provided above with a hardened skin for 1.75 of its terminal portion (see Fig 22, a). The main portion is rounded, and following the hardened tip are two rows, about twenty to a row, of hardened semi-cartilaginous spines, which stand more or less erect, but curve

FIG- 22.

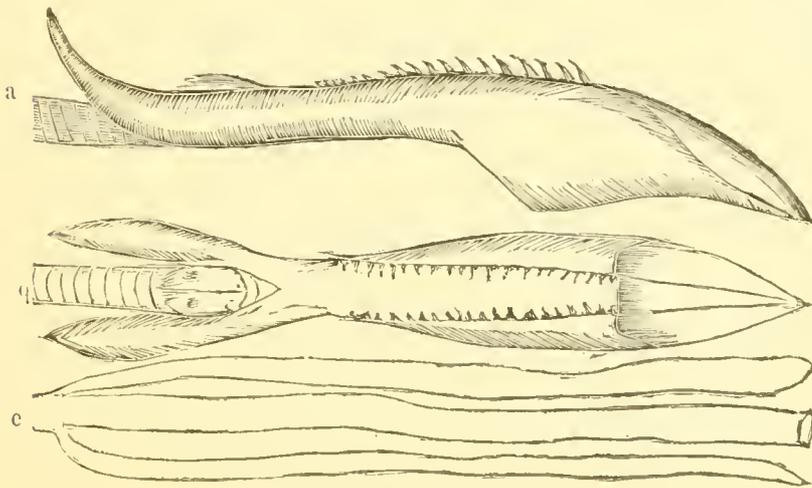
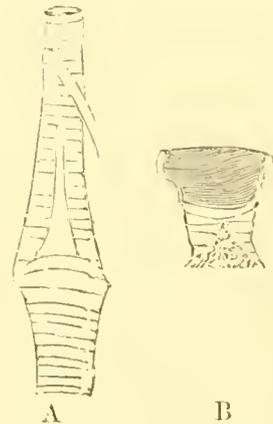


FIG. 24.



Tongue of Flamingo two thirds life size; a, side ; b, top ; c, cœca, life size. A, inferior larynx B, bronchial tube, of Flamingo, both life size.

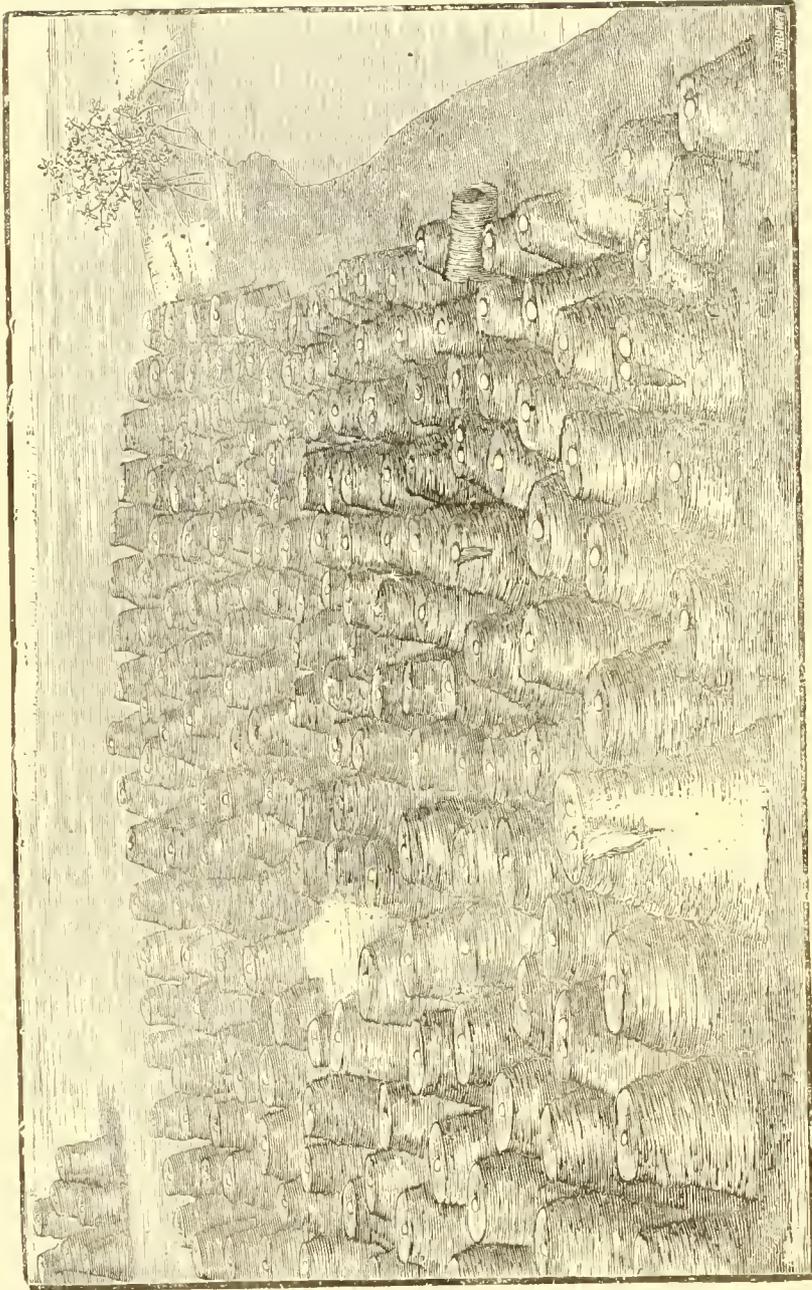
backward. The tongue narrows toward the base so rapidly that the last spines terminate on either margin. Beneath it gradually enlarges for 2.00 of its length, to about .85 deep by .75 wide, then abruptly narrows to .60 in diameter. The entire tongue, including hyoid bones, measures about 6.00 in length, and is about .35 in its narrowest portion.

The superior larynx does not differ greatly from that of most of the geese. The trachea is straight, without dilatation, and is 22.50 long. The sterno-trachealis is well developed and has the usual sternal attachment. There is a single strip of a bronchialis (see Fig. 24, A). The bronchial tubes are very short-1.00 long, with about six half rings, and the vibrating surface of the tympaniforms occupies only about .50 of the upper portion. There is no os transversale, consequently no semiluna membrane, hence the loud sonorous cries of the Flamingo are produced by the comparatively small tympaniforms, aided, doubtlessly, by the great length of trachea.

The heart is of a long, pointed oval form, 1.00 by 2.00. The right lobe of the liver greatly exceeds that of the left in size, and the gall sack is greatly developed.

The oesophagus is straight, without special dilatation, measuring 24.00 to the proventriculus, which is provided with simple, elliptical glands arranged in a zonular band, 1.25 wide. Stomach, rather elliptical in form, 1.20 by 1.65 by 1.10, with quite muscular walls .90 thick; internal membrane, hard and rugose. The intestines are small and long, measuring 9 feet and 9 inches to the cœca, which are 4.00 long and without any special dilatation (see Fig. 22, c). The food of the Flamingo consists largely of a small species of mollusk; a gasteropod of the genus *Cerithium*, that inhabits the shallow waters of the lakes and lagoons of the salinas.

FIG. 25.



Flamingo rookery found on the west coast of Andros, May 14, 1884.

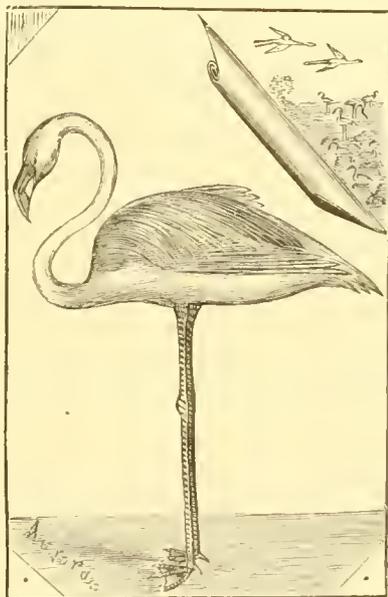
Although, as stated under Habits, the Flamingoes occasionally resort to ponds of brackish water to drink, I think that, as a rule, they drink pure salt water: I judge this to be a fact, inasmuch as our pet Flamingo Aurora, could never be induced to take any thing else.

The foregoing description of the internal organs, was made from the dissection of a female, obtained on the island of Inagua, Feb. 4th., 1888.

HABITS.

There was, perhaps, no bird which I was more anxious to see in its native wilds, than the Flamingo. This was more particular the case as I had heard, even from the natives of the Bahamas, such widely varying accounts of the habits, to say nothing of the published descriptions of this bird. It was therefore with peculiar sensation of one who has arrived very near the consummation of some long cherished scheme, that I found myself on the afternoon of May 12 1884 in a vessel in which I was absolute master for a time, which was lying at anchor off a little creek that enters Middle Bight, Andros, from the northward. The scene was peculiar and thoroughly characteristic of the home of the Bahama Flamingoes, wherever I have found them.

FIG. 26.



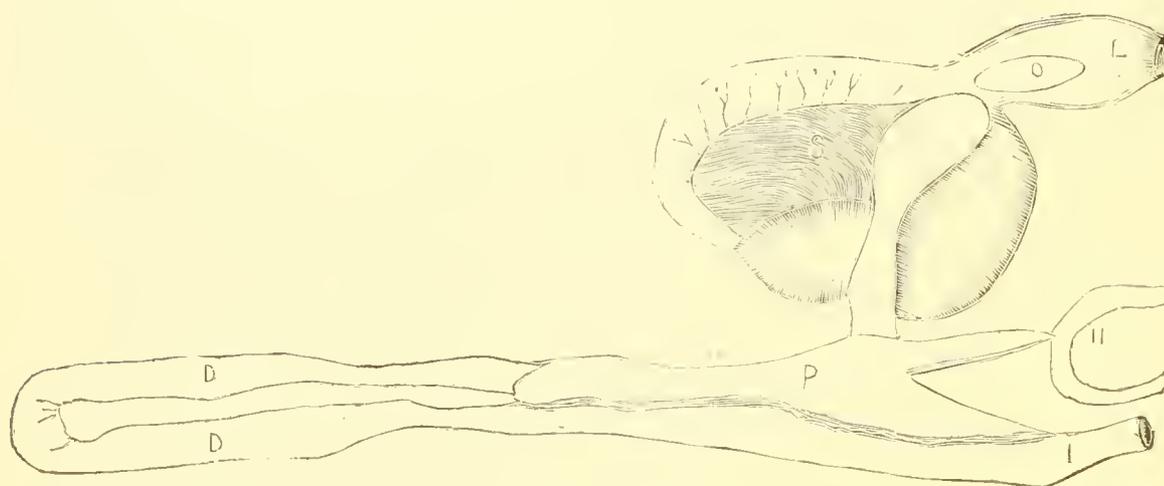
Tamed Flamingo, Aurora.

The water in which our small craft was lying was barely deep enough to float her, although we were anchored half a mile from shore. From this point the bottom, which was composed of soft whitish mud, sloped gradually to the clayey banks; then the light colored, level marl flats extended for miles north and south; terminating on the west in the coast line of the island some two miles distant, and eastward by a long line of piney woods looking blue and indistinct in the distance.

Immediately after anchoring we entered our flat-bottomed bateau, and taking one man to propel the boat, pushed out into the winding creek. The water here was a few inches deep only and, on account of the whitish colored mud at the bottom, was a light pea green in color. This, together with the white, unprotected marly surface of the land, formed a medium from which the sun was reflected with such dazzling brightness as to be very oppressive to the eyes, while the heat was intense.

Our first stopping place was a mangrove bush which enlivened the dreary waste of whiteness with its dark green foliage, in order to procure some mottled specimens of the Reddish Egret, and while here caught sight of my first living Flamingo. I was placing my newly obtained herons in the boat, when, glancing northward, I saw four red birds

FIG. 27.



Stomach, duodenum, etc. of a Flamingo. L, proventriculus; S, stomach; O, spleen; D, D, duodenum; P, pancreas; II, section of small intestine to which a point of the pancreas adheres, an unusual occurrence among birds; I, intestine. From a female taken on Inagua, Feb., 4th., 1888. Life size.

flying toward us, but very far off. We instantly concealed ourselves and anxiously watched the approach of the scarlet strangers. They were flying in a straight line, one behind the other, and were headed toward a point on the flats slightly to the eastward of us. On they came until they were nearly abreast of us when they lowered their long legs, raised their necks, and came down in the shallow water of a little bay about four hundred yards away. Here they began to walk slowly up toward the head of the bay, occasionally stopping to arrange their feathers or to probe on the bottom by bending the head forward and downward. My efforts to stop these birds proved unsuccessful, for, as they neared the middle of the bay, they became alarmed at something, and seeing that they were about to fly, I gave them a charge of large shot, which, as they must have been two hundred yards away, only had the effect of making them run a few paces,

spread their wings, and depart as they came, but this time honking most sonorously as if remonstrating with me for invading their hitherto undisturbed territory.

Later that evening we saw several other flamingos, and next morning encountered a flock of some thirty or forty, in a shallow lagoon some five miles from the vessel. We succeeded in getting within two hundred yards of these, when they began to flap their wings and to pace along through the water, spreading out into a long line. Alarmed at our near approach, they too spread their wings, formed a line in the air, and vociferating loudly, departed in a northwesterly direction.

All that day we searched the flats for the breeding ground of the Flamingos, but without success, although we did succeed in finding two nesting places of previous seasons, but none that were occupied. Noting, however, that the general course of the Flamingos seen had been northward, I concluded to search the west coast of Andros in that direction.

The morning of May 14th, found us well on our way, winding in and out among the dangerous mud banks that abound on this coast. We had landed at one or two places where Flamingos occurred, but had been disappointed in not finding the nesting place. Several times I had climbed to the mast head to look out over the wide marly plane that was intersected by a net work of lagoons and creeks, hoping to see an assembly of scarlet birds that I knew must indicate the presence of a rookery, but at length, through constant disappointment, was beginning to loose faith in ever finding the desired breeding place on Andros.

Our captain and pilot were anxious about keeping the vessel in such an exposed situation, and upon consultation, I concluded to push ahead for Wide Opening, a place that offered a secure anchorage for the night. I was sitting on deck idly looking over the side of the vessel at the familiar objects, seen so clearly through the pelueid waters, but without regarding them much, when I heard our pilot, who was on the lookout at the mast head, exclaim, "We don't go to Wide Opening today, massa!" My first idea, upon hearing this, was that the vessel had entered some eul-de-sac in the banks, from which the wind was unfavorable to extricate her.

With this idea in mind, my first glance fell upon the water ahead, in search of the light green spots that indicate shoals. As none were to be seen extensive enough to cause alarm, my next look was upward, into the dark face of our faithful pilot, when I saw by the expression on his countenance that obstructions from mud banks was far from his mind.

Springing into the shrouds, as the ereole descended, I was soon aloft looking to the eastward. There, far in the interior, I could see a low, extended, ruddy line, like a brilliant, crimson sunset cloud resting on the level land.

* * * * *

An hour later we stood within three hundred yards of five thousand Flamingos. We were drenched to the skin and covered with marl, having had to wade three creeks in which the mud and water were arm-pit deep; but what did that matter! Minor af-

fairs were forgotten in the magnificent spectacle before us. The immense flock of huge crimson birds being alarmed began to raise their wings, flap them, and honk hoarsely. Here we paused for a moment's consultation, then leaving Mrs. Maynard (who had bravely kept up with us) to hold back Spottie, the dog, I pushed rapidly forward, followed by my negro guide. There was not a single bush to shelter us, so we were in open sight of the birds, and when we got within about two hundred yards of them, they began to pour out of the rookery, running out from among the nests in two wide columns, one to the right and one to the left of us, for we came up directly in the center of the nesting. When each bird, as it came out, had acquired sufficient impetus by running a short distance with wings half raised, it spread its long pinions fully, moved them rapidly a few times, and thus launched upward into the air. The movement of so many black-tipped wings in contrast with the scarlet bodies, long necks, and peculiarly formed heads, resembled rapidly whirling wheels. Each Flamingo was now trumpeting with the utmost power of its lungs, and the sound, added to the rush of so many wings produced an almost deafening uproar. This, together with the sight of so many large birds, excited my negro almost to frenzy. Before leaving his house, he had armed himself with an old-fashioned musket, which he had charged with nearly a quarter of a pound of powder, on which he had rammed down a quantity of oakum, then poured in a handful of B B B shot. With this gun and ammunition he had expected to do great execution, hence his excitement.

We had now arrived at the margin of a body of water about a hundred yards wide, a kind of estuary making in to the westward of the rookery. It was not deep, but would have prevented us from moving fast, so I turned as I came upon the beach which bordered this water, and ran down it toward the end, in order to come up with the birds that were rising on the northern portion of the rookery.

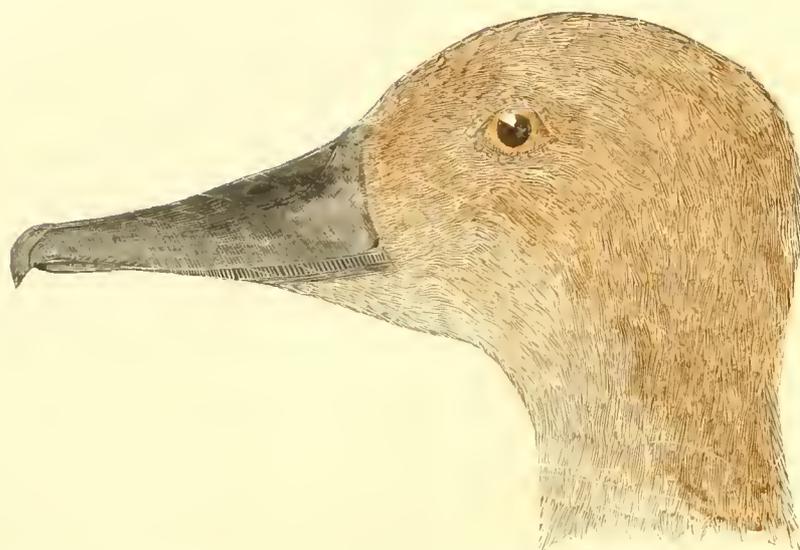
My man by this time was so crazed by a nearer sight of the hundreds of scarlet and black birds, that he quite lost his head, and began yelling at the top of his voice, as he dashed after me, "Don't fire, massa! don't fire! don't! don't!" At this moment I heard a report like that of a cannon, and fairly felt the ground shake. Turning, I saw that the negro had discharged his gun with the muzzle pointed into the water. He had stopped running, whether voluntarily or from the recoil of his weapon, I cannot say, instantly dropping the butt of his gun to the ground to reload, but never for an instant ceased his cry of "Don't fire! don't fire!" By this time I was within a hundred yards of the nearest birds, almost all of which were on the wing. Here I came to a sudden pause, and although I must acknowledge that I was somewhat excited, I did manage to bring down six Flamingos with two discharges of my hammerless Scott. At this moment, I once more heard the roar of the huge musket, and turning, saw that the negro had fired into the air. At this instant, perceiving that one of the birds that I had wounded was running away, the excited guide dashed after it, but the long legs of the slightly injured bird led him such a race that we did not see either bird nor man for over an hour, when they both came back together, the bird dead, hanging over the shoulder of the man.



FIG. 28.

Head of adult male Flamingo. *Inagna*, Feb. 4th., 1888.

FIG. 29.



Head of the Fulvous Tree Duck, *Dendrocygna fulva*, female, taken at Brownsville, Texas, April, 1891.

FIG. 30.



Head of Barnacle Goose, *Branta leucopsis*, found in a Boston market by the Bangs Brothers, in the autumn of 1878.

We had now ample leisure to collect our thoughts, as the birds had moved away to a distance and alighted. As we came up to the rookery we had seen hundreds of birds sitting on their nests with their legs doubled under them, not hanging down as is usually represented, and when we came to examine the nests we saw at once the absurdity of this theory. Some completed nests, containing eggs, were only six inches high, some on the other hand were at least four feet above the water. Now a bird with legs two feet long might manage to dangle them down from a four-foot nest, if it chose to put itself in such an uncomfortable position, but it would experience some difficulty in doing this on a nest only six inches high. Many nests were fully eighteen inches in diameter at the top, and some three feet broad at the base, quite a straddle for a bird the legs of which are placed only some two or three inches apart.

The rookery occupied about a half-acre of land, or rather what was once land, for all, or nearly all, the nests were surrounded by water, and were built on a kind of peninsula which had water on three sides of it. The nests were constructed wholly of marl, piled layer upon layer without waiting for any of the plastic material to dry, for in some cases the bottom was as soft as the top. In scooping up the marl, the birds evidently use the lower mandible of the bill, which is spread and flattened with the feet. The clay is not gathered at random about the nest, but from a pit on either side, or often from three pits, and it is the joining of these pits in a continuous series that causes the nests to be surrounded by water. None of the nests were constructed quite to the margin of the peninsula, thus a dike nearly surrounded the rookery. I say nearly, for this was broken through at the southern end, and the water from the creeks flowed in, thus the slight inland tide rose and fell among the nests.

The nests were, as a rule, not over two feet apart, measuring from their base, but they were generally constructed in groups of from three to seven or eight, each one being joined to one or two others at the base, oftentimes for a foot or more. This rookery had evidently been used for at least one year previous to this, as we saw many nests, especially the higher ones, which to all appearances had been constructed on top of an old foundation. New nests built throughout of soft mud were, on the average, only a foot high, and were built in a certain part of the rookery. All of the nests in the older portion of the rookery contained eggs, as a rule only one being deposited, and this was placed in the shallow cup on the top of the truncated cone. Incubation had begun, and in nearly all the eggs the embryos were considerably advanced. Thus it was apparent that most of the Flamingos had laid all of the eggs that they would that season. We estimated that there were in the neighborhood of 2,000 nests, and in all of these we found only some fifty sets of two eggs, and three in one case only.

There is considerable waste among the eggs, from two causes: first, by the eggs rolling off the too slightly hollowed tops of the nests, thus we found many eggs in the water; second, from the eggs sinking into the soft mud of the newly formed nests. We found quite a number almost buried from having been deposited before the top of the nest

had become sufficiently hardened to support their weight. The tops of the old structures were nearly as hard as stone, while the entire edifice was so firm that we could walk over the nests, stepping from one to another. The whole nesting presented a most peculiar appearance, reminding one of a pottery, where large inverted pots had been set out to dry, each being surmounted by a chalky white egg.

The Flamingos all left the immediate neighborhood of the rookery and settled in a large body about two miles away. Occasionally through the day a few would come back to reconnoitre, sometimes singly and at other times in small groups. These birds were exceedingly wary, however, and I did not succeed in getting more than one or two. As night approached they began to come in more numerous, and when it was nearly dark some alighted in the water so near where I was concealed behind a clump of mangrove bushes, which furnished the only means of concealment for miles around, that I got one or two more.

While I was inspecting the rookery, during the day, I discovered a single Flamingo that was standing in the middle of a large lagoon, not far from the rookery. This bird was evidently wounded, for I saw it make several unsuccessful efforts to rise. Calling my dog I started after it with the idea of capturing it alive. As I approached, by wading through the shallow water, it retreated, emerging finally upon the flats on the other side of the lagoon. Here it could get over the ground faster than I could, but as the whole country was intersected by a net work of creeks and lagoons, it was frequently obliged to enter the water, then I had the advantage for I could walk over the muddy bottoms faster than the bird could; thus I managed to keep within about a hundred yards of it. But in spite of my utmost efforts I could not get nearer, and thus the chase continued until we had gone between two and three miles, quite out of sight of the rookery and of the vessel, when the bird came to a wide, deep lagoon, into which I forced it to go; here it made its way with comparative slowness on account of the muddy bottom, but I also sank until at length I was waist deep and could move only with difficulty. Then perceiving that the bird was actually swimming but that it would soon get into more shallow water I spoke to my obedient dog who had faithfully kept by my side, telling her to go on. She made a brave dash forward, and with her usual intelligence as soon as she came up to the Flamingo managed to drive it into shallow water near me where she held it, by putting her paw on its neck, until I came and captured it.

This Flamingo, which was a female, proved to be one of the most interesting pets that I ever owned and I learned much of the habits of this singular species of bird from her. She became tame so rapidly that by the time we reached Nassau, where we went as soon as we could get there, after leaving Andros, she would eat readily and would follow us about the yard or into the house. We fed her upon boiled rice and bread soaked in water. She ate it by inverting her bill in the vessel in which it was placed; thus the bend in the anterior position of the upper mandible came in contact with the bottom of the water and the food was drawn into the mouth. When feeding she kept up a champing movement of the mandibles much as is done by Ducks.

We called her Aurora and she soon knew her name, coming at call. Although Aurora had the range of the yard of the house in which we lived, she preferred to stay either in the house or near it, being of a social, and even affectionate, disposition. She was fond of standing by my side as I sat at work, and would frequently rest her body on my knees; this her long legs readily permitted her to do. Sometimes she would flap her wings, evidently for exercise, but never attempted to fly. Aurora and Spottie (the dog) became fast friends: the Flamingo never, from the first, exhibiting the slightest fear of her four-footed friend. I have on several occasions seen the bird grasp the dog by one ear with her bill and lead it out of the way when she wanted to pass.

On our second voyage to the southward and eastward, among the keys, Aurora accompanied us, and never exhibited any disposition to leave the vessel. We kept this Flamingo until the middle of June, but just before our departure north, much to our regret, she died.

FIG. 30.

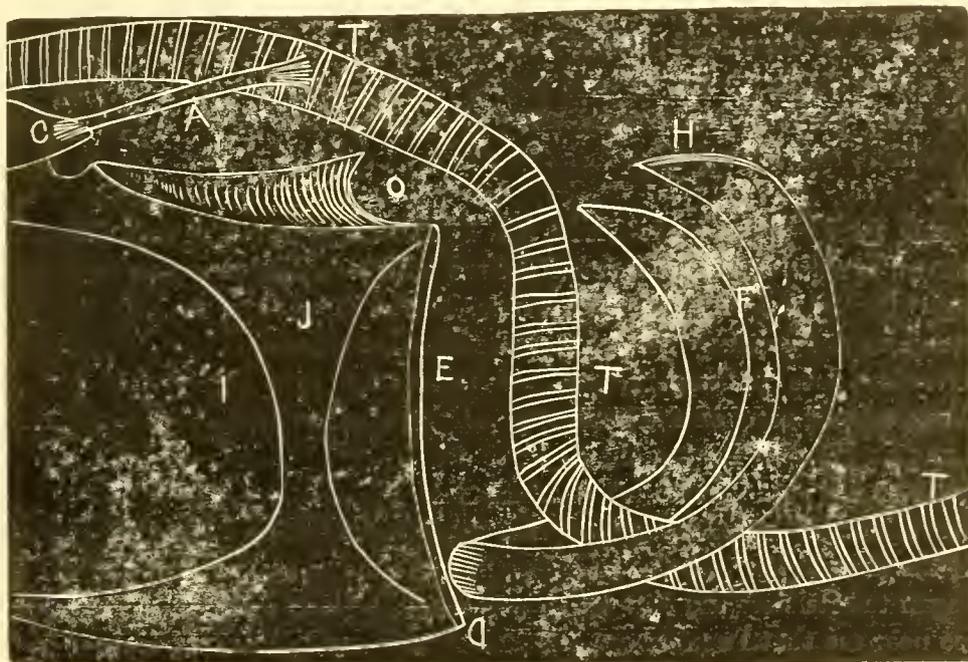


Diagram of the relative position of the trachea and sternum of the Canada Goose, *Berniela Canadensis*. T, T, T, trachea; F, furcula; H, termination of furcula where it articulates with the coracoids, which are removed. O, furrow where one coracoid articulates with the sternum. E, I, keel of sternum, D, its tip. J, thickened portion of sternum. A, sterno-trachialis. C, costal process of sternum to which the sterno-trachialis adheres.

According to the attitudes assumed by Aurora, and by other Flamingos, that I have seen, the body is rarely raised above a level, even when the head is raised in the act of looking. Another peculiarity, that I have never seen mentioned, regarding the Flamingo, was one which I learned from my pet, that was that the axillary feathers, which are very long, are frequently projected upward behind the wing and over the body, standing out on either side of the back like little fans. Another Flamingo that I obtained living at Inagua exhibited both of these peculiarities. This attitude and position of the axillary feathers may be seen in the cut, fig. 26; which was made from a drawing of Aurora.

In January, 1888, I visited Inagua. The interior of this island is one vast salina, and is a famous resort for the Flamingos. Here I had an excellent opportunity to study the notes uttered by these birds, as nearly every night some of the Flamingos would fly over Mathewstown, where I lived, uttering their cry as they flew. At regular intervals, one bird, which I afterwards, from observations made in the daytime, found to be the leader of the flock would vociferate what would sound like the syllables "er-conk-conk-conk," given harshly, this would be immediately answered by the "conk-conk-conk," of others, probably females, rendered in a much more melodious tone. When Flamingos are disturbed, or frightened, their cries are a confused series, of conks and gobbles which remind one much of the mixed cries of Ducks and Geese. Flamingos when at rest will frequently give a single "conk," a kind of call to attract the attention of any stragglers, and when they perceive an enemy they give a harsher cry. Flamingos are of a social disposition, and often gather in large numbers, especially at night, at which times they feed.

Through the kindness of my friend, Mr. Daniel Sargent, American Vice Consul at Mathewstown, Inagua, who kindly furnished me with means of conveyance, I was enabled, in company with my able and efficient guide, Daniel Sweeting, to visit the salinas on several occasions and to study the habits of the Flamingos there.

At one time, late in January, we had penetrated into the interior of the island many miles, and had reached the borders of a large, shallow lake, near the shore of which was a mangrove island. During the daytime we had seen numbers of Flamingos and I was assured by my guide that they fed near this island at night. Accordingly about sunset, we concealed ourselves among the mangroves of the island, and awaited the coming of the Flamingos. As the sun disappeared numerous Cormorants, Pelicans and Herons began to settle on the low trees over our heads, and one large Brown Pelican alighted so near me that I could have touched it with my gun barrel. As soon as the short twilight gave place to darkness, we heard the honk of the Flamingos and soon they began to arrive, each group alighting with a splash in the water near. Soon hundreds had gathered, and although we could hear them wallowing about, so dense was the darkness, that neither my guide or myself could see a single bird. Finally I saw what I thought was a group of Flamingos and fired. As the report of my gun rang out, awaking the echos far down the lake and over the silent land, first came a sudden stillness, followed

by the rush of hundreds of wings with which was mingled the cry of so many frightened birds that it seemed for a moment as if pandemonium was opened. Although most of the other birds returned to the island, we heard no more of the Flamingos that night. I am happy to be able to state that a severe fright was the only injury that any of the birds sustained from my shot, for a careful search made by daylight the next morning, when we arose from our grassy bed by the lake, failed to reveal even a single loosened feather.

On February 4th, my indefatigable guide came to me with the information that some Flamingos were visiting a brackish water pond some ten or twelve miles away. We drove to the spot, arriving just at nightfall, in time to conceal ourselves in some bushes on the margin of the little pond which was some fifty yards in diameter, and awaited the coming of the Flamingos. Soon we heard them honking and when it was quite dark many came flying past, then four settled in the pond, followed by five others. As soon as they were down I could hear them moving about and drinking, but on account of the darkness, which was augmented by the surrounding foliage, could not see a single bird. But a change soon came, for the moon, which was nearly full, and which had hitherto been obscured by a thick bank of clouds suddenly pushed her way upward into the clear sky, illuminating the water in front of me, disclosing the scarlet birds grouped together. A single shot brought down four and another was picked up the next day on the savannah by a creole who was in search of wild horses. We got no more Flamingos that night, but the next evening, although I was not fortunate enough to procure a single bird, Mr. Sargent, who accompanied me, shot four.

Since my visit to the rookery on Andros I have been informed by His excellency Sir Henry Arthur Blake, governor of Jamaica, who is stationed at the Bahamas, that my statement that the Flamingos double their legs under them when sitting on their nests has been confirmed by his own observations. I am also pleased to be able to record that, at my suggestion, Governor Blake presented a bill to the assembly, at Nassau, in which it was proposed to protect Flamingos, and other birds, during the breeding season, and that the bill passed and became a law. I was induced to make this suggestion to the governor on account of the information that I gathered from the natives relative to the wholesale destruction of young Flamingos nearly every year, especially on Andros, by the creoles, who killed the young birds, before they could fly, for food.

According to the accounts derived from the creoles, young Flamingos run nearly as soon as hatched, but possibly this statement cannot be depended upon, as it is probable that these people seldom, if ever, visit the rookerys until the birds are well grown.

There is a great similarity between the cries of the Flamingo and those given by the common wild goose, yet the vocal apparatus of both birds varies greatly. While, as seen in Fig. 24, B, the bronchial tubes of the Flamingo are very short, with a small vibrating tympaniform surface, the same tubes in the Canada Goose are very long with a great development of vibrating surface. See Fig. 31. The trachea of the Flamingo is also straight while that of the Goose is bent near the larynx. See fig. 30.

WHOOPING SWAN.

CYGNUS MUSICUS.**Whooping Swan.**

DESCRIPTION.

SP. OR. Size, large. Bill, similar in form to that of the Whistling Swan. Tail feathers, twenty in number, normally. COLOR. White throughout. Bill, black, with a large yellow blotch on the side, surrounding the nostrils and occupying more than one half of the bill.

DIMENSIONS.

Length, 50.00 to 60.00; stretch, 72.00 to 84.00. Wing, 20.00 to 24.00; tail, 7.00 to 8.00. bill, 3.50 to 4.00; tarsus, 3.50 to 4.00.

OBSERVATIONS.

Known from the closely allied Whistling Swan by one large yellow spot about the nostrils on bill. Northern Europe, accidental or occasional in Greenland.

NESTS AND EGGS.

NESTS, placed on the ground in marshes, composed of reeds, dead grasses, etc. Eggs, two to five in number, yellowish white in color, oval in form. Dimensions 4.50 by 2.40 to 4.35 by 2.95.

HABITS.

The well-known Whooping Swan is an inhabitant of Northern Europe, migrating southward in winter. This species is occasionally taken in Greenland.

ANSER CAERULESCENS.**Blue Goose.**

Anser caerulescens LINN. Syst. Nat. I. : 1766.

DESCRIPTION.

SP. CH. Form, robust. Size, medium. Bill, stout. Head and upper half of neck, mostly white, frequently tinged with orange in front. Lower neck and body grayish brown, each feather broadly bordered terminally with paler; but these edgings become nearly obsolete on the neck where the tint is darker, and joins irregularly the white above it. Rump and wings, pale, pearl gray. Primaries, black, fading basally into hoary gray. Secondaries, deep black, narrowly margined with white. Tail, deep bluish, each feather distinctly bordered with white. Bill and feet, reddish. Sexes, similar, but the female is slightly smaller than the male.

YOUNG. Similar to the adult, but with head and neck the same color as the breast and body, but darker. Chin, white. Bill and feet, blackish.

DIMENSIONS.

Length, 27.50 to 29.00; stretch, 55.50 to 56.00, wing, 15.25 to 16.50; tail, 5.50 to 6.00; bill, 2.10 to 2.20; tarsus, 2.90 to 3.00.

OBSERVATIONS.

Distinguished from the young of the Snow Goose, to which it bears considerable resemblance, especially in the younger stages, by the constantly dark colors of the rump and lower parts of the body: these always being white in the Snow Goose.

HABITS.

The Blue Goose, which was for a long time considered only a phase of plumage of the Snow Goose, has recently been demonstrated by Mr. Robt. Ridgway to be a perfectly valid species, that occurs in summer in the interior of the northern portions of North America, east of the Rocky Mountains, and, according to Mr. Ridgway, it breeds about the Eastern shores of Hudson's Bay. It winters in the interior of the United States, west of the Mississippi River, but occasionally appears on the Atlantic Coast. It does not appear to differ in general habit from its allies.

ANSER ALBIFRONS.**European White-fronted Goose.**

DESCRIPTION.

SP. CN. Size, large, about that of the American White-fronted Goose, differing from it, in having a slightly shorter bill. Nests and eggs are indistinguishable from that of *Anser gambeli*.

HABITS.

The White-fronted Goose of Europe is occasionally taken in Greenland but never appears to reach the continent of North America.

BERNICLA LEUCOPSIS.**Barnacle Goose.**

FIG. 29.

DESCRIPTION.

SP. CII. Size, medium. Tail, normally of sixteen feathers. COLOR. Front and sides of head and chin white, with a dark line from base of bill through eye. Remainder of head and neck, all around, black. Back and wings also black, with the feathers of the latter bluish at base, and margined with whitish. Rump and tail black. Upper and under tail coverts, and under parts, white, tinged with gray on sides. Bill and feet, black, iris, brown. Sexes similar.

DIMENSIONS.

Length, 27.00 to 28.00; stretch, 54.00 to 55.00; wing, 16.50 to 17.00; tail, 5.50 to 6.00; bill, 1.25 to 1.60; tarsus, 2.50 to 2.75.

OBSERVATIONS.

Known at once by white cheeks with the black line through eye. See fig. 29.

NESTS AND EGGS.

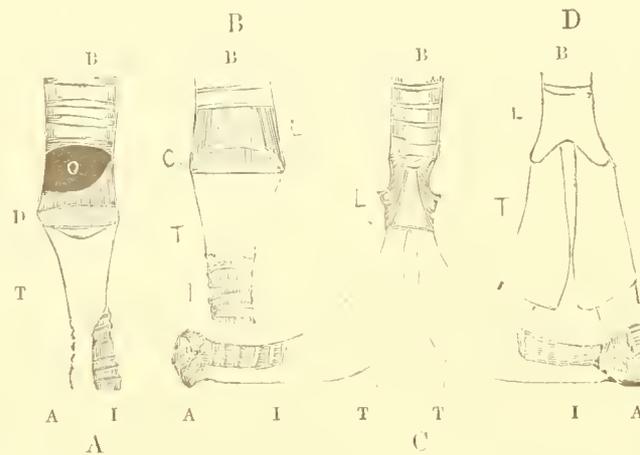
NESTS, placed on the ground, composed of grass, weeds, etc. EGGS, Six to eight in number, elliptical in form, yellowish cream in color, 2.75 by 1.85 to 2.85 by 1.87.

HABITS.

The Barnacle Goose has been taken at Hudson's Bay (*American Naturalist*, Vol. II, 1868, p. 49), in North Carolina (*American Nat.*, Vol. V, 1871, p. 10), on Long Island (*Bull. Nat. Club*, II, 1878, p. 18), in Illinois (*Forest and Stream*, Nov. 23, 1876). And

a specimen was obtained by the Bangs brothers in the Boston market in the spring of 1876. This specimen was unfortunately entirely plucked, excepting the head, which through the kindness of the Messrs. Bangs, I have now before me, and of which I have given a colored figure (See page 108, fig. 29). This species occurs regularly in Greenland, however, and hence it may be looked for as an occasional visitor to our coast.

FIG. 31.



Illustrating the inferior larynx of a male Canada Goose (*Bernicla canadensis*) taken in Maine in April, 1894. A, inside view of larynx and inside view of one bronchial tube, T, the other having been removed, O, being the open space in the trachea. B: D, is the os transversabile; T, bronchial, half rings. B, Opposite side view of larynx, B; and outside of bronchial tube, T; C, is a cartilaginous bone; B, the trachea; T, the bronchial half rings. C, is a view of the entire larynx, L, seen from below, with both bronchial tubes T, T, entire; I, I, are the half rings; A, A, a portion of the lungs; B, the trachea. D, is a view of the larynx, L, seen from above, with the transparent portion of the bronchial tubes, T; B, is the trachea. All figures are life size.

NOTES ON THE CANADA GOOSE, *BERNICLA CANADENSIS*. The inferior larynx of this species presents some of the most singular characters that I have ever seen among birds. The trachea is straight until it enters between the fork of the furcula; then it bends quite abruptly upward until a little above the level of the coracoids. It then continues straight to the inferior larynx. This arrangement can readily be understood by referring to the diagram given at fig. 30, 111. Here T, T, T, is the trachea, F, is the furcula, II, its upper terminations which articulate with the coracoids, that have been removed; E, I, is the keel of the sternum; O, the articulating furrow of one coracoid (the right). This bend in the trachea is not very unusual among other birds, but the next feature to which I wish to call attention is quite remarkable, and this is the shortness of the first, and, in fact, in this species, the only vocal muscle, the sterno-trachealis. This has its origin about 2.00 above the inferior larynx, near the base of the coracoids and is thus quite near the costal process of the sternum to which it adheres, being, in fact, only 1.25 long, which is comparatively the shortest example of this muscle that I have ever found. In the diagram (fig. 30) this muscle is marked A, and the costal process C. The inferior larynx is destitute of even a single muscle of any kind. It consists of a bony ring somewhat forked behind on the margin above (See fig. 31, D, L), but straight below (See ib. C, L). On either side is a projection, (ib. C, L), formed by a cartilaginous half ring, that is .50 long, and that is in the form of a crescent, (ib. B, C). Behind this cartilaginous half ring is a soft space rather semi-luna in form, which rests on a straight, bony half ring, to which adheres the first portion of

the outside of the bronchial tubes, (See *ib.* B). The bronchial tubes, in themselves, are the most remarkable of any that I have seen, for in them the vibrating surface of the tympaniform membranes have reached the highest development possible. In fact, practically the entire surface of the tubes has become vibrating membrane. This may be readily comprehended by referring to the cut, fig. 31. Here at C may be seen the lower side of the tubes, T, T, where all of the unshaded portion is as thin as tissue paper and as transparent as glass. The shaded portion at I, I, shows all that remains of the half rings of the bronchial tube, five, and one imperfect one, and these, as seen at A, I, do not extend wholly round the tube, leaving a portion of the tympaniform membrane to extend quite to the lungs (*ib.* C, A). Above, the tympaniforms are widened, but narrow abruptly at a point where the half rings begin (See *ib.* D, T). The tubes also narrow to about $\frac{1}{13}$ where they enter the larynx (See C, L). Here they are divided by a wide os transversale, that widens from below upward, but which does not support any semiluna membrane. See A, b, where the inside of the left bronchial tube is given, the right having been removed, leaving the open space in the larynx, o. The outside of this tube is given at B, T.

As there is no trace of any other laryngeal muscle, other than the sterno-trachealis, the Canada Goose gives us a positive proof that this muscle has direct control of the vocal organs. The normal condition of the large vibrating surface of the bronchial tubes is a constant tensified state, but is relaxed to a greater or less extent in order to give the requisite modification to the sonorous voice of the goose, and on account of this shortness they probably act more quickly.

Every one who has given the subject any thought must have come to the conclusion that the voice of the Canada Goose is of vast importance to it, as a species, as is, in fact, the voice of all gregarious birds which migrate far, as it is by the cries which the older members utter that the younger and untried birds in the flock are kept from straggling. This is especially true of the Geese which often pass quite above the clouds in their aerial journeys. Now as geese require all of their strength to sustain themselves on their protracted voyages, none can be wasted unnecessarily, hence we find that a vocal apparatus has become evolved whereby loud sounds can be produced with very little effort. To understand this matter thoroughly, one has only to watch a rooster in the act of crowing and see what efforts he is obliged to make in order to eject his cry. These efforts are most of them necessary (excepting possibly the preliminary flapping of the wings) as I have satisfied myself by an examination of the vocal organs. In order to give a single crow a rooster puts forth more strength than a wild goose would in honking many times, for with such vocal organs as I have described the Canada Goose must honk nearly as easily as he breathes. But in order to produce this peculiar vocal apparatus the bronchial tubes have been brought to such an extreme degree of thinness that they must be greatly weakened; in short, when we consider that every breath that the bird draws must pass through tubes the walls of which are no thicker than the thinnest tissue paper, it would seem that the life of the bird must be in constant jeopardy, as the danger of rupturing the delicate tissues of these vital organs must be great.

However this may be, I can say with truth that the vocal organs which the Canada Goose carries in his dusky-plumaged breast are the most beautiful of any that I ever saw, and although I have always listened to the sounds produced by them as they winged their way through the trackless realms of air with great interest, since I have understood more of how these sonorous cries are produced the pleasure of hearing them is enhanced ten-fold.

BERNICLA CANADENSIS HUTCHINSI.

Hutchins's Goose.

DESCRIPTION.

SP. CH. Size, small. Tail, normally of sixteen feathers, or less. Coloration is as the Canada Goose, but possibly averaging darker.

SMALLER WHITE-CHEEKED GOOSE.

DIMENSIONS.

Length, 25.00 to 30.00 ; stretch, 50.00 to 54.50. Wing, 14.30 to 15.75 ; tail, 4.75 to 5.50 ; bill, 1.30 to 1.45.

NESTS AND EGGS.

NESTS, placed on the ground. EGGS, five or six in number, ovate in form, dull white in color. Dimensions, 3.11 by 3.19 to 2.12 by 2.18.

OBSERVATIONS.

Known by the small size and sixteen tail feathers, but closely allied to the Canada Goose and specimens are of rather frequent occurrence that are difficult to determine.

HABITS.

I have on several occasions found geese in the Boston markets, which had been killed on the Atlantic Coast, and which from their small size and less number of tail feathers would appear to be Hutchins' Geese. Whether these examples merely represent the extremes of individual variation of the Canada Goose and that they are offsprings of that species, or that they are stragglers from the West and offsprings of similar parents, is difficult to state. The home of the true form of Hutchins' Goose is west of the Mississippi River.

BERNICLEA LEUCOPARIA.**Smaller White-Cheeked Goose.**

DESCRIPTION.

SP. CH. Size, small, tail of sixteen feathers. Resembles Hutchins' Goose but darker in color, with the line of demarkation between the white of the lower parts and the dark above being more sharply defined, and there is a half collar of white on the front of the neck (in addition to the white of the throat) not far from the body. Length, 24.00 or less, wing, about 15.00.

HABITS.

In the Autumn of 1867 I procured a specimen of a small Goose in the Quincy Hall Market, Boston, that had a half collar on the lower neck and which had a less number of tail feathers than the Canada Goose. This bird was freshly killed and was presumably taken in the vicinity of Boston. The specimen was made into a skin and is no doubt in the collection of some one of the many ornithologists who were in the habit of purchasing skins of me at that time. The species, or sub-species, as it is generally regarded, occurs in the Pacific coast, thus my specimen must have been a decided straggler.

DENDROCYGNA FULVA.**Fulvus Tree Duck.**

FIG. 28. Head of female, adult.

DESCRIPTION.

SP. CH. Form, slender. Size, medium. Bill, about as long as head. Legs long: the tibiae being naked for about 1.00. Toes, considerably longer than the tarsus.

COLOR, ADULT. Head darker on top and becoming lighter on sides and below, and entire lower parts, cinnamon red. Middle of neck surrounded with a broad ring of whitish, streaked with dusky. Back, wings and tail, and stripe down middle of neck behind, dark brown, with the shoulders, dark cinnamon, and the feathers of the upper back are rather broadly margined with this same color. The long feathers on the sides and flanks are broadly centrally streaked with creamy white, that is edged with dark brown. Upper and under tail coverts, creamy white. Bill and feet, blackish. Sexes, similar.

DIMENSIONS.

Length, 22.00; wing, 9.00; tail, 2.25; bill, 1.80; tarsus, 2.00; middle toe, 3.25.

OBSERVATIONS.

Readily known from the Black-billed Tree Duck by the absence of any black on the lower surface of the body below, and from the Bahama Tree Duck by the absence of brown mottlings on these parts.

DESCRIPTION OF NESTS AND EGGS.

NESTS, placed in hollow trees, composed of the usual material. Eggs, ten to fifteen in number, elliptical in form. Color, white with a greenish tinge. 1.50 by 2.00 to 1.60 by 2.30.

HABITS.

The only claim that the Fulvus Tree Duck has to our fauna is on account of the accidental occurrence of a specimen in Louisiana many years ago. I have never seen a specimen living and know nothing about its habits. The West Indian Tree Duck, *Dendrocygna arborea*, inhabits wooded ponds or swamps and when disturbed will take refuge in thickets, often on the upland. The home of the Fulvus Tree Duck is in the Southwestern portion of North America.

ANAS FULVIGULA.

Florida Duck.

DESCRIPTION.

SP. CH. **SIZE,** smaller than the Dusky Duck, *Anas bosca*, with a less number of tail feathers.

COLOR. Much more yellowish in color than in the Dusky Duck, with longitudinal streaks of yellowish in the feathers above, and with V-shaped markings of yellowish on the tail. Chin and throat, clear yellowish. Bill, greenish.

DIMENSIONS.

Length, 21.00 to 22.00; stretch, 33.00 to 34.00; wing, 10.00 to 10.50; tail, 4.00 to 4.15; bill, 2.00 to 2.15; tarsus, 1.65 to 1.75.

NESTS AND EGGS.

NESTS, placed on the ground, composed of grass, weeds, etc. Eggs, elliptical in form, six to ten in number, greenish in color. Dimensions, 1.35 by 2.25 to 1.70 by 2.30.

OBSERVATIONS.

This species may be readily known from *Anas bosca* by the yellowish color, longitudinal stripes in the feathers above, and V-shaped marks on the tail. It occurs in central and southern Florida from about the latitude of the northern end of Indian River southward to the termination of the main land.

HABITS.

As indicated in the first edition of this book, as seen on page 80 of the present edition, in 1872 I discovered what I then considered as a local race of Black Duck in Florida. I obtained the first specimens I ever saw at Salt Lake, and later, in April, found them breeding on the marshes of Indian River. All the remarks on page 80. of the present edition that refer to the Florida form of Black Duck may be applied to this species.

Although at that time I found the Florida Duck abundant and breeding commonly, I did not find them so common upon another occasion in the spring of 1886, when I once again visited the region which lies between Merritt's Island and Mosquito Lagoon. At this time, although far from being rare, their number was greatly diminished, and although I gave the matter careful attention I succeeded in finding a single nest only, and that was placed in the middle of a patch of high grass which contained two or three acres, and was several hundred yards from the water.

Like its northern relation this duck is not inclined to be gregarious, and I never saw more than three or four together; usually they were seen in pairs in the little ponds which are scattered over the marshes of both Merritt's Island and the mainland opposite. Here they were quite shy, jumping into air nearly perpendicularly for some ten feet, then darting away at right angles, when disturbed. When shot on the water and only slightly wounded, but in such a manner as to prevent them from flying, they at once make for the shore and conceal themselves in the grass that covers the marshes. If dropped wounded upon the marsh they almost invariably conceal themselves and do it so quickly that it was almost impossible to catch them before they were out of sight. So skillful were they in thus eluding capture that I never remember finding a Florida Duck after it had once got fairly into the grass. Another singular thing was that my dog, Spottie, could never find one either, although her powers of scenting out hidden animals were remarkable. Coots and other species of Ducks were always found by her and I never knew her to lose a wounded quail, even in the thickest cover composed of saw palmettos and brambles, but these Ducks always baffled her. I have seen a wounded Florida Duck enter the grass from the water, leaving a distinctly marked wet and muddy trail behind her, and have instantly taken the dog to the spot, but she was never able to obtain the slightest clew to the whereabouts of the hidden bird, which evidently left no scent behind.

QUEQUEDULA CRECA.

European Teal.

DESCRIPTION.

SP. CH. SIZE, form, and general coloration of the Green-winged Teal, but differs in having no white crescent before the wing, and in having a green band on the sides of the head decidedly bordered with whitish; the barrings on the sides are coarser, and the long scapulars as well as the inner secondaries are creamy white externally, black bordered.

NESTS AND EGGS.

NESTS, placed on the ground, composed of weeds and grass, etc. Eggs, six to eight in number elliptical in form, pale creamy buff in color. Dimensions, 1.20 by 1.80 to 1.25 by 1.95.

HABITS.

The European Teal appears to be a constant resident in Greenland and is occasionally taken on our Atlantic coast where doubtlessly it would not differ essentially in habit from the American Green wing.

QUERQUEDULA CYANOPTERA.**Cinnamon Teal.**

DESCRIPTION.

SP. CII. Size and form of the Blue winged Teal. ADULT MALE, Head, neck and lower parts, rich purplish chestnut, becoming dusky on abdomen. Sides and flanks, black. Inter scapulars and back, chestnut, marked with U-shaped bars of black and becoming dusky in the middle. Tertiaries, black, with a central stripe of dusky. Scapulars, similar, blue on outer webs of outermost feathers. Lesser wing coverts, plain light blue. Middle coverts dusky, tipped with whitish. Speculum, green. Primaries and tail, with coverts dusky, edged with pale. Axillaries, white. Bill, black. Iris, orange. Feet, orange, with webs blackish.

ADULT FEMALE. Similar to that of Q. discors, but the upper part of the throat is unstreaked and the abdomen distinctly spotted.

YOUNG MALE. Similar to the female but the markings below are decidedly streak like.

DIMENSIONS.

Length, 14.50 to 16.50; stretch, 23.50 to 25.50; wing, 7.30 to 7.75; tail, 3.00 to 3.50; bill, 1.50 to 1.75; tarsus, 1.20 to 1.30.

OBSERVATIONS.

Readily distinguished in the adult stage from the Blue-wing by the uniform chestnut color beneath. The female is larger than that of the Blue-wing, and decidedly streaked on the abdomen.

NESTS AND EGGS.

NESTS, placed on the ground, composed of grasses and lined with feathers and down. Eggs, eight to twelve in number, oval in form. Pale buff in color. Dimensions, 1.80 by 1.30 to 1.87 by 1.44.

HABITS.

This well known western Teal, so abundant west of the Rocky Mountains is occasionally found in the Gulf States, even as far east as Indian River, Florida. It does not appear to differ in habit from the Blue-wing.

NETTA RUFINA.**Rufous-crested Duck.**

DESCRIPTION.

SP. CII. About the size of the Red-headed Duck, with the head conspicuously crested.

COLOR. ADULT MALE, head and upper neck, rusty red with a rosy tinging. Lower part of neck, fore

part of back, brown, and middle of belly, black. Hind back, grayish brown, with a large patch of white on each side, which becomes dusky on rump and upper tail coverts. Tail, ashy grey. Primaries, whitish, edged and tipped with grayish. Bill, vermilion, tipped with white. Feet, orange red, and iris, brown.

ADULT FEMALE. Reddish brown above, darkest on crown and rump, becoming lighter beneath, whitish on throat and upper portion of neck beneath. Speculum, gray, edged with brown.

OBSERVATIONS.

Of this European duck a single specimen was found in Fulton Market, New York City, in February 1872.

SOMATERIA MOLLISSIMA.

European Eider.

SP. CH. Size, form and color of the American Eider, *S. borealis*, but differs in the form of the bill and accompanying frontal process. The bill is more depressed basally and the V-shaped process has the arms narrower and more pointed terminally (See Cut of this in Appendix). Nests and eggs similar. This American Eider was separated from the European by A. E. Brehm (Verz. Samml. Emp. Vogel, p. 147, 1887) on account of the above indicated characters and named *S. borealis*, which name should now be applied to it.

The European Eider occurs on Cumberland Sound and probably migrates southward.

OEDEmia FUSCA.

European Scoter.

DESCRIPTION.

SP. CH. Form and size and color similar to that of the American Scoter, but differs in having a black stripe in the red of the bill, and in having a more curved outline of the feathers at the base of the bill. Occurs in Greenland as a straggler from the old world.

NOMONYX DOMINICUS. ✓

St. Domingo Duck.

DESCRIPTION.

SP. CH. Size, small. The inner secondaries are greatly lengthened and fold over the primaries in the closed wing. **COLOR.** Rusty red throughout, varied with black above. Top of head, black. There is a large white patch on the wing formed by a number of the coverts and bases of the secondaries. Axillaries also white. **YOUNG,** differ in having the back more blackish, spotted with yellowish brown, and the general plumage elsewhere is mottled with grayish. There are two blackish stripes on sides of neck.

DIMENSIONS.

Length, 12.50 to 13.50; wing, 4.15 to 5.25; tail, 2.25 to 2.35; bill, 1.40 to 1.45; tarsus, 1.60 to 1.75.

OBSERVATIONS.

This rather singular Duck is readily known by the small size and elongated secondaries. It occurs in Central and South America and in the West Indies. Accidental in the United States. Specimens have been taken on Lake Champlain and in Wisconsin. (See Proc. Boston Soc. Nat. His., Vol. VI, p. 375; Amer. Nat. Vol. V, p. 441; and Baird, Birds of N. A., 1858, p. 925.)

ORDER XV. ALECTORIDES. CRANES, ETC.

Leg., long, and naked above the tarsal joint. *Posterior toe*, present, and more or less elevated above the level of the anterior toes. *Keel*, usually exceeding in height the width of the sternum. *Marginal indentations*, absent, or two and deep.

This order includes the Cranes, Courlans, Rails, Gallinules, Coots, etc., all of which are widely distributed, but are better represented in the Temperate and Torrid Zones than elsewhere. The young are covered with down and run at birth.

FAMILY I. GRUIDÆ. THE CRANES.

Bill, long, straight, and deeply grooved. *Terminal portion of furcula*, joined firmly to tip of keel, which is high, thick, and greatly exceeds the width of the sternum which is narrow and without marginal indentations. *Anterior portion of keel* projected forward, flattened, and hollowed to receive a bend of the trachea.

Members of this family are all very large, powerful birds. The stomach is muscular, and the intestines are long and slender, but the cœca are usually small. The legs are long but the toes are quite short.

GENUS I. GRUS. THE TRUE CRANES.

GEN. CH. *Top of head*, destitute of feathers in adults and covered with small scales. *Sternum*, narrow, with the posterior margin indented. *Tertiarics*, elongated and curved downward.

Members of this genus have the sternum narrow, equaling about one half the width of the coracoids. The tibia is naked for its lower half. Sexes, similar. There are two species within our limits.

GRUS CANADENSIS.

Sandhill Crane.

Grus Canadensis TEMM., ANL.

DESCRIPTION.

SP. CH. *Form*, robust. *Size*, large. *Tongue*, long, slender, and tapering gradually to tip which is pointed. *Naked space on head*, scalloped behind.

COLOR. *Adult*. Slaty-blue throughout, becoming dark-brown on primaries. *Iris*, ruby-red. *Naked space about head*, lake. *Legs and bill*, black. *Young*. Similar, but tinged with yellowish above, and the iris is yellow.

OBSERVATIONS.

Readily known by the large size and bluish color. See succeeding species for further comparison. Distributed, in summer, throughout the West. Constantly resident in Florida.

DIMENSIONS.

Average measurements of specimens from Florida. *Length*, 41.00; *stretch*, 73.00; *wing*, 46.50; *tail*, 8.25; *bill*, 5.00; *tarsus*, 9.50. *Longest specimen*, 42.00; *greatest extent of wing*, 71.00; *longest wing*, 20.00; *tail*, 9.50; *bill*, 5.10; *tarsus*, 10.00. *Shortest specimen*, 40.00; *smallest extent of wing*, 52.00; *shortest wing*, 19.00; *tail*, 7.00; *bill*, 4.90; *tarsus*, 9.00.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground in marshy places, composed of mud, grass, weeds, &c. *Eggs*, two in number, rather elliptical in form, ashy-yellow in color, spotted and blotched irregularly with reddish-brown and black. *Dimensions* from 2.15 x 3.40 to 2.21 x 3.65.

HABITS.

The first time that I ever met with a living Sandhill Crane, was at Lake Harney. I had wandered out into the piney woods which at that point, are quite low with an occasional

small, circular, cypress swamp which is always surrounded by a more luxuriant growth of grass than is found elsewhere. I was nearing one of these places, when I was startled by hearing loud, prolonged, gobbling cries, mingled with cacklings, just as though a number of Turkeys and Geese had met and were holding a most vociferous consultation. At first, I could not make out the exact point from which all this clatter proceeded, as the woods were completely filled with the din which echoed and re-echoed through the surrounding arches formed by the trees. But a nearer inspection discovered a single bird of a large size, stalking off slowly, and then to my amazement, I perceived that he alone was the author of all the noise, and that I, by invading what he had considered his especial possessions, was the innocent cause of all this uproar. I recognized the bird as the Sandhill Crane, at once, but upon trying to make a nearer acquaintance, off he went, still keeping up his continuous din. This clamorousness is one of the chief characteristics of these birds when disturbed, and during early mornings they will also gobble, evidently for their own gratification, while they will do the same thing when sailing high in air in wide circles, with out-stretched legs and neck, and motionless wings, a habit to which they are addicted at times.

The Sandhill Cranes gather in large flocks on the unfrequented prairies of Central Florida, but no matter how remote the locality from settlements, the birds are always very wild, but upon one occasion, I succeeded in creeping within a hundred yards of some fifty or more, rifle in hand. The birds were walking about, and I waited until I had a favorable opportunity, when I fired, severely wounding one. The rest rose with loud cries and were flying away, when, to my surprise, a large Crane, evidently perceiving me, turned and came with headlong speed, directly toward me, gobbling continuously. I waited quietly until he was within ten feet of my head, when thinking he meant mischief, I took a snap shot at him with my rifle, but in the excitement of the moment, missed his body, the ball merely passing through his feathers. This salute fortunately turned him and he followed his retreating companions. I then started after the wounded bird which was using his legs to good effect, and although the bird was a swift runner, I was succeeding in outstripping him, when he gave me the second surprise that I had received that day, by turning in his tracks and meeting me half way. The Crane came boldly up and made a lunge at me with his powerful bill, but here the contest proved too unequal for him, for reaching out suddenly, I caught him by the neck, when I soon terminated the conflict.

Sandhill Cranes breed in March in Florida, placing their nests in the shallow water of one of the marshes which occasionally occur in the piney woods. The birds heap up a mass of mud, roots, grass, weeds, etc., forming a conical pile which is elevated about six inches above the water, and which is some eighteen inches in diameter on the top. This is slightly hollowed and the two eggs are deposited on it, while the female sits on them in the ordinary manner by doubling her long legs beneath her. She is quite conspicuous when on this mound, but when she perceives an intruder, she quietly slips off and skulks away through the grass, taking care not to rise until she has gone some distance, when she flies silently away. The dancing of this species has frequently been described by writers, and I have not only seen wild birds jumping up five or six feet in air, with partly extended wings,

running about in circles, or performing other capers, but have also seen domesticated Cranes equally agile. One kept in a yard at Cedar Keys, near our camp, not only entertained his master by his grotesque performances, but also took upon himself the duties of a watch dog, and whenever a stranger attempted to pass into the gate in order to reach the house, the Crane would endeavor to oppose his entrance; then if the intruder persisted in his efforts, the bird would not hesitate to strike him with his strong beak, and the only way to get by him in safety was to seize the bird by the bill and drag him a short distance, when he would retreat, giving vent to his anger in loud screams.

GRUS AMERICANA.

White Whooping Crane.

Grus Americana TEMM., Anal.

DESCRIPTION.

SR. CR. Form, robust. Size, very large. Tongue, long, thin, and gradually tapering toward tip which is pointed. Naked space on top of head, rounded backward. Tertiaries, greatly elongated.

COLOR. *Adult.* Pure white throughout, with the primaries and spurious wing, black. Sides of head, dusky. Naked space about head, lake. Legs and bill, black. Iris, ruby-red. *Young.* Similar to the adult, but overwashed with yellowish, and the iris is yellow.

OBSERVATIONS.

Readily known by the large size, white color as described, and rounded naked space on top of head, this being scalloped in the Sandhill. Both species have the head fully feathered when very young. Distributed, in summer, throughout the West. Rare in South Central Florida.

DIMENSIONS.

Average measurements of specimens from Western North America. Length, 52.00; stretch, 77.00; wing, 24.50; tail, 9.25; bill, 5.45; tarsus, 11.45. Longest specimen, 51.00; greatest extent of wing, 78.00; longest wing, 21.00; tail, 9.50; bill, 5.75; tarsus, 11.80. Shortest specimen, 50.00; smallest extent of wing, 76.00; shortest wing, 23.00; tail, 9.00; bill, 5.50; tarsus, 11.00.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground in marshy places, composed of mud, weeds, and grass. *Eggs*, two in number, elliptical in form, yellowish-ash in color, spotted and blotched coarsely and irregularly with reddish-brown and umber. Dimensions from 2.60 x 3.90 to 2.65 x 4.00.

HABITS.

Some years ago, the late Capt. Dummett assured me that the White Whooping Crane occurred on the prairies which lie to the eastward of the Kissimee River and Lake Okeecho-bee, and this report has also been confirmed by others. I have, however, never been fortunate enough to meet with a specimen of this fine Crane in Florida, and think that it must be confined to the section mentioned above.

There are some differences in the structure of the trachea of the present species when compared with that of the preceding. The keel in both is wide and well produced forward, but in the Sandhill Crane, the trachea only enters it for about two inches, bends upward to the level of the body of the sternum, then forward and downward, inclining backward, but once more turns forward, emerging just below the point of entrance, and curving downward, proceeds in its usual course to the larynx. Thus there is but one convolution in the keel, which occupies only about seven inches, whereas in the Whooping Crane there are said to be two distinct convolutions occupying some twenty-eight inches. It would be interesting to note the differences in tone produced by these tracheal modifications. The Whooping Cranes resemble the Sandhills in habit, and are common throughout the West.

FAMILY II. ARAMIDÆ. THE COURLANS.

Bill, very long, slightly curved, and quite deeply grooved on basal third. Terminal portion of furcula, not widened, nor joined to tip of keel which is not wide but high, greatly exceeding the width of the sternum which is narrow and without marginal indentations.

Members of this family are of medium size, with rather long legs and toes. The upper mandible is thick for nearly its entire length, but gradually curves downward toward the tip; whereas the lower grows more slender for its terminal third, tapering gradually to an acute point. The posterior margin of the sternum is indented with a single, central scallop.

GENUS I. ARAMUS. THE COURLANS.

The generic characters are as given under the Family heading, with the following additions. The œsophagus is not wide, is without dilatation, and opens into a large proventriculus provided with simple, oval glands arranged in a zonal band. The space between proventriculus and stomach is long, curved, and lined with a soft membrane which lies in longitudinal folds. The stomach is rounded, flattened, very muscular, and lined with a hard, rugose membrane. The intestines are not very long and the cœca are moderately well developed, with the blind ends dilated. The trachea is a little widened at top, but the remainder is rounded and about the same size for its entire length. It is straight for 4.25, then curves gradually around, passing upward for 1.55, turns quite suddenly downward for 1.00, bends upon itself, laterally and upward for .75, then curves down again for 1.15 but passes upward in a final curve for 1.50, turns down and pursues its usual course to the larynx. Thus there are three distinct whorls of the trachea forming an ellipsis which measures about 1.80 x 1.30, while there are about 7 inches of the trachea in these convolutions which lie directly in the fork of the furcula. The entire length of the trachea is 20.50 and it is provided with lateral muscles which do not, however, follow the bends of the trachea, but join together and cross them in an oblique line, then separate to form the sterno-trachealis a little further down. These muscles are only 7 inches long. The larynx is flattened and provided with a small bronchialis. Tympaniform membrane, present. Sexes, similar. There is but one species within our limits.

ARAMUS SCOLOPACEUS.

Courlan.

Aramus scolopaceus Bon, Am. Orn, III; 1828, 111.

DESCRIPTION.

Sp. Ch. Form, slender. Size, medium. Tongue, very long, thin, slender, and narrowing gradually to tip which is rounded. Head, large.

Color. *Adult.* Dark chocolate-brown throughout, glossed above with greenish. Throat, ashy, and all the feathers, excepting on posterior portions, are centrally streaked with white. Iris and legs, brown. Bill, brown, yellow at base of lower mandible. *Young.* Similar, but much paler. *Nestlings.* Are covered with black down.

OBSERVATIONS.

Readily known by the peculiar form and chocolate-brown color streaked with white. Constantly resident in Middle and Southern Florida.

DIMENSIONS.

Average measurements of specimens from Florida. Length, 27.00; stretch, 41.00; wing, 12.50; tail, 5.25; bill, 5.00; tarsus, 5.00. Longest specimen, 28.00; greatest extent of wing, 42.00; longest wing, 13.00; tail, 5.50; bill, 5.50; tarsus, 5.50. Shortest specimen, 26.00; smallest extent of wing, 40.00; shortest wing, 12.00; tail, 5.00; bill, 4.50; tarsus, 4.50.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in bushes, composed of sticks, weeds, and grass. *Eggs,* from ten to fifteen in number, rather elliptical in form, ashy-yellow in color, lined, sprinkled, spotted and blotched irregularly with reddish-brown and umber. Dimensions from 1.70 x 2.35 to 1.75 x 2.50.

HABITS.

I have spoken of the Sandhill Cranes as being noisy birds, but they are excelled in this respect by the Courlans, whose long, oft-repeated notes have given them the name of Crying Birds. They are also called Limpkins in Florida and are particularly abundant in the marshes on either side of the St. John's, from Blue Spring to the mouth of the Wekiva,

and also on this stream and the Oclawaha River further north. I found them common about Lake Harney, and Tiger brought me two from the Everglades and assured me that they were plenty in certain sections of those wide-spread marshes. I had frequently heard the loud notes of this species, as I traversed the rivers, but it was not until the first week in February, 1872, that I saw a specimen. I was being skulled up the river by an assistant, in a gunning float, and had shot a Florida Gallinule, when, at the report of my gun, the loud cries of a Courlan rang out from a small creek on the opposite side. We quickly pushed across and made our way into an opening under some overhanging branches, when the louder notes gave place to a low, chattering sound which appeared to come from a distance. After examining the neighboring shores for a time, unsuccessfully, I chanced to glance at the end of a log upon which I was standing, when I discovered the Courlan sitting there, jerking his head up and down, much after the manner of a Rail. I watched him for some time, when upon making a motion with my gun, he rose lightly, when I shot him. This habit of standing and stupidly gazing at the intruder, I afterward found to be characteristic of the species. When startled, they fly with dangling legs and out-stretched neck, dropping, after a short flight, into the nearest retreat. They appear to prefer the more wooded sections of swamps, but I have, on a few occasions, started them from the grassy borders of the streams. These birds have now been nearly driven from the borders of the rivers which are navigated, retreating to the smaller creeks and bayous which are so choked with aquatic plants that it is almost impossible to force a boat through them. The Courlans breed in February, placing the nests on bushes which overhang the water, and when their homes are approached, the birds quietly leave them. The loud cries of this species are evidently produced by the singularly modified trachea which I have described under generic characters. Audubon states that two that he dissected, had this organ straight and simple, measuring only ten inches in length, with one hundred and eighty-six rings; whereas a male from which I have taken my description, has the trachea double this length, with two hundred and fifty rings. It is probable that Audubon's birds were young, while my was an adult.

FAMILY III. RALLIDÆ. THE RAILS, ETC.

Bill, variable in form and length. Legs, rather short, but the toes are long, and although occasionally margined or lobated, they are never webbed. Marginal indentations, two and deep.

Members of this family have the œsophagus straight, without dilatation. Proventriculus moderately large, with simple glands variably arranged. The intestines are not very short, and the cœca are well developed, being usually quite long. The larynx is variable.

GENUS I. RALLUS. THE LONG-BILLED RAILS.

GEN. CH. Bill, much longer than head, grooved for its terminal two thirds, slender, and slightly curved, and has no frontal plate at its base. Toes, not margined nor lobated. Keel, twice as high as width of sternum. Marginal indentations, narrow but deep.

Members of this genus have the glands of the proventriculus arranged in a zonular band which has two rounded projections in front. The sternotrachealis is present, and there is a small bronchialis. Tympaniform membrane, also present. Sexes, similar. There are three species within our limits.

RALLUS LONGIROSTRIS.

Clapper Rail.

Rallus longirostris BODD, Tab. Pl. enl.; 1784.

DESCRIPTION.

Sr. Ch. Form, robust. Size, large. Tongue, long, thin, slender, and tapering gradually toward tip which is acutely pointed.

Color. *Adult.* Above, greenish-brown, becoming purplish on primaries, with the feathers overwashed and edged with ashy. Sides of head, bluish-ash. Line from bill over eye and under surface, pale ashy-red, tinged with bluish on the sides of neck. Sides, flanks, under wing and tail coverts, brown, banded with white. Iris, feet, and bill, brown, the latter, reddish-orange at base. *Young.* Similar to the adult but darker above and paler below.

OBSERVATIONS.

Readily known by the large size and general ashy-blue tinting, especially below. Distributed, in summer, from Massachusetts, southward; wintering from the Carolinas to Key West.

DIMENSIONS.

Average measurements of specimens from Eastern North America. Length, 14.00; stretch, 20.30; wing, 6.00; tail, 2.50; bill, 2.35; tarsus, 2.25. Longest specimen, 14.50; greatest extent of wing, 20.75; longest wing, 6.50; tail, 2.70; bill, 2.50; tarsus, 2.59. Shortest specimen, 13.50; smallest extent of wing, 20.00; shortest wing, 5.50; tail, 2.25; bill, 2.25; tarsus, 2.00.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground in marshy places, composed of grass, weeds, etc. *Eggs*, from eight to ten in number, oval in form, buffy-yellow in color, dotted and spotted irregularly, but sparsely, with reddish-brown and lilac. Dimensions from 1.05 x 1.60 to 1.15 x 1.75.

HABITS.

The coasts of South Carolina and Georgia are low, and many sounds make into the land, which receive the contents of numerous rivers. Between these sounds, are islands, back of which are creeks of varying widths, in which the tide rises and falls; while between these bodies of water and the mainland, are extensive marshes, many miles in width. These level tracts are scarcely elevated above low water mark, consequently are overflowed by every flood tide, and during the extreme high water that occurs at the full of the moon, even the grass tops of all, but some of the more elevated spots, are submerged. As remarked, these marshes are widely spread, extending from the islands to the westward, as far as eye can reach, and stretching from the extreme northern confines of the State of South Carolina, quite to Florida. Many aquatic birds find a home in this lonely reach of country, but by far the most abundant, at all seasons, are the Clapper Rails, and their harsh voices may be heard at all hours of the day and night, as they skulk through the grass or run along the margins of the creeks in search of food. Like all the members of this genus, these Rails are difficult to start, and the only way in which they can be secured in numbers, is to watch the occurrence of a spring tide which, overflowing nearly everything, forces the birds to take refuge in the few clumps of grass left uncovered, or they will sit upon the floating debris and quietly await the falling of the water.

The number of these Rails which occur in this section, is simply incalculable, but it is safe to say that they may be counted by millions. If a gun be discharged at night-fall, when the birds are most active, the Rails in the immediate vicinity, will utter harsh screams which will be answered by others, and before the echo of the shot has died away, the marsh for miles around, will be resounding with their discordant cries. These Rails have few enemies; it is true, that minks abound in these marshes, and may, occasionally, catch one, and I have frequently seen the Marsh Hawks attempt to capture these birds, but nev-

er saw one succeed in doing anything more than to cause the Rail to scream loudly and beat a vigorous retreat through the high sheltering grass. This species breeds in the drier portions of the marshes, near the islands, depositing their eggs in March and April. They are partly migratory, those which occur as far north as New York and New Jersey, retreating south in winter.

RALLUS ELEGANS.

King Rail.

Rallus elegans AUD., Orn. Biog., III; 1835, 27.

DESCRIPTION.

Sp. Cu. Form, robust. Size, large. Tongue, long, thin, and slender, gradually tapering toward tip which is acutely pointed.

Color. *Adult.* Greenish-brown above, streaked with darker. Upper wing coverts, deep chestnut-red. Sides of head, bluish-ash. Beneath, chestnut-red, with the sides, flanks, and under wing and tail coverts, brown, banded with white. Throat and under eyelid, also white. *Young.* Similar to the adult, but darker above and paler below.

OBSERVATIONS.

Readily known by the pale chestnut-red markings below, and absence of any bluish-ash on either surface. Distributed, in summer, throughout the inland marshes, from New York, southward. Winters in the South.

DIMENSIONS.

Average measurements of specimens from the South. Length, 18.00; stretch, 24.50; wing, 6.35; tail, 3.25; bill, 2.50; tarsus, 2.45. Longest specimen, 19.00; greatest extent of wing, 25.00; longest wing, 6.75; tail, 3.50; bill, 3.00; tarsus, 2.75. Shortest specimen, 17.00; smallest extent of wing, 24.00; shortest wing, 6.00; tail, 3.00; bill, 2.00; tarsus, 2.25.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground in marshy places, composed of grass, weeds, etc. *Eggs*, from eight to ten in number, oval in form, bluish-white or creamy in color, dotted and spotted sparsely with reddish-brown and lilac. Dimensions from 1.15 x 1.55 to 1.25 x 1.75.

HABITS.

Although the King Rails are almost exclusively fresh water birds, I have shot them on the salt marshes about Cedar Keys, in company with the Clapper Rails. Both species are confined to the Middle and Southern Sections but are occasionally taken in Massachusetts, although as yet, I believe, have never been found breeding so far north. The King Rails evidently do not differ in habit from the preceding species, being noisy birds and partly nocturnal. They are migratory, passing southward with the first frosts, some spending the winter in Florida.

RALLUS VIRGINIANUS.

Virginia Rail.

Rallus Virginianus LINN., Syst. Nat., I; 1766, 263.

DESCRIPTION.

Sp. Cu. Form, rather slender. Size, small. Tongue, long, thin slender, and tapering gradually toward tip which is pointed.

Color. *Adult.* Above, dark-brown, with all the feathers, excepting primaries, edged with brownish-yellow. Upper wing coverts, deep chestnut-red. Sides of head, bluish. Line from bill to point over eye, and throat, creamy-white. Under portions, chestnut-red, with flanks and under wing and tail coverts, black, banded with white. Legs, iris, and bill, brown with the latter reddish-orange at base of lower mandible. *Young.* Similar but much darker, the earlier stages being nearly black. *Nestlings.* Are covered with black down glossed with green and the bill is white, with the base of lower mandible, line along its side joining a band across bill, black.

OBSERVATIONS.

Readily known by the small size, long, curved bill, and colors as described. Distributed, in summer, from Canada to Florida. Winters in the South.

DIMENSIONS.

Average measurements of specimens from Eastern North America. Length, 9.25; stretch, 13.50; wing, 3.95; tail, 1.45; bill, 1.45; tarsus, 1.32. Longest specimen, 9.78; greatest extent of wing, 14.00; longest wing, 4.30; tail, 1.75; bill, 1.62; tarsus, 1.40. Shortest specimen, 9.50; smallest extent of wing, 13.00; shortest wing, 3.45; tail, 1.50; bill, 1.25; tarsus, 1.25.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground in marshy places, composed of grass, weeds, etc. *Eggs*, from eight to ten in number, oval in form, creamy in color, sparsely spotted and dotted with reddish-brown and lilac. Dimensions from .90 x 1.20 to .95 x 1.30.

HABITS.

One hot July day, when I was a small boy, I was lying at full length in a meadow, in order that I might quench my thirst from a cool spring that was so thickly surrounded by water docks, grass, and other herbage, as to be nearly hidden. I had taken a long draught, when a chuckling sound attracted my attention, and looking up, I saw what then appeared to me to be a singular bird, with a long, sword-shaped bill, standing by the edge of the spring within a foot of my head, quietly gazing at me. As I raised my head, he gave a quick nod or two, as if to say, "That's all right," then turned and walked slowly away, with a stately, swinging gait, evidently satisfied that I was too small to be considered at all dangerous. It was some years after this event, that I saw a Virginia Rail with his proper cognomen attached, but I at once recognized the bird as being similar to the guardian of the spring in the meadow. The Virginia Rails inhabit the wet, fresh water marshes from Canada to Florida, but appear to prefer those which are partly grown up to bushes. This propensity I could not explain, until I saw one in the aviary of Mr. August Koch who has fitted up an abode for captive birds with great care, having a fountain, miniature pond, rock work with grottos, all embellished with numerous plants, among which are some vines that twine up to the ceiling. One of the most attractive birds, among the many which lived in this enclosure, was the Rail mentioned, which was quite tame, and which evidently behaved much as it would have in its native swamp. It fed readily, waded about in the water, and when slightly alarmed, would take refuge among the surrounding ferns, etc.; but what surprised me most, was to see it climb up the vines, which it did with the utmost ease, clinging to the branches with its long claws, and in this way, it often reached the top, some ten feet from the ground. The bird was evidently hunting for insects and this habit was probably acquired when among the bushes in the meadows.

When only slightly alarmed, the Virginia Rails utter a chuckling sound, but if badly frightened or greatly annoyed, especially during the nesting season, when they have young, they will emit a sharp squeak, but their regular notes are harsh screams, usually given at night. These Rails breed early in June, building on some slightly elevated spot, either in the grass or among the bushes, and when their domiciles are approached, the birds quietly leave them. The young leave the nest as soon as hatched, and run nimbly through the grass. They become scattered somewhat during the day, but toward night, they will utter sharp cries, in order that the adults may know of their whereabouts, and then the entire brood will gather beneath the parent for warmth. I have, on several occasions, captured these little black Rails in the evening, having ascertained where they were by hearing them peeping. When taken young, they become very tame, feeding readily upon bits of meat or insects, behaving much like young chickens. They are, however, very delicate

and difficult to rear, as they require considerable attention, especially at night, when they should be kept warm. The Virginia Rails are migratory, disappearing from New England by the last of September.

GENUS II. PORZANA. THE SHORT-BILLED RAILS.

GEN. CH. *Bill, not as long as head, not grooved nor curved, is rather thick at base but has no frontal plate. Toes, not margined nor lobated. Keel, twice as high as width of sternum. Marginal indentations, narrow but deep.*

Members of this genus have the glands of the proventriculus arranged in a zonular band which is without rounded projections in front. The sterno-trachealis is present, and there is a small bronchialis. Tympaniform membrane, also present. Sexes, similar. There are three species within our limits.

PORZANA CAROLINA.

Carolina Rail.

Porzana Carolina CAB., JOHN., 1856, 428.

DESCRIPTION.

SP. CH. Form, slender. Size, medium. Tongue, not very long, rather fleshy, and narrowing gradually to tip which is rounded.

COLOR. *Adult.* Line back of eye and upper parts, brownish-yellow, broadly streaked with brown and dotted with white. Wings, brown with the outer primaries edged with white. Line on top of head, space around bill and line down throat, black. Breast and sides of head and neck, slaty-blue. Remainder of under parts, white, banded with greenish and dusky on sides and flanks. Under tail coverts, reddish-buff. *Young.* Similar, but are overwashed with reddish below and lacks the black markings about head and throat. Iris, brown. Bill, yellow. Legs, greenish. *Nestlings.* Are covered with black down and have a tuft of orange colored bristles at base of bill.

OBSERVATIONS.

Readily known by the medium size, short, thick bill, and colors as described. Distributed, in summer, from Canada southward. Winters in the South.

DIMENSIONS.

Average measurements of specimens from Eastern United States. Length, 8.75; stretch, 13.75; wing, 4.25; tail, 1.95; bill, .85; tarsus, 1.35. Longest specimen, 9.00; greatest extent of wing, 14.50; longest wing, 4.42; tail, 2.16; bill, .90; tarsus, 1.40. Shortest specimen, 8.50; smallest extent of wing, 13.00; shortest wing, 4.15; tail, 1.75; bill, .75; tarsus, 1.25.

DESCRIPTION OF NESTS AND EGGS.

Nests. placed on the ground in marshy places, composed of grass, weeds, etc. *Eggs,* six to ten in number, oval in form, reddish-buff in color, dotted and spotted, irregularly, but sparsely, with reddish-brown and lilac. Dimensions from .85 x 1.20 to .95 x 1.25.

HABITS.

Although the Carolina Rails differ somewhat in structure from the Virginia, they resemble them in many habits; both rise when first disturbed, fly in a straight line a short distance, with dangling legs, and drop into the grass, after which it is difficult to make them start a second time, and both inhabit similar places, but the present species is inclined to prefer open meadows which are free from bushes. The Virginias are also almost exclusively fresh water birds, while the Carolinas are equally abundant on both salt and fresh marshes, but prefer the latter as breeding grounds. All the Rails swim and dive well but I think the Carolinas rather excel them all in this respect, for they will not only take readily to the water, but will pass beneath it with great facility, and I once saw one run nimbly along the bottom of a brook, the water of which was about a foot deep, by clinging to aquatic plants, and crossing it obliquely, emerged on the other side, thus passing over some fifteen feet while submerged. I have also seen these Rails run rapidly over the surface of the water, where there were a few plants to afford them a slight support. These Rails migrate from New England with the first hard frosts, after which they gather in immense numbers on the salt marshes of New Jersey, but gradually pass southward, occurring

in winter from the Carolinas to Key West. They breed in Massachusetts during the last week in May or first in June.

PORZANA NOVEBORACENSIS.

Yellow Rail.

Porzana Novboracensis Cass., Baird's Birds N. A.: 1858, 750.

DESCRIPTION.

SP. CH. Form, slender. Size, small. Tongue, wide, thin, and horny, especially at tip which is gradually rounded and bifid. Bill, rather slender.

COLOR. *Adult.* Above, and on sides and flanks, dark-brown, with all the feathers, excepting primaries, longitudinally streaked with yellowish and transversely banded with white. Neck, breast, and under tail coverts, reddish-buff. Remainder of under portions, and tips of secondaries, white. Legs, iris, and bill, brown, with the latter yellow at base of lower mandible. *Young.* Similar to the adult but paler below.

OBSERVATIONS.

Readily known by the small size, broad white band on secondaries, and colors as described. Distributed, in summer from Hudson's Bay to Massachusetts. Winters in Florida.

DIMENSIONS.

Average measurements of specimens from Eastern North America. Length, 6.75; stretch, 12.50; wing, 3.55; tail, 1.65; bill, .55; tarsus, .80. Longest specimen, 7.25; greatest extent of wing, 13.00; longest wing, 3.80; tail, 1.75; bill, .60; tarsus, .85. Shortest specimen, 6.00; smallest extent of wing, 12.00; shortest wing, 3.25; tail, 1.50; bill, .50; tarsus, .75.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground in marshy places, composed of grass, weeds, etc. *Eggs*, from six to ten in number, oval in form, deep buff in color, dotted and spotted irregularly, but very sparsely, with reddish-brown and lilac. Dimensions from .85 x 1.15 to .80 x 1.05.

HABITS.

"September eighth, 1868, walking with a young lad over a squash field on high land, but within twenty or thirty rods of a meadow; suddenly I heard the boy who was on the lookout for specimens, exclaim, 'Here's a Sparrow with white wings!' 'Shoot it!' said I, and looking toward him, I saw him beating about among the squash leaves, then raise his gun and fire, after which he ran forward, and stooping down, exclaimed, 'It is a Rail!' I hastened to the spot, took the bird in my hand, and to my surprise and delight, it proved to be the rare Yellow Rail, the first that I had ever seen; a female it proved upon dissection, (No. 1240). This was in the dusk of the evening, and when first started, the bird made a squeaking noise, but not loud, for I stood within fifteen rods of the place and did not hear it. The secondaries of this specimen are broadly margined with white, a fact not noticed by Audubon or Baird; thus this must be peculiar, or these ornithologists would have observed it; indeed it gave the bird the appearance of having white wings, in the dusky light in which it was shot. I should think that it is a young bird but in perfect plumage. The body and head remind one strongly of some of the small foreign Quails."

The above is an extract from one of my note books, and four years later, on the twentieth of January, I started a Yellow Rail in one of the partly submerged marshes on the border of the St. John's River in Florida, near Blue Spring. This specimen rose some distance from me and flew quite rapidly, for a Rail, in a straight line for some distance, then dropped into the tall grass, from which I could not make it rise again. I easily recognized this specimen by the small size and conspicuous white tippings to the primaries, a character which I find is constant in all specimens that I have examined, but which appears to have been overlooked by most writers on ornithology. In June, 1873, I heard some sin-

gular chuckling or metallic-like notes coming from the inaccessible bogs on the Magdalen Islands. These peculiar sounds, I then judged, were produced by Yellow Rails but I never saw one of the birds on the islands. The foregoing is all that I have to record, from personal experience, of the Yellow Rails, a bird which appears to be quite rare every-where. Specimens are, however, occasionally taken throughout the Eastern Section of the United States, especially in Massachusetts in autumn.

PORZANA JAMAICENSIS.

Little Black Rail.

Porzana Jamaicensis Cass., *Birds, N. A.*; 1858, 749.

DESCRIPTION.

Sp. Ch. Form, slender. Size, very small. **Color.** *Adult.* Back and neck, dark chestnut-red. Remainder of upper surface, very dark-brown, spotted and transversely banded with white. Sides of head and entire under portions, bluish-ash, transversely banded on abdomen and under tail coverts with white. Iris, red; feet, brown; bill, black.

OBSERVATIONS.

Readily known by the small size and dark colors as described. Distributed, as a rare summer resident, from Massachusetts, southward. Winters south of the United States.

DIMENSIONS.

Average measurements of specimens from Eastern North America. Length, 5.50; stretch, 11.50; wing, 3.25; tail, 1.35; bill, .55; tarsus, .95. Longest specimen, 6.00; greatest extent of wing, 12.00; longest wing, 3.50; tail, 1.50; bill, .60; tarsus, 1.00. Shortest specimen, 5.00; smallest extent of wing, 11.00; shortest wing, 3.00; tail, 1.25; bill, .50; tarsus, .90.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground in marshy places, composed of grass, weeds, etc. *Eggs*, from six to eight in number, oval in form, creamy in color, finely dotted and spotted with reddish-brown. Dimensions from .75 x 1.00 to .80 x 1.05.

HABITS.

Although the Little Black Rail has been taken in Massachusetts on one or two occasions, it is very rare here, as it is, in fact, every-where in our section; and I know nothing of its habits from personal observation, as I never saw a living specimen. It does not, however, appear to differ from other Rails which live in the fresh water marshes.

GENUS III. GALLINULA. THE GALLINULES.

Bill, about as long as head, not grooved nor curved, rather thick at base, and provided with a large frontal plate. *Toes*, margined. *Keel*, equal in height to the width of the sternum. *Marginal indentations*, two and deep.

Members of this genus have the glands of the proventriculus arranged in a zonular band, but scalloped above and below. The sterno-trachealis is present and well developed, and there is a wide but thin bronchialis. Tympaniform membrane, also present. Sexes, similar. There are two species within our limits.

GALLINULA GALEATA.

Florida Gallinule.

Gallinula galeata Br., *Am. Orn.*, IV; 1832, 128.

DESCRIPTION.

Sp. Ch. Form, slender. Size, rather large. Tongue, white in color, rather fleshy, horny at tip which is provided with cilia.

Color. *Adult.* Ashy-blue throughout, darkest anteriorly. Middle of back and wings, rich, dark yellowish-brown. Tail and middle of its under coverts, black. Outer under tail coverts, spots in a line on side, and tips of feathers on belly and abdomen, white. Tip of bill, yellow; remainder of this, frontal plate, and tibia, sealing-wax red; feet, greenish.

Young. Similar to the adult but overwashed with reddish above, and the feathers below are overwashed with reddish and tipped with white. The frontal plate is not as large, and this, bill, and tibia are greenish.

Nestlings. Are covered with a black down glossed with greenish, with a few white bristles about the throat, on side of head, and over eye. Bill, yellow, without frontal plate, and feet black.

OBSERVATIONS.

Readily known by the nearly uniform bluish-ash color, and absence of lobations on the toes. Distributed, in summer, from Massachusetts, southward. Rare as far north as Canada. Winters in the South.

GALLINULA MARTINICA.

DIMENSIONS.

Average measurements of specimens from Eastern North America. Length, 13.50; stretch, 22.00; wing, 6.70; tail, 2.50; bill, 1.12; tarsus, 1.75. Longest specimen, 14.00; greatest extent of wing, 23.00; longest wing, 7.00; tail, 3.00; bill, 1.25; tarsus, 2.25. Shortest specimen, 13.00; smallest extent of wing, 21.00; shortest wing, 6.40; tail, 2.00; bill, 1.00; tarsus, 1.25.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground in marshy places, composed of grass, weeds, etc. *Eggs*, from eight to ten in number, oval in form, creamy-buff in color, spotted and dotted with brown and amber. Dimensions from 1.20 x 1.75 to 1.30 x 1.80.

HABITS.

Although the Florida Gallinules occur regularly in Massachusetts, and even breed in some of our larger marshes, they are not common here. In Florida, however, the species is remarkably abundant and deposit their eggs in May. The nests are placed on the drier portions of the marshes, among thick reeds or rushes, and when the locality is approached, the birds quietly leave their domiciles and disappear in the sheltering vegetation. In general habits, the Florida Gallinules somewhat resemble the Rails, spending much of their time among the grass and aquatic plants which border rivers and other bodies of fresh water. They will, however, occasionally emerge from these retreats and walk over the exposed margins of the water, wade in the shallows, or make their way over the floating vegetation. These birds also swim well, but when thus engaged, the head is jerked backward with every motion of the legs, as if the birds were walking with the body partly submerged. If disturbed when not in shelter, the Gallinules either dive into the water or rise, and fly with dangling legs, to the nearest grass, into which they drop like Rails; but unlike these birds, they can be started again quite easily. These Gallinules readily become tame, and a specimen, brought to me from the Everglades, by the Seminole chief, Tiger, and which he assured me, had been in captivity but a few days, was so unsuspecting that it fed from my hand. It had a long string fastened to its leg, and had become quite accustomed to this method of confinement, for it never attempted to escape; but I had only kept it a few days, when it was unfortunately killed by a predatory opossum.

GALLINULA MARTINICA.

Purple Gallinule.

Gallinula martinica LATH., Ind. Orn., II; 1790, 769.

DESCRIPTION.

SP. CH. Form, robust. Size, medium. COLOR. *Adult*. Upper part of body, brownish-green, darkest on back and rump. Wings and tail, brown, edged on outer webs with green. Head and under parts, bluish-purple, darkest on abdomen and tibia, with sides and under wing coverts, greenish. Under tail coverts, white. Bill, red, tipped with yellow. Frontal plate, blue. Iris, brown. Legs, greenish.

OBSERVATIONS.

Readily known by the purplish and green colors, and absence of lobatings on the toes. Distributed, in summer, in Florida. Accidental as far north as Massachusetts. Winters south of the United States.

DIMENSIONS.

Average measurements of specimens from Florida. Length, 12.50; stretch, 20.50; wing, 6.50; tail, 3.25; bill, 1.12; tarsus, 2.12. Longest specimen, 13.00; greatest extent of wing, 21.00; longest wing, 7.00; tail, 3.50; bill, 1.25; tarsus, 2.25. Shortest specimen, 12.00; smallest extent of wing, 20.00; shortest wing, 6.00; tail, 3.00; bill, 1.00; tarsus, 2.00.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground in marshy places, composed of grass, weeds, etc. *Eggs*, from six to ten in number, rather elliptical in form, creamy in color, finely and rather sparsely dotted with brown and amber. Dimensions from 1.15 x 1.70 to 1.20 x 1.75.

HABITS.

The Purple Gallinules are only found in Florida during summer, appearing on the marshes of the interior in May, and I have seen them walking over the floating vegetation on the St. John's River, appearing much like the preceding species, but are quite readily distinguished, even at a distance, by the brighter colors. These birds breed late in May in Florida, for I have received eggs from that section, taken at this time. In migrating, these Gallinules appear to move in flocks, for I was informed by the wreckers, that occasionally the exposed margins of the outer keys are covered with them, at which time they are so tame that they can be captured in the hand without difficulty. The Purple Gallinules have been taken as far north as Massachusetts, but are very rare here.

GENUS IV. FULICA. THE COOTS.

GEN. CH. *Bill, about as long as head, not grooved nor curved, thick at base, and provided with a frontal plate. Toes, lobated. Keel, not equal in height to the width of the sternum. Marginal indentations, two, wide and deep.*

In members of this genus the glands of the proventriculus occupy two circular spaces on the upper and lower portions, which measure .75 in diameter in our species. The stomach is very muscular. The trachea is flattened above, then becomes rounded and narrows rapidly below the origin of the sterno-trachealis which is long and slender, emerging from the trachea .50 from the larynx, and there is a wide but thin bronchialis. The bronchial tubes are small, bend inward near the center, where they are connected by a wide ligature. The tympaniform membrane and os transversale are both absent. Sexes, similar. There is one species within our limits.

FULICA AMERICANA.

Coot.

Fulica Americana GM. Syst. NAT., I; 1788, 704.

DESCRIPTION.

SP. CH. Form, robust. Size, rather large. Tongue, white in color, very thick, fleshy, and pointed at tip which is horny.

COLOR. *Adult.* Uniform, dark bluish-ash, becoming nearly black on the head and neck, with outer edge of outer primaries, tips of secondaries, and under tail coverts, white, while the last has a black line down the center. Iris, brown. Legs, greenish. Bill, yellow, white at tip, with a band across center and frontal plate, brownish-red. *Young.* Similar to the adult but paler and the feathers are more or less tipped with white.

OBSERVATIONS.

Readily known by the lobated toes and uniform dark bluish-ash colors as described. Distributed, as a summer resident, from Canada southward. Winters in the South.

DIMENSIONS.

Average measurements of specimens from Eastern United States. Length, 15.60; stretch, 25.25; wing, 7.25; tail, 1.33; bill, 1.33; tarsus, 1.75. Longest specimen, 16.22; greatest extent of wing, 27.50; longest wing, 8.00; tail, 2.25; bill, 2.30; tarsus, 2.30. Shortest specimen, 13.50; smallest extent of wing, 23.00; shortest wing, 6.50; tail, 1.89; bill, 1.20; tarsus, 1.25.

DESCRIPTION OF NESTS AND EGGS.

Nests. placed on floating vegetation or on the ground in marshy places, composed of grass, weeds, etc. *Eggs,* six to ten in number, oval in form, creamy white in color, finely dotted and spotted with black. Dimensions from 1.15 x 1.80 to 1.40 x 2.00.

HABITS.

Coots are common on both fresh and salt waters from Canada to Florida, especially in autumn, but are more numerous toward the South, and I have seen thousands at a time on the bays of Indian River. There can be but little doubt that the Coots breed in Florida, as they occur in numbers there throughout the year. In habits, these birds resemble both the Ducks and Gallinules, as they not only swim and dive well but make their way through the grass with ease and swiftness. When disturbed on the open water, they will swim with

graceful ease into the nearest grass or other vegetation, from which it is difficult to make them rise; and I have on several occasions, pushed the prow of my boat into a clump of aquatic plants, only a few feet in diameter, in which two or three had taken refuge, without starting them, although I could plainly see them crouching among the vegetation, so near that I could almost touch them with my hand. When rising, the Coots will run along the surface of the water, then fly, like the Rails, with dangling legs. The notes of the Coots resemble those of the Gallinules but are, if anything, more harsh and grating.

The Coots are remarkably abundant in the little ponds and lagoons on the marshes which lie to the eastward of Indian River, Florida. Here they have the habit of gathering together in a nearly solid mass in the middle of the body of water on which they float and it is exceedingly difficult to make them leave one of these chosen resorts. Even when shot at those that are uninjured will frequently remain while those which do fly generally circle about and after a time return. I remember once of walking along the margin of a narrow creek near Mosquito Lagoon, with my assistant, when we encountered a large body of Coots. At the point where we found them the creek was only about ten yards wide, and as we could walk faster than the birds could swim, we were soon abreast of them, but although we were so close to them none of them attempted to fly, but as we passed the first portion of the flock, the Coots of which it was composed, turned and swam back, then, sheep-like, all followed, and we stood still while hundreds of them swam past us. As the birds were crowded together, somewhat, their ranks were quite wide so that the nearest birds were only a few feet away.

This crowding together of Coots appears to inspire them with confidence and a hundred of these birds in a body are far easier to approach, without alarming them, than one or two. There may be some reason for this, and as will be seen by the following statement, they are safer from one class of enemies, at least, in a body than when single.

Fish Hawks are not remarkably common near the upper end of Merritts' Island and thus the Bald Eagles, which are very common, are obliged to subsist for themselves, but I never saw one attempt to catch fish but they do catch Coots, and it is a singular sight to see one so engaged. The Eagle hovers over a bunch of Coots and endeavors by diving down towards the flock to make them scatter. The Eagle will never attack a Coot when surrounded by its fellows, but the instant one is separated from the flock his life is in jeopardy, for, no matter how expertly he dives, his untiring enemy is above him whenever he comes to the surface, and drives him further and further from his friends, who never attempt to protect him, but who swim away as fast as their lobated toes will propel them. But the chase, unequal in the outset, soon ends—the exhausted Coot rises for the air which it must have, when like a thunderbolt falls the Eagle and the lifeless waterfowl is borne away to satisfy the hunger of the eaglets who are waiting, expectant, in their stick-built home in the high top of some neighboring pine. I have never seen the Coots attempt to defend themselves even when a body, in fact, they always dive and scatter somewhat when the Eagle comes swooping downward toward them, but quickly gather

again as soon as they rise. The reason why the Eagle tries to separate one Coot from its fellows must be that he can then trace that particular bird, and by chasing it until it is exhausted, effect its capture, whereas it would quite easily elude him if it kept among its fellows. Among Coots, their safety lies in numbers, even if all be cowards, but the wonder is, not that the Eagles know this, but that the Coots themselves do.

FULICA ATRA.**European Coot.**

DESCRIPTION.

SP. CH. Size, form and general color of the American Coot, but differs in having the bill and frontal plate entirely white. The edge of wing and first primary is also white but there is no white on sides of tail. The eggs are similar to those of the American Coot, but average a little larger. A common European species, occurring in Greenland.

RALLUS SATURATUS.**Louisiana Clapper Rail.**

DESCRIPTION.

SP. CH. Size, form and general coloration similar to that of the Clapper Rail but more ashy above with broad stripes of brown; breast, dull crimson. Occurs in Louisiana.

RALLUS SCOTTI.**Scotts' Rail.**

DESCRIPTION.

SP. CH. Similar to the Clapper Rail but with the bill more slender, darker above, being nearly black; below, ashy gray mixed with cinnamon. Axillary and flanks, slate-colored, distinctly barred with white. Described by Mr. Sennet, from Western Florida, in the Auk, April, 1889, p. 165.

PORZANA MARUETTA.**Spotted Crake.**

DESCRIPTION.

SP. CH. Form similar to the Carolina Rail, but the size is a little smaller. COLOR. Dark reddish brown above, olive-tinted. Head and neck freely spotted with white and remaining back spotted and shortly striped with white and marked with blackish. Slaty-gray below, becoming whitish on the belly, with the breast spotted with white, and the flank barred with white. The sides of flanks are buff. Top of head and upper throat blackish. Quills and tail, dark greenish brown. Bill, orange red at base. Feet, yellowish green. Iris, reddish brown. The young lack the black of face and have the chin whitish.

DIMENSIONS.

Length, 8.25 to 8.50; wing, 4.25 to 4.75; tail, 2.00 to 2.10; bill, .85 to .90; tarsus, 1.40 to 1.45.

NESTS AND EGGS.

NESTS, placed on the ground composed of grasses, etc. EGGS, eight to twelve in number, oblong oval in form, creamy buff in color spotted with reddish brown. Dimensions, 1.30 by .94 to 1.35 by .98.

CORN CRAKE.

OBSERVATIONS.

This interesting little Rail, which is a well known European species, occurs in Greenland and may be at once distinguished from the Sora Rail by the white spottings below.

GREX PRATENSIS.

Corn Crane.

DESCRIPTION.

SP. CII. Bill similar to that of the Sora Rail, but the wings are longer, folding nearly to the end of the tail, and the legs are shorter. Dark brown above, mottled with yellowish brown. Upper and under wing coverts rusty red, and the quills are reddish brown. Bluish gray below, becoming ashy on throat, and the flanks are varied with reddish brown. There is an ashy line over the eye and a line through it of dark brown. Bill, iris, and feet brown, the latter pale.

DIMENSIONS.

Length, 10.00 to 10.50; wing, 5.50 to 6.00; tail, 2.00 to 2.25; bill, .80 to 1.00; tarsus, 1.50 to 1.80.

OBSERVATIONS.

The well known Corn Crane of Europe occurs occasionally in Greenland and has been taken in New Jersey and Bermuda. It may be known by the long wings and short legs.

NESTS AND EGGS.

NESTS, placed on the ground, composed of grass, etc. EGGS, nine or twelve in number, oval in form, pale buff in color, spotted and blotched with reddish brown and lilac. Dimensions, 1.50 by 1.73 to 1.55 by 1.75.

ORDER XIV. HERODIONES. HERONS ETC.

Legs, long and naked far above the tarsal joint. Posterior toe, present, well-developed, and always on a level with the anterior toes. Keel, not exceeding in height the width of the sternum. Marginal indentations, two or four. Terminal expansion, with or without central projection, and it usually approximates very closely to the tip of keel.

This Order includes the Ibises, Herons, Spoonbills, etc., all of which are widely distributed, but are generally better represented in the Tropics than elsewhere, while the species are rare north of the Temperate Zone. Some of the species vary considerably in external form, as well as in anatomical characters but all these points are given under family and other headings.

FAMILY I. IBIDIDÆ. THE IBISES AND SPOONBILLS.

Bill, at least twice as long as the head and grooved throughout. Furcula, short, well arched, not projected backward, nor approximating very closely to the tip of keel. Marginal indentations, four.

The head is more or less naked in adult specimens. The trachea is flattened throughout and the larynx is about normal and provided with a thin bronchialis. The stomach is muscular, and there are two small cœca. Members of this family are widely distributed throughout the world, occurring mainly, however, in the Tropics. The young are covered with down at birth, but are comparatively helpless and are fed by regurgitation.

GENUS I. IBIS. THE IBISES.

GEN. CH. *Bill, longer than head, quite slender, not expanded at tip, and well-curved downward. Sterno-trachealis, present. Webs between toes, small.*

The larynx is normal in position. The intestines are large and short. Sexes, similar. There are two species within our limits.

IBIS ALBA.

White Ibis.

Ibis alba VIEILL., Orn. Diet.; 1816.

DESCRIPTION.

SP. CH. Form, robust. Size, medium. Tongue, short, .35 long, somewhat fleshy, and narrowing gradually to tip which is rounded.

COLOR. *Adult.* Head, naked beyond eyes. Pure white throughout, with the four outer primaries tipped with black glossed with green. Bill, naked space about head, and feet, bright yellow. Iris, pale blue.

Young. Above, and on head and neck, dark-brown glossed with greenish on the former and streaked on the two latter with ashy. Lower back, rump, upper tail coverts, and lower portions, white. Head, feathered to eyes. Bill, naked space about head, and legs, brownish-yellow. Iris, brown.

OBSERVATIONS.

There are all gradations in plumage between the adult and young, specimens being frequently mottled with white above. Readily known in the adult stage by the curved bill and pure white colors, and in the young stage by the white posterior portions above. Distributed, in summer, from the Carolinas, southward; wintering in Florida. Stragglers occasionally wander north, even as far as New England.

DIMENSIONS.

Average measurements of specimens from Florida. Length, 24.50; stretch, 37.35; wing, 11.25; tail, 4.30; bill, 5.20; tarsus, 3.70. Longest specimen, 27.50; greatest extent of wing, 33.50; longest wing, 11.75; tail, 4.70; bill, 6.05; tarsus, 4.30. Shortest specimen, 21.50; smallest extent of wing, 36.25; shortest wing, 10.50; tail, 3.90; bill, 4.35; tarsus, 3.15.

DESCRIPTION OF NESTS AND EGGS.

Nests. placed on trees or bushes and composed of sticks, somewhat loosely arranged. *Eggs,* two or three in number, oval in form, ashy-blue in color, spotted and blotched irregularly with reddish-brown of varying shades. Dimensions from 1.40 x 2.15 to 1.65 x 2.40.

HABITS.

The great strong-hold of the White Ibises in Florida, is the marshes which lie on both sides of the upper St. John's, above Lake George. Here the level country stretches out on either hand as far as the eye can reach, but as it is nearly always inundated, leaving only the grass-tops exposed, or wide-spread, muddy flats, which are so soft that they will not bear the weight of a man, this section is nearly or quite inaccessible. This proves fortunate for the birds, and Herons and Ibises frequent this section in numbers which appear astonishing to one who is not accustomed to seeing a large number of birds together; for they gather in flocks of hundreds of thousands, fairly darkening the air when they rise.

This appears to be merely the winter quarters of the White Ibises, for in spring, they retreat to the coast, mainly on the west side of the peninsula, to breed. At this season, the gular sac beneath the bill, undergoes a singular change, becoming greatly thickened and much brighter in color. The white Ibises now choose islands along the unfrequented portion of the coast as breeding places, building their nests on the low mangroves or bushes. They also roost in similar places, flying into the interior to feed. I have always found this species very shy and difficult to approach, especially when feeding, but when they have had their fill of crawfish and other small crustaceans, of which they are very fond, and are resting on the bushes, they may be approached quite closely by using caution. They are very difficult to kill and when only winged, run nimbly through the tangled thickets, so that it is not easy to capture one in this condition.

IBIS FALCINELLUS.

Glossy Ibis.

Ibis falcinellus VIEILL., Orn. Diet; 1816.

DESCRIPTION.

Sr. Ch. Form, robust. Size, large. Tongue, short, and gradually tapering toward tip which is pointed. Outer marginal indentations, narrow, but as deep as inner.

Color. Adult. Rich chestnut-brown throughout, with top of head, nape, both sides of wings, excepting lower coverts, and tail, metallic green with a purplish iridescence. Iris, red.

Young. Similar to the adult but the head and neck are grayish and the feathers are more or less edged with white. Iris, brown. Bill and feet, dark-brown, in all stages.

OBSERVATIONS.

Specimens of the Glossy Ibis from the East Coast, which I have examined, appear to differ from the well-known Texas form in having no white on the face, thus it remains to be decided whether our birds are stragglers from across the Atlantic or whether they come to us from South America. Readily known by the chestnut color as described. Not uncommon in Florida and rare in the Northern States.

DIMENSIONS.

Average measurements of specimens from Eastern North America. Length, 25.00; stretch, 33.00; wing, 11.50; tail, 4.25; bill, 4.25; tarsus, 3.25. Longest specimen, 26.00; greatest extent of wing, 36.00; longest wing, 12.50; tail, 4.50; bill, 4.50; tarsus, 3.50. Shortest specimen, 24.00; smallest extent of wing, 30.00; shortest wing, 10.50; tail, 4.00; bill, 4.00; tarsus, 3.00.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in trees or low bushes, composed of sticks, loosely arranged. *Eggs*, two or three in number, varying from elliptical to oval in form, deep greenish-blue in color, unspotted. Dimensions from 1.37 x 1.85 to 1.50 x 2.15.

HABITS.

The first time that I ever met with the Glossy Ibises, was at Lake Harney, many years ago. I had pitched my tent on the eastern shore, and taking my gun, walked out into the piney woods. I had not gone far, when I saw a flock of Ibises, which I at once recognized as being the Glossy, feeding around a small, shallow pool. I approached them rather carelessly, thinking that they would be quite tame, as the country was then a perfect wilderness, but before I had gone within gun-shot, they rose, as if by common consent, and flew rapidly away over the lake, and I never saw them again.

The next time that I met with them, I was far up the St. John's, when a flock consisting of a half dozen specimens, came dashing down the river, and flying very irregularly, passed within a few yards of me, but so quickly that I did not have time to raise my gun. Thus my acquaintance with this species is not very extended, but I do not think that they

breed in Florida. Specimens of this species have been taken only in the Eastern Section of the United States, as far north as New Haven, Connecticut, and as far west as Colburn, Massachusetts, during the first week in May, 1878, one of which is in the collection of the Bangs Brothers. These, and all others which I have examined, were evidently stragglers from the Old World or from South America, but whether the Florida birds which I found, belonged to this class, remains to be proved. I am under the impression, however, that I have somewhere seen a specimen, taken in Florida, which did not resemble the Texan form.

GENUS II. PLATALEA. THE SPOONBILLS.

GEN. CH. *Bill, but slightly curved, rarer than twice as long as head, much flattened, and widely expanded at the rounded tip. Sterno-trachealis, absent. Webs between toes, large.*

Members of this genus are remarkable for the singularly flattened bill. The trachea is also peculiar, being elevated, and the bronchial tubes are greatly elongated. The intestines are small and long. Sexes, similar. There is but one species within our limits.

PLATALEA AJAJA.

Roseate Spoonbill.

Plataea ajaja LINN., Syst. Nat., I: 176, 231.

DESCRIPTION.

Sp. CH. Form, robust. Size, large. Tongue, very short, only .25 long, triangular in form, with the tip pointed. Sternum, stout. Outer marginal indentations, equal in depth to inner.

Color. *Adult.* Rosy-red throughout, brightest beneath, and much lighter on neck. Tuft of recurved feathers on neck, band on wing, and upper and lower tail coverts, rich carmine. Patch on side of neck, pale orange. Tail, brownish-orange, rosy at base. Head, naked, green in color, with space around eye and gular sac, bright orange, while a line of black extends from bill to occiput. Bill, bluish, mottled with dusky at base. Feet, pinkish. Iris, deep carmine.

Young. Similar to the adult, but much paler, and lack the bright markings, while the tail is rosy and the primaries are tipped with dusky. Iris and feet, brown. Bill, yellowish, brown at base.

OBSERVATIONS.

Known from all others by the spoon-like bill, and rosy colors as described. Distributed, as a constant resident, in Florida. Rare in summer, as far north as the Carolinas.

DIMENSIONS.

Average measurements of specimens from Florida. Length, 29.35; stretch, 51.50; wing, 11.50; tail, 4.75; bill, 6.35; tarsus, 3.50. Longest specimen, 33.75; greatest extent of wing, 53.00; longest wing, 15.00; tail, 5.00; bill, 7.00; tarsus, 4.00. Shortest specimen, 28.00; smallest extent of wing, 48.00; shortest wing, 11.00; tail, 4.50; bill, 5.75; tarsus, 3.00.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in trees, composed of sticks loosely arranged. *Eggs,* two or three in number, oval in form, ashy-white in color, spotted and blotched, rather sparsely, with pale reddish-brown. Dimensions from 1.70 x 2.50 to 1.75 x 2.60.

HABITS.

When I first visited Florida, I was quite surprised to hear the inhabitants speak of the Pink Curlews as being very common, and I naturally supposed that the Scarlet Ibis was the species they had in mind; but upon further inquiries, I found that this appellation was applied to the Roseate Spoonbills, and learned that the Scarlet Ibis was entirely unknown in the State. Years ago, the Roseate Spoonbills were found throughout Florida, but as their feathers have long been valuable for ornaments, the birds have been exterminated or driven away from the Northern, Eastern, and Middle Sections, and now are found in numbers, only on the Western coast, even being rare on the Keys. The Spoonbills are not unlike the White Ibis in general habits, but differ from this species in breeding in the interior. They may be seen feeding on the muddy flats of the coast, in spring and winter, but late in summer and in autumn, they wander more, at which time they are found about the lakes in the interior of the State. These handsome birds are exceedingly graceful in

movement, resembling the Herons in this respect; and when wounded, they are very gentle, seldom attempting to defend themselves. They are also easily tamed and I once saw one in a cage, which was quite unsuspecting, feeding mostly upon small fishes, bread, and cooked sweet potatoes, which it would take from the hand. The Roseate Spoonbills breed early, usually in February or March, choosing islands in the nearly inaccessible swamps or lakes of the interior, as nesting places, where they rear their young in perfect safety.

FAMILY II. TANTALIDÆ. THE WOOD IBISES.

Bill, about three times as long as head but not grooved. Furcula, long, wide at base, not well-arched, but projected backward until it meets the tip of the keel. Marginal indentations, two.

The head is completely naked in adult specimens. The trachea is rounded, and the larynx is simple, with a thin sterno-trachealis, but there are no other laryngeal muscles. There is no tympaniform membrane but the os transversale is present and also a small semilunar membrane. The proventriculus is large, globular in form, and is provided with simple, oval glands. The stomach is not very muscular, and the fold of the duodenum is short, inclosing a small pancreas. The intestines are small and long, but the cœca are very short, being in fact merely rudimentary.

GENUS I. TANTALUS. THE WOOD IBISES.

Members of this genus are all large, with the bill stout, otherwise the characters are the same as are given under Family heading. Sexes, similar. There is but one species within our limits.

TANTALUS LOCULATOR.

Wood Ibis.

Tantalus loculator LINN., Syst. Nat., I, 1766, 240.

DESCRIPTION.

SP. CH Form, robust. Size, large. Tongue, very short, .85 long, wide at base and tapering gradually to tip which is rounded.

COLOR. *Adult.* White throughout, with wings and tail very dark-brown, glossed with green. Head and neck, naked, the latter with transverse ridges. Under tail coverts, greatly elongated and projecting beyond tip of tail.

Young. Similar to the adult, but the neck and a part of the head are covered with dusky feathers; the under tail coverts are not elongated, and the scapularies are brownish. Bill, horn-color, iris, brown, and feet, bluish, in all stages.

OBSERVATIONS.

Readily known by the large size, and colors as described. Distributed, in summer, from Florida to the Carolinas, and up the Mississippi, as far as Southern Illinois. Winters in Florida.

DIMENSIONS.

Average measurements of specimens from Florida. Length, 42.50; stretch, 61.00; wing, 18.50; tail, 4.75; bill, 7.75; tarsus, 7.25. Longest specimen, 45.00; greatest extent of wing, 62.00; longest wing, 19.00; tail, 5.00; bill, 8.50; tarsus, 7.50. Shortest specimen, 41.00; smallest extent of wing, 60.00; shortest wing, 18.00; tail, 4.50; bill, 7.00; tarsus, 7.00.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in high trees, composed of sticks loosely arranged. *Eggs,* one or two in number, rather elliptical in form, chalky-white in color, occasionally spotted with pale reddish-brown. Dimensions from 1.70 x 2.70 to 1.75 x 2.75.

HABITS

The Wood Ibises are among the shyest birds found in Florida, and I have many times tried to obtain a shot at them, but up to the present date, I have never even fired at one. I have often marked down a flock of a dozen or more individuals when they alighted in a

thick cypress swamp, then paddled cautiously toward the place, but they always managed to see me before I caught sight of them; one would give a harsh cry as a signal to the rest, when off they would go, always taking care to rise into the dense swamp, never passing out over the open water. They feed in the thickest swamps, when in flocks, but it is not unusual to see solitary individuals on the marshes. They also perch on trees and one will frequently occupy an elevated position as a lookout, while the others are feeding, and the sentinel takes good care to give prompt notice of the approach of an intruder. Bartram says that the Wood Ibises are solitary birds and Audubon is inclined to dispute this, affirming that they associate in flocks. I think both are right, for in the winter, it is not rare to see single birds feeding, or sitting on the trees, or even circling about, high in air, for this is a regular habit with the species, and they often accompany the White Ibis in these aerial gyrations. The Wood Ibises breed about March, nesting in high trees which border lakes or rivers. I had a Wood Ibis brought to me, when I was in Williamsport, Pennsylvania, in June, 1879. It was found on the morning of the twenty-first instant, by a farmer who was on his way to market, standing by the road-side in an exhausted condition. The man easily killed it and took it into the city. A writer in one of the local papers, in commenting on the instance, said that the bird had doubtless dropped from a large flock which passed over the place during the preceding day. I know not how true this statement may have been, but with the exception of another specimen taken in New York State, about the same time, which would, perhaps, tend to confirm the report, I do not think a single specimen of the Wood Ibis has ever been taken on the east side of the Alleghany Mountains.

FAMILY II. ARDEIDÆ. THE HERONS.

Bill, at least twice as long as the head and usually acutely pointed. Furcula long, not well arched, and extended backward, until it meets the tip of keel, and is provided with a central projection. Marginal indentations, two.

Middle toe nail, pectinated. Head, feathered, excepting space in front of eye. The trachea is rounded throughout and the larynx is provided with a sterno-trachealis and a thin bronchialis, while the tympaniform membrane and os transversale are present. The stomach is not muscular, and is furnished with a medium sized pyloric lobe. The intestines are short and wide, and there is but a single cœcum. Members of this family are distributed throughout the Temperate and Torrid Zones. The young are born blind and naked, and while in this helpless state, are feed by regurgitation. Sexes, similar.

GENUS I. ARDEA. THE TRUE HERONS.

GEN. CH. *Bill, long and quite slender. Legs, very long. Tail feathers, twelve, stiffened. Head, back, or breast, provided with lengthened plume-like feathers.*

Members of this genus are conspicuous on account of the plumes which adorn either the head, breast, or back, and sometimes all three portions are thus ornamented. There are ten species within our limits.

ARDEA HERODIAS.

Great Blue Heron.

Ardea herodias Linn., Syst. Nat., I; 1766, 237.

DESCRIPTION.

SP. CH. Form, robust. Size, large. Tongue, very long, thin, and gradually tapering toward tip which is pointed. Head, breast, and back, furnished with long, lanceolate plumes. Lower third of tibia, naked.

Color. Adult. Above, and on sides, flanks, and under wings, bluish-ash, darkest on wings, and palest on scapulae. Top of head, black, with occiput, and sides below this, black. Neck and throat, dusky, black in the throat with black and white central portion below, black streaked on the bill of both sides below. Under tail coverts, white. Tibia and edge of wing, chestnut. Iris and bill, yellow. Legs, brown. Nails, yellow. Top of head black, brownish-yellow.

Young. Similar to the adult but paler and tinged with reddish, top of head lacks the white, throat, white, neck, ash; and there are no plumes. Iris, feet, and bill, brown, the latter yellow at base.

OBSERVATIONS.

Florida specimens have the neck much lighter than more northern birds, the upper portion of it being frequently quite white. Readily known by the large size and colors as described. See succeeding species for further comparison. Distributed, in summer, from Hudson's Bay to Key West; wintering in the South.

DIMENSIONS.

Average measurements of specimens from Eastern North America. Length, 46.25; stretch, 73.00; wing, 19.50; tail, 7.50; bill, 5.50; tarsus, 7.25. Longest specimen, 48.00; greatest extent of wing, 75.60; longest wing, 20.00; tail, 8.00; bill, 6.00; tarsus, 7.50. Shortest specimen, 44.50; smallest extent of wing, 70.50; shortest wing, 19.00; tail, 7.00; bill, 4.25; tarsus, 7.00.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in trees or bushes, composed of sticks, loosely arranged. *Eggs*, two to four in number, varying from elliptical to oval in form, greenish-blue above, rufous below. Dimensions— $1.10 \times 2.50 \times 1.80 \times 2.80$.

HABITS.

There are few birds which understand how to take care of themselves, better than the Great Blue Herons, for there is scarcely an individual among them, which does not know, to an inch, the range of a shot gun. They are very shy, even in Florida, where they are extremely abundant, and where they spend their time, much as they do in the North, in wandering singly, or in twos or threes, about the beaches and on the mud flats. They feed upon fish, and a single blow from their powerful beak, is sufficient to kill a good sized member of the funny tribes. When one of these birds is wounded and placed in a situation where it cannot use its long legs, it can wield this same weapon so dexterously, that it will often cause a dog to retreat in discomfiture, and even a man is often at a loss to capture one living. These Herons are particularly pugnacious and one that I kept in confinement in Florida, was always ready for a quarrel, not only with me and my friends, but was also constantly trying to get at some beautiful White Herons, which I allowed to go at large, in order that he might strike them. This bird would occasionally escape from the inclosure in which he was kept, and would wander out to the neighboring beach, in search of food. When I perceived that he was out, I would go in search of him, provided with a long, slender stick. The Heron would carefully watch my approach, with head drawn in, until I got quite near, when I would exclaim, "Go back! Go back!" and shake the stick at him; then the bird would suddenly start up, and with wings half extended, run rapidly to his cage, enter it, and creep into a barrel which I kept laid on its side for him to rest in at night. This bird managed, after a time, to kill one out of three of my White Herons, when I gave him his liberty. He lingered about the camp for a short time, but finally disappeared.

I found the Great Blue Herons breeding on an island in South Lake, in the interior of Florida, late in February. The nests contained both fresh eggs and half-grown young, with all stages between. Even at this early age, the more advanced young exhibited the peculiar characteristics of which I have spoken, for they would leave the nests, walk over the tree-tops, and endeavor to kill the helpless young of some White Herons that were

breeding near. In the North, where the birds breed in May, the nests are usually placed in high trees, but in the heronry of which I have been speaking, the birds often built in low bushes, and I have even seen the nests on the ground. The cry of the Great Blue Heron is loud and harsh, and is more often repeated at night than at any other time, for this species is partly nocturnal and often fishes during the hours of darkness. These Herons are migratory, passing southward in autumn, and although none winter as far north as New England, they often remain here until late in November.

ARDEA WURDEMANNI.

Florida Heron.

Ardea Wurdemanni BAIRD, Birds N. A.; 1858, 669.

DESCRIPTION.

SP. CH. Form, robust. Size, large. Tongue, very long, slender, and narrowing gradually to tip which is pointed. Head, neck, and breast, provided with long, lanceolate plumes. Lower half of tibia, naked.

COLOR. *Adult.* Above, bluish-ash, becoming lighter on neck and scapularies, and darkest on primaries. Throat, white, centrally streaked with black and rufous. Top of head, white, edged on the forehead with black. White beneath, streaked on sides with black. Tibia and edge of wing, ashy-chestnut. Naked space about head, greenish-brown. Iris and bill, yellow. Feet, brown.

OBSERVATIONS.

Known from the preceding species by the naked tibia, white top to head, black forehead, and white under parts, and from all others, by the large size and colors as described. Constantly resident on the Florida Keys.

DIMENSIONS.

Average measurements of specimens from Florida. Length, 49.50; stretch, 74.50; wing, 20.50; tail, 7.75; bill, 6.50; tarsus, 8.25. Longest specimen, 50.00; greatest extent of wing, 75.00; longest wing, 21.00; tail, 8.00; bill, 7.00; tarsus, 8.50. Shortest specimen, 48.00; smallest extent of wing, 74.00; shortest wing, 20.00; tail, 7.50; bill, 5.95; tarsus, 7.95.

DESCRIPTION OF NESTS AND EGGS.

Nests. placed on trees and composed of sticks, somewhat loosely arranged. *Eggs,* two or three in number, varying from elliptical to oval in form, pale bluish-green in color, unspotted. Dimensions from 1.80 x 2.60 to 1.85 x 2.90.

HABITS.

The Florida Herons have long been a puzzle to ornithologists, but that such a species exists, is now proved beyond a doubt; though they are far from being common and are, I believe, restricted to the Florida Keys, or at best, are mere stragglers on the mainland; and I do not think that a well authenticated specimen has ever been taken there, those which are considered this species, being merely Great Blue Herons, with dark streaks on the forehead; for, at least, two instances of this kind have come under my notice. Some writers on the subject are inclined to dispose of the Florida Herons, by considering them merely a plumage of the Great White, but I greatly fear that such conclusions rest too much upon purely theoretical grounds. It is true, that it has been alleged, that birds of both species have been found in one nest, and without doubt, this is a fact; yet it proves nothing, unless, indeed, the nestlings were too small to go about much; for any one who is familiar with Florida heronries, knows that the young birds leave the nest almost as soon as fledged, and walk over the branches; and if suddenly surprised, will squat in the nearest nest. I was once on an island, during the last week in April, which was covered with a dense growth of high mangroves and buttonwood, on which Great Blue Herons, Florida, and Great White were breeding; but I did not find the young mixed at all, simply because they were then too small to move about, but this might not have been the case two weeks

later. The flight of this fine Heron, resembles that of the Great Blue, being regular, with each flapping of the wings, greatly prolonged. They breed on the Keys and, I think, always prefer high trees.

ARDEA OCCIDENTALIS.

Great White Heron.

Ardea occidentalis AUD., Orn. Biog., III; 1835, 542.

DESCRIPTION.

SP. CU. Form, robust. Size, large. Tongue, long, slender, and tapering gradually to tip which is pointed. Head and breast, provided with long, lanceolate plumes. Lower half of tibia, naked.

COLOR. *Adult*. Pure snowy white throughout. Bill and iris, yellow. Feet and naked space in front of eyes, greenish. *Young*. Similar to the adult but lacks the plumes and the bill is dusky at tip.

OBSERVATIONS.

Readily known by the large size and pure white color as described. Constantly resident on the Florida Keys. Rare on the mainland as far north as Lake George.

DIMENSIONS.

Average measurements of specimens from Florida. Length, 47.50; stretch, 72.50; wing, 18.50; tail, 6.50; bill, 6.50; tarsus, 7.50. Longest specimen, 50.00; greatest extent of wing, 75.00; longest wing, 19.50; tail, 7.00; bill, 7.00; tarsus, 8.00. Shortest specimen, 45.00; smallest extent of wing, 70.00; shortest wing, 17.00; tail, 6.00; bill, 6.00; tarsus, 7.00.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in trees, composed of sticks loosely arranged. *Eggs*, two or three in number, rather elliptical in form, light bluish-green in color, unspotted. Dimensions from 1.80 x 2.40 to 1.85 x 2.45.

HABITS.

The Florida Keys are composed of two distinct kinds of islands; the outer, which are formed on the tops of coral reefs, and the inner, which have grown up merely through the agency of the mangroves, as described on previous pages. These latter are very low, being frequently inundated, and are surrounded by muddy flats, through which there are winding canals to a belt of deep water, which nearly always surrounds the islet. These islands occupy a triangular section, the base of which extends from about five miles to the westward of Cape Florida, quite to Cape Sable, twenty-five miles away, while the apex is at Indian Key, about the same distance to the southward. These keys are often close together and it has been alleged that it is impossible to pass among them, but there are passages completely through; and although there are not a dozen men living, who know the intricate channels from Biscayne to the Gulf of Mexico, I was fortunate enough to secure one of these, and he took out little vessel safely through. We found many large circular lagoons, often five or six miles in diameter, among these keys, but they were crossed and recrossed by old reefs, so that navigation was very dangerous; and then it was exceedingly difficult to find the natural canals which connected one of these solitary sheets of water, which are seldom enlivened by the presence of even a canoe, with another; and they were so narrow, that our sails often brushed the mangroves on either side, as we wound our way along.

We were just emerging from one of these passages, into a large expanse of water, when I observed two Great White Herons standing on the tops of some mangroves near, and by promptly raising my gun which lay near, managed to secure one of the birds, before it left its perch, and the other, just as it rose. These proved, however, to be young, but were fully grown. From this point, into the Gulf, we found these birds common but

very shy, it being often quite impossible to go within half a mile of them. A few days after securing the two young, I was standing on a little island which was entirely surrounded with mud flats, that we were obliged to anchor our yacht a mile or so off. This small key was completely covered with nests of the Great White Heron, some of which were empty, and some contained young nearly fledged, while there were eggs in one or two. When we cast anchor, a cloud of old birds rose up from the place, and flew slowly away, quite out of sight. They were all snowy white, not a colored specimen of any species, being among them; nor were there any among the young, left behind, for I carefully examined every nest, as they were all built low, some not over five feet from the ground. The young were scattered about on the branches, but when approached, retreated to their large nests, and there lay perfectly flat. I waited here for three hours, trusting that the old birds would return, but none came, so taking one of the largest young, which was about two thirds grown, away with me, I left the spot. This was the only breeding place I ever saw, devoted exclusively to the Great White Herons. I had found a few breeding on high mangroves, a short time previous, in company with the Great Blue and Florida Herons, and had secured one or two eggs, but this being about the first of May, was much too late, for they evidently begin to lay as early as February. The Great Whites are, beyond all doubt, the shyest of the Herons; but in spite of this, their numbers are rapidly decreasing, for they were evidently much more abundant when the species was discovered by Audubon, some forty-five years ago; and the total extermination of this prince of Waterfowl, on the Florida Keys, is a mere matter of time. These majestic Herons may be recognized when flying at a distance, by the regular, prolonged flappings of the wings. The young bird which I had captured, proved so untamable and savage, striking at everything that came near, that I soon gave it its liberty.

ARDEA EGRETTEA.

White Heron.

Ardea egretta Gm., Syst. Nat., 1: 1788, 629.

DESCRIPTION.

Sp. Ch. Form, robust. Size, medium. Tongue, very long, thin, and gradually tapering toward tip which is pointed. Back, furnished with long, filamentous plumes. Lower half of tibia, naked.

Color. *Adult*. Pure, snowy white throughout. Legs, black. Iris, bill, and naked space about head, bright yellow. *Young*. Similar to the adult, but lacks the plumes.

OBSERVATIONS.

Readily known by the medium size, pure white color, yellow bill, and black legs. Distributed, in summer, from New Jersey, southward. Stragglers are occasionally found as far north as New Brunswick. Winters from the Carolinas, south.

DIMENSIONS.

Average measurements of specimens from Florida. Length, 38.25; stretch, 55.00; wing, 14.25; tail, 5.25; bill, 3.85; tarsus, 5.25. Longest specimen, 41.50; greatest extent of wing, 58.50; longest wing, 15.50; tail, 6.50; bill, 4.60; tarsus, 6.50. Shortest specimen, 31.75; smallest extent of wing, 5.50; shortest wing, 13.00; tail, 4.00; bill, 3.15; tarsus, 4.00.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in trees or bushes, composed of sticks loosely arranged. *Eggs*, from two to four in number, varying from elliptical to oval in form, pale bluish-green in color, unspotted. Dimensions from 1.40 x 2.21 to 1.65 x 2.3.

HABITS.

One of the most abundant Herons in Florida, are the White, and they are constantly resident throughout the State, not only in the interior, but also on the coast; though I

think they rather prefer the islands in the fresh water lakes, as breeding places. They nest about the middle of March, placing their domiciles in trees or bushes, at no great height from the ground. The birds are quite shy and will seldom alight near the intruder, even when they have young. These fine Herons are not in the least nocturnal, and will always resort to particular places, usually islands in the interior waters, to roost, assembling in large numbers at sunset, and departing by day-break. They are easily tamed, if taken young, and become quite intelligent. The Seminole Chief, Tiger, brought me a half grown young from the Everglades, and it accompanied me on my trip through the Keys, feeding readily on fish which my man caught for it. This bird was accustomed to sit on the prow of a canoe which was towed astern of the yacht, and when hungry, the Heron would walk deliberately along the rope, by which the smaller vessel was fastened to the larger, and which was some ten feet long, and thus come on board. One day when it was making this trip, a sudden flaw struck the sail, causing the rope to sway, and the bird was thrown into the water. We were moving at the rate of ten or twelve miles an hour, and the bow of the little boat swept past the Heron in an instant, but it appeared to know just what to do, for, without making any useless struggles, it merely reached out and caught the edge of the rapidly passing stern with its bill, gave a flap or two, and in a moment regained its perch on the prow. This bird was afraid of strangers and whenever we landed near a settlement, it would never wander far from its boat, taking refuge in it when any one approached. When it saw me returning and wished to come to me, if a stranger was about, it would take a wide circle, in order to avoid him, and run to meet me, with half extended wings, chattering loudly. This note is used as an answer, even after the birds become fully grown, and two which I possessed and brought North, would give it, even when called at night. In spite of their gentle disposition, I am sorry to record that these birds possess the same tyrannical disposition which characterizes their larger relatives, for the first bird that I had, constantly tormented a half grown Anhinga that I owned and which was accustomed to wander about with the Heron; and besides this, he killed one or two young Louisiana Herons, while one of those that I brought North, performed a like service for a pet Least Bittern which was quietly sunning itself on a porch. The ordinary note of these Herons is a harsh scream given as they fly. The White Herons are partly migratory, some going, at least, as far north as New Jersey to breed.

ARDEA CANDIDISSIMA.

Snowy Heron.

Ardea candidissima Gm., Syst. Nat., 1; 1788, 633.

DESCRIPTION.

SP. CR. Form, slender. Size, small. Tongue, long, and tapering gradually toward tip which is pointed. Head, back, and breast, furnished with long, recurved, filamentous plumes.

COLOR. *Adult.* Pure, snowy white throughout. Iris, naked space in front of eye, legs, and base of bill, orange-yellow. Bill and feet, black. *Young.* Similar but lacks the plumes, and the feet are black.

OBSERVATIONS.

Known by the white color, black bill, and small size. Distributed, in summer, from New Jersey to Key West; wintering in Florida. Stragglers occasionally occur as far north as New England.

DIMENSIONS.

Average measurements of specimens from Eastern North America. Length, 23.75; stretch, 38.00; wing, 40.35; tail, 3.45; bill, 3.70; tarsus, 3.55. Longest specimen, 26.00; greatest extent of wing, 44.00; longest wing, 11.75; tail, 3.60; bill, 3.80; tarsus, 3.85. Shortest specimen, 21.50; smallest extent of wing, 35.00; shortest wing, 10.00; tail, 3.40; bill, 2.90; tarsus, 3.30.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in trees or bushes, composed of sticks, loosely arranged. *Eggs*, two to four in number, varying from elliptical to oval in form, pale greenish-blue in color, unspotted. Dimensions from 1.20 x 1.80 to 1.25 x 1.85.

HABITS.

The Snowy are among the most agile of all the Herons, rising very lightly and quickly from the ground; then, when on the wing, moving quite swiftly. They may always be distinguished from the White Heron, by this peculiarity; then their wings are moved more rapidly than those of that species, for the wing-beats of the larger bird, are given quite slowly but not as deliberately as are those of the Great White. The Snowy Herons are distributed throughout the entire extent of Florida, but prefer the inland waters to those of the coast. They breed in March, about the same time as the larger species, often in company with them. When the nests of either of these Herons are approached, the birds silently leave them and fly about, without uttering a cry, or settling on the neighboring trees, quietly watch the proceedings. These little Herons assemble in large flocks, in winter, and I think I never witnessed a finer sight, than that presented by a large number of these beautiful birds, when flying swiftly through the air, and when they turn, which they do with graceful ease, the sunlight glancing upon their plumage, reveals its snowy whiteness to perfection.

ARDEA PEALI.

Peale's Egret.

Ardea Peali Bon. Syn.; 1828, 304.

DESCRIPTION.

SP. CH. Form, robust. Size, medium. Tongue, very long, slender, and narrowing gradually to tip which is pointed. Head, neck, and breast, provided with slightly curled, lanceolate plumes and there are long, filamentous ones on the back. Lower half of tibia, naked.

COLOR. *Adult*. Pure snowy white throughout. Naked space in front of eyes, and basal half of bill, bright purple, the latter, black terminally. Iris, yellow. Feet, bluish. *Young*. Similar to the adult but lack the plumes.

OBSERVATIONS.

Readily known by the lanceolate feathers on head, neck, and breast, and pure white color as described. Constantly resident in Southern and Middle Florida.

DIMENSIONS.

Average measurements of specimens from Florida. Length, 29.70; stretch, 42.00; wing, 44.25; tail, 4.70; bill, 3.95; tarsus, 5.45. Longest specimen, 30.35; greatest extent of wing, 54.50; longest wing, 15.50; tail, 5.60; bill, 4.25; tarsus 5.75. Shortest specimen, 27.50; smallest extent of wing, 48.00; shortest wing, 13.00; tail, 4.00; bill, 3.60; tarsus, 4.90.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on trees and composed of sticks, somewhat loosely arranged. *Eggs*, two to four in number, varying from elliptical to oval in form, pale bluish-green in color, unspotted. Dimensions from 1.50 x 2.05 to 1.55 x 2.25.

HABITS.

Nearly all the Herons, when in full plumage, are beautiful, but to my mind, the present species surpasses them all; indeed, it would be difficult to find a more lovely bird than a living Peale's Egret, and no one who has seen a specimen in good plumage, will consider this opinion exaggerated. I made my first acquaintance with these fine birds, on Indian

River, where they are as common as anywhere in the State, excepting, perhaps, on the Keys. Just north of the Cane Canal, between Indian River and Mosquito Lagoon, is a series of hummocks, above which are low marshes that contain a few fresh water ponds. Numerous wild mammals have resorted to these pools, from time immemorial, to satisfy their thirst; so that the ground, for some distance around their margins, is destitute of vegetation, and spurs lead out from them in all directions. Near these denuded belts, are bushes, and by creeping up behind them, one has an uninterrupted view of the entire margin which surrounds the water. I never approached one of these places, but what it was full of Herons of several species, and it was here, that I secured my first Peale's Egret; and I afterward found that this locality was a regular resort for them. They generally came pouring in from the southward, in loose, straggling flocks, during the morning, and departed in the same direction, when disturbed or at night; but I never found them breeding on Indian River, although I searched carefully for their heronries. A few years later, however, I discovered the strong-hold of this species, and secured not only the eggs, but also the young in all stages. This was among the interior keys, where I found fresh eggs as late as the twentieth of April; and the nests were built on low mangroves which overhung the water. Peale's Egret does not appear to be migratory, but merely wanders about during winter.

ARDEA RUFA.

Reddish Egret.

Ardea rufa Bodd., Tabl. Pl. Enl., 1784.

DESCRIPTION.

Sp. Cu. Form, robust. Size, medium. Tongue, long, slender, and tapering gradually to the tip which is pointed. Head, neck and breast, provided with lanceolate plumes, and those on back are long and filamentous. Half of tibia, naked.

Color. *Adult.* Dark bluish-ash throughout, with head and neck reddish, tinged with violet. Naked space about head and basal half of bill, bright purple, while the remainder of latter and feet are black. Iris, yellow.

OBSERVATIONS.

Known by the reddish neck and dark bluish-ash color as described. Constantly resident throughout Southern and Middle Florida.

DIMENSIONS.

Average measurements of specimens from Florida. Length, 29.50; stretch, 47.25; wing, 13.25; tail, 4.50; bill, 4.25; tarsus, 5.50. Longest specimen, 30.00; greatest extent of wing, 49.25; longest wing, 13.75; tail, 5.00; bill, 4.50; tarsus, 6.00. Shortest specimen, 29.00. smallest extent of wing, 44.50; shortest wing, 12.50; tail, 4.00; bill, 3.80; tarsus, 5.00.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in trees, composed of sticks loosely arranged. *Eggs*, two to four in number, rather elliptical in form, light bluish-green in color, unspotted. Dimensions from 1.40 x 1.85 to 1.50 x 2.00.

HABITS.

Audubon considered this species, which had hitherto been regarded as distinct, as the young of Peale's Egret, but Prof. Baird, in the Birds of North America, having the undoubted young of the Reddish Egret at hand, re-described it as a separate species; but of late, writers are again inclined to regard these two birds as one, affirming that the individuals are either red or white, when hatched, and remain so through their entire lives. Now this hypothesis rests upon the fact, that one or two ornithologists have found the young of different colors, in the same nests, but as I have already related, under the head of Florida Heron, this proves nothing, unless the young were very small.

While I do not positively assert that ornithologists are wrong in deciding that Peale's and the Reddish Egrets are one species, I must say that I cannot, at present, believe that they are right in this declaration; simply, because my experience with these birds, tends to show that the species are quite distinct. During my first season in Florida, although I found Peale's Egret very abundant on Indian River, I did not see a single Reddish, nor did I ever find them at all common there; in fact, I have taken but one bird, the only specimen I ever saw, in this section, and this was two or three years after my first visit. I did not find the red birds at Miami, nor on the outer Keys, where the white ones were not uncommon. The first that I met with, were on Card's Sound, one of those peculiar bodies of water, among the interior Keys, of which I have spoken. Here a flock of three flew slowly past me, but I did not see any more on that trip, while Peale's Egrets were particularly abundant. On the contrary, while on the West coast of Florida, below Tampa Bay, we found nothing but Reddish Egrets, and here they fairly swarmed, breeding in company with other Herons, at John's Pass, early in April. I do not doubt but what the white birds occur on the West coast, but they are certainly rare there. Such are the results of my observations and they surely go far toward proving that these Egrets are both good species. The Reddish Egrets do not differ from Peale's in general habits; neither are migratory, but wander some in winter.

ARDEA LUDOVICIANA.

Louisiana Heron.

Ardea Ludoviciana Wils., Am. Orn., VIII; 1811, 13.

DESCRIPTION.

Sp. Cn. Form, slender. Size, rather small. Tongue, long, and tapering gradually toward tip which is pointed. Head and breast, furnished with lanceolate plumes and those of the back are long and filamentous. Bill, very long.

Color. *Adult.* Above, ashy-blue tinged on the neck with deep chestnut-red. Occipital plumes and line down neck, rufous and white. Throat, creamy. Pure white beneath. Iris, naked space in front of eye, leg, and base of bill, greenish, the latter dusky at tip. *Young.* Similar to the adult, but lacks the plumes and are tinged with rufous above.

OBSERVATIONS.

Readily known by the comparatively small size, pure white color beneath and ashy-blue above. Distributed, in summer, from the Carolinas to Key West; wintering in Florida.

DIMENSIONS.

Average measurements of specimens from Florida. Length, 25.50; stretch, 35.30; wing, 10.50; tail, 3.75; bill, 3.85; tarsus, 3.75. Longest specimen, 26.50; greatest extent of wing, 38.50; longest wing, 11.00; tail, 4.10; bill, 4.10; tarsus, 4.00. Shortest specimen, 23.00; smallest extent of wing, 33.15; shortest wing, 10.00; tail, 3.50; bill, 3.75; tarsus, 3.50.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in trees or bushes, composed of sticks loosely arranged. *Eggs*, from two to four in number, varying from elliptical to oval in form, bluish-green in color, unspotted. Dimensions from 1.30 x 1.75 to 1.40 x 1.80.

HABITS.

The Louisiana Herons are rather inclined to be solitary in habit, frequenting the shallow waters of the coast, in preference to the margins of the inland streams and lakes. They are extremely agile while fishing, running rapidly after their prey when it endeavors to escape. They are also good flyers, rising quickly, and when on the wing, moving rapidly, or will occasionally dart downward, something like a Tern or Gull. They are quite unsuspecting, being, in fact, the tamest of all the Herons, for they may be approached quite closely, even when they have a full view of the intruder. While breeding, they will often

remain on the nests, until one is quite near them, and I once saw a female sit perfectly still, until I had climbed quite up to her abode, when she strack at me several times, before attempting to fly. I found these birds breeding in willow trees, which stood in small ponds that were surrounded by a thick growth of saw grass, on the marshes of Indian River. Gathering the eggs in these places is, however, not a pleasant operation for one who is not accustomed to water moccasins and alligators, as all these heronries swarm with these reptiles, which feed upon the young birds that fall from the nests; and the collector is obliged to exercise great care, or he will find himself in closer proximity to these disagreeable animals than is desirable. I was once in a rookery with a cracker who was in my employ, and we had lingered until nearly dark, when the man, who wore no stockings and had his pants rolled up to his knees, turned to go out of the swamp, through a path made by the bears and deer. He had made only a single step, when I who was closely behind him, chanced to glance down at his feet, when I saw a very large moccasin, coiled directly where he was about to place his foot. The reptile was ready to strike and in another instant, would have sprung forward, but before it had time to execute its purpose, I seized the man who was unconscious of his danger, as he was watching some White Ibises that were flying in to roost, by the shoulder and jerked him back with one hand, and at the same time, fired my gun with the other, completely demolishing the snake's head. The cracker who was as stoical as an Indian, merely uttered an exclamation, and stepped on, when I once more drew him back and discharged the other barrel of my gun, decapitating a second moccasin which was lying about a foot from the first.

In these places, the birds were breeding rather low, building their nests not over a dozen feet from the water, but I found them breeding on high mangroves, thirty or forty feet from the ground, on the Keys. These Herons are partly migratory, some passing North, as far as the Carolinas, but the greater portion breed in Florida, where large numbers congregate in winter.

ARDEA CÆRULEA.

Little Blue Heron.

Ardea cærulea LINN, Syst. Nat., I; 1766, 239.

DESCRIPTION.

SP. CH. Form, slender. Size, rather small. Tongue, very long, thin, and gradually tapering toward tip which is pointed. Back, head, and breast, furnished with long, lanceolate plumes. Lower half of tibia, naked.

COLOR. *Adult.* Dark slaty-blue throughout, with the neck reddish, tinged with violet. Iris, yellow. Naked space about head, legs, and basal half of bill, greenish, the latter black terminally. *Young.* Pure, snowy white throughout, with tips of primaries and top of head tinged with bluish.

OBSERVATIONS.

There are all stages of coloration between the blue adult and white young, some specimens being completely mottled. The adult may be known by the dark blue colors and lanceolate plumes on back, and the young by the bluish tinging on primaries and top of head. Distributed, in summer, from the Carolinas, southward. Winters in Florida. Stragglers are occasionally found as far north as Massachusetts.

DIMENSIONS.

Average measurements of specimens from Florida. Length, 21.75; stretch, 38.00; wing, 10.75; tail, 3.75; bill, 3.27; tarsus, 3.65. Longest specimen, 23.00; greatest extent of wing, 40.00; longest wing, 11.50; tail, 4.50; bill, 3.55; tarsus, 3.75. Shortest specimen, 20.50; smallest extent of wing, 36.00; shortest wing, 10.00; tail, 3.00; bill, 3.00; tarsus, 3.50.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in trees or bushes, composed of sticks loosely arranged. *Eggs*, from two to four in number, varying from elliptical to oval in form, dark bluish-green in color, unspotted. Dimensions from 1.25 x 1.60 to 1.35 x 1.82.

HABITS.

The Little Blue Herons are, without exception, the most agile of the family, springing into air when startled, with the ease of a Snipe, and when once on the wing, moving with great rapidity. These birds exhibit a decided predilection for inland waters, running about the margins of the lakes and rivers, or walking over the aquatic plants which float on the surface, in order to catch fishes, frogs, or insects. It is a noticeable fact, that birds in the white plumage are much tamer than those in the blue, but this may be accounted for, by fact, that the light colored specimens are all young. It is also quite rare to see a blue bird without companions, while the white are more solitary, and a single individual will often haunt a certain spot for months. Thus, there was one at Blue Spring, which was accustomed to fish in a small stream that was about half a mile long, and the bird never left it, even roosting at night in the high trees that overhung the water. These Herons breed while in the white plumage, and also when passing from one stage to the other. There can be no doubt but what the white birds are all comparatively young, for although they often acquire the long plumes when thus colored, they invariably assume the blue livery, as a final dress; but on the other hand, I do not think that any are blue from birth, they all, according to my experience which has been very large, for I have examined hundreds of specimens, pass through the white phase of plumage. These little Herons are accustomed to wander considerably and I have even met with them in Massachusetts, where, however, they are only stragglers.

ARDEA VIRESCENS.

Little Green Heron.

Ardea virescens LINN, Syst. Nat., 1; 1766, 238.

DESCRIPTION.

Sp. Ch. Form, robust. Size, very small. Tongue, very long, slender, and narrowing gradually to tip which is pointed. Head, neck, back, and breast, provided with lanceolate plumes. Lower fourth of tibia, naked.

Color. *Adult.* Top of head and upper parts, dark-brown, glossed with green on all but quills which are tinged with bluish as are also the plumes on back. Wing feathers, edged with reddish and tipped with white. Neck, chestnut-red, streaked in a line in front, with white and dusky. Beneath, ashy, tinged with yellowish. Iris and feet, yellow. Naked space in front of eyes and bill, brown and yellow.

Young. Similar to the adult but lack the plumes: the feathers of the upper parts are edged with reddish, and the neck and lower parts are streaked with dusky.

OBSERVATIONS.

Readily known by the small size and greenish glossing above. Distributed, in summer, throughout the United States, Winters in Florida.

DIMENSIONS.

Average measurements of specimens from Eastern North America. Length, 17.50, stretch, 24.25; wing, 7.25; tail, 2.75; bill, 2.20; tarsus, 2.45. Longest specimen, 19.30; greatest extent of wing, 28.00; longest wing, 7.85; tail, 3.00; bill, 2.40; tarsus, 2.90. Shortest specimen, 15.50; smallest extent of wing, 20.50; shortest wing, 6.75; tail, 2.35; bill, 2.00; tarsus, 2.00.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in trees or bushes, composed of sticks, loosely arranged. *Eggs*, three to five in number, elliptical in form, greenish-blue in color, unspotted. Dimensions from 1.10 x 1.45 to 1.25 x 1.60.

HABITS.

The Little Green Herons are known to all who have ever rowed a boat on any of our creeks or rivers, or walked along their margins, for these birds are common from Canada

to Key West. They wade about the shallows, in search of fishes or frogs, and when disturbed, will rise with a shrill cry, which they repeat several times as they fly along the water, to alight on some favorite tree, from which point of observation, they will anxiously scan the intruder, with out-stretched necks. In the North, where they arrive early in May, they build their nests in some secluded thicket, in the neighborhood of ponds or streams, depositing their eggs about the first of June. Here the birds are rather solitary during the breeding season; but in Florida, where they lay in March and April, they often assemble in small heronries, and I have taken as many as fifteen nests, from one small island which was only a few yards in diameter. Among the Keys, they often place their domiciles on the roots of the mangroves, frequently not over six inches above high water mark.

The Little Green Herons are not very shy birds, when not persecuted, and in Florida, they are very tame, allowing one to walk within a few yards of them. They make interesting pets and I once kept three which I had captured when quite young, all one summer. These birds which were allowed to go and come as they chose, always spent the night in a barrel which was laid on its side in a loft, the Herons gaining access to it, by passing through a partly opened window. These birds would always come to me when called, and remained about the place until autumn, when they departed, evidently migrating with others of the same species.

GENUS II. NYCTIARDEA. THE NIGHT HERONS.

GEN. CH. *Bill, quite short and thick. Legs, not very long. Tail feathers, twelve, stiffened. Head or back, provided with leathard plume-like feathers.*

Members of this genus are conspicuous on account of their nocturnal habits, their eyes being remarkably large. There are two species within our limits.

NYCTIARDEA GRISEA.

Night Heron.

Nyctiardea grisea Sw., *Classif. Birds*, II, 1837, 354.

DESCRIPTION.

SP. CH. Form, robust. Size, large. Tongue, long, slender, and tapering gradually to tip which is pointed. Head, provided with three or four long, slender plumes. Lower fourth of tibia, naked.

Color. *Adult.* Top of head and back, black, glossed with green; remainder of upper surface, yellowish-ash. Forehead and under surface, creamy-white. Naked space about head, greenish. Bill, black, yellow at base of lower mandible. Iris, deep carmine. Legs, yellow.

Young. Similar to the adult, but the black above is replaced by yellowish-rufous; the wings are strongly tinged with rufous, and the plumes are lacking.

Young of the year. Dark-brown throughout, with the feathers streaked with yellowish-rufous and the wings are tipped with white. Ashy below, streaked with dusky. Iris, yellow, and feet, greenish. This plumage is retained until the following spring.

OBSERVATIONS.

There is a singular form of this species which occurs both North and South, in which the young become much bleached, being, in fact, pale brown, streaked with white. All stages of plumages occur between the young and adult. Known by the peculiar form, long plumes, and colors as described. Distributed, in summer, from Canada southward; wintering from Massachusetts to Florida.

DIMENSIONS.

Average measurements of specimens from Eastern North America. Length, 24.75; stretch, 41.60; wing, 12.25; tail, 4.35; bill, 2.99; tarsus, 3.15. Longest specimen, 25.50; greatest extent of wing, 45.00; longest wing, 12.50; tail, 4.43; bill, 3.15; tarsus, 3.35. Shortest specimen, 24.00; smallest extent of wing, 43.00; shortest wing, 12.00; tail, 4.20; bill, 2.75; tarsus, 3.00.

DESCRIPTION OF NESTS AND EGGS.

Nests. placed on trees and composed of sticks, somewhat loosely arranged. *Eggs.* Three to five in number, varying from elliptical to oval in form, pale bluish-green in color, un-spotted. Dimensions from 1.35 x 1.90 to 1.55 x 2.15.

HABITS.

The Night Herons are among the most widely distributed of the family, and their cries may be heard in almost any section, from Maine to Florida, as they make their nightly excursions from their roosts to their feeding grounds. The notes uttered by these birds, which are loud and abrupt, have gained for them a number of uncouth appellations, among which Quak, Squak, and Gobly-gossit are examples. As may be inferred from the name, these Herons are decidedly nocturnal in habit, seeing remarkably well by night, during which time, they usually feed; but in the breeding season, when they have their young to care for, they fish by day-light, as well as during the hours of darkness. It has been affirmed by some, that the Night Herons are furnished with a phosphorescent light on the peculiar powder patches, with which all the Herons are provided and which usually lie along the breast; but I now think that this, perhaps, is a matter of question, as tame Night Herons which I have kept, exhibited no such peculiarities. It is probable, however, that the oily powder which readily falls from the short, downy feathers, tends to attract fish, as it is not uncommon to find it floating on the water in which a Night Heron has been standing.

The Night Herons deposit their eggs in Florida, from the middle of March to the middle of April, and in the North, they breed from the first of May until June. Heronries of these birds are particularly filthy, when compared with those of other Herons, as the birds appear to bring in a much greater supply of fish, than is eaten by the young, and this either falls to the ground and decays, or is left on the nests. Then the young Herons are always ready to disgorge the contents of their stomachs, upon the slightest provocation, and the half digested fish which they throw up, has an exceedingly disagreeable odor. These Herons are very noisy birds, even when unmolested, and both young and old keep up a continual discord, the adults croaking or emitting guttural cries, and the young answering by chattering. When an intruder enters their abode, however, these sounds are increased some ten fold, for then, every bird not only joins in the chorus, but each appears to try to outdo the others, in giving vent to the most uncouth and ear-grating sounds; in fact, if one wishes to acquire a good idea of pandemonium, let him visit a large Night Heronry.

These birds are not particularly wild when they are not shot at, and will often alight on the trees over the head of the collector. When taken young, they become very tame, and I once kept five for a season. These birds surprised me, by the variety of disposition which they displayed. For example, one was very affectionate and would always run to meet me before the others saw me, and delighted in perching on my knee, and in allowing me to caress him; another was extremely neat and sleek in appearance, but this bird was quite shy and never allowed me to touch him. While a third was noticeably untidy, his feathers always presenting a ruffled appearance; this bird was remarkably greedy, and on one occasion, when I was chopping some fish for them with a hatchet, he reached out for a morsel, just as the instrument was falling, and before I could check the blow, the upper mandible of the Heron was completely severed. This accident did not appear to trouble

the bird much, for after the stump had healed, he could eat nearly as well as usual. They would all fish for themselves, and during their nightly rambles, would sometimes fall in with others of the same species and induce the strangers to return to roost with them, in a small orchard back of the house, so that quite a company would gather there at times. But upon my approach, they would all rise with loud cries, accompanied by the tame ones who would follow their friends some distance, but after a time, would invariably return to their roosts. These birds remained with me until autumn, when they departed, evidently migrating with their wild companions, and I never saw them again. The Night Herons usually migrate from Massachusetts, early in November, but a few seasons ago, when the weather was unusually mild, they remained in this vicinity all winter.

NYCTIARDEA VIOLACEA.

Yellow-crowned Night Heron.

Nyctiardea violacea Sw., Bird-, II; 1837, 351.

DESCRIPTION.

SP. CH. Form, robust. Size, rather small. Tongue, long, thin, and gradually tapering toward tip which is pointed. Back and head, furnished with long, lanceolate plumes. Lower third of tibia, naked.

COLOR. *Adult.* Pale ashy-blue throughout, streaked on back with black. Upper half of neck and head, blue-black, with top of latter, and patch on its side, pale straw-yellow. Iris, orange. Naked space about head, greenish. Legs, yellow. Bill, black.

Young. Dark greenish-brown above, streaked and spotted with yellowish. Ashy-white beneath streaked with brown. Legs, greenish.

OBSERVATIONS.

The adult may be known by the yellow crown, and the young by the small size, short, thick bill, and dark greenish color on back. Distributed, in summer, from the Carolinas, southward. Winters in Southern Florida. Stragglers are occasionally found as far north as Massachusetts.

DIMENSIONS.

Average measurements of specimens from Florida. Length, 22.50; stretch, 41.00; wing, 11.50; tail, 4.25; bill, 3.00; tarsus, 3.40. Longest specimen, 23.00; greatest extent of wing, 42.00; longest wing, 12.00; tail, 4.50; bill, 3.10; tarsus, 3.65. Shortest specimen, 22.00; smallest extent of wing, 40.00; shortest wing, 11.00; tail, 4.00; bill, 2.90; tarsus, 3.25.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in trees or bushes, composed of sticks loosely arranged. *Eggs*, from two to four in number, varying from elliptical to oval in form, yellowish-green in color, unspotted. Dimensions from 1.40 x 1.90 to 1.50 x 2.00.

HABITS.

The Yellow-crowned Night Herons do not appear to be common birds anywhere, and although they occur sparingly throughout Florida, I found them more numerous at Miami than elsewhere, and obtained their eggs from the Everglades, early in April. This species is not nearly as nocturnal in habit, as the preceding, and although I have seen them flying at night, I have also observed them wading about the roots of the overhanging mangroves, in search of fish, during daylight. When their hunger is appeased, they sit on the low limbs of the trees which project over the water. They are extremely shy birds and are quite difficult to kill, then when slightly wounded, run with great speed among the tangled roots of the mangroves, always making for the densest thickets, so that it is quite difficult to procure specimens. The cry of the Yellow-crowned Night Herons is loud but differs from that of the common Night Heron, and they are not as noisy. These birds migrate northward, as far as the Carolinas, in summer, and stragglers have even been taken in Massachusetts.

GENUS III. BOTAURUS. THE BITTERNS.

GEN. CH. *Bill, not long, but sharply pointed. Tail feathers, ten or twelve, soft. Lower neck, destitute of feathers behind. Tarsus, short, and toes, long. Plumes, absent.*

Members of this genus are rather dull in color, usually with the feathers of the lower neck elongated in front. The eyes are small, but the birds are more or less nocturnal in habit. There is but one species within our limits.

BOTAURUS MINOR.

American Bittern.

Botaurus minor BOIE, Isis; 1826, 979.

DESCRIPTION.

SP. CH. Form, robust. Size, medium. Tongue, very long, slender, and narrowing gradually to tip which is acutely pointed.

COLOR. *Adult.* Above, dark-brown, spotted and sprinkled with yellowish and reddish. Sides of head and under surface, pale yellow, lightest on throat, broadly streaked with yellowish-rufous and dusky. Triangular patch on the sides of neck, black. Iris, yellow. Naked space in front of eye, legs, and bill, greenish. Line from eye and top of bill, brown.

Young. Similar to the adult, but is much paler throughout and the black patch on the neck is nearly obsolete, while the bill is dusky.

OBSERVATIONS.

Readily known by the mixed yellowish and rufous colors as described. Distributed, in summer, from Canada southward; wintering in the South.

DIMENSIONS.

Average measurements of specimens from Eastern North America. Length, 28.50; stretch, 43.22; wing, 11.50; tail, 3.50; bill, 3.10; tarsus, 3.75. Longest specimen, 34.00; greatest extent of wing, 50.37; longest wing, 13.50; tail, 4.00; bill, 3.50; tarsus, 3.95. Shortest specimen, 23.50; smallest extent of wing, 37.10; shortest wing, 9.59; tail, 3.00; bill, 2.50; tarsus, 3.25.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground in marshy places, composed of sticks, loosely arranged, and grass. *Eggs*, three to six in number, elliptical in form, and varying from greenish-ash to brown in color, unspotted. Dimensions from 1.65 x 2.10 to 1.80 x 2.25.

HABITS.

The peculiar *punc-a-pog* of the Bittern has been a familiar sound to me from childhood, as a pair used to nest every season in a marshy place, not far from the house, and their singular cries could be heard every evening. The notes which may be expressed by the syllables given above, are emitted in a peculiar tone, just as though the bird were under water, or that it struck its wings upon the surface. This sound is oftener uttered about sunset or during the night than at any other time, but in the breeding season, it may be heard at all times of the day. The birds are very solitary in habit and frequent those wet, boggy meadows, where it is almost impossible to walk without sinking into the soft ooze, but they will occasionally emerge from these retreats and alight upon the overhanging branches of some neighboring thicket; then if disturbed, will rise with a harsh croak, fly a short distance, and plunge into the morass. If pursued at such times, they are exceedingly difficult to start, for they will either skulk through the grass, or hide beneath the surface of the water, leaving only the bill exposed.

In Lake Umbagog, Maine, are small islands, upon some of which trees, thirty feet high, are growing, and they are all covered with a luxuriant growth of shrubbery and grass; in short, to all appearances, these islets are solid land, yet they have no firm connection with the bottom of the water, but are simply stranded, and during gales which occur at high water, are driven from place to place at the sport of the wind. The larger of these floating islands which often contain nearly half an acre of land, are so buoyant that one

may walk over them in perfect safety, but the smaller ones sink beneath the weight of a man, so that it is not safe to venture on them. These isolated spots of land are the chosen resort of the American Bitterns and here they build their nests of sticks, placing them on the ground amid the luxuriant grass, often but a few inches above the level of the water. The birds are not particularly shy when sitting, and I have often walked within a few feet of them, before they would rise; and upon one occasion, when one had her nest on one of the smaller islands, where the surface sunk beneath my weight for some distance around, the bird clung to her abode, even after it was submerged. This was about the first week in June, and I found from three to six fresh eggs, but in Massachusetts, where they build on a bog in wet meadows, they lay a little earlier than this; and from observations made in Florida, although I never found an egg, I am inclined to think that these birds breed early in March. During summer, these Bitterns are not found very commonly on the seashore, but in autumn, I have frequently shot them on the salt marshes, and at this season, they are very fat. This species is migratory, but some linger until very late, and I have started them from beside an open spring, late in November, when the ground was covered with snow. Bitterns appear to be subject to some peculiar disease which causes the skin of the neck to become greatly thickened, when it hangs in loose folds. During the past summer, Mr Outram Bangs called my attention to the fact, that when the Bitterns alight in the tall grass, they pull down a quantity, thus forming a perch upon which they sit.

GENUS IV. ARDETTA. THE LITTLE BITTERNS.

GEN. CH. *Bill, quite short and acutely pointed. Legs and toes, not very long. Tail feathers, either eight or ten, not stiffened. Head provided with slightly lengthened feathers.*

Members of this genus are very small, with the lower neck behind destitute of feathers, but those on the sides and front are elongated. There is but one species within our limits. Sexes, not similar.

ARDETTA EXILIS.

Least Bittern.

Ardetta exilis GRAY., Gen. Birds, 1849.

DESCRIPTION.

SP. CH. Form, slender. Size, very small. Tongue, wide at base, long, and tapering gradually toward tip which is horny and pointed.

COLOR. *Adult male.* Top of head, back, and tail, black, glossed with green. Wings, brown, with outer edge of inner secondaries, tips of all and of the greater coverts, sides of neck and stripe on sides of head next the black, chestnut-red. Upper wing coverts, neck, and under surface, buffy-yellow, mixed with white. Spot on side of breast, brown. Iris, naked space about head, bill, and feet, yellow.

Adult female. Similar to the male but the black of the back is replaced by brown and the yellow is overwashed with ashy and streaked with brown.

Young of the year. Similar to the adult female, but is mottled with reddish and yellowish above. In the last two stages, the top of the upper mandible is brown.

OBSERVATIONS.

Readily known by the small size, and colors as described. Florida birds have only eight tail feathers, whereas those from the North have ten. Distributed, in summer, from Massachusetts, southward; wintering in Florida.

DIMENSIONS.

Average measurements of specimens from Florida. Length, 13.25; stretch, 16.75; wing, 4.85; tail, 1.70; bill, 1.85; tarsus, 1.75. Longest specimen, 13.50; greatest extent of wing, 17.50; longest wing, 5.00; tail, 1.75; bill, 1.90; tarsus, 1.80. Shortest specimen, 13.00; smallest extent of wing, 16.00; shortest wing, 4.75; tail, 1.65; bill, 1.75; tarsus, 1.70.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in tops of grass or bushes, composed of sticks, weeds, and grass. *Eggs*, from three to four in number, elliptical in form, pale blue in color, unspotted. Dimensions from .95 x 1.25 to 1.00 x 1.30.

HABITS.

The Least Bitterns are not uncommon in Massachusetts in suitable localities. They are fond of wide-spread marshes, being seldom found out of them, and even there, appear to prefer the wettest and most inaccessible portions. When disturbed in these retreats, they rise suddenly and fly with a hurried flapping motion of the wings, to the nearest clump of bushes, and alighting in them, will instantly disappear; but unlike the common Bittern, they can be readily started again. In the North, these pigmy Herons build early in June, placing the nests in low bushes, the roots of which are usually submerged, only a foot or two above the water; but in Florida, where these birds are particularly abundant, they breed through the entire month of April, and I have obtained nearly full grown young and eggs, as late as the first week in May. Here the nests were placed in reeds and grass, often quite near the ground, but at times near the tops, and although it is not rare to find a single pair breeding apart from others, several usually build together in the same locality, in which case the birds appear to be on excellent terms, seldom, if ever, quarreling. When their domiciles are approached, especially if they contain young, the birds rise with a shrill cry, fly a short distance, and settling on the reed-tops, watch the intruder with out-stretched necks. The young leave the nest when only about one third grown, and wander about the grass and reeds, clinging to the stalks so tenaciously that it is quite difficult to remove them.

The Least Bitterns, unlike their larger relative which is very untamable and fierce, even when young, are quite gentle and readily become tame. Some young that I took from the reeds, on the borders of Lake Harney, proved to be most interesting pets, especially one that I succeeded in bringing North. This bird would follow me about everywhere, and whenever he saw me, would utter a lively chatter. He was very agile and could climb with great ease. I was obliged to keep him in confinement, as he showed a decided propensity to wander, but as he had a large room in which to roam about, he appeared perfectly contented, and fed readily upon small fishes which he caught for himself out of a basin. He would bathe regularly every day and, when wet through, would climb to the top of a large branch which was placed in a corner of his abode, in order to dry himself. Small and gentle as he was, he exhibited the same propensity to destroy birds which were not as strong as himself, as is shown in all the Herons. Having captured a Hummingbird, I placed it in the room with the Least Bittern, where it lived for some days. As it ate well, was quite tame, and appeared in excellent health, I was quite confident that I could keep it for some time; but the Bittern settled the matter effectually. The Hummingbird was accustomed to alight on the top of the branch on which the Bittern perched, and whenever the latter saw it in this position, he would creep cautiously toward it, and endeavor to strike it, but the Hummingbird, when I was present, would avoid the stroke by flying. But one day, after a short absence from the room, I went in to feed the Hummingbird but could not find it, and looking in the Bittern's bathing dish, saw that the surface of the water was covered with feathers. This was all that remained, however, to tell the story of the tragedy which had occurred; yet the cause of the disappearance of my little pet, was too apparent, for the Bittern was accustomed to dip any food given him, in water, before

eating it. This Bittern lived until cold weather, when he drooped and died. The Least Bitterns are migratory, but some winter in Southern Florida.

ARDETTA NEOXENA.

Cory's Least Bittern.

Ardetta neoxina CORY, Auk, April, 1886, page 262.

DESCRIPTION.

SP. CH. Form slender. Size, small, and other characters much as in *A. exilis*.

COLOR. Adult. Top of head, back and tail, black, glossed with green, and the feathers of the back of neck tipped with greenish black. Side of head and throat, chestnut. Breast and underparts, quite uniform reddish chestnut, changing into blackish on the sides. Under tail coverts, dull black. Upper wing coverts, reddish chestnut, under, pale chestnut. Primaries, dark slaty.

OBSERVATIONS.

This fine little bittern may be distinguished from the common Least Bittern by the nearly uniform dark reddish chestnut of the under parts, which are pale buff in *A. exilis*, and by the generally darker colors.

DIMENSIONS.

Length, 10.80; wing, 4.30; bill, 1.80; tarsus, 1.40.

HABITS.

The first specimen of Cory's Least Bittern was taken in Western Florida, in 1886, and described by Mr. Cory in *The Auk*, as cited above. A second specimen was obtained in the same locality a year or two later, but the species is still very rare in collections.

NOTES ON THE AMERICAN BITTERN. In *Contributions to Science*, Vol. 1, 1889, page 59, I gave a detailed account of the Vocal organs of the American Bittern, then new to science, which article I dedicated to Mr. Bradford Torrey, and this matter is here reproduced, much as then written, with some additional notes upon the subject.

For over a hundred years, writers who have noticed the peculiar notes of the American Bittern, have propounded various theories regarding the probable method by which these sounds are produced. Some of these theories were apparently absurd; for example, we find it stated that the bird thrusts its beak beneath the water, and thus bubbles out the sound: again, we are told that the bird beats either the water or a stake with its wings; none, however, came near the truth. It remained for Mr. Bradford Torrey, and his friend Prof. Walter Faxon, after watching a Bittern which was repeatedly uttering its notes, under peculiarly favorable circumstances, in the spring of 1888, to advance an hypothesis of the method by which the sounds are produced which is substantially correct. A most interesting account of this has been published by Mr. Torrey in the *Auk*, for January, 1889.

Briefly stated, Mr. Torrey's theory is, that the Bittern draws air into its oesophagus, and thus somehow, by this peculiar method, produces the singular pumping sound.

When this paper of Mr. Torrey's first came to my notice, I may frankly state, that, although greatly impressed with the careful manner in which he made his observations, I believed he was mistaken in his conclusions, for I was sure that the pumping sounds of the Bittern had their origin in the inferior larynx, as is the case with the notes of all other birds of which we have knowledge. After dissecting, as will be seen further on, probably the identical Bittern from which Mr. Torrey made his notes, I met with such strong, although totally unexpected and unprecedented evidence, of the general correctness of his theory, (that the notes proceed from the oesophagus) that I have with pleasure dedicated this article, wherein I have recorded what I consider one of the most important discoveries in ornithological anatomy that it has been my

lot to make, to Mr. Torrey, as a slight mark of my appreciation of the excellence of his powers of observation.

Although I had several times dissected specimens of the Bittern, during the fall and winter, I had never chanced to observe the vocal muscles in spring, and in order to settle the question as to the method by which the sound is produced, beyond dispute, I knew that it was quite necessary to procure a bird while in full possession of its vocal powers. Accordingly I visited the Wayland marshes on the 13th of May, in company with my friend, Mr. C. W. Chamberlin. We pushed our boat up the West Brook, and although we saw two Bitterns in the morning, were unable to secure one. About three o'clock in the afternoon, as we were returning, I heard the note of a Bittern, coming from the vicinity of the railroad bridge. The sound was only given two or three times, then ceased. In about ten minutes, the bird pumped again, uttering, as before, a few notes, then remained quiet a short time. During the intervals of the cessation of sound, we advanced toward the point from which it appeared to come, and after hearing the notes repeated about half a dozen times, managed to locate the bird at a point between us and the bridge. Assured that the Bittern was within shot, I stepped on to the marsh, when up it got and I easily killed it.

Now as this was quite near the place where Mr. Torrey observed his Bittern, the previous year, it is highly probable that I, by a singular chance, secured the very Bittern that gave rise to the article in the Auk. In fact, Mr. Torrey has since written me that he thinks this is the case, as he has observed the bird there this season. Although I much regret having been obliged to sacrifice Mr. Torrey's pet Bittern, the call of science was so imperative, that I think the end has justified the means in this instance. If the notes of this particular Bittern are at all irate, that any act of mine has hurried his flight across that river which is wider, darker, and more mysterious than either the Sudbury or the Concord, it ought to be appeased by the satisfaction of having been the bird that has given origin to two quite lengthy articles. (Both of which, since the publication, have been translated into German). Then again, it has given me considerable satisfaction to have worked upon the very Bittern whose *ponk-a-pogs*, through Mr. Torrey's efforts, have been heard around the world, for the results of my labors seem much more conclusive.

The most noticeable external peculiarity about this Bittern is the greatly thickened skin of the neck. [NOTE. See note regarding this on page 158 of this edition of *Birds of Eastern North America*, those remarks about the thickened skin of the neck having been written for the first edition.] This thickening extends all around, but is especially developed from the lower portion of the black stripe, downward, where by its own weight, it hangs in a baggy manner some distance from the neck. Owing to this distension there is a narrow, naked space formed in front, that extends from the lower throat downward. This is about .75 wide and provided with a little scattering down, is grass green in color, while the usual naked portion of the neck above, is bluish pink. The exposed skin of the face is bluish or livid, with a band of dark brown extending from the eye to the base of the upper mandible. The iris is yellow margined with reddish orange.

Upon inserting a tube in the mouth, I find that the oesophagus can be greatly distended, inasmuch so that it measures, at least, seven inches at the base externally. Upon opening the skin on the back of the neck, I found a mass of air bubbles lying between it and the vertebral muscles. These air cells are enclosed in tissue and resemble those seen in the Pelicans, but are larger. Their function, in this case, is evidently to protect the neck from undue pressure, which would otherwise be caused by the inflated gullet.

The gullet, independent of the muscles which surround it and the skin, is, when inflated to its greatest capacity, flattened above and puffed out on the sides and below, especially at the base. In form, it is narrowest near the mouth, becomes gradually enlarged as it proceeds downward, then contracts quite suddenly at the base of the neck. It is about 9.00 inches long, 4.00 wide, and 6.00 deep.

The muscles that surround the oesophagus are thin and separated from the skin by a layer of gelatinous or watery tissue, which is so intimately connected with the skin of the neck, as to be inseparable from it. This watery tissue is filled with large, rather isolated, blood vessels, and the striped muscular fiber beneath it, is surcharged with blood. Indeed the whole surface of the neck resembles skin that has been bruised and is evidently in a feverish condition.

These muscles which I have called oesophagal vocal, are separated along the neck above by a space about .50 wide, but below, the division is not as apparent, as the two lie directly together. Each muscle extends the entire length of the oesophagus, or rather of the inflatable portion of it, and is about 9.00 inches long by 4.00 broad: they attain their greatest thickness near the lower base, being .29 with the watery matter. The muscles are about the same width for three fourths their length, from the base upward, but

narrow above, and on the upper margin become considerably thickened and send off a spur, the occipital vocal, on either side, which adhering to the crest of the bone of the back of the skull, above all of the neck muscles, act as retractors. These occipitals are .20 wide by some 2.00 long, but are thin. See fig. 32, e, c.

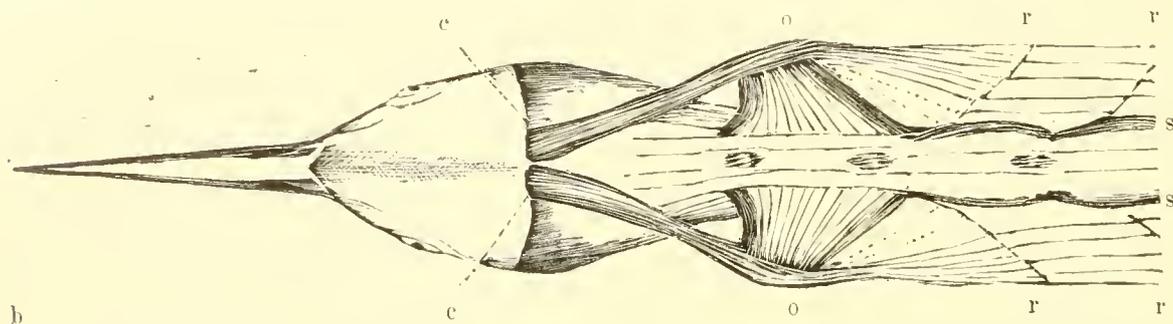


FIG. 32. Upper portion of head of American Bittern, one half life size; b, bill; c, occipital vocal muscle; o, thoracic; r, tendons, s, vertebral muscles.

where I have represented the upper side of a Bittern's head, one half life size, and fig. 33, where a side view of the same is given, s, being the upper portion of the compressing muscle. Also see fig. 34 where an ideal section of a pumping Bittern is given, the lettering being the same as above.

On the lower margin of each enveloping muscle, near the base of the neck, is a narrow spur or rather a prolongation of the muscle, .50 wide by 2.00 long, but thin, Fig. 34, t. This is attached to the muscles in the scapular regions, and sends a branch across the back to meet its fellow on the opposite side.

On the lower portion of the upper margin of each enveloping muscle, another spur arises, which proceeding upward, adheres to the lower portion of the bill, directly beneath the nostrils, fig. 33, p o, and fig. 34, p. This is also a retractor and supporting muscle.

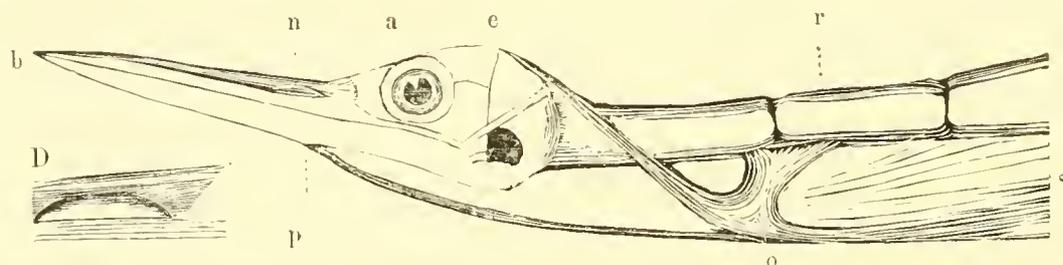


FIG. 33. Side view of head of American Bittern, one half life size; b, bill; n, nostril; a, eye; c, occipital vocal; o, thoracic; r, tendons; s, oesophagus muscle; p, maxillary vocal muscle. D, external closing valve of nostril.

These three accessory muscles support the enveloping muscle and aid in contracting it. Another function of the scapular attachment is to act as a kind of a spineter, to cut off the air in the gullet and prevent it from entering the proventriculus and stomach. The function of all the muscles thus far mentioned, is to force the enclosed air out of the expanded gullet.

For retaining the enclosed air in the gullet, there is a most singular arrangement. Lying on either side of the neck, attached partly to the first and partly to the second neck joints, is a short, thick, muscle, the thoracic, to the lower side of which is attached the occipital. See figs. 32, 33, and 34, o. This peculiar muscle is 1.20 long, .90 wide and .45 thick. It arises well under the neck, and when swollen by contraction, bulges out and meets its fellow opposite, and these, with the upper larynx, which lies beneath them, and a little behind, but which can be firmly pressed against them, completely obstruct the passage to

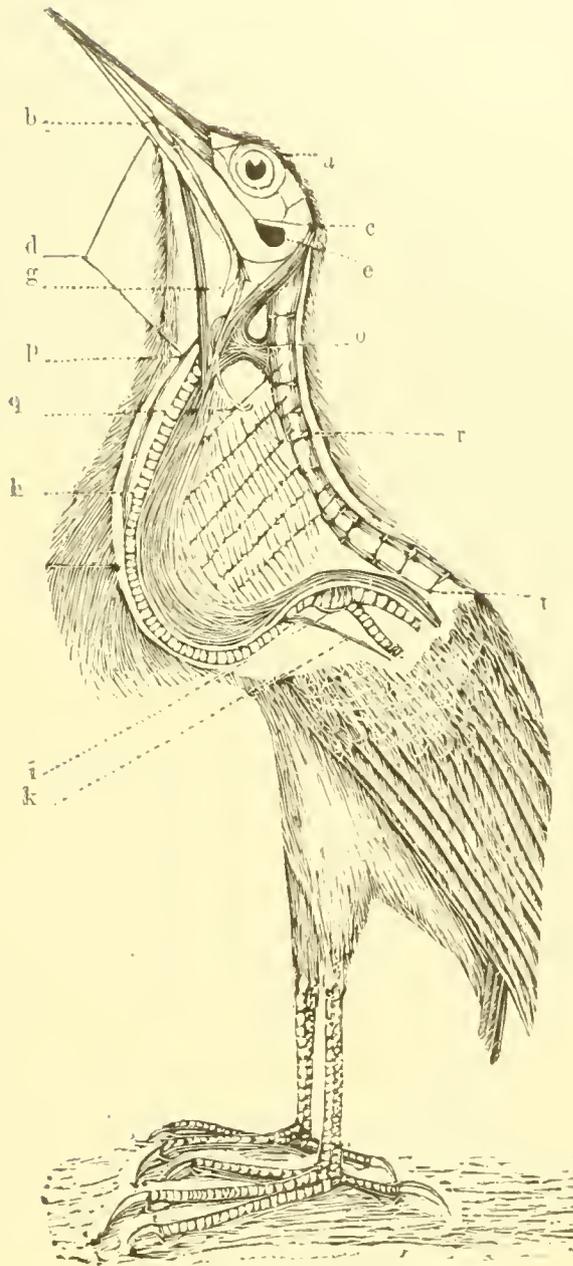


FIG. 34. a, eye; b, first valvular, or mandibular, vocal muscle; c, occipital vocal muscle; d, space occupied by first bubble of air ejected; e, ear; g, tongue; p, maxillary vocal muscle; o, thoracic vocal muscle; q, muscle of tongue; r, vertebrae and six tendons supporting the oesophagal vocal muscle; t, retractor muscle to upper larynx; i, inferior larynx; k, sterno tracheal muscle.

the gullet. This arrangement can be better understood by referring to fig. 35, where I have given a section, life size, through the neck and thoracic muscles; n, neck; e, e, thoracic vocal muscles; c, c, upper larynx; t, tongue; s, s, tongue muscles.

These obstructions, or valves, of the gullet are opened by drawing the thoracic muscle upward and sideways and by drawing the larynx downward and backward. This latter named operation is accomplished by the aid of a retractor which has its origin on the lower portion of the larynx, and then extending downward, adheres to the lower portion of the oesophagal muscle. See fig. 34 and 36, h.

Nor does this complicated arrangement for producing sound end here; lying in the lower mandible, on either side, adhering to the jaws just beneath the nostrils, are two muscles. These mandibular muscles are about 1.20 long, and each gradually becomes enlarged toward the anterior portion until it comes in contact with its fellow opposite. See fig. 36, b, where a life-sized figure of the interior of the terminal two thirds of the lower mandible is given: beneath these muscles, which also play the part of valves, is slipped the tongue, *ib. g.*, and thus by pressing upward crowds the muscles against the roof of the upper mandible, completely obstructing the passage from the entrance of the gullet, to the tip of the bill.

This mandibular valve can be seen in section, in fig. 38, B, where a figure twice life size is given: t, upper mandible: f, bone of same: j, j, lower mandible: o, o, mandibular muscle, beneath which is the tongue.

The nasal opening in the interior of the upper portion of the mouth is peculiar and seems to indicate that the air is taken into the gullet through the nostrils. The anterior nasal opening is closed as in many species of birds, with a valve shown in fig. 38, where is given a figure twice life size. One side is longer than the other, and at the base, that is, nearest the gullet, is a concavity, j, into which the convexity in the opposite side fits. A, is the opening, and w, the hinge angle. Between this valve and the posterior, permanently open, nasal entrance is a space that is closed; fig. 36, B, where a figure of the upper portion of the mouth of the Bittern, half life size, is given; z, is the anterior valvular opening, closed; v, the permanently open posterior entrance that comes within the mouth of the gullet, the lower edge of which is brought up against the intervening closed space, *ib. x.* thus preventing the escape of the air. The external nostrils, fig. 33, are furnished with large coverings which act as valves; a life size view of one of these is given at fig. 33, D.

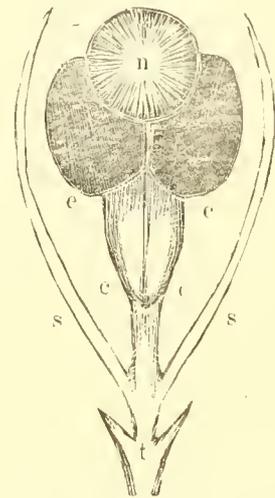


FIG. 35. End view of tongue and vocal muscles in throat of American Bittern, life size; n, neck; e, e, thoracic muscles; t, tongue; s, s, tongue muscles; c, c, maxillary vocal muscles.

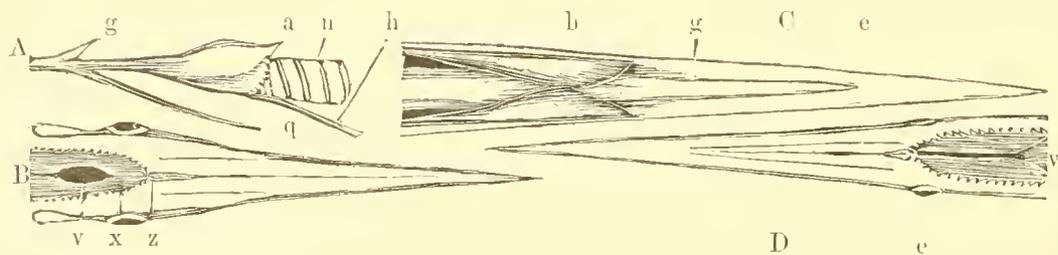


FIG. 36. Illustrating vocal muscles, mandibles, etc., of American and Least Bittern. A, g, tongue; a, upper larynx; n, wind pipe; h, maxillary vocal muscle of American Bittern. B, inside of lower mandible of Am. Bittern; v, permanently open nasal orifice; x, closed space; z, anterior valvular opening. C, inside upper mandible, life size, Am. Bittern; b, mandibular vocal muscles; g, tongue. D, inside of upper mandible, life size, Least Bittern; e, nasal opening.

The Least Bittern, which has no need of such an arrangement, has no closed interspace between the two nasal openings : fig. 36, D, where is given a life size figure of the upper portion of the mouth of this species. Over *e* is the anterior nasal opening, back of which, terminating at *v*, is the continuous posterior opening.

In order to prevent the air from entering the windpipe, over which it passes to reach the gullet, the valves of the larynx are guarded with extra strong muscles which serve to close it. Compare fig. 36, A, upper larynx of American Bittern, one half life size, with that of the Least Bittern, fig. 37, life size, upper fig. side view, lower, as seen from below : *a*, is the larynx with the muscles : *g*, tongue : *n*, trachea : in all the figures. The muscles of the larynx of the larger species completely envelope the end of the trachea, whereas in the smaller species, they merely cover the top and sides.

Now having mentioned all the parts which make up the sound-producing organs, I will explain how they are used, and how, by their aid, the booming of the Bittern is accomplished.

The air is evidently drawn into the gullet through the nostrils, as already explained, the bill being closed during this process. The nostrils are closed when a portion of air is introduced sufficiently large to swallow and as this cannot escape, at least beyond the mandibular valve, fig. 34, *b*, it is readily taken into the gullet, by the simple act of gulping it down. The gullet, or oesophagus receptacle, once full of air, during which operation, according to Mr. Torrey's observations, the bird goes through some very strange contortions, our musician is ready to utter his melodious song, or rather what answers for such.

The muscles that act upon the inflated gullet now compress it, the valves at *ib. o* are opened and a bubble of air is admitted into the space between the two sets of valves, indicated by the diverging lines at *ib. d* being stopped at the mandibular muscles, *ib. b*. This is the first note, "punk," a few seconds intervene and then the mouth is opened and the air within it is released, or forced out by another bubble behind it, coming from the air reservoir, and we have two syllables, nearly together, "a-pog" the whole rendering, to my ears, being, "punk-a-pog" with a peculiar watery intonation that must be heard to be thoroughly understood.

I presume that there is considerable variation in the notes, as among other birds ; that is, no two Bitterns sing exactly alike. Varying distances will also cause the notes to sound differently ; intervening objects like woods or hills will obstruct the cadence and will cause it to vary ; then again, it is difficult to find two persons who will exactly agree as to the expression of bird notes, these sounds evidently not producing the same impression upon one as upon another.

With all this, however, I have little to do at present, and my story of one of the most clumsy, ill-contrived arrangements for producing sound, that was ever possessed by any living animal, is nearly told. I may say that no anatomist, even in his wildest dreams, would ever have conceived such a scheme ! Indeed, the whole system is so utterly without precedent among birds that have come under my observation, that had I not been absolutely forced to believe that the notes of the American Bittern were produced by this most singular muscular arrangement, which evidently assume these peculiar functions for a short time only, by having it exhibited to me so clearly that there is no room for doubt, I never could have given it credit.

When Mr. Torrey compared the voice of the Bittern to the sound produced by a pump, his simile was not far from correct ; the vocal apparatus of this bird is like a pump with two boxes. Mr. Torrey is rather inclined to think the sounds are made by the act of inhaling air, but Professor Faxon more correctly thinks the sounds are made by exhalation.

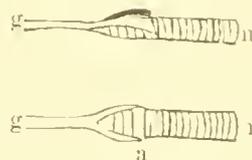


FIG. 37. Upper larynx of Least Bittern, life size ; upper fig., side ; lower, lower side ; *a*, larynx ; *n*, trachea ; *g*, tongue.

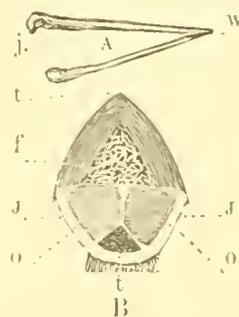


FIG. 38. Illustrating vocal organs of American Bittern. A, closing valve anterior nasal opening ; *j*, upper side ; *w*, hinge. B, section through bill ; *f*, bone of upper mandible ; *j*, *j*, lower mandible ; *o*, *o*, mandibular muscles ; *t*, tongue. Both figures are twice life size.

After examining the vocal organs described, with the results indicated, I was not surprised, upon looking at the inferior larynx, to find that the usual sound-producing apparatus here was nearly functionless, and evidently only used to give utterance to the harsh note that the Bittern emits at times upon rising when disturbed. The sterno tracheal muscle, fig. 39, A, B, C, D, and fig. 34, k, that acts as a retractor for the vibrating, or tympaniform, membrane, is not particularly well developed. The tympaniform membrane, fig. 39, A and B, o, although broad, is thick and incapable of much vibration, and finally, the bones which make up the body of the larynx, *ib.* A, and B, are short and, on the sides, are fused together, as seen in *ib.* D. I have given figures of the lower larynx, to show a peculiar modification for preventing too great pressure against the inside of the bronchial tubes, by the distended lower portion of the gullet, which passes between them. Although the air is cut off, in a great measure, from this portion, by the scapular attachment of the large compressing muscle, fig. 34, t, yet there must be considerable inflation of this part. As seen in fig. 39, C, the bronchial tubes are considerably widened, even on the upper side, and below, their

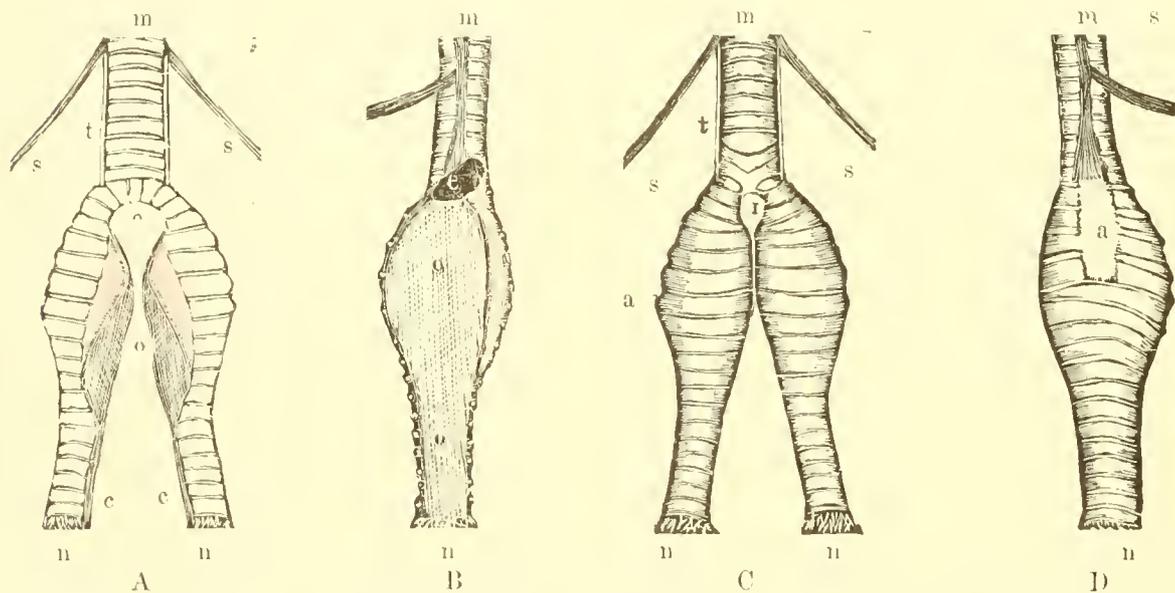


FIG. 39. Inferior larynx of American Bittern, male, life size: m, trachea; t, tracheal muscle; s, sternotrachealis; a, t, bony portion of larynx; o, tympaniform membrane; n, lungs.

width is no less. On the under side of each tube, there is a swollen portion, made up of a hard, rather fibrous substance. This is the portion colored pink in fig. 39, A, B. This elevated portion comes in contact with the gullet and prevents it from pressing against the tympaniform membrane. Fig. 39, A, shows the lower side of the larynx, C, the upper side; B, is the inside of the left bronchial tube, the right side being removed at this junction with the trachea, c. *ib.* D, shows the outside of the same tube. All the figures are the size of life. Other references not given, are as follows: m, trachea; t, beginning of slight bronchial muscle, best seen in fig. D, between m and a; c, bronchial tubes; and n, position of lungs.

SUMMARY.

I give below a summary of the various modifications that the organs of the American Bittern have undergone in order to produce the pumping notes. I do not wish to be understood to say that the muscles given are positively new to science, but that the functions to which they are here applied, have never been noticed, and that they have become so modified in order to perform these functions, as to warrant the applications which I have given them. I have never noticed anything of the kind among other Herons, and a pair of Least Bitterns, *Ardetta exilis*, taken at Wayland, June 10th of this year, did not, upon careful examination, show even a rudiment of the peculiar vocal muscles, and they were about to breed.

1. The oesophagal, enveloping muscles assume peculiar characters for the breeding season. They weighed, with the skin, six ounces. May be present in other species, for the purpose of shaking the skin of the neck: for example, the constrictor colli of Owen, seen in the Apteryx, may be something similar.

2. The scapular prolongation of the oesophagal muscle has an analogy to the muscle that assists to empty the crop in Pigeons and in some other birds, but they have a different attachment; viz., to the inside of the coracoid bones.

3. The occipital vocal. I have never seen described anything just like this muscle, neither have I found it in other birds. A Cochin-china fowl had a flat muscle starting below the ear and just in front of it, and extending back some two inches, to be inserted on the skin of the neck, its use evidently being to raise the feathers of the neck.

4. The maxillary vocal; I have never seen anything like this muscle.

5. The thoracic is a most peculiar muscle at this time, being surcharged with blood and evidently temporarily greatly enlarged.

6. The mandibular vocal are also singular muscles, surcharged with blood and evidently enlarged for the occasion. I am under the impression that I have seen these muscles either in this species before or in some other Heron, but I do not appear to have made a note of it.

7. The retractor to the superior larynx is not present in the Least Bittern, nor in most birds; I found it, however in a Cochin-china fowl, but in this case it extended to the body, and was attached to the lower portion of the termination of the furcula.

The inferior laryngeal modifications and the bubbles in the tissue to prevent undue pressure, the one on the neck and the other on the bronchials, together with the crop-supporting tendons of the neck, appear to be common modifications, arising with requisite circumstances.

On August 8th, 1889, after the above account was printed I procured a young male Bittern, fully grown but bearing marks of having only recently assumed the full plumage of the first year.

In this specimen, quite to my surprise, I find not only that the vocal muscles about the neck are represented by the merest rudiments, but that the swollen appearance on the inside of the bronchial tubes near the tympaniform membrane is completely absent. (See fig. 40, T, where I figure the inside of one

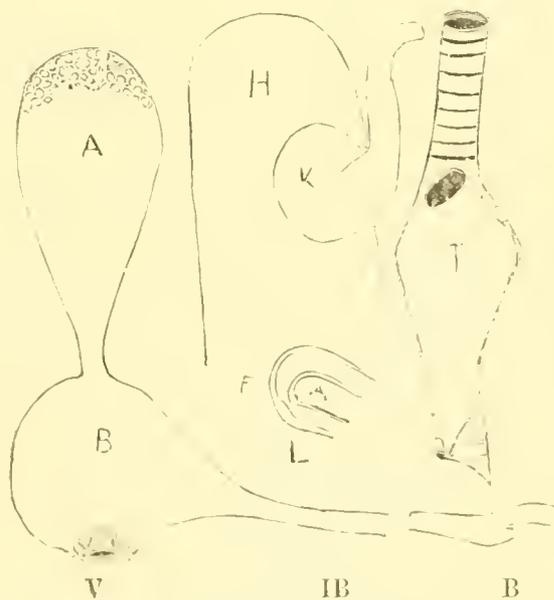


FIG. 40. Illustrating internal organs of young American Bittern. B, Cloaca; A, peculiar appendage; I, intestine; B, B, coecum; H, stomach; K, pyloric lobe; L, valve of pyloric; A, inside, F, outside. T, tympaniform membrane; V, vent.

of the bronchial tubes.) The tympaniforms themselves are also very thin, and appear much more capable of vibration than in the adult.

A peculiar feature in this specimen which I have never seen in any other bird is a singular sac which lay directly on the lower portion of the kidneys. It is pear shaped, measuring about 1.60 by .70, with the walls about .18 thick and made up of numerous oval glands about .05 by .04. From those glands exudes a thin whitish fluid. The sac opens at its small end directly into the cloaca and I cannot find that it communicated by any duct or opening of any kind with any other organ. At fig. 40, A, I have given a life size sketch of this singular organ with the cloaca and a portion of the intestine. A is the sac with the glands indicated on the upper portion only. B, the cloaca, D, the intestine, E, the cecum or the rudiment of it. A space of a little over 2.50 intervenes at the broken space which I have left between D and E. I have at present no idea of what the functions of this peculiar sac with its accompanying gland are.

As in most members of the family the stomach of the Bittern is furnished with a pyloric lobe, which is furnished with a closing valve. At F, fig. 40, I give a life size sketch of the pyloric end of the stomach of the young male Bittern with its lobe. H, is the stomach, K the pyloric lobe. The closing valve occurs between the intestine and the stomach and consists of a thickened portion of the intestine being pushed forward so as to come in contact with the opposite wall, which is also somewhat thickened. At L I have given a section of this valve, A, is the valve, B, the opposite wall of the intestines.

I have said in the foregoing article that I have not found any of the muscles named in any other species of heron, but in a young Little Green Heron taken in Newtonville, August 1st, 1889, I did find the rudiments of the occipital vocal muscles. They are thin straps, extending from the occiput back to nearly the first vertebral joint and are thus about .55 long. See fig. 41, here I have given a life size cut of these rudimentary membranes. H is the back of the head, A, A, the occipital vocal muscles (in this case probably functionless), and B the first vertebra of the neck.

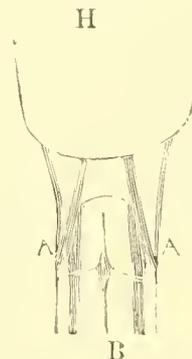


FIG. 41. H, Back of head of Little Green Heron. A, A, rudiments of occipital vocal muscles. B, upper neck vertebrae.

ARDEA WARDI.

Ward's Heron.

DESCRIPTION.

SP. CII. Quite similar to *A. herodias*, but a little larger, with a larger, heavier bill. The neck and sides of the head are pale cinnamon, often nearly white. The black line on side is broken into stripes; and the intervening space is less heavily streaked with black. The loreal region is dark brown with a pea green stripe, running through it, which does not, however, come in contact with either bill nor eye. Bill nearly yellow.

OBSERVATIONS.

Distinguished at once from the Great Blue Heron by the whitish color of the sides of head and neck and by the yellow bill. It is said to have a white phase of plumage.

DIMENSIONS.

Length, 48.00; stretch, 75.66; wing, 20.00; tail, 7.75; bill, 5.90; tarsus, 5.90.

HABITS.

In the first edition of this work, as will be seen on page 144 of the present edition, this page being reproduced from the old edition without change, under head of Observations, I speak of the Great Blue Heron of Florida as having whitish necks. The difference which I then observed has since been found to be constant, and Mr. Ridgway has justly considered it of sufficient importance, taken in connection with the larger size and other minor characters, to entitle the bird to specific rank. The given account of the habits of the Great Blue Heron in Florida given on page 144 will therefore apply to this species.

In the spring of 1885 I found this species quite common on the eastern shores of Indian River, Florida. They frequented the marshes, through which are scattered little ponds. I was standing on the margin of one of these marshes one day in April, watching two of these Herons, which appeared to be quarrelling over some object which one of them held in its bill. We had recently burned the grass in this vicinity, so that I had an unobstructed view of the birds. After dodging about the marsh some moments to avoid the persistent attacks of its companion, the Heron which had the object desired by both, rose and still holding its prey in its bill flew directly toward me, followed by the other bird. I stepped behind a bunch of palmettos and awaited its approach. It kept its direct course until it was within seventy-five or eighty yards of me, when it suddenly turned at right angles. Seeing that it would come no nearer I raised my gun and fired. Although the distance was too great for me to stop the bird, the shot had the very effect that I most desired, for it caused the Heron to drop its prey, which fell on the open marsh where I easily found it. Much to my surprise and delight this proved to be a fine specimen of that singular aquatic arviculine mammal, which had been recently described by Mr. True as *Neofiber alleni*, from a single specimen, which up to this time remained unique.

Thus I had to thank Ward's Heron, for not only exhibiting to me a singular habit, but also for supplying me with the second specimen in existence of a desirable mammal.

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NOTE ON SNOWY HERON. On April 8th, 1885, I found a small colony of these Herons breeding in some willows that grew in a small point near Banana River, north of Merritt's Island, Florida. Here I had an excellent opportunity of observing their breeding habits, and here I heard for the first time the peculiar song. The birds, probably the males, stood erect on the branches of the willows, puffed out the neck, then gave utterance to a series of about six notes, which sounded almost exactly like bubbles of air, passing through a moderately sized tube into water.

At this time I was unaware of the singular method by which the Bittern produces its notes thus I did not make any special examination of the neck and oesophagus of specimens procured at that time. In spite of the propensity of this species to associate in flocks and in heronries to breed, they are of quite a quarrelsome disposition when nesting.

During my earlier visits to Florida I found the beautiful little Snowy Egret exceeding common and very unsuspecting, allowing one to walk within a short distance of them, but in 1885 I found them not only quite uncommon but very shy, and I regret now to have to record, from reports given me by friends that at this time (1895) few if any herons of this species remain in Florida even in the wider sections of the everglades. For the extermination of this and other allied species of Herons in Florida and elsewhere those ladies who use their plumes for personal decoration are wholly responsible. I am happy to be able to record, however, that the Florida legislature has at last enacted a law prohibiting the taking of Herons in that state. This wise measure comes late, but yet, if the law be rigidly enforced, it may save some of the species from utter extermination.

NOTES ON PEAL'S AND REDDISH EGRETS. Since writing the articles on those two species in the old edition of this work, reproduced in this on pages 149 and 150, I have had the opportunity of examining fresh material and of gathering new facts concerning these Herons. I give below extracts from my note-book.

"Andros, South Shore, April 29, 1884. Shot a white Egret (*A. peali*) on Man of War Bush, which was a female in ordinary plumage. Later shot another fine female in the most elegant plumage that I ever saw. The basal portion of the bill was of a brilliant purplish blue, this extending on to the naked skin about the eye, where it was intensified into brilliant blue. The edges of the mandibles were purple. The legs were purplish blue, black on the lower portion of the front of the tarsus, and the toes were black above. The plumage was very full. This bird was sitting near a nearly completed nest. She contained eggs which she would have deposited in a few days. The iris of the first bird was white; that of the second, white also, but with a dark ring around it. In the same rookery was a young bird fully fledged and about fully grown. Its iris was yellow. The nest was placed on the mangroves some five feet from the water, and was quite an elaborate affair for a heron."

"April 30. Have obtained both species (Peals and Reddish) but they are far from being common. Capt. McBride brought me three eggs of a pair of White Birds (Peals) which he procured in a bunch of mangroves.

"Grassy Creek, May 6th. Specimens of both species seen.

"West coast of Andros, May 13th. Shot two specimens in the blue plumage well mixed with white. At a Heronry occupied by Yellow-crowned Night Herons I secured two blue young and Mrs. Maynard shot the adult male which was in mixed plumage. At the same place I got a white bird that exhibits considerable blue on the white.

"Feb. 15, 1885. Common at Inagua in white dress. (Peals). Eggs taken."

It has long been an undecided question with ornithologists as to whether the white and red forms of Herons which have been named the Reddish and Peals Egrets are really distinct. That is do Red birds always produce red young and White birds white young. And are those plumages once acquired retained for life? Then again do birds of different colors ever mate together?

From my observations of these birds I think that the red and white birds are distinct species. That is parents of either color alone produce young of the same color as themselves and a plumage once acquired is always retained.

My reasons for so thinking may be gleaned from the following summary of facts. First, let me state, however, that my notes on those Egrets in Florida were mainly taken twenty-five years ago, when the state was comparatively unsettled, and consequently the Herons were undisturbed. Today partly on account of the rapid settlement of the country, but more particularly on account of the long and continuous persecutions to which the Herons have been subjected, notes upon their range will be of comparatively little value.

Peal's Egret was very abundant on Indian River, but the Reddish was so rare there that I found a single specimen only in two seasons.

The two species came together on the south shore of Florida among the interior keys, but even here the white birds predominate. On the west coast of Florida we got nothing but Reddish Egrets, not a white bird being seen. On the south shore of Andros, Bahamas, I got both species about equally common, and mixed plumages. Both species occurred at Grassy Creek, but at Inagua white Egrets only were found.

Now comes what is apparently the puzzling part of the question, for on the west coast of Andros we got birds of mixed plumage, but, be it noted, we did not find any birds of unmixed color, excepting in case of the young, which were blue, and these were the offspring of mixed parents, both of which were secured. What are we going to do with this mixed form?

We have seen that both Peal's and the Reddish Egret are inclined to live apart from one another in separate localities and when they do come together do not interbreed, hence those mixed birds are not the offspring of parents of both species, although this may have been the first origin of the mixed race, but not necessarily so.

Looking back for the origin of the parent stock, it becomes evident that either Peal's or the Reddish Egret came into existence first, and a study of analogous species would point to the hypothesis that the colored form was the first and that the white phase is merely a perpetuated race of albinos brought about

by the weakening of the species either through too close interbreeding or from some other cause. Thus it was that the acquiring of the white plumage came about gradually, birds in mixed dress appearing first and these mating together produced a tendency toward white birds much more rapidly. But at first all young birds would be reddish. Now this is just what is going on in the colony of Egrets which I found on the west coast of Andros. A small number of Reddish Egrets, becoming isolated, had through too close interbreeding, produced a race of partial albinos which may advance or may remain fixed, much as it is, or may revert back to the parent stock.

That Peal's and the Reddish Egrets are distinct species, with the observed facts quoted before me, I cannot doubt, neither can I doubt that the mixed race is an incipient species, being evolved from the Reddish Egret, and as such its status must be indicated by a name, which I give below.

ARDEA RUFA MUTATA *Novo.*

Changing Egret.

DESCRIPTION.

Sub Sp. Ch. Form, size and general plumage similar to that of the Reddish Egret, but differs in having the plumage irregularly mixed with white.

Young of the year, similar to those of the Reddish Egret or possibly occasionally mottled.

OBSERVATIONS.

This sub-species occurs typically on the west coast of Andros Island, Bahamas, and also casually in Florida.

NOTES ON THE YELLOW-CROWNED NIGHT HERON. HABITS:

This interesting species of Heron is very common in many portions of the Bahamas and other islands of the West Indies, and I have had an excellent opportunity of observing its habits there. On the Bahamas it is known as the Golden, and is much hunted by the inhabitants, being a greatly esteemed article of diet.

The food of the Yellow-crowned Night Herons is mainly land crabs, which they are very expert at catching, killing and breaking to pieces. They will eat all kinds, excepting possibly the large white crab, a species which often measures fourteen inches across the body and claws, and which weighs about a pound. This animal appears to be too strong and bulky for the Herons to manage, but they will kill the Black Crab, a crustacean which measures nearly or quite a foot across the body and claws. But a favorite crab with this Heron is a smaller species, which resembles the Black Crab in form, which is, on account of its being a favorite with the Heron, called the Golden Crab by the Bahamans. This crab is very abundant. Another crab, or rather group of land crabs, which I think is exempt from the attacks of the Golden is the Hermit Crab, for they retreat within their borrowed shells, and guard the entrance with their large claws.

On the Bahamas the Yellow-crowned Night Herons begin to breed the last week in April. On the 28th I procured two sets of eggs consisting of two each, but I do not think as a rule that they lay the full set of three and four eggs until the first week in May. The nests are generally placed low, in some instances not over a foot from the ground. They are usually huge stick-built structures, well hollowed, and remind one strongly of the nests of hawks, and they are often even lined with leaves.

When driven off the nests the Herons retreated without noise. They would often run from the nest and stand gazing silently at me, not over twenty or thirty yards away.

When wounded, the Yellow-crowned Night Heron does not attempt to take to the water, but endeavors to hide in the thickets. They defend themselves bravely, but do not make any outcry, in fact they are at all times much more silent than are the common Night Heron, seldom crying, even at night. A single pair will occasionally breed by themselves, but usually they will nest in small communities. Thus I found quite a heronry, containing about ten nests, on the west coast of Andros, May 13, 1894, and the eggs were in a slightly advanced state of incubation.

I found the Yellow-crowned Night Heron common on the islands of Cayman Brae and Little Cayman in March and April, 1888, and on the latter island several used to visit the clearing about the house in which I lived, and, evidently attracted by the cries of a species of tree frog that frequented the buildings, used to alight on the roof of the house and run about the shingles.

NOTES ON THE LOUISIANA HERON. In my description of this species I say that the iris and naked space about the eye and the base of bill and feet are greenish. This is true for a greater part of the year, but for a few weeks, during the breeding season, there is considerable change in the colors of these parts. The last of February a change of color begins. The first to change is the iris, this gradually becomes first yellow, then rosy red. The base of the bill next becomes bluish and this color extends both ways, deepening in shade as it increases, until it covers three fifths of the bill and occupies all of the naked space about the eye, when it has become brilliant cobalt blue. This change is accomplished in Florida by the first of April. The legs and feet also change to a plumbeous color. When I published my account of the Louisiana Heron, in the first edition, I do not think that this change had been observed by any one. The first to notice the bright colors about the bill and of the eye was Mr. Cory, who found birds thus marked on the Bahamas, and, misled by published accounts of the colors of these parts in the Louisiana Heron, redescribed specimens characterized by this bright array of color as *Ardea cyanirostris*.

NOTES ON HABITS. I found the Louisiana Heron quite abundant and breeding on the Bahamas, April 30, 1884, nesting in small rookeries on the little keys that lie off the south shore of Andros. I also found them common at Inagua in February, 1888, and abundant on Cayman Brae in April of the same year.

IBIS RUBER.

Scarlet Ibis.

DESCRIPTION.

SP. CH. Size and form about that of the White Ibis, but scarlet throughout, with tips of several primaries black. Naked parts of head, bill and legs purplish red.

OBSERVATIONS.

This species is tropical, but three were seen at a distance by Audubon in Louisiana, July, 1821. Coles records examining fragments of a specimen taken on the Rio Grande, June, 1864, and Brewster speaks of a specimen in the Museum of Charleston College, South Carolina, labelled as being taken in Florida. (See notes also in Appendix).

ORDER XIII. LIMICOLAE. SHORE BIRDS.

Legs, long and naked to above the tarsal joint. Posterior toe, when present, elevated above the level of the anterior. Marginal indentations, usually four. Terminal expansion of furcula, without central projection, and it does not approximate closely to the top of keel.

Members of this order are distributed throughout the world. The form is peculiar; the legs and wings are long, the tail, short, the neck moderate, while the bill is either as long as the head or greatly lengthened, and straight, or curved up or down. The marginal indentations are usually four; rarely, however, only two occur. The furcula is not especially well-curved, being, at least, twice as long, measured to the terminal expansion, as wide at base. The head and cheeks are well feathered to the bill. The eggs are usually placed on the ground, and the young are covered with down when hatched and run at birth.

FAMILY I. CHARADRIIDÆ. THE PLOVERS.

Bill, short, not longer than the head, rather cylindrical, and hard at tip. Hind toe, absent or rudimentary. Marginal indentations, four; inner, more than half a dec., as outer. Keel, about equal in length to the width of the sternum.

These birds are rather stout, with short, well-rounded bodies and quite stout legs. The head is large and the neck short. The stomach is quite muscular and the cœca is very well developed. The species are well distributed throughout the world.

GENUS I. SQUATAROLA. THE FOUR-TOED PLOVERS.

GEN. CH. *Bill, quite thick, nearly as long as head which is very large. Tail, slightly rounded. Hind toe, present, but small.*

Members of this genus, in the adult stage, are black beneath and light above, bandal with darker. Sexes quite similar. There is but one species within our limits.

SQUATAROLA HELVETICA.

Black-bellied Plover.

Squatarola helvetica Cuv., R. A. 1817.

DESCRIPTION.

SP. CH. Form, robust. Size, large. Sternum, stout. Tongue, long, t^hin, and narrow, fleshy at the tip which is pointed.

Color. *Adult in spring.* Forehead to eyes and entire under parts, excepting under wing and tail coverts which are white, black with a purplish luster. Above, excepting primaries which are brown streaked with white next the shafts, white, tinged with ashy on the sides of neck and rump, irregularly barred on all, excepting these parts, with dark-brown.

Adult in winter. Dark-brown above, with every feather edged and spotted with white and yellowish-white. Beneath, white, streaked on breast, sides, and flanks with black. Axillaries, also black. Feet, black.

Young. Quite similar to the above but darker and the streakings below are more noticeable. Feet, greenish. Bill, black, iris, brown, in all stages.

OBSERVATIONS.

Readily known from all other Plovers by the black axillaries which are always present, and the rudimentary hind toe. Distributed in summer, throughout Arctic America, wintering in the South.

DIMENSIONS.

Average measurements of specimens from Eastern America. Length, 11.35; stretch, 22.65; wing, 7.45; tail, 2.60; bill, 1.25; tarsus, 1.75. Longest specimen, 11.75; greatest extent of wing, 21.75; longest wing, 8.00; tail, 3.00; bill, 1.40; tarsus, 2.00. Shortest specimen, 11.00; smallest extent of wing, 21.50; shortest wing, 6.90; tail, 2.40; bill, 1.10; tarsus, 1.55.

DESCRIPTION OF NESTS AND EGGS.

Eggs, placed in a depression of the soil, four in number, rather pyriform in shape, brownish-drab in color, spotted and blotched irregularly with large dark-brown markings which often become confluent. Dimensions, from 1.40 x 2.42 to 1.45 x 2.35.

HABITS.

The Black-bellied Plovers do not make their appearance amid the swarms of southward flying shore birds which sweep down the coast, until about the first of September. Then their loud, clear notes may be heard in all directions, especially on those dull, foggy mornings which precede an easterly storm. At such times, they are comparatively tame, for they are evidently weary with their long migration from the North and anxious to feed, in order to depart before the coming storm sets in.

Although the Black-bellies, or Beetle Heads as they are called when in their modest autumnal dress, alight on the hills in search of grasshoppers, they may often be found on sandy beaches, feeding upon small crustaceans and other products of the sea, and occasionally they visit the grassy marshes or pools on them. Their stay in Massachusetts is prolonged until the latter part of October, when the majority has passed southward. In May, however, when they have assumed their dark-colored livery and are on their way to their northern breeding grounds, their visit to us is short, for they pass very quickly, often remaining but a few days.

In Florida, where I have found this species very common, not only on both coasts but also on the Keys, they live wholly on the beaches. In the North, they are very wild, for few birds are more hunted, but in the wilder sections, they lose this shyness in a great measure, but still are never very unsuspecting. They moult late in April, before leaving the South, and I have secured full plumaged adults in May.

GENUS II. CHARADRIUS. THE THREE-TOED PLOVERS.

GEN. CH. *Bill, rather slender, not as long as the head which is not strikingly large. Tail, nearly square. Hind toe, absent.*

Members of this genus, in the adult stage, are black below and dark above, banded with golden and marked with white. Sexes, quite similar. There is but one species within our limits.

CHARADRIUS FULVUS.

Golden Plover.

Charadrius fulvus Gm. Syst. Nat. 1, 1788, 687.

DESCRIPTION.

SP. CH. *Form, robust. Size, large. Tongue, not very long, thin and horny, narrowing toward tip which is slightly rounded.*

Adult in summer. Black throughout, excepting primaries and tail, which are dark-brown, with a purplish luster, the latter being narrowly tipped with white and banded with lighter and the former having a central spot of white on shafts with the upper surface spotted and banded with golden and white, while a band of white passes across forehead, over eye, and broadening out extends down side of neck to upper breast. Under tail coverts, banded with white. Under wing coverts and axillaries, ashy-brown.

Adult in winter. Similar to the summer dress above, but the black on lower surface is mixed, to a greater or less extent, with white and ashy.

Young. Not unlike the winter adult but are paler above and ashy white below, where the feathers are edged and spotted with dusky, especially on the breast. Iris, brown, bill, and feet, black, in all stages.

OBSERVATIONS.

Known from the preceding species by the absence of the hind toe and ashy axillaries and from all other Plovers by the golden markings above. Distributed, as a summer resident, throughout Arctic America, wintering south of the United States.

DIMENSIONS.

Average measurements of specimens from Eastern North America. Length 10.40; stretch, 22.25; wing, 7.25; tail, 2.75; bill, .85; tarsus, 1.75. Longest specimen, 10.80; greatest extent of wing, 23.00; longest wing, 7.50; tail, 3.00; bill, .95; tarsus, 1.90. Shortest specimen, 10.00; smallest extent of wing, 21.50; shortest wing, 7.00; tail, 2.40; bill, .80; tarsus, 1.50.

DESCRIPTION OF NESTS AND EGGS.

Eggs, placed on the ground in a hollow scratched in the soil, with a little grass, etc.; two to four in number, pyriform in shape, deep chocolate-brown in color, spotted and blotched irregularly with large confluent markings of brown of varying shades. Dimensions from 1.35 x 1.80 to 1.45 x 2.10.

HABITS.

The Golden Plovers differ somewhat in habit from the Beetle Heads; thus, although they remain in Massachusetts about as late as the latter named species, they arrive earlier; their notes are mellow and given in greater variety, for besides the whistle which is uttered while flying, they have a peculiar chuckling note, when about to alight. They are also fond of the open wind-swept hill-tops near the coast, where they feed upon grasshoppers, but occasionally a straggler will alight on a beach or marsh. In migration, they are again peculiar, for although very common during autumn along the eastern coast, I never knew of a specimen being taken here in spring; nor did I ever meet with one in Florida. They pass quite out of the United States, spending the winter in South America and adjacent islands. On their return to the northern breeding grounds, they merely pass through the country, west of the Mississippi, but nest in the same section as the Black Bellies, like them, placing the eggs on the ground on some slight elevation.

GENUS III. ÆGIALITIS. THE RINGED PLOVERS.

GEN. CH. *Bill, short, not as long as the head which is of moderate size. Tail, rounded or nearly square. Hind toe, absent.*

Members of this genus are quite uniform in color above and white below, usually with a conspicuous black ring around neck. The eyes are large.

ÆGIALITIS MONTANUS.

Mountain Plover.

Ægialitis montanus BAIRD, Birds, N. A., 1858, 693.

DESCRIPTION.

Plate XV. Adult.

SP. CH. Form, rather slender. Size, large. Bill, long and slender. Tail, square. Tertiaries, nearly reaching the tips of wings. Sexes, similar.

Color. *Adult.* Above, pale yellowish-brown, becoming lighter on the rump. Primaries and tail, brown, the former tipped with black, and the latter narrowly tipped with white, preceded by a broad band of black. Forehead and line over eye, white, above and below which is one of black extending to eye. Under parts, yellowish-white, tinged with a deeper shade on the breast and sides.

Young. Lacks the black band in front and the white of forehead is tinged with dull yellow. Bill, black, iris, brown, and legs, yellow, in all stages.

OBSERVATIONS.

Readily known by the large size, lack of rings on the breast, combined with the uniform pale yellowish-brown above. Distributed throughout the United States, west of the Mississippi Valley. Rare at Key West in winter.

DIMENSIONS.

Average measurements of specimens from Western North America. Length, 9.00; stretch, 18.32; wing, 6.25; tail, 2.75; bill, .85; tarsus, 1.55. Longest specimen, 9.10; greatest extent of wing, 18.75; longest wing, 6.75; tail, 2.95; bill, .90; tarsus, 1.60. Shortest specimen, 8.90; smallest extent of wing, 18.00; shortest wing, 5.50; tail, 2.60; bill, .80; tarsus, 1.43.

DESCRIPTION OF NESTS AND EGGS.

Eggs, placed on the ground in a depression of the soil on a little grass. They are from two to four in number, decidedly pyriform in shape, greenish-brown in color, finely and plentifully dotted with very dark-brown and black. Dimensions from 1.10 x 1.40 to 1.12 x 1.50.

HABITS.

On the first day of December, 1870, as I was walking along the beach, near the barracks, at Key West, I observed a small flock of about half a dozen birds running in front of me, occasionally uttering a low, mellow whistle. I at once saw that they were something new to me but, as they were extremely wild, it was some time before I could obtain a specimen, but at last I secured one by taking a long shot, made just as they were rising, when the rest flew away and I never saw them again. Thus the history of the Mountain Plover, for such the stragglers proved to be, in our section, is easily written, but judging from this instance and from published accounts, this Plover does not differ strikingly in habit from many of its allies.

ÆGIALITIS VOCIFERUS.

Killdeer Plover.

Ægialitis vociferus BAIRD, Birds N. A.; 1858, 692.

DESCRIPTION.

Plate XV. Young.

Sp. CH. Form, slender. Size, large. Bill, long and slender. Tail, long and rounded. Tertiaries, nearly reaching the tips of the elongated wings. Sternum, stout, outer marginal indentations, considerably deeper than inner. Tongue, not long, thin, and slender, horny at extreme tip which is pointed. Sexes, similar.

Color. *Adult*. Above, greenish-brown. Rump, upper tail coverts, and base of tail, cinnamon-red; and outer pair of feathers of latter, white, banded with black, while the tips of all but central pair are tipped with white which is preceded by a broad band of black. Wings, dark-brown, with lines on inner webs, elongated spots on primaries, tips, and base of secondaries, white. Forehead and line through eye, white, above and below which is a band of black, passing back of eye. Beneath white, which extends in red to back of neck, above which, behind, is a band of reddish, and below is a broad ring of black which rapidly narrows behind, however; beneath this, after an interval, is a band of black on breast.

Young. Similar to the adult, but every feather above is edged with reddish, while the throat and space between the black bands are tinged with it.

Nestlings. Are covered above with a yellowish-ash down mixed with rufous. Beneath, white, tinged on the sides with rufous. The black bands on the head are much as in the adult but the lower one is continuous, uniting behind. There is, however, but one ring below, the continuous upper. Eyelids, red, iris, brown, bill, black, and feet yellow, in all stages.

OBSERVATIONS.

Known from all other Plovers by the the two black bands on the throat and breast, and cinnamon rump. Distributed in summer throughout North America, not very common in New England. Winters in the South.

DIMENSIONS.

Average measurements of specimens from North America. Length, 10.00; stretch, 20.25; wing, 6.50; tail, 4.00; bill, .75; tarsus, 1.45. Longest specimen, 10.50; greatest extent of wing, 21.00; longest wing, 6.75; tail, 4.50; bill, .90; tarsus, 1.65. Shortest specimen, 9.50; smallest extent of wing, 19.50; shortest wing, 6.25; tail, 3.50; bill, .60; tarsus, 1.30.

DESCRIPTION OF NESTS AND EGGS.

Eggs, placed on the ground in a slight depression of the soil, on a little grass, etc.; four in number, abruptly pyriform in shape, creamy in color, spotted and lined with dark-brown and umber, but there are more spots than lines. Dimensions from 1.00 x 1.35 to 1.05 x 1.50.

HABITS.

On a December evening, some years ago, I stepped from the deck of a steamer upon a wharf at Fernandina in Florida, well-pleased to find the solid land beneath my feet once more, for the weather during the voyage, had been unusually stormy and I, among others.

had been suffering all the discomforts attendant upon such a rough passage; then, too, I had just left a frozen, snow-covered land, over which the chilly north winds were sweeping; now I was greeted by soft airs from the balmy South, the merry chirp of insects rang in my ears, while the full moon, newly risen, illumined a scene which I then looked upon for the first time. I wandered off across the town and as I was passing a strip of low land, I was almost startled by hearing loud screams, and at the same moment, two or three birds started up, almost at my feet and, continuing their cries, circled around my head. I could make out their form quite clearly in the brilliant moonlight and, although it was the first time that I had ever seen them living, I recognized the Killdeer Plover. The ease with which they flew at night somewhat surprised me, but I afterward found that they are partly nocturnal and I have many times since then, been awakened in the darkness by their shrill notes.

The Killdeer Plovers are very common in the Carolinas during winter, not only frequenting the shores but also haunting moist places in the interior, and I have often seen them in the streets of the villages, where they are very unsuspecting. Southward their numbers increase and on the marshes of the St. John's River, I found them in immense flocks. They are noisy birds when on the wing but while running on the ground, utter a plaintive cry. As they are not at all shy where they are not much hunted, they may be approached quite closely, when they will merely run away, but if pursued, they will often squat, lying quite flat, in order to conceal themselves; then, if approached very closely, they will rise suddenly, with loud, shrill screams which they reiterate until they alight. Thus they often prove a nuisance when one is trying to obtain a shot at some shyer bird, as the noise made by these restless Plovers, causes all other birds in the immediate vicinity to take wing.

I found the Killdeers common on the Keys in winter but do not think any remain to breed, but they do nest on Indian River, depositing their eggs late in May, and in Pennsylvania, they lay about the same time. As might be judged by the foregoing account, they are quite solicitous when their nests are approached and their out-cries often inform the collector that the eggs are near. These birds were very common throughout New England some years ago and although I have occasionally met with a straggler, they are quite rare here now, and but few remain to breed.

ÆGIALITIS WILSONIUS.

Wilson's Plover.

Ægialitis Wilsonius BAIRD, Birds, N. A. 1858, 693.

DESCRIPTION.

SP. CH. Form, robust. Size, not large. Tertiaries not nearly reaching tips of wings. Tail, short and rounded. Sternum, stout, the outer marginal indentations, but slightly deeper than inner. Tongue, long, thin and horny, narrowing toward tip which is slightly rounded.

COLOR. *Adult male.* Above, pale ashy-brown, becoming darker on tip of tail, the outer feathers of which are white. Wings, dark-brown, with line on inner web, central stripes on primaries, base of secondaries, and bar across greater coverts, white. Forehead and line over eye, white, above and below which is one of black. Under parts, white, with a broad band of black across breast.

Adult female. Quite similar to the above but the black markings of head and neck are replaced by some of brown. The winter male resembles the female.

Young. Similar to the adult female, but much more reddish, especially on band across breast. Iris, brown, bill, black, and feet, yellow, in all stages.

OBSERVATIONS.

Known from all other Plovers having a single ring around neck, by the comparatively large size of the bill which is not only thick but is nearly as long as the head. Distributed in summer along the Eastern coast as far north as New Jersey. Winters on the Florida Keys and Bahamas.

DIMENSIONS.

Average measurements of specimens from Florida. Length, 7.85; stretch, 15.00; wing, 5.75; tail, 1.75; bill, .88; tarsus, 1.12. Longest specimen, 8.15; greatest extent of wing, 16.00; longest wing, 5.90; tail, 2.00; bill, 1.05; tarsus, 1.28. Shortest specimen, 7.50; smallest extent of wing, 11.00; shortest wing, 4.65; tail, 1.45; bill, .70; tarsus, 1.05.

DESCRIPTION OF NESTS AND EGGS.

Eggs, placed on the ground in a slight depression of the soil, on a few bits of shells, etc.; three in number, perfect shape, creamy in color, finely and thickly lined and spotted with black, but there are more lines than spots. Dimensions from 1.00 x 1.35 to 1.05 x 1.40.

HABITS.

The northern end of Key West is comparatively barren as the lime rock which forms the foundation of the entire key, has here only a scant supply of soil over it and, consequently, there is but very little vegetation. Between this section and the southern, more fertile, end of the key, is a low-lying tract which can be flooded with sea water in which, in fact, some years ago, formed, in a great measure, natural salt ponds, but they then only covered a limited surface. Now, however, square, shallow basins have been dug over a greater extent, and used for the manufacture of salt, the water being let into them and allowed to evaporate in the sun, leaving the salt. These square basins are separated from one another by dykes along which one can walk and where various species of shore birds alight. Among them are large quantities of Plovers of the genus of which I am writing, and I have, with a single discharge of my gun, killed three species, viz., Wilson's, Piping, and Ring-neck; and the day when I took the first and only specimen of the Mountain Plover ever shot east on the Mississippi, I secured, in all, six species of the genus *Ægialitis* in about an hour, a feat which I will venture to say, will seldom be repeated.

While here, I paid considerable attention to the habits of Wilson's Plover, then in the winter dress, but did not observe that they differed strikingly from other small Plovers, excepting that, perhaps, the flight is a little heavier; but when I found them breeding on Indian River, a few years later, I found that they had some characteristic habits.

Early in May I observed the males in pursuit of the females and alighting beside them, at the same time uttering a series of peculiar, sharp, abruptly given whistles. Confident that they were breeding, a few days later I visited the beach ridge, just north of Cape Canaveral, to look for the eggs, but although there were several pairs of birds circling about, it was not until I happened to see a female run from the nest, that I chanced to discover her three eggs. These were placed in a small hollow scratched in the sand, on some bits of shell and fish bones gathered by the birds, but in a little open space, surrounded by sea purslane, a low plant which grows plentifully about; and all that I afterward found, were placed in a similar situation. The birds ran nimbly about or circled overhead, so that it was impossible to decide just where a nest was situated, and the males were constantly

giving their stuttering notes, while the females only uttered a brisk whistle. I never found Wilson's Plover much north of Key West during winter, but they migrate along the coast early in April, some going as far north as New Jersey to breed.

ÆGIALITIS SEMIPALMATUS.

Ringneck Plover.

Ægialitis semipalmatus Cab., Journ.; 1856, 425.

DESCRIPTION.

SP. CH. Form, robust. Size, not large. Bill, short, not nearly as long as head. Tail, short and rounded. Tertiaries, not nearly reaching the tips of wings. Membrane between toes, large. Sternum, stout, outer marginal indentations, slightly deeper than inner. Tongue, not long, fleshy at base, thin, horny at extreme tip which is rounded. Sexes, similar.

Color. *Adult.* Above, dark ashy-brown, becoming lighter on the tail which is narrowly tipped with white, while the outer pair of feathers are entirely of this color and all but these are crossed by a broad band of black. Wings, dark-brown, with tips base and lines on inner webs of secondaries, central elongated spots on primaries, and tips of greater coverts, white. Forehead and top of head to eye, line below it extending over ear coverts, and broad ring on breast which rapidly narrows behind, black. Beneath, white, which extends in a collar back of neck. Crescent on forehead, also white.

Young. Similar to the adult but the black markings are replaced by some of ashy-brown and every feather above is edged with yellowish-white. Bill, black, yellow at base, iris, brown, and legs, yellow, in all stages.

OBSERVATIONS.

Readily known from all other Plovers by the comparatively short bill and large webs between toes. Distributed in summer, from Labrador, northward. Winters in the South.

DIMENSIONS.

Average measurements of specimens from Eastern America. Length, 7.05; stretch, 11.05; wing, 5.12; tail, 2.16; bill, .55; tarsus, .90. Longest specimen, 7.50; greatest extent of wing, 15.60; longest wing, 5.70; tail, 2.30; bill, .60; tarsus, 1.00. Shortest specimen, 6.65; smallest extent of wing, 11.50; shortest wing, 1.55; tail, 2.05; bill, .50; tarsus, .80.

DESCRIPTION OF NESTS AND EGGS.

Eggs, placed in a depression of the soil, four in number, rather pyriform in shape, creamy in color, spotted irregularly and plentifully with brown of varying shades. Dimensions from .90 x 1.35 to .95 x 1.40.

HABITS.

The Ringnecks are among the first of the returning shore birds, to find their way southward, some appearing early in August, while others continue to come until October, when they suddenly disappear toward the South. The first that make their appearance, are the young and females and later, the adult males follow. These Plovers have a loud, though mellow, whistle, easily distinguished from that of other shore birds. They are fond of the beaches on the open sea, where they run nimbly along the sand, avoiding the incoming waves with great agility, then following them out, in order to pick up the small crustaceans, etc., left by the water. They also visit the pools on the salt marshes, where they eat aquatic insects, and I have even taken grasshoppers from their stomachs. I fully expected to find this species nesting on the Magdalen Islands as they breed plentifully on the neighboring coast of Labrador, but was disappointed, and I do not think that they even nest there, at least in any numbers.

ÆGIALITIS MELODUS.

Piping Plover.

Ægialitis melodus Cab., Journ. 1856, 424.

DESCRIPTION.

SP. CH. Form, robust. Size, small. Tertiaries, not nearly reaching the tips of the wings. Tail, short and rounded.

The membrane not large. Sternum stout, the outer marginal indentation being but very little deeper than inner. Tongue soft, fleshy, and rounded at tip. Sexes, very similar.

Color. *Adult.* Above, very pale ashy-brown, becoming lighter on tail which is tipped with white, and the outer feathers are of the same color, while all, excepting these, are crossed by a broad band of dark-brown. Wings, dark-brown with line on inner webs, elongated spots on outer webs of inner primaries, central stripes on outer, basal tips of primaries, and bar across greater coverts, white. Forehead, white, above which is a lunette of black. Underparts white, which extends in a collar back of neck and below this is a band of black which meets behind, broadens on sides and is frequently interrupted on breast, but is sometimes continuous.

Young. Quite similar to the adult but the black markings of head and neck are nearly, or quite, obsolete. The females are generally paler than the males.

Nestlings. Are covered above with a yellowish-ash down mixed with rufous. Beneath, white. Iris, brown, bill, black, yellow at base, and feet, yellow, in all stages.

OBSERVATIONS.

Known from all other Plovers having a single ring around neck, by the comparatively small bill and tom membrane as well as pale colors, they being the lightest of the genus in our section. Distributed in summer along the coast from the Carolinas as far north as the Gulf of St. Lawrence. Winters on the Florida Keys and Bahamas.

DIMENSIONS.

Average measurements of specimens from Eastern North America. Length, 6.75; stretch, 11.45; wing, 4.75; tail, 2.75; bill, .66; tarsus, .92. Longest specimen, 7.30; greatest extent of wing, 15.45; longest wing, 5.03; tail, 2.65; bill, .72; tarsus, .98. Shortest specimen, 6.30; smallest extent of wing, 13.50; shortest wing, 4.50; tail, 1.90; bill, .50; tarsus, .85.

DESCRIPTION OF NESTS AND EGGS.

Eggs, placed on the ground in a slight depression of the soil, on a few bits of shells, etc.; four or five in number, pyriform in shape, pale yellowish-ash in color, finely and thickly spotted and dotted with black, yellow and lilac. Dimensions from .90 x 1.10 to 1.00 x 1.20.

HABITS.

There are peculiar sections of sea shore along our eastern coast, which are covered with shifting sand that the high winds of autumn and winter are constantly sweeping into dunes which are of ever varying form; consequently, but little vegetation grows on them. These barren tracts are the chosen resort of the Piping Plovers and the pallid tints of these birds are so nearly like the color of the sands on which they live, that, when they are motionless, it is almost impossible to detect one a short distance away, and on a foggy morning, when objects are only indistinctly seen, the birds are quite invisible twenty or thirty yards away, even while running. At such times, especially during the breeding season, they utter a peculiar, long-drawn whistle which coming, as it does, out of the enshrouling fog, has a singularly wild and mournful effect. Besides this cry, the birds emit other and more lively notes which are more often given when their nesting places are approached. The eggs are laid in a simple hollow scratched in the sand and the birds, as if aware that they would be more conspicuous if placed on a smooth surface, choose nesting places in the hollows between the dunes, into which the edding winds have swept bits of bark, twigs, and other debris.

When sitting, I think the female seldom flies unless disturbed but simply runs to the neighboring beach, in order to feed, without rising and returns the same way. Now as the eggs are quite hard to find on account of the birds leaving them whenever they perceive an intruder, I would look for the track of a Plover in the sand and by following it persistently, would finally come to the nest, the proximity to which could always be determined by the increased number of tracks, crossing and recrossing the one which was my guide.

The Piping Plovers arrive from the North in May, the eggs are deposited early in June, and the young run at birth, squatting on the naked sand when they perceive an intruder or are warned to do so by some peculiar note of their parents who, solicitous for the safety of their offspring, are constantly on the lookout for enemies. The little Plovers soon learn to use their wings, however, and fly well by the middle of July, then all migrate to the South during the latter part of August, passing the winter on Key West, in company with the preceding species. Contrary to my expectations, I found the Piping Plovers breeding in great numbers on the Magdalen Islands, nesting on the long sand spits or among the dunes.

FAMILY II. HÆMATOPODIDÆ. THE OYSTER CATCHERS, ETC.

Bill, at least as long as head, compressed throughout, and hard at tip. Hind toe, absent or small. Keel, not equal in height to the width of the sternum. Marginal indentations, four.

These birds are very stout, with well-rounded bodies and short legs. The head is not very large and the neck short. The cœca are very long. Sterno-trachealis, present but there are no other prominent laryngeal muscles. Tympaniform membrane present as well as os transversale, but there is no semilunar membrane.

GENUS I. HÆMATOPUS. THE OYSTER CATCHERS.

GEN. CH. *Bill, much longer than head and compressed laterally at tip. Hind toe, absent. Stomach, not muscular. Furcula, well arched.*

Members of this genus have the inner marginal indentations slightly deeper than outer. Sexes similar. There is but one species within our limits.

HÆMATOPUS PALLIATUS.

Oyster Catcher.

Hæmatopus palliatus TEMM., Man., II; 1820, 532.

DESCRIPTION.

SP. CH. Form, robust. Size, large. Bill, twice as long as head. Sternum, stout. Tongue, thin, wide at base, narrowing toward tip which is rounded.

COLOA. *Adult.* Head and neck all around, black. Above, reddish-brown. Upper tail coverts, lower surface of body, spot on lower eyelid, tips of greater wing coverts, and secondaries, white, with large elongated spots of brown on terminal portion of feathers of latter.

Young. Similar to the adult, but the feathers above are edged with white. Iris, brown, bill and eyelid, carmine, and feet, pinkish, in all stages.

OBSERVATIONS.

Readily known by the large size, absence of the hind toe, and long, compressed bill. Distributed, as a summer resident, along the Eastern coast as far north as New Jersey, wintering from the Carolinas, southward.

DIMENSIONS.

Average measurements of specimens from Florida. Length, 18.59; stretch, 31.50; wing, 10.00; tail, 3.92; bill, 3.35; tarsus, 2.30. Longest specimen, 19.00; greatest extent of wing, 35.00; longest wing, 10.40; tail, 4.10; bill, 3.60; tarsus, 2.40. Shortest specimen, 18.00; smallest extent of wing, 31.00; shortest wing, 9.60; tail, 3.75; bill, 3.10; tarsus, 2.20.

DESCRIPTION OF NESTS AND EGGS.

Eggs, placed on the ground in a hollow scratched in the soil, with a little grass, etc.; two to four in number, rather oval in form, creamy or even white in color, spotted and blotched irregularly with brown of varying shades. Dimensions from 1.50 x 2.15 to 1.55 x 2.25.

HABITS.

On our voyage southward in the yacht *Nina*, we met with the Oyster Catchers for the first time, at Smithville, North Carolina. This was late in November and they were evidently established there for the winter, for they frequented the oyster bars in the harbor, in large numbers. At high water, they would retreat to the sand bars on the beach ridge, where they would sit perfectly quiet, with their heads drawn in and their bills inclining downward, much after the manner of Woodcock. But when the outgoing tide left the tops of the oyster bars exposed, they would come flying silently in, at first singly, then in pairs, while groups of a few would follow, until, at last, they would come in flocks of a dozen or more. They would alight among the oysters and when the bivalves gaped open, as is their habit when the water first leaves them, the birds would thrust in the point of their hard, flat bills, divide the ligament with which the shells are fastened together, then, having the helpless inhabitant at their mercy, would at once devour it. They were not long in making a meal, for specimens which I shot after they had been feeding a short time, were so crammed that by simply holding a bird by the legs and shaking it gently, the oysters would fall from its mouth. They appeared to feed almost exclusively on this kind of food at Smithville, for I never found anything else in their stomachs; in fact, they ate so many oysters that their flesh was strongly flavored with them.

Oyster Catchers are quite shy when shot at frequently and as they are difficult to kill, it is not easy to procure specimens. When one is knocked down, the collector is not sure of it, as they not only run with great swiftuess but swim and dive nearly as well as Ducks, and a wounded bird, if able to run, will at once take to the water. When disturbed, they rise with loud screams and if captured after being disabled, utter similar cries which are apt to attract the attention of their companions, causing them to circle about.

In Florida, I found large flocks of these birds on the marshes back of Amelia Island, gathering about the fresh water ponds to drink and bathe; here they were unusually shy, not allowing me to come within a hundred yards of them. Oyster Catchers breed along the sandy beaches of the coast and adjacent islands, from Florida to New Jersey, nesting about June.

GENUS II. STREPSILAS. THE TURNSTONES.

GEN. CH. *Bill, short, about as long as the head, but not compressed laterally at tip. Hind toe, present. Stomach, muscular. Furcula, not well arched.*

Members of this genus, have the outer marginal indentations much deeper than inner. Sexes, similar. There is but one species within our limits.

STREPSILAS INTERPRES.

Turnstone.

Strepsilas interpres LIL., Prod.; 1811, 263.

DESCRIPTION.

SP. CH. Form, robust. Size, not large. Bill, not long. Sternum, stout. Tongue, rather long, thin, not wide at base, and narrowing toward tip which is rounded.

COLOR. *Adult.* Sides of head and neck, rump, upper tail coverts, under portions, and tail, white, with band on latter, crescent shaped mark on upper coverts, broad band on neck, extending down on side of breast and in a line back of ear coverts, line from lower mandible to throat patch, another line from forehead to eye, passing under it into the last, and

patch on hind neck, black. Remainder of upper parts, mottled with black, chestnut-red, and white. Secondaries, white, with an elongated spot of brown on terminal portion. Primaries, brown, with base of all and tips of inner, white.

Young. Similar to the adult but the black markings are not as distinct, nor is there much red above. Bill, black, iris, brown, and feet, red, in all stages.

OBSERVATIONS.

Readily known by the peculiar black markings on the head and breast. Distributed in summer, throughout Arctic America; wintering from the Carolinas, southward.

DIMENSIONS.

Average measurements of specimens from Eastern America. Length, 9.25; stretch, 18.00; wing, 5.40; tail, 2.60; bill, .95; tarsus, 1.02. Longest specimen, 9.50; greatest extent of wing, 19.50; longest wing, 6.05; tail, 2.75; bill, 1.00; tarsus, 1.15. Shortest specimen, 9.00; smallest extent of wing, 18.50; shortest wing, 5.75; tail, 2.50; bill, .90; tarsus, .90.

DESCRIPTION OF NESTS AND EGGS.

Eggs, placed on the ground in a depression of the soil, on a little grass. They are from two to four in number, rather pyriform in shape, greenish-ash in color, spotted and blotched irregularly and thickly with yellowish-brown, and scattering with dots of amber. Dimensions from 1.17 x 1.56 to 1.20 x 1.65.

HABITS.

The Turnstones are easily recognized by their conspicuous colors, especially by the white rump with its black spot; in fact, they appear so completely mottled with black, white, and red, that in some sections, they are called Calico Birds. They arrive from the North early in August and while in Massachusetts, during autumn, spend the greater portion of their time on rocks which have been left exposed by the tide, searching for small marine animals. They will, however, occasionally alight on the marshes, in order to catch grasshoppers, on which they sometimes feed. In the North, where they are hunted continually, like all shore birds, they become very shy but in the South, where larger game is abundant, they are seldom disturbed and, consequently, are quite unsuspecting, being so tame, in fact, that I have frequently walked within a few yards of them without causing them to take wing. In this section, they resort to the pebbly sea beaches, along which they run nimbly, occasionally pausing to turn over the smaller stones or shells, that they may find the insects which lurk beneath them, and it is this habit which has given them the name of Turnstone.

These birds do not appear to be very common anywhere and in all my experience on the coast between the two great gulfs, I do not remember having seen over twenty together at one time, and this number is rare; indeed, I should consider a flock consisting of ten or a dozen specimens, quite large for this species. I saw a few scattering Turnstones flying about the oyster bars at Smithville, North Carolina, during the last week in November, and from this point to Key West, they are found during winter but are never very abundant in the South. They return North in May but when migrating to their breeding grounds, they pass quite rapidly. The note of the Turnstone, consists of an abrupt, clear whistle, usually given just as the birds rise or is occasionally uttered as they fly.

FAMILY III. RECURVIROSTRIDÆ. THE STILTS.

Bill, much longer than the head, more or less curved upward, flattened and hard throughout. *Hind toe,* absent or very small. *Keel,* about equal in height to the width of the sternum. *Marginal indentations,* four. *Legs,* exceedingly long.

RECURVIROSTRA AMERICANA.

The neck is rather long and slender but the most noticeable feature is the greatly lengthened legs. The head is not large in comparison with the well-rounded body. The sternum is quite narrow with the marginal indentations nearly equal in depth, while the furcula is moderately well arched.

GENUS I. RECURVIROSTRA. THE AVOCETS.

GEN. CH. *Bill, well curved upward, more than twice as long as head which is not very large. Hind toe present but small. Tip of closed wing, but little longer than tail.*

Members of this genus have the bill considerably flattened. Sexes, quite similar. There is but one species within our limits.

RECURVIROSTRA AMERICANA.

American Avocet.

Recurvirostra Americana Gm., Syst. Nat., I; 1788, 693.

DESCRIPTION.

SP. CH. Form, robust. Size, large. Bill, curved upward considerably but the tip is slightly hooked. Wings, pointed. Sternum, stout.

COLOR. *Adult.* Head and neck all around, cinnamon-red. Body, white, with scapularie white and broadly edged with white, tertiaries, greater wing coverts, and primaries, black.

Young. Quite similar to the adult but the head and neck are white, tinged with ash above, and the black markings are not as clear. Iris, red, bill, black, and legs, greenish, in all stages.

OBSERVATIONS.

Readily known by the decidedly upturned bill, long legs, and presence of hind toe and prominent toe membrane. Distributed in summer, west of the Mississippi. Rare on the Eastern coast.

DIMENSIONS.

Average measurements of specimens from Western North America. Length, 16.62; stretch, 29.50; wing, 9.25; tail 3.85; bill, 3.55; tarsus, 3.40. Longest specimen, 18.00; greatest extent of wing, 31.00; longest wing, 10.00; tail, 3.95; bill 3.75; tarsus, 3.50. Shortest specimen, 15.32; smallest extent of wing, 28.00; shortest wing, 8.50; tail, 3.70; bill, 3.35; tarsus, 3.30.

DESCRIPTION OF NESTS AND EGGS.

Eggs, placed on the ground in a slight depression of the soil, three or four in number, rather pyriform in shape, ash-yellow in color, spotted and blotched irregularly and quite thickly, but seldom coarsely, with yellowish-brown of varying shades. Dimensions from 1.25 x 1.95 to 1.40 x 2.05.

HABITS.

The Avocet, although common in the region west of the Mississippi, appears to be quite rare on the eastern coast and I have never met with it living nor can I recall a recent instance of its capture in the North. It has been taken here rarely but occurs more often in the South. Published accounts of the habits of this bird, show that it differs but slightly from that of the succeeding species.

GENUS II. HIMANTOPUS. THE STILTS.

GEN. CH. *Bill, but slightly curved upward, and less than twice the length of the head which is rather large. Hind toe, absent. Tips of closed wings, considerably longer than tail.*

Members of this genus have the bill well rounded toward tip which is pointed. Sexes, similar. There is but one species within our limits.

HIMANTOPUS NIGRICOLLIS.

Black-necked Stilt.

Himantopus nigricollis Vieill., Diet., X; 1817, 42.

DESCRIPTION.

SP. CH. Form, robust. Size, large. Bill, long. Sternum stout. Tongue, rather long, thin, and slender, narrowing toward tip which is pointed but not horny.

COLOR. *Adult.* Forehead to eye, line back of eye, lower eyelid, rump, upper tail coverts, tail, and under portions, white; under wing coverts and remaining portions, black with a purplish luster.

Young. Quite similar to the adult but the black markings are not as clear and the tail is tinged with ashy. Iris and legs, red, and bill, black, in all stages.

OBSERVATIONS.

Readily known by the nearly straight bill, long legs, and absence of hind toe and prominent toe membrane. Distributed in summer, throughout the United States. Rare on the Eastern coast north of the Carolinas, wintering south of the United States.

DIMENSIONS.

Average measurements of specimens from Florida. Length, 14.65; stretch, 26.70; wing, 8.75; tail, 3.65; bill, 2.60; tarsus, 4.72. Longest specimen, 15.00; greatest extent of wing, 28.50, longest wing, 9.00; tail, 3.75; bill, 2.75; tarsus, 4.50. Shortest specimen, 14.25; smallest extent of wing, 25.00; shortest wing, 7.50; tail, 2.50; bill, 2.45; tarsus, 3.95.

DESCRIPTION OF NESTS AND EGGS.

Eggs, placed on the ground in a slight depression of the soil, three or four in number, rather pyriform in shape, ashy-yellow in color, spotted, blotched, and lined irregularly and quite thickly, but seldom coarsely, with yellowish-brown of varying shades. Dimensions from 1.15 x 1.52 to 1.25 x 1.76.

HABITS.

On the fifteenth of March, the Black-necked Stilts made their first appearance at Salt Lake in Middle Florida. At first there were but one or two pairs, then they came pouring in, and soon, whenever I walked over the marshes, their harsh cries resounded on all sides. This was my first acquaintance with the bird and I spent many hours watching their singular movements, until they became perfectly familiar to me, but they always interested me and I often found myself observing them, even after I had lived among them for months.

As may readily be inferred from a glance at the birds, the Black-necked Stilts run very rapidly but in the midst of their career, they will pause suddenly, bend their long legs, and pick up something from the ground, then off again after more food. Their favorite method of feeding, however, was to wade in the shallow pools, often becoming submerged to the body, and I have frequently seen them wading in this manner among flocks of Ducks, consisting of several species. When alarmed while in the water, they will raise their long wings and rise as lightly as if on the land. After they have finished their meal, they return to the shore and squat quietly down in groups but each individual faces the wind, especially if it be blowing hard. They are not shy birds as a rule, allowing one to approach within a few yards, but if the intruder go too near, they will give a bow or two, as if balancing themselves, then rise with a harsh scream which becomes continuous when they are badly frightened.

On the marshes of Indian River, there are certain spots, especially near the water, on which vegetation never grows. Early in April, I observed that the Stilts were frequenting these places and on the twenty-third, found the birds nesting on them, the eggs being placed on the naked soil in a slight depression. It was quite easy to find the eggs, as the birds would not start until I was close to them and if I did not at first perceive where one got up, I had only to retreat a short distance, when the unsuspecting bird would quietly walk back to her nest, bend her long legs, and sit down. The note, at this time, was quite different from that given earlier in the season, as they now uttered short syllables sounding like *put, put, put,* repeated rapidly, that of the males being harsh, while the females

gave it shriller and more continuous. The Black-necked Stilts are found abundantly all through Florida but are not as common above the peninsula and as we pass northward along the coast, they become rare; yet in years past, stragglers have been taken in Massachusetts but none have been recently seen, however, so far north. They leave Florida for the South, early in autumn.

FAMILY IV. PHALAROPODIDÆ THE PHALAROPES.

Bill, slender, longer than head, straight and hard throughout. Hind toe, present and well-developed, while the toes are partly webbed and provided with a lateral membrane. The legs are not strikingly long and the tarsus is compressed laterally. Keel, about equal in height to the width of the sternum. Marginal indentations, four.

Members of this family are singular birds, exhibiting some characters which are peculiar, not only to the Sandpipers but also to the Ducks, the structure of their feet, enabling them to swim well while the peculiar, lengthened, compact feathering beneath is buoyant and water-proof. The stomach is muscular and the proventriculus is large with the glands arranged in a zonular band. The cœca are long. There are but three species known, all of which may, perhaps, be placed in one genus.

GENUS I. PHALAROPUS. THE PHALAROPES.

The three known species of Phalaropes, all of which occur within our limits, do not appear to me to differ sufficiently to take generic rank, therefore I have placed them in a single genus, the characters of which are given under the family heading. Sexes, quite similar.

PHALAROPUS WILSONI.

Wilson's Phalarope.

Phalaropus Wilsoni SAB., App. Frank. Journ; 1823, 691.

DESCRIPTION.

Sr. Cu. Form, robust. Size, large. Bill, nearly twice as long as head, hard and flattened throughout. Legs, long. Lateral toe membranes, nearly straight and the basal ones are small. Tail, doubly emarginate. Tongue, long, thin, and slender, narrowing toward tip which is pointed but not horny.

Color. *Adult.* Above, pale pearly-ash, becoming lighter on the occiput and changing into brown on wings, which is darker on primaries. Secondaries and tail tipped with white, and the latter is mottled with it. There is a dusky line passing through eye, darkening into velvety black back of it, which broadens out on neck. This ends abruptly, but is followed by a line of deep chestnut that passes down the back on to the scapularies, narrowing as it proceeds. Upper tail coverts, line over eye, and under parts, creamy-white, strongly tinged on neck and more lightly on upper breast and sides with reddish.

Young. Grayish above, mottled with black and white, and tinged on the neck with reddish, but lack the black and chestnut markings of the adult. The sides are grayish. When newly fledged, the feathers above are edged with reddish. Bill and feet, black, and iris, brown, in all stages.

OBSERVATIONS.

Readily known by the large size, long bill, nearly straight lateral toe membranes as well as small basal ones, and long legs. Distributed in summer, throughout North America, from Kansas to the region of the Saskatchewan, generally west of the Mississippi, but a few breed in Illinois. Very rare on the Eastern coast in autumn; wintering south of the United States.

DIMENSIONS.

Average measurements of specimens from Western North America. Length, 8.85; stretch, 15.00; wing, 5.05; tail, 2.10; bill, 1.30; tarsus, 1.20. Longest specimen, 9.50; greatest extent of wing, 15.50; longest wing, 5.50; tail, 2.30; bill, 1.50; tarsus, 1.35. Shortest specimen, 8.25; smallest extent of wing, 14.50; shortest wing, 4.60; tail, 1.90; bill, 1.10; tarsus, 1.14.

DESCRIPTION OF NESTS AND EGGS.

Eggs, placed on the ground in a hollow scratched in the soil, with a little grass, etc.; two to four in number, rather pyriform in shape, ashy-yellow in color, spotted and blotched irregularly, and usually coarsely, with brown of varying shades. Dimensions from .90 x 1.20 to .95 x 1.35.

HABITS.

Wilson's Phalarope, although very common in the West, is exceedingly rare on the Atlantic coast of the United States and I have never met with a specimen living, nor do I now remember hearing of an authentic instance of its recent capture, at least in New England. It does, however, occur east of the Mississippi, as it breeds in Illinois. According to notes, this Phalarope is quite unique among birds, as it is affirmed that the female is not only brighter in plumage than the male but that she does all the courting, while the male sits on the eggs after they are deposited. Mr. F. T. Jenks of Providence, who has been among these birds when they were breeding, assures me that the above mentioned facts are true and others have asserted the same thing. In the face of all these witnesses, I shall not venture a remark but will merely tell the tale to my readers as it is told to me. Wilson's Phalarope arrives from the South with other shore birds and departs with them in the autumn.

PHALAROPUS HYPERBOREUS.

Northern Phalarope.

Phalaropus hyperboreus TEMM., Man., II; 1820, 709.

DESCRIPTION.

Sp. CH. Form, rather slender. Size, small. Bill, slender and but slightly longer than head. Legs, not long. Lateral toe membranes, wide, and scalloped at each phalangeal joint, while the basal ones are large. Tail, considerably rounded. Tongue, long, thin, and slender, narrowing toward tip which is pointed.

COLOR. *Adult*. Above, very dark ashy-brown, darkest on head and lightest on rump, mixed with bright chestnut on back. A ring of chestnut-red surrounds neck and a stripe of the same color extends down sides of it. Tips of greater wing coverts and under portions of body, white, with the sides tinged with ashy mixed with reddish.

Young. Lack the chestnut markings of the adult and the feathers above are sometimes edged with reddish, otherwise similar. Iris, brown, bill and feet, black, in all stages.

OBSERVATIONS.

Readily known by the small size, short, slender, pointed bill, rounded tail, wide, scalloped, lateral toe membranes and large basal ones. Distributed, as a summer resident, throughout the circumpolar Arctic Regions; wintering in the South Temperate Zone.

DIMENSIONS.

Average measurements of specimens from Eastern America. Length, 7.75; stretch, 13.75; wing, 4.55; tail, 2.25; bill, 1.00; tarsus, .80. Longest specimen, 8.00; greatest extent of wing, 11.50; longest wing, 4.60; tail, 2.50; bill, 1.10; tarsus, .85. Shortest specimen, 7.50; smallest extent of wing, 13.00; shortest wing, 4.50; tail, 2.00; bill, .90; tarsus, .75.

DESCRIPTION OF NESTS AND EGGS.

Eggs, placed on the ground in a depression of the soil, on a little grass. They are from two to four in number, rather pyriform in shape, varying from greenish to yellowish-ash in color, spotted and blotched irregularly, thickly, and usually coarsely, with brown of varying shades. Dimensions from .75 x 1.02 to .80 x 1.10.

HABITS.

Off the eastern and southern side of Grand Menan are spots where the tide rushing out of the Bay of Fundy, meets the waters of the ocean, causing a peculiar agitation on the surface. These are called rips by the fishermen and their presence is not only detected by the whirling of the water but also by the floating sea weed and debris brought down

by the rivers which empty into the bay. These floating patches are the chosen resorts of the Northern Phalaropes when on their way southward from their northern breeding grounds in autumn. Here they remain for a short time, then depart further south. When they are migrating, if it chances to be stormy, occasionally a little group will stray on shore and haunt the pools along the beaches, looking and acting much like Peeps, but, as a rule, they remain at sea, excepting when breeding. During the winter, I have frequently met with them in large flocks, feeding on those floating islands of gulf weed which lie on the water off the coast of Georgia and the Carolinas. They appeared to be feeding on small mollusks, etc., which live on the sea weed, running about on it much as the small Sandpipers do on land, and whenever the steamers on which I have been, approached too near them, they would rise, uttering a shrill peep, and alight on the next patch.

I have seen these Phalaropes many miles from land during all hours of the day, even late in the afternoon when a storm was imminent. Where they go for safety when those gales, for which the region about Cape Hatteras is famous, sweep over the ocean, I know not. It is possible that they retreat to the calmer waters of the Sounds at such times but I have looked for them in vain, both during and after gales, in Pamlico Sound which is just opposite the point where they are most common at sea. They migrate northward in spring, breeding in the Arctic Regions.

PHALAROPUS FULICARIUS

Red Phalarope.

Phalaropus fulicarius Bon., Obs. Wils ; 1825, 232.

DESCRIPTION.

Sp. Cu. Form, rather slender. Size, small. Bill, but little longer than head, stout, and much flattened. Legs, short. Lateral toe membranes, scalloped at each phalangeal joint but the basal ones are not as large as in the preceding species. Tail, rounded. Tongue, rather wide and fleshy, becoming horny at tip which is rounded.

Color. Adult. Throat and upper parts, dark-brown, becoming ashy on wings and tail, with feathers of back broadly edged with yellowish-rufous. Tips of secondaries, stripe on side of head, under wing coverts, and axillaries, white. Remainder of under parts, deep brownish-red, becoming purplish on abdomen, and tinged with ashy on breast.

Young. Yellowish-brown above, mottled with dusky, darkest on head and wings. Tips of secondaries, forehead, and entire under parts, white. Bill, greenish, iris and feet, brown, in all stages.

OBSERVATIONS.

Known from the two preceding species by the broad, stout, much flattened bill which is scarcely longer than head. Distributed, in summer, throughout the Arctic Regions; wintering in the South.

DIMENSIONS.

Average measurements of specimens from Eastern North America. Length, 8.15; stretch, 15.50; wing, 7.25; tail, 2.50; bill, .95; tarsus, .80. Longest specimen, 8.75; greatest extent of wing, 16.00; longest wing, 7.50; tail, 2.75; bill, 1.00; tarsus, .85. Shortest specimen, 7.50; smallest extent of wing, 15.00; shortest wing, 7.00; tail, 2.25; bill, .90; tarsus, .75.

DESCRIPTION OF NESTS AND EGGS.

Eggs, placed on the ground in a slight depression of the soil, on a little grass, etc. They are from two to four in number, pyriform in shape, varying from greenish to yellowish-ash in color, spotted and blotched irregularly, thickly, and usually coarsely, with brown of varying shades. Dimensions from .85 x 1.15 to .90 x 1.30.

HABITS.

The Red Phalaropes are by far the rarest of the genus in the United States but are, however, occasionally met with on the eastern coast in autumn. Of two specimens now in the collection of the Bangs Brothers, one was obtained in Boston Market a year or two

ago and the other was taken at Magnolia on the nineteenth of September, 1869; another was shot near the same place shortly after. Both of these latter named specimens were running along the border of a small, fresh water pond situated near the shore. Out of the large number of small Phalaropes seen off the coast, it is possible that some may prove to be of this species. The Red Phalaropes appear to be much more maritime than the others, seldom being found in the interior. They breed in the Arctic Zone, like all Phalaropes, placing the eggs on the ground. The males of this and the preceding species are said to be duller in color than the females and to perform the duties of incubation.

FAMILY V. SCOLOPACIDÆ. THE SNIPES, ETC.

Bill, variable in length but grooved throughout, and covered with a soft skin at tip. Marginal indentations, two or four.

This is a large family and, like all the present order, the members present quite variable characters; thus it is exceedingly difficult to find any one peculiarity possessed by all the genera. The bill is either greatly lengthened or shorter than the head and is much curved, straight, or even recurved. The stomach is muscular or soft, with a large or small proventriculus. The intestines are small and long or large and short. Cæca, long or nearly rudimentary. The laryngeal muscles are variable. The above given characters represent the extremes, while there are every possible gradation between the two limits, and other peculiarities of form, which are given under generic and specific characters.

GENUS I. PHILOHELA. THE WOODCOCKS.

GEN. CH. *Bill, less than twice the length of the head which is rather large. Legs, short, with tibia feathered to tarsal joint. Three outer feathers of primaries, attenuated. Keel, equal in height to width of sternum. Marginal indentations, two, small. Coracoids, somewhat exceeding in length the height of keel.*

The stomach is oval in form and quite muscular, with a hard, rugose membrane. The proventriculus is large. The intestines are small but long and the cæca very short. Sterno-trachealis, quite stout. Bronchialis, quite well developed and there is a slight broncho-trachealis, extending over two half rings, while a singular accessory muscle which is membranous, emerges from the lower portion of the trachea and spreading triangularly adheres to the bronchials above, and below, to the rudimentary manubrium. Tympaniform membrane, present but there is no os transversale. Sexes, similar. There is but one species within our limits, which is more or less nocturnal.

PHILOHELA MINOR.

American Woodcock.

Philohela minor GRAY, List Genera; 1841.

DESCRIPTION.

SP. CH. Form, robust. Size, large. Tongue, fleshy, long, thin, and slender, narrowing toward tip which is pointed but not horny. Sternum, stout.

COLOR. *Adult.* Above, ashy-brown, irregularly banded with yellowish-rufous, mottled on the back with ashy, and coarsely marked with dark velvety-brown. Line from bill to eye, short line on ear coverts, top of head and tail, dark-brown, with the two latter banded with yellowish-rufous and the tail is tipped with ashy above and white beneath. Forehead to eye, ashy. Sides of head and under parts, reddish-buff, palest centrally, and tinged with ashy on neck. Under tail coverts, streaked with black and tipped with white.

Young. Quite similar to the adult but much more richly colored below and darker above, where the dark markings are rather irregular.

Nestlings. Are covered with a reddish-buff down, marked above with very dark-brown much as in the adult. Bill, feet, and iris, brown, in all stages.

OBSERVATIONS.

Readily known by the three peculiarly attenuated outer primaries, form, and colors as described. Distributed in summer, throughout Eastern North America; wintering in the South.

DIMENSIONS.

Average measurements of specimens from Eastern North America. Length, 11.10; stretch, 18.25; wing, 5.25; tail, 2.55; bill, 2.55; tarsus, 1.25. Longest specimen, 11.60; greatest extent of wing, 19.55; longest wing, 5.75; tail, 2.60; bill, 2.75; tarsus, 1.30. Shortest specimen, 10.50; smallest extent of wing, 17.00; shortest wing, 1.75; tail, 2.50; bill, 2.45; tarsus, 1.20.

DESCRIPTION OF NESTS AND EGGS.

Eggs, placed on the ground in a slight depression of the soil, on a few leaves, etc., three or four in number, varying from oval to pyriform in shape, and from creamy to buff in color, spotted, and blotched irregularly, and quite thickly, with pale reddish-brown of varying shades. Dimensions from 1.10 x 1.65 to 1.20 x 1.70.

HABITS.

The frost has scarcely left the meadows in early spring, before the twittering notes of the Woodcock can be heard as they emerge from some thicket in which they have been hiding all day, and fly rapidly to the nearest bog, where they usually feed at this season. Shortly after their arrival, they select a suitable locality for breeding, often choosing a slightly elevated spot in some swamp, generally in a thicket, and the eggs are deposited by the second week in April. In Florida, where, I am informed by Mr. G. A. Boardman, the Woodcocks breed, the eggs are laid early in February. It is possible that two broods are raised in a season in some sections, for Mr. August Koch showed me a nest containing two eggs, built in a swamp at Williamsport, Pennsylvania, on the twenty-third of May. The female was sitting on the nest and although we approached within a few feet of her, she did not attempt to fly but kept perfectly motionless, evidently trusting to her peculiar colors which correspond quite well with her surroundings, for concealment. The young make their appearance in about four weeks, and the little downy birds run as soon as hatched and are as well skilled in the art of hiding beneath leaves, as young Partridges. They also fly early, so that by the time they are two weeks old, it is almost impossible to take one alive. The adult and young remain in the low lands until after the moult which takes place late in June. They then enter the corn fields and probe for worms, and later, may be found in birch and other woods, even on hill-tops.

The method by which the Woodcocks capture worms, is peculiar and I once kept one alive in a cage made of a packing case, for some time, so that I had an opportunity of watching it as it fed. At first it was quite wild and would rise every time I went near it, striking its head with such force against the roof of its prison, that it would fall back stunned. To prevent it from injuring itself, I removed the wooden top of the box and substituted some mosquito netting, against which it could fly without danger of being killed. The floor of its house was covered to the depth of four or five inches, with dark-colored loam, in which I planted a quantity of weeds, beneath which the Woodcock could hide. I would drop a number of worms on this soil, which, as the bird was too shy to feed at first, had ample time to bury themselves. At times, however, I was able to watch the bird unseen by it; then the Woodcock which had remained hidden in the corner behind the sheltering weeds, would emerge cautiously and walk over the ground, slowly and deliberately, pausing every instant or two as if listening intently. Then he would stamp with one foot, giving several sharp, quick blows, after which he would bow his head near the ground and again listen. Then, suddenly, he would turn either to the right or left, or take a step or

two forward, plunge his bill into the earth, and draw out a worm which he would swallow, then repeat this performance until all the worms were eaten. After the bird had been in confinement for a few days, it became so tame that it would run and pick up the worms that were thrown into its cage, taking two or three in its bill at one time and devouring them eagerly. This Woodcock had a peculiar way of walking and making its way among the weeds, which reminded me more of the Rails than the Sandpipers. I kept it two or three weeks, then finding that it was almost impossible to supply a sufficient number of worms to satisfy its hunger, I gave it liberty to fly from a window. It took a short flight to a potato patch near and eagerly began probing for worms, but finally walked away, disappearing among the weeds.

The twittering or whistling notes of the Woodcocks, given as they rise, have often attracted the attention of writers, some of whom affirm that it is produced by the wings, others that it is vocal, and I am inclined to the latter hypothesis, as the sound is withheld sometimes and given at others. The song uttered during the breeding season, has also been noticed considerably of late. I have never heard it but the notes are said to be almost as varied as those given by some of our insessorial birds. Judging from the structure of the larynx which is unique among the birds of this order, which I have examined, I should say, that although the notes might be varied, they would all be given in the same tone, which would be decidedly minor; for, as a rule, I think the gradations of tone are produced by the vibrations of the semilunar membrane which is absent in the Woodcocks. Of the migration and autumnal habits of these birds, I shall not write, they being well-known to all sportsmen.

GENUS II. GALLINAGO. THE SNIPES.

GEN. C.I. *Bill, more than twice as long as head which is not very large. Legs, short, not feathered to tarsal joint. Outer feathers of primaries not attenuated. Keel, exceeding in height the width of sternum. Marginal indentations, two, deep, inclosed in adults. Coracoids, equal in length to height of keel. Hind toe, present.*

The stomach is cuboid in form, quite muscular, and lined with a hard, rugose membrane. Proventriculus, moderate. Intestines, large and short, with cœca quite long. Sterno-trachealis, not stout, and there is a slight bronchialis, but no other laryngeal muscles. Tympaniform membrane, present, but there is no os transversale. Sexes, quite similar. There is but one species within our limits.

GALLINAGO WILSONI.

Wilson's Snipe.

Gallinago Wilsoni Bon., List; 1838.

DESCRIPTION.

SP. CII. Form, rather slender. Size, medium. Tongue, fleshy, long, thin, and slender, narrowing toward tip which is pointed. Sternum, stout.

COLOR. *Adult.* Above, very dark-brown, spotted, banded, and streaked, excepting on primaries, with pale reddish and white. Outer web of first primary, also white. Sides of head, yellowish-rufous, with line from bill to eye and one on ear coverts, brown. Belly, abdomen, under wing coverts, and axillaries, white, banded with brown. Remainder of under portions, yellowish-red, banded and streaked, excepting on the throat, with brown. Tail, dark-brown, tipped with white which is preceded by a broad band of chestnut-red, finely barred with black.

Young. Quite similar to the adult, but paler below and darker and more reddish above. Bill, iris and feet, brown, in all stages.

OBSERVATIONS.

Readily known by the slender form, long bill, bright chestnut on tail, and other colors as described. Distributed, in summer, from Northern New England, northward; wintering from the Carolinas, southward.

DIMENSIONS.

Average measurements of specimens from Eastern North America. Length, 10.00; stretch, 16.75; wing, 5.75; tail, 2.25; bill, 2.55; tarsus, 1.32. Longest specimen, 11.75; greatest extent of wing, 17.25; longest wing, 6.50; tail, 2.50; bill, 2.75; tarsus, 1.50. Shortest specimen, 10.25; smallest extent of wing, 16.25; shortest wing, 5.00; tail, 2.00; bill, 2.40; tarsus, 1.15.

DESCRIPTION OF NESTS AND EGGS.

Eggs, placed on the ground in a slight depression of the soil, on a little grass, etc. They are from two to four in number, pyriform in shape, varying from pale greenish-brown to yellowish-ash in color, spotted and blotched irregularly, and usually faintly, with light reddish-brown and number. Dimensions from 1.05 x 1.50 to 1.10 x 1.60.

HABITS.

There are few sportsmen, worthy of the name, who do not know the *scape* of Wilson's Snipe as they rise from the wet meadows and pursue their rapid zigzag flight. When started from a spot in which they have been feeding, in spring, Snipe are quite apt to fly a short distance, then settle down again, but in autumn, they appear more restless and will often circle around, high in air, calling continually until joined by several others, when all will depart for some distant feeding ground. I found these Snipe very common along the borders of rivers and creeks in the Carolinas but I never met with them so abundantly as on the marshes of Indian River in Florida. Here they perfectly swarm, two or three rising at every step of the sportsman, and after flying a short distance, will tamely settle down again. From this point southward, they are common and I even met with them on the borders of the fresh water ponds at Key West. Snipe migrate late in September as a rule, lingering for a time in New England and the Middle States, but by the first of November, the greater portion have departed, yet I have frequently shot them when the ground was completely frozen, as they rose from the side of some open spring.

On the Magdalen Islands, are certain swampy tracts of country, filled to a great depth with a black, muddy ooze and water which is of an icy coldness. The top of this morass is in many places covered with grass, weeds, and often bushes, but which never becomes firm enough to bear the weight of man. The light-footed Snipe, however, run over it with ease and it is here that they build their nests and raise their young in perfect safety. Almost any time during the day in summer, the males may be heard uttering a peculiar winnowing sound, while they circle about, high in air, darting suddenly to one side every time they give these notes. Wilson's Snipe also deposit their eggs in similar bogs in Northern Maine.

GENUS III. MACRORHAMPHUS. THE MARSH SNIPES.

GEN. CH. *Bill, more than twice as long as head which is small. Marginal indentations, four; outer deeper than inner. Coracoids, equal in length to height of keel.*

Stomach, flat in form, quite muscular and lined with a finely rugose membrane. Proventriculus, small. Coeca, quite long. Sterno-trachealis, thin and there is a weak bronchialis, but no other laryngeal muscles. Tympaniform membrane present. Sexes, similar. There is but one species within our limits.

MACRORHAMPHUS GRISEUS.

Red-breasted Snipe.

Macrorhamphus griseus LEACH, Cat. Brit. Mus.; 1816, 31.

DESCRIPTION.

Sp. CH. Form, rather slender. Size, medium. Tongue, very long, thick, fleshy, rounded at base, grooved throughout its entire length, becoming thinner at tip and gradually pointed.

COLOR. *Adult in spring.* Above, very dark-brown, becoming ashy on secondaries and upper wing coverts which are edged and banded with white, with all the feathers, excepting primaries, edged and banded with chestnut-red. Rump, upper tail coverts, and tail, white, banded with dark-brown. Shaft of outer primary, white. Sides of head and under parts, chestnut-red, with line from bill to eye, spots, or short bars, on sides of neck, breast, sides, flanks, and under tail coverts, dark-brown. Under wing coverts and axillaries, white, banded with dark-brown.

Adult in winter. Ashy above with the feathers darker centrally, and white beneath, streaked on the throat, breast, sides, and flanks with ashy.

Young. Quite similar to the winter adult, but darker above and more ashy below. Bill and iris, brown, and feet, greenish, in all stages.

OBSERVATIONS.

Quite variable in plumage, the above given stages representing the extremes, with all gradations of color between. In spring the body feathers only are moulted and occasionally individuals, in moulting, will not assume the red dress but will retain the gray throughout the summer. These may be young but it is not a constant plumage with birds of that age as they are usually red but paler than the adult. Viewed in the light of my past experience with these birds, which has been somewhat extended, as I have handled hundreds of Red-breasted Snipe from the Atlantic Coast and have seen many skins from the West, I cannot agree with some of our distinguished ornithologists in according specific or even varietal rank to long-beaked individuals, for I have frequently seen all gradations between the two extremes known as *scolopaceus* and *griseus*, both in size and color. It is quite true, that on the northern coast specimens having the extremely lengthened bill are comparatively rare, but in Florida there is as great a proportion of them as among any other waders subject to a like variation. Readily known by the long bill, white tail and shaft to outer quill, and other colors as described. Distributed, in summer, throughout Arctic America; wintering from the Carolinas, southward.

DIMENSIONS.

Average measurements of specimens from Eastern North America. Length, 11.50; stretch, 18.75; wing, 6.30; tail, 2.37; bill, 2.62; tarsus, 1.56. Longest specimen, 12.50; greatest extent of wing, 20.00; longest wing, 7.10; tail, 2.60; bill, 3.00; tarsus, 1.77. Shortest specimen, 10.50; smallest extent of wing, 17.50; shortest wing, 5.50; tail, 2.13; bill, 2.24; tarsus, 1.35.

DESCRIPTION OF NESTS AND EGGS.

Eggs, placed on the ground in a slight depression of the soil, on a little grass, etc. They are from two to four in number, pyriform in shape, varying from pale greenish-brown to yellowish-ash in color, spotted and blotched irregularly, and usually faintly, with light reddish-brown and umber. Dimensions from 1.10 x 1.55 to 1.15 x 1.75.

HABITS.

The Red-breasted Snipe make their appearance in Massachusetts in autumn, from the middle of August to the middle of September, varying as to the exact date, with different years. In habit, they sometimes resemble Wilson's Snipe, for they will occasionally lie, quietly hidden, in the grass of the marshes until the sportsman approaches quite near, when they will suddenly rise with a loud, clear whistle and fly rapidly away. At other times, however, their habits approximate more nearly to those of the majority of shore birds, for they may be seen feeding on the borders of pools, running nimbly about, and picking up aquatic insects, small mollusks, etc. In the North, they are most emphatically a bird of the marshes, but in the South, I found them on the beaches in company with other wading birds.

Red-breasted Snipe are very abundant in the latter named section, being common from the Carolinas to Key West, but I found them rather more numerous on the sandy borders of Salt Lake in the interior of Florida, than elsewhere at this season, but in spring, they congregated in flocks of thousands on Indian River. This was early in May and the birds were passing from the gray winter dress to the brighter spring plumage, and then as soon as their feathers were grown, which was accomplished in a very short time, they departed for the North. These Snipe arrive in Massachusetts in spring, early in June, remain but a day or two, then make their way to their northern breeding grounds.

GENUS IV. MICROPALAMA. THE LONG-LEGGED SANDPIPERS.

GEN. CH. Bill, less than twice the length of the head. Marginal indentations, four; outer, twice as deep as inner. Coracooids, slightly exceeding in length the height of keel. Basal membranes between toes, large. Legs, very long, with tibia feathered for about one half its length.

Members of this genus have the bill expanded at tip and slightly curved. The legs are strikingly long. Sexes, similar. There is but one species within our limits.

MICROPALAMA HIMANTOPUS.

Stilt Sandpiper.

Micropalama himantopus BAIRD, Birds N. A.; 1858, 726

DESCRIPTION.

SP. CH. Form, slender. Size, medium. Tongue, long, thin, and slender, tapering toward tip which is slightly rounded. Sternum, stout.

COLOR. *Adult.* Above, very dark-brown, becoming lighter on the scapularies and upper wing coverts, with the feathers of the back, edged with reddish and white. Band from bill, meeting on occiput, and spot behind eye, dull reddish. Upper tail coverts, white, banded with black. Tail, white, broadly tipped with ashy. Under parts, pale yellowish-red, transversely banded with dark-brown.

Adult in winter. Above, ashy-brown, with the center of the feathers, darker. The rufous bands on head are replaced by some of white; and the central under portions are pure white, streaked on throat, breast, sides, and under tail coverts, with dusky. Otherwise, similar to the above.

Young. Very similar to the winter adult but much more rufous above. Bill, brown, iris, brown, and feet, greenish, in all stages.

OBSERVATIONS.

Readily known by the long legs, large basal toe membrane, and colors as described. Distributed in summer, throughout Arctic America; not common on the coast of New England, in autumn. Winters south of the United States.

DIMENSIONS.

Average measurements of specimens from Eastern North America. Length, 9.07; stretch, 16.40; wing, 5.00; tail, 2.15; bill, 1.60; tarsus, 1.70. Longest specimen, 9.15; greatest extent of wing, 16.80; longest wing, 5.25; tail, 2.35; bill, 1.70; tarsus, 1.85. Shortest specimen, 9.00; smallest extent of wing, 16.00; shortest wing, 4.75; tail, 1.90; bill, 1.50; tarsus, 1.60.

HABITS.

The Stilt Sandpiper which is not of uncommon occurrence on the New England coast, during the autumnal migration, is called by many gunners, the Bastard Yellow Leg and is considered to be a hybrid between the Red-breasted Snipe and Lesser Yellow Leg. This absurd idea, without doubt, had its origin in the fact that this long-legged Sandpiper presents some characters common to both species; not only in form and color does it resemble them but it has some habits of both, and also associates with them. Thus individuals are met with among the flocks of Red-breasted Sandpipers on the marshes, where they behave much like their larger companions; and others occur with small companies of Yellow Legs and feed on the borders of pools. I have also seen solitary individuals alight to my decoys, as I lay hidden in a booth, while now and then, flocks consisting of half a dozen specimens, may be seen flying swiftly along the shore, uttering a chuckling whistle as they go. I never had any difficulty in distinguishing the Stilt Sandpiper by its note and form, for the long legs give it a characteristic appearance. I once started one of this species at Dummett's, on Indian River, on the twenty-fourth of April, 1872. This is the only specimen that I ever saw in the state, neither did I ever meet with the species in the North in spring. I have never seen an authentic specimen of the egg of the Stilt Sandpiper.

GENUS V. TRINGA. THE SANDPIPERS.

GEN. CH. *Bill, usually short, twice as long as head, straight or but little curved. Coracoids, exceeding in length the height of keel. Outer marginal indentations, deeper than inner.*

The legs are variable in length but are never very long. The stomach is flat or cuboid in form, quite muscular, and lined with a hard, rugose membrane. Proventriculus, moderate. Intestines, large and short, with the caeca quite long. Sterno-trachealis, not stout, and there is a slight bronchialis, but no other laryngeal muscles. Tympaniform membrane, present, but there is no os transversale. Sexes, quite similar. There are ten species within our limits.

TRINGA PUSILLA.

Semipalmated Sandpiper.

Tringa pusilla LINN., Syst., Nat., 1; 1766, 252.

DESCRIPTION.

SP. CH. Form, slender. Size, small. Tail, doubly emarginate. Tongue, rather fleshy and wide at base, narrowing toward tip which is horny and pointed. Bill, stout and widened at tip. Toes, provided with a basal membrane. Outer marginal indentations, twice as deep as inner.

COLOR. *Adult.* Above, ashy-gray, each feather having a dark-brown center. Wings, upper tail coverts, and two central tail feathers, dark-brown, with the remainder of latter, ashy. Line from bill over eye and entire under parts, white, rather finely streaked on sides of head, on neck, across breast, and on sides with dark-brown.

Young. More uniformly ashy above, with a slight tinge of reddish to the edges of the feathers, and lacks, in a great measure, the markings below. Bill and feet, black, iris, brown, in all stages.

OBSERVATIONS.

Readily known by the small size, black legs, stout bill, and membrane between toes. Distributed in summer, from Labrador, northward; wintering from the Carolinas, southward.

DIMENSIONS.

Average measurements of specimens from Eastern America. Length, 6.73; stretch, 11.95; wing, 3.75; tail, 1.41; bill, .92; tarsus, .79. Longest specimen, 6.86; greatest extent of wing, 12.75; longest wing, 4.15; tail, 1.80; bill, 1.24; tarsus, .98. Shortest specimen, 5.69; smallest extent of wing, 11.14; shortest wing, 3.31; tail, 1.03; bill, .69; tarsus, .60.

DESCRIPTION OF NESTS AND EGGS.

Eggs, placed on the ground in a depression of the soil, on a little grass. They are from two to four in number, decidedly pyriform in shape, varying from greenish to yellowish-ash in color, spotted, blotched, and dotted irregularly and thickly, with brown of varying shades. Dimensions from .80 x 1.29 to .85 x 1.25.

HABITS.

The Semipalmated Sandpipers, or Black-legged Peeps as they are known to sportsmen, arrive from the North, among the first of the southward flying shore birds, some making their appearance as early as the first week in July. They come slowly at first but soon the flocks increase in size, until every creek, river mouth, and bay, along the coast, is swarming with them, while they are often found in the interior, and I once shot several that were feeding around a small pool, left by the rain, at Watsonstown, Pennsylvania. Although this species occurs on the marshes, they have a predilection for beaches which border on rivers or the open sea, where they may be seen with the larger wading birds, and often accompany them in their flights. These birds are very abundant in the South and I have frequently observed flocks of this and the succeeding species on Indian River, Florida, which numbered among the thousands, occupying a stretch of shore nearly as far as the eye could reach. They linger during their autumnal migration until the first of October, but when on their way north in spring, like all shore birds, move quite rapidly, passing a given point in a few days. These Sandpipers, like many of the genus, breed in the far North, placing their eggs on the ground, usually choosing some marshy locality as a breeding ground.

TRINGA MINUTILLA.

Least Sandpiper.

Tringa minutilla VIEILL., Nouv. Diet., XXXIV, 1819, 452.

DESCRIPTION.

Sp. Ch. Form, slender. Size, very small. Tail, doubly emarginate. Tongue, long, thin, and slender, narrowing gradually to tip which is pointed. Bill, slender, not widened at tip. Outer marginal indentations, twice as deep as inner. Toes, without basal membrane.

Color. *Adult.* Above, dark-brown, with the feathers, excepting primaries, bordered with yellowish-ash, rufous, and white. Tail feathers, excepting middle pair which are dark-brown, ashy. Line from bill over eye and entire under parts, white, tinged on sides of head, across breast, and on sides with yellowish-ash, and these parts are finely streaked with dark-brown.

Young. Similar to the adult but much more rufous above and lacks, in a great measure, the streakings below. Bill, black, iris, brown, legs, greenish-yellow, in all stages.

OBSERVATIONS.

Known by the small size, slender bill, greenish legs, and absence of basal toe membrane. Distributed, in summer, from Labrador, northward; wintering from the Carolinas, southward.

DIMENSIONS.

Average measurements of specimens from Eastern North America. Length, 6.13; stretch, 12.08; wing, 3.67; tail 1.62; bill, .85; tarsus, .72. Longest specimen, 6.76; greatest extent of wing, 12.17; longest wing, 3.80; tail 1.85; bill, .95; tarsus, .80. Shortest specimen, 5.67; smallest extent of wing, 11.00; shortest wing, 3.53; tail, 1.50; bill, .65; tarsus, .65.

DESCRIPTION OF NESTS AND EGGS.

Eggs, placed on the ground in a slight depression of the soil, on a little grass, etc., three or four in number, decidedly pyriform in shape, varying from creamy to buff in color, spotted and blotched irregularly, and quite thickly, with brown of varying shades. Dimensions from .70 x .90 to .75 x 1.00.

HABITS.

Least Sandpipers or Peeps of sportsmen are, perhaps, the best known of game birds, for they are the legitimate prey of every one, from the ragged urchin who chooses to endanger his life by burning gunpowder in a dilapidated tube which was formerly a gun, to the city exquisite who, armed with costly breech loader, sallies out to make havoc among the Curlew and Plover but whose greatest actual achievement consists in knocking over a few Peeps as they sit by the pools on the marshes. In habits, these pretty little shore birds do not differ from the majority of the members of the genus. They are fond of the marshes and it is not uncommon to start solitary individuals or small flocks consisting of three or four specimens, from out the grass, when they will rise with a feeble cry and make their way swiftly, in an eccentric flight across the flats. They may also often be seen on the beaches in company with larger wading birds, and it is noticeable that the small species are seldom, if ever, molested by the larger. Thus I have frequently observed a number of Peeps running about among a flock of Sickle-billed Curlew, without the latter appearing to pay the slightest attention to the little birds, even when they passed directly beneath their long bills. In time of migration, these birds closely resemble the preceding species.

TRINGA BAIRDI.

Baird's Sandpiper.

Tringa Bairdi Seale, P. Z. S., 1867, 332.

DESCRIPTION.

Sp. Ch. Form, slender. Size, rather small. Bill, slender, but little shorter than the head, and slightly widened at tip. Toes, without basal membrane. Tongue, long, thin, and slender, tapering toward tip which is pointed. Outer marginal indentations, twice as deep as inner.

COLOR. *Adult.* Above, dark-brown, with all the feathers, excepting primaries, edged with pale brownish-yellow, becoming brighter on scapularies. Outer upper tail coverts, edged with white. Central tail feathers, dark-brown; remainder, ashy. Sides of neck, upper breast, and sides, ashy-yellow, finely streaked with dark-brown. Remainder of under parts, white.

Young. Quite similar to the adult, but ashy above, where the edgings are much more rufous and the tinging below is paler, with the spots very indistinct or obsolete. Bill brown, yellow at base, feet greenish, and iris, brown, in all stages.

OBSERVATIONS.

This species resembles the preceding in general coloration, but may be readily known by the larger size, black legs, and generally paler colors as described. Distributed in summer, throughout Arctic America; abundant in the West during the migrations; rather rare on the coast of New England in autumn. Winters south of the United States.

DIMENSIONS.

Average measurements of specimens from Eastern North America. Length, 7.25; stretch, 15.50; wing, 4.85; tail, 2.15; bill, .90; tarsus, .85. Longest specimen, 7.50; greatest extent of wing, 16.00; longest wing, 5.00; tail, 2.30; bill, .95; tarsus, .90. Shortest specimen, 7.00; smallest extent of wing, 15.00; shortest wing, 4.50; tail, 2.00; bill, .85; tarsus, .80.

DESCRIPTION OF NESTS AND EGGS.

Eggs, placed on the ground in a slight depression of the soil, on a little grass, etc. They are from two to four in number, pyriform in shape, varying from ashy-yellow to buff in color, spotted and blotched with brown of varying shades. Dimensions from .90 x 1.28 to .95 x 1.35.

HABITS.

Although Baird's Sandpiper was taken by many of the earlier scientific expeditions in the West, it was not described as a species until 1861, when Dr. Coues discovered that it was different from either Bonaparte's Sandpiper or the common Grass Bird, with which it had been previously confounded. It is a perfectly distinct species, found commonly in the West during the migrations, and visiting the Atlantic coast rather rarely, but regularly, in autumn, usually quite late, either in September or October. While here, it frequents the sides of hills or high marshes but is occasionally found near the pools. The note is quite different from that of other Sandpipers, insomuch so, as to be at once distinguishable; but in general habits, this bird resembles other members of the genus, like many of them, breeding in the Arctic Regions.

TRINGA MACULATA.

Pectoral Sandpiper.

Tringa maculata VIEILL., Nouv. Dict., XXXIV: 1819, 465.

DESCRIPTION.

SP. CH. Form, robust. Size, medium. Bill, slender, a little longer than head, and slightly rounded at tip. Toes, without basal membrane. Tongue, long, thin, and fleshy, tapering toward tip which is rounded. Outer marginal indentations, at least twice as deep as inner.

COLOR. *Adult.* Above, dark-brown with every feather, excepting primaries, edged with yellowish-ash and rufous. Tail, ashy-brown, becoming darker in the center, and tipped with white and yellowish. Line from bill to eye, brown. Sides of head, neck all around, upper breast, and sides, yellowish-ash, streaked with dark-brown. Remainder of under parts, white.

Young. Similar to the adult but decidedly rufous on the edges above and brighter on the ashy below. Bill and iris, brown, and feet, greenish, in all stages.

OBSERVATIONS.

Readily known from the preceding species, by the large size, greenish legs, and darker colors; and from the succeeding, by the dark-brown upper tail coverts; and from all others, by the colors as described. Distributed, in summer, from Labrador, northward; wintering south of the United States.

DIMENSIONS.

Average measurements of specimens from Eastern North America. Length, 8.50; stretch, 16.35; wing, 5.55; tail, 2.15; bill, 1.15; tarsus, 1.00. Longest specimen, 8.75; greatest extent of wing, 16.75; longest wing, 5.90; tail, 2.30; bill, 1.25; tarsus, 1.10. Shortest specimen, 8.25; smallest extent of wing, 16.00; shortest wing, 5.20; tail, 2.00; bill, .90; tarsus, .90.

HABITS.

The Pectoral Sandpipers, known to many as Grass Birds, are common autumnal migrants along our coast, frequenting the marshes and feeding about the pools or on the flats in the grass. They are not shy birds as a rule and will often lie close and start suddenly, like the common Snipe; hence, they are sometimes called Jack Snipe. The note is a rather feeble whistle and their flight is swift and eccentric. They appear from the North late in July and remain until October, then reappear in May but are not common at this season. These birds seem to be quite uncommon in the Southern States below New Jersey and I do not now recall an instance of their capture in Florida, nor do I think that any remain in the United States during winter. They are said to breed in Labrador and northward but I have never met with a well authenticated egg.

TRINGA FUSCICOLLIS.

Bonaparte's Sandpiper.

Tringa fuscicollis Vieill., Nouv. Dict., XXXIV; 1819, 461.

DESCRIPTION.

Sp. Ch. Size, rather small. Form, slender. Bill, slender and but slightly widened at tip. Toes, without basal membrane. Tongue, not long, white in color, thin and narrow, tapering gradually toward tip which is rounded and the sides of the terminal portion are provided with very fine cilia, while the hyoid bones are curved upward behind the occiput. The outer marginal indentations are more than twice as deep as wide; but are narrow and incline in the adult.

Color. *Adult in summer.* Above, dark-brown, every feather, excepting primaries, bordered with ashy-yellow and yellowish-rufous, the latter color being more prominent on top of head, on a spot behind eye, and on back. Sides of head, neck all around, and sides, pale yellowish-ash, finely streaked with dark-brown. Line from bill over eye and remaining under portions, pure white.

Adult in winter. Ashy above, with the centers of the feathers dusky. White, beneath, and more finely streaked than in summer, otherwise similar.

Young. Similar to the winter adult but show considerable rufous above and are more finely streaked below. Bill, dark-brown, flesh colored at base of lower mandible, iris and feet, brown, in all stages.

OBSERVATIONS.

I have given above, a description of the summer plumage of this species which I have never seen in print before. Two specimens in this dress, kindly loaned me by my friend, Mr. W. B. Dowse, one from his own cabinet and the other from that of Mr. Hapgood, the well-known sportsman, vary somewhat. That belonging to Mr. Dowse, has the colors very dark, consequently the brown markings are well defined. The streakings below are extended over the entire lower portions, even the under tail coverts are streaked and the upper are banded. Known from all others by the straight bill, white upper tail coverts, and colors as described. Distributed, in summer, throughout Arctic America; the majority wintering south of the United States, but occasionally one may be found in Florida at this season.

DIMENSIONS.

Average measurements of specimens from Eastern North America. Length, 7.13; stretch, 15.00; wing, 4.22; tail, 2.05; bill, .92; tarsus, .95. Longest specimen, 8.00; greatest extent of wing, 15.25; longest wing, 5.00; tail, 2.20; bill, .95; tarsus, 1.00. Shortest specimen, 7.15; smallest extent of wing, 14.75; shortest wing, 4.35; tail, 1.99; bill, .90; tarsus, .90.

HABITS.

The first specimen of Bonaparte's Sandpiper that I ever saw, I shot on some rocks, left exposed by the out-going tide, in the mouth of Essex River, where they were feeding in company with the Turnstones. This was in the autumn, many years ago, and during following seasons, I could always find them there whenever I went in search of them. Although these birds have many habits in common with other Sandpipers, they appear to be unique in some particulars, the above mentioned predilection for rocks between tide marks, being one characteristic of the species; then they are fond of haunting springy places on the

uplands. Their notes are also peculiar, one cry in particular, being loudly given and greatly prolonged, resembling the scream of a rapacious bird more than the whistle of a Sandpiper. As will be seen by the description, they present some anatomical features not shared in common with any other species of the group which I have examined.

Bonaparte's Sandpipers arrive from the North, a little later than the general flight of shore birds, appearing in September; then soon depart for the South. I once shot a specimen in Florida in winter, but this was the only one I ever saw in the State, neither did I ever see them further north at this season, so judge that they pass the winter south of the United States. They are quite rare in New England during spring; insomuch so, that the only specimens that I ever saw in the full summer plumage, were the two from the cabinets of Messrs. Dowse and Hapgood, which they procured at Chatham in the spring of 1880. I think that authentic specimens of the eggs of this species are unknown.

TRINGA MARITIMA.

Purple Sandpiper.

Tringa maritima BRUNN., Orn. Bor.; 1764, 54.

DESCRIPTION.

SP. CH. Form, robust. Size, medium. Bill, straight, about as long as head, slender, and not widened at tip. Legs, short. Toes, without basal membrane. Tongue, long, thin, and slender, tapering toward tip which is pointed. Outer marginal indentations, twice as deep as inner.

COLOR. *Adult.* Above, dark smoky brown, becoming ashy on the neck and having a violet tinge on the back. All the feathers, excepting primaries, are edged with dark bluish-ash which becomes whitish on the wings. Outer tail feathers, ashy, tipped with white. Sides of head, neck all around, and upper breast, bluish-ash. Remainder of under parts, white, streaked with ashy everywhere, excepting on abdomen. Lower eyelid and spot in front of eye, white.

Young. Similar to the adult but some of the feathers above are edged with yellowish and rufous. Bill, dark-brown, lighter at base, iris, brown, legs, greenish-yellow, in all stages.

OBSERVATIONS.

Known by the general dark bluish-ash color, violet tinging above, and short legs. Distributed, in summer, throughout the Arctic Regions. Winters along the coast of the Northern and Middle States.

DIMENSIONS.

Average measurements of specimens from Eastern North America. Length, 8.50; stretch, 11.50; wing, 5.25; tail, 2.25; bill, 1.12; tarsus, .85. Longest specimen, 9.00, greatest extent of wing, 15.00; longest wing, 5.50; tail, 2.50; bill, 1.25; tarsus, 1.00. Shortest specimen, 8.00; smallest extent of wing, 14.00; shortest wing, 5.00; tail, 3.00; bill, 1.00; tarsus, .75.

DESCRIPTION OF NESTS AND EGGS.

Eggs, placed on the ground in a slight depression of the soil, on a little grass, etc., three or four in number, decidedly pyriform in shape, varying from yellowish-ash to greenish in color, spotted and blotched irregularly, and rather coarsely, with brown of varying shades. Dimensions from .90 x 1.30 to 1.00 x 1.40.

HABITS.

The plumage of the Purple Sandpipers is particularly long and full, proclaiming that they are inhabitants of a boreal clime, and they are most emphatically birds of the North, few being found south of New Jersey and they are rare even that far south; in fact, the greater portion pass the winter north of Massachusetts, peopling the rocky, inhospitable shores of Maine and New Brunswick. They arrive on Grand Menan late in October and gradually push their way southward. They appear to be somewhat limited in distribution in Massachusetts; thus they are not common north of Cape Ann but always occur in numbers on the rocky islands of Beverly Harbor. The note of the Purple Sandpipers is a feeble

whistle, not unlike that given by Peeps. They feed upon small mollusks which they pick off the rocks, when they are left exposed by the falling tide. On one or two occasions, I have seen specimens flying along the hill sides near the ocean but it is rare to find them even thus far from the waves. One or two cases are on record of their occurrence in the interior but they are so decidedly maritime that such instances are quite exceptional. I also find that there is a specimen in the Smithsonian Institution, which was taken on Key Biscayne, Florida, but this is quite beyond their usual range. The Purple Sandpipers depart northward in early spring.

TRINGA ALPINA.

Red-backed Sandpiper.

Tringa Alpina LINN., Syst., Nat., I; 1766, 249.

DESCRIPTION.

Sp. Cn. Form, slender. Size, medium. Bill, slender, longer than head, slightly curved and widened at tip. Outer marginal indentations, twice as deep as inner. Toes, without basal membrane. Tongue, long, thin, and slender, narrowing gradually to tip which is pointed.

Color. *Adult in summer.* Above, dark-brown, each feather, excepting primaries, broadly edged with bright rufous. Base of secondaries, edges of inner primaries, and tips of greater wing coverts, white. Tail, excepting middle pair of feathers which are dark-brown, ashy. Middle of belly, black. Remainder of under parts, white, finely streaked on sides of head, on neck, across breast, and on sides with dark-brown.

Adult in winter. Uniform yellowish-ash above, with the feathers slightly mottled with dark-brown. White, beneath, tinged across breast and on sides with ashy, and these parts are very finely streaked with dark-brown.

Young. Similar to the winter adult, but some of the feathers above are slightly edged with rufous. Bill and feet, black, and iris, brown, in all stages.

OBSERVATIONS.

Readily known by the long, curved bill and black patch beneath, in summer; and at other seasons by the uniform ashy colors as described. Distributed in summer, throughout the Arctic Regions; wintering from Maryland, southward.

DIMENSIONS.

Average measurements of specimens from Eastern America. Length, 8.32; stretch, 15.25; wing, 4.80; tail, 2.15; bill, 1.35; tarsus, 1.00. Longest specimen, 8.75; greatest extent of wing, 15.75; longest wing, 5.00; tail, 2.30; bill, 1.50; tarsus, 1.05. Shortest specimen, 8.00; smallest extent of wing, 14.50; shortest wing, 4.75; tail, 2.00; bill, .90; tarsus, .95.

DESCRIPTION OF NESTS AND EGGS.

Eggs, placed on the ground in a depression of the soil, on a little grass. They are from two to four in number, decidedly pyriform in shape, varying from greenish to yellowish-ash in color, spotted, blotched, and dotted irregularly and thickly, with reddish-brown of varying shades, and more sparsely with amber. Dimensions from .95 x 1.30 to 1.00 x 1.35.

HABITS.

When the first cold blasts come sweeping down from the North, driving great waves of southward flying shore birds before them; when the hark of the Wild Geese is heard, and the sand spits are whitened with Gulls, the little Red-backed Sandpipers, or Dunlins, appear. Late as they are, they do not seem to be in any hurry but linger about the sandy shores of Massachusetts, from early October until late in November, indeed, the first snow often finds them here. I found them very common on the eastern shore of Chesapeake Bay, on the second of November, 1878, and from this point, south, as far as Indian River, Florida, they were abundant but always appeared to prefer the sandy beaches to the muddy flats. At this season, the birds were all in gray attire but I found them in the bright summer plumage at Dummett's, late in May, at which time, they were preparing to migrate northward. Occasionally stragglers of this and other species of shore birds which breed in the far North, will remain in Massachusetts during summer.

TRINGA SUBARQUATA.

Curlew Sandpiper.

Tringa subarquata TEMM., Man., I; 1815, 393

DESCRIPTION.

Sr. Cu. Form, slender. Size, medium. Bill, slender, longer than head, slightly curved and widened at tip. Toes, without basal membrane. Outer marginal indentations, less than twice as deep as inner.

Color. *Adult.* Above, dark-brown becoming ashy on the rump and wings; every feather, excepting primaries, edged with bright yellowish-rufous. Upper tail coverts, white, transversely banded with dark-brown. See primaries, tipped with white. Tail, ashy. Beneath, dark yellowish-rufous, with the under wing coverts, axillaries, under tail coverts, sides, and flanks, white.

Young. Ashy, above, with few red markings. Under parts, ashy-white tinged on breast and sides, with yellowish. There is a whitish line from bill over eye, and the tail feathers are also whitish; otherwise similar to the adult. Iris, brown. bill and feet, greenish, in all stages.

OBSERVATIONS.

Readily known by the slightly curved bill, white banded upper tail coverts, unspotted lower portions, and colors as described. Distributed throughout the Old World. Rare on the Eastern coast of the United States.

DIMENSIONS.

Average measurements of specimens from Eastern North America. Length, 8.35; stretch, 15.50; wing, 4.50; tail, 2.25; bill, 1.35; tarsus, 1.12. Longest specimen, 8.75; greatest extent of wing, 16.00; longest wing, 5.00; tail, 2.50; bill, 1.50; tarsus, 1.25. Shortest specimen, 8.00; smallest extent of wing, 15.00; shortest wing, 4.00; tail, 2.00; bill, 1.25; tarsus, 1.00.

HABITS.

The Curlew Sandpiper has been known as an inhabitant of the United States for many years, yet it has never been taken in any numbers. Specimens, however, have been obtained from New Brunswick to Florida but more have been found in New Jersey than elsewhere. It is a well-known, widely distributed, European species, the breeding place of which appears to be unknown; consequently the eggs have never been taken. It is an open question whether the birds taken with us are merely stragglers from across the Atlantic, or whether they breed on this continent in high latitudes. The Curlew Sandpiper appears to frequent the muddy flats or beaches covered with debris, in company with other Sandpipers having similar habits.

TRINGA CANUTA.

Red-breasted Sandpiper.

Tringa canuta LINN., Syst. Nat. I; 1766, 251.

DESCRIPTION.

Sr. Cu. Form, robust. Size, large. Bill, stout, but little longer than head, and slightly widened at tip. Legs, short and stout. Toes, without basal membrane but widely margined. Tongue, rather wide, and tapering toward tip which is rounded and provided with a tuft of coarse cilia. The outer marginal indentations are twice as deep as inner.

Color. *Adult in summer.* Above, pale bluish-ash, lined and spotted with black and pale reddish. Rump and upper tail coverts, white, transversely banded with black. Tips of greater wing coverts, white. Primaries, dark-brown, edged with white. Tail, ashy. Under portions, pale chestnut-red, lighter on abdomen. Axillaries, under wing and tail coverts, flanks, and tibia, white, banded with dark-brown.

Adult in winter. Above, pale bluish-ash with each feather edged with whitish } preceded by a band of black. Line over eye, whitish. Beneath, white tinged with yellowish, finely mottled across breast and on sides with bluish-ash. Otherwise, similar to the above.

Young. Similar to the winter adult but lacks, in a great measure, the yellowish tinging below. Bill, black, iris, brown and feet, greenish, in all stages.

OBSERVATIONS.

Readily known by the larger size, and pale bluish-ash colors above. Distributed, in summer, throughout the Arctic Regions. Winters south of the United States.

DIMENSIONS.

Average measurements of specimens from Eastern North America. Length, 10.50; stretch, 20.50; wing, 6.22; tail, 2.65; bill, 1.35; tarsus, 1.20. Longest specimen, 11.00; greatest extent of wing, 21.00; longest wing, 6.50; tail, 2.80; bill, 1.40; tarsus, 1.40. Shortest specimen, 10.00; smallest extent of wing, 20.00; shortest wing, 6.00; tail, 2.50; bill, 1.25; tarsus, 1.00.

HABITS.

In former years, the Red-breasted Sandpipers, Knots or Gray Backs, as they are more commonly called, were very abundant along our borders, appearing in immense flocks, but now they are far from numerous and it is rare to see more than a dozen together. These handsome birds frequent the beaches and probe in the mud at low tide, then at high tide, return to the long sand spits to rest. I have always found them very shy in autumn and difficult to obtain. This is a maritime species, seldom, if ever, being found in the interior. Audubon states that some spend the winter in Florida but I have never seen one in the State nor do I think that they occur there now. In autumn, they seem to be generally distributed along the coast, appearing in August and remaining until late in September, but in spring, they move northward very quickly, entering Massachusetts in May with the other returning shore birds. At this season, they occur commonly on the South Shore but I never met with them north of Cape Ann, nor do I think that they are found there, at least, in any numbers.

GENUS VI. CALIDRIS. THE THREE-TOED SANDPIPERS.

GEN. CH. *Bill about as long as head, straight and slightly expanded at tip. Coracoids, exceeding in length the height of keel. Marginal indentations four; outer twice as deep as inner. Hind toe, absent.*

The legs are never very long. The stomach is cuboid in form, quite muscular, and is lined with a hard rugose membrane. Proventriculus moderate. Intestines, large and short with the caeca quite long. Sterno-trachealis not stout and there is a slight bronchialis, but no other laryngeal muscles. Tympaniform membrane, present but there is no os transversale. Sexes, quite similar. There is but one species within our limits.

CALIDRIS ARENARIA.

Sanderling.

Calidris arenaria ILL., Prod., 1811, 249.

DESCRIPTION.

SP. CH. Form, robust. Size, large. Tongue, rather fleshy, not horny, about the same width for two thirds its terminal length, then abruptly pointed.

COLOR. *Adult in summer.* Above, dark-brown, every feather, excepting primaries, edged with white and rufous. Tail, ashy, tipped with white and with middle feathers, darker. Tips of greater wing coverts and base of wing feathers, white. Under parts, white, strongly tinged anteriorly with yellowish-rufous, spotted with dark-brown.

Adult in winter. Pale ashy above, spotted with dark-brown and in patches with yellowish-rufous. Beneath, white, with some spots of rufous on the anterior portions, otherwise as in the summer adult.

Young. Dark-brown above, spotted with white and tinged with yellow which extends to sides of breast, otherwise, similar to the winter adult. Bill and feet, black, iris, brown, in all stages.

OBSERVATIONS.

Known from all others by the absence of the hind toe and general pale colors as described. Distributed, in summer, throughout Arctic America; wintering from the Carolinas, southward.

DIMENSIONS.

Average measurements of specimens from Eastern North America. Length, 8.25; stretch, 15.65; wing, 4.90; tail, 2.05; bill, 1.05; tarsus, .95. Longest specimen, 8.75; greatest extent of wing, 16.25; longest wing, 5.50; tail, 2.25; bill, 1.20; tarsus, 1.10. Shortest specimen, 7.75; smallest extent of wing, 15.00; shortest wing, 4.40; tail, 1.85; bill, .90; tarsus, .80.

DESCRIPTION OF NESTS AND EGGS.

Eggs, placed on the ground in a slight depression of the soil, on a little grass, etc. They are from two to four in number, pyriform in shape, varying from dark ashy-yellow to greenish-brown in color, spotted and blotched with brown of varying shades. Dimensions from .10 x 1.35 to .15 x 1.15.

HABITS.

The Sanderlings are among the most abundant of our shore birds and are, in fact, the most common of those which frequent the sandy beaches, they being almost exclusively confined to sandy shores. Their pale colors render them quite conspicuous, when flying over the green waves or against the black sky; but when they alight on the sand, they correspond so nearly with the ground, that when they are quiet, it is almost impossible to distinguish them a short distance away. It is seldom, however, that they remain inactive, for they are lively birds and are constantly chasing the waves out, in search of food left by that great store house of Nature,—the sea. Then when the huge billows come rushing in and expend their fury on the shelving beach, in a long, wide sheet of seething foam, the little Sanderlings run so quickly before the advancing water, that the spray seldom wets their delicate feathers. After a storm, hundreds of these birds may be seen thus engaged, spreading out in long lines in order that they may not interfere with one another, and many lonely reaches of sea-board, from Maine to Florida, are enlivened by the presence of these true children of the sand. The Sanderlings arrive in New England in August, remain until quite late, then gradually move southward. They are abundant from the Carolinas to Key West during winter but migrate northward in May.

GENUS VII. PHILOMACHUS. THE RUFFS.

GEN. CH. *Bill, about as long as head, straight and slightly expanded at tip. Hind toe, present. Feathers of neck, greatly elongated.*

PHILOMACHUS PUGNAX.

Ruff.

Philomachus pugnax GRAY, List; 1841.

DESCRIPTION.

SP. CH. Form, robust. Size, large. Bill, straight, about as long as head, slender, and widened at tip. Legs, stout. Toes, without basal membrane. Tip of closed wing, reaching to end of tail. Tertiaries, nearly as long as primaries.

COLOR. *Adult.* Above, ashy, darkest on rump, palest on head, mottled, sprinkled, and banded irregularly, with rufous and dark-brown. Outer upper tail coverts, white. Under parts, white, mottled to a greater or less extent with black.

Young. Head and neck all around, ashy, finely streaked with dusky. Remainder of upper parts, dark-brown, each feather, excepting primaries, broadly edged with ashy and yellowish-rufous. Upper tail coverts, white, with a central line of dark-brown. Tail, ashy-brown, tipped with white. Remainder of under parts, ashy-white, darkest across breast. Bill, dark-brown, lighter at base, iris, brown, legs, greenish-yellow, in all stages.

OBSERVATIONS.

This is an exceedingly difficult bird to describe as the colors, especially in the adult stage, are extremely variable. Thus the elongated neck feathers vary from nearly white, slightly marked with black, to black, sprinkled with white, and the other colors are equally changeable. The young are more uniform. Readily known by the large size, straight bill, stout legs, and white upper tail coverts, centrally lined with dark-brown. Distributed, in summer, throughout Northern Europe. Rare in Eastern North America.

DIMENSIONS.

Average measurements. Length, 10.50; stretch, 21.50; wing, 6.92; tail, 2.62; bill, 1.55; tarsus, 1.85. Longest specimen, 11.00, greatest extent of wing, 22.00; longest wing, 7.25; tail, 2.75; bill, 1.75; tarsus, 2.00. Shortest specimen, 10.00; smallest extent of wing, 21.00; shortest wing, 6.40; tail, 2.50; bill, 1.40; tarsus, 1.75.

DESCRIPTION OF NESTS AND EGGS.

Eggs, placed on the ground in a slight depression of the soil, on a little grass, etc., three or four in number, decidedly pyriform in shape, varying from yellowish-ash to greenish in color, spotted and blotched irregularly, and rather coarsely, with brown of varying shades. Dimensions from 1.15 x 1.60 to 1.25 x 1.80.

HABITS

The occurrence of the Ruff which is a well-known European bird, in North America, is quite rare but it has now been taken here too often to be regarded as a mere straggler, and the same remarks may refer to this species that I have applied to the Curlew Sandpiper, regarding its breeding on our side of the Atlantic but in high latitudes. Nuttall, in 1834, was the first to record it from North America. Then Mr. Geo. N. Lawrence, writing in *Birds of North America*, in 1858, gives it as accidental on Long Island, and again records it in his *Birds of New York* in 1866. Mr G. A. Boardman found one or two at Calais but on the New Brunswick side of the St. Croix. Mr. William Brewster obtained a female from the Newburyport marshes, on the twentieth of May, 1871. This is given, upon Prof. Baird's authority, as being the sixth specimen ever obtained in North America. Mr. Brewster's bird had the ovaries quite well developed and would have laid within two or three weeks. On the tenth of November, 1872, Dr. Theo. Jasper took one thirty miles east of Columbus, Ohio, which is, I think, the only specimen ever taken so far in the interior. Mr. Brewster, on the eighth of September, 1874, was fortunate enough to obtain another female at Upton, Maine. As I write, I have a fine specimen before me, obtained at Chatham, Massachusetts, about the fifteenth of September of the present year, 1880. This is a female of the year and Mr. Gordon Plummer has secured it for his fine collection of North American birds. At the suggestion of Mr. W. B. Dowse, Mr. Plummer has kindly forwarded the specimen to me for examination and identification, and I have based my above given description of the young, upon this specimen which I believe is the ninth recorded as having been taken in North America, the third from New England, and the second from Massachusetts. It is worthy of note, that none of the specimens yet taken on the continent, have the peculiar, elongated feathers about the neck as seen in European male birds.

GENUS VIII. ACTITURUS. THE HIGHLAND SANDPIPERS.

GEN. CH. *Bill, about as long as head, a little curved, slender, and not expanded at tip. Gape, wide. Head, large and neck, small.*

The sternum is narrow, about as wide as height of keel which does not exceed the length of coracoids. Outer marginal indentations, wide and three times as deep as inner. Legs, long and stout. Tail, long and rounded. The stomach is oval in form, quite muscular, and lined with a hard, finely rugose membrane. The proventriculus is large. The intestines are small but long, and the ceca rather short, with blind ends dilated. The sterno-trachealis is quite stout and there is a weak bronchialis, but no other laryngeal muscles. Tympaniform membrane, present but there is no os transversale. Sexes similar. There is but one species within our limits.

ACTITURUS BARTRAMIUS.

Bartram's Sandpiper.

Actiturus Bartramius LINN., BON., Saggio; 1831.

DESCRIPTION.

SP. CH. Form, rather slender. Size, large. Tongue, not long, thin, wide at base, then narrowing gradually to tip which is pointed.

COLOR. *Adult.* Above, dark-brown, having a greenish gloss, with every feather, excepting primaries which are mottled and banded with whitish on the inner webs, edged with yellowish-ash and rufous. Rump, unmarked. Outer upper tail coverts, banded with yellowish-ash. Tail, ashy-buff, darker in the center, tipped with white and banded with dark-brown. Beneath, yellowish-white, banded on under wing coverts and axillaries, and spotted, in arrow-shaped marks, on neck, breast, and sides, with dark-brown.

Young. Similar to the adult, but more yellowish above, the secondaries and inner primaries are tipped with white. Bill, iris, and feet, brown, in all stages.

OBSERVATIONS.

Readily known by the larger size, slightly curved bill, the banded inner webs of primaries, and yellowish colors above. Distributed, in summer, from Pennsylvania, northward. Winters south of the United States.

DIMENSIONS.

Average measurements of specimens from Eastern North America. Length, 11.80; stretch, 21.50; wing, 6.62; tail, 3.25; bill, 1.12; tarsus, 1.82. Longest specimen, 12.25; greatest extent of wing, 22.00; longest wing, 6.75; tail, 3.35; bill, 1.20; tarsus, 2.00. Shortest specimen, 11.50; smallest extent of wing, 21.00; shortest wing, 6.50; tail, 3.20; bill, 1.05; tarsus, 1.65.

DESCRIPTION OF NESTS AND EGGS.

Eggs, placed on the ground in a depression of the soil on a little grass. They are from two to four in number, rather pyriform in shape; pale buff in color, spotted and dotted irregularly and sparsely with yellowish-brown of varying shades. Dimensions from 1.25 x 1.75 to 1.35 x 1.90.

HABITS.

Late in summer or early in autumn, two or three species of small locusts become very abundant on the elevated tracts of country along the coast of Massachusetts; in fact, they occur in such swarms, that the hills become quite brown, for nearly every green thing is devoured by these pests. There is no great evil, however, which is not productive of some good, and the sportsman has reason to bless the locusts, for Bartram's Sandpipers, or Upland Plovers, as they are more commonly known, are very fond of these insects and consequently visit the hills in numbers, to feed upon them. Early in the morning, the clear, mellow whistle of the Sandpipers can be heard, as they fly across the intervening country, to reach their feeding grounds. When coming to the hills, they generally fly up the wind and alight under the brow of the elevations, where they will settle, giving a chuckling note as they do so, after which they are silent, for the cry, so often given when on the wing, is seldom repeated when the birds are on the ground. Bartram's Sandpipers are now very shy in Massachusetts and it is almost impossible to approach near enough to obtain a shot, by walking in an upright position, but by creeping on all fours, one can go quite near them, as they do not appear to recognize a man when he is in this attitude. Their favorite resorts on the hill tops, appear to be the little ravines where the grass is greenest, and where, consequently, the locusts are, if anything, more numerous. When startled, the birds almost always rise into the wind, uttering their note as they go. About noon, they will occasionally leave the more elevated spots and visit the marshes, but do not remain on them long. The endeavors of the sportsman to decoy these wary birds within gun shot, by imitating their cries, seldom proves successful and the only sound that will attract their attention, is the peculiar noise which the birds give when alighting.

I found Bartram's Sandpipers breeding in Pennsylvania in June, and when the nest was approached, the female quietly left it, but afterward, both birds would circle about, uttering loud cries. The young are fledged by the middle of August and accompany their parents. At this time, the birds are fond of resorting to particular fields and if driven from one, will fly to another. The sportsmen take advantage of this fact, and by lying behind some convenient stone wall or clump of bushes, intercept them as they fly from one feeding ground to another. Bartram's Sandpipers migrate from the middle of August to the middle of September in autumn, and return north in May, breeding throughout the more unsettled districts of the Eastern and Middle States.

BUFF-BREASTED SANDPIPER

GENUS IX. TRYNGITES. THE BUFFY SANDPIPERS.

GEN. CH. *Bill, about as long as head, straight and slender, but not expanded at tip. Coracoids, exceeding in length the height of keel. Marginal indentations, four; outer, twice as deep as inner. Hind toe, present.*

Members of this genus are quite small in size when compared with those of the preceding, but, excepting the slight differences given above, resemble them in anatomical and other characters. Sexes, quite similar. There is but one species within our limits.

TRYNGITES RUFESCENS.

Buff-breasted Sandpiper.

Tryngites rufescens Cuv., Journ.; 1819, 470.

DESCRIPTION.

SP. CH. Form, slender. Size, medium. Bill, slender and feathered to nostrils. Tail, long and well rounded. Wings, long and pointed.

COLOR. *Adult.* Above, pale ashy-brown, every feather lined and spotted centrally with black, glossed with greenish. Primaries, dark-brown, with inner webs ashy, marbled with black. Tail, ashy-brown, darker on middle feathers, tipped with white and transversely banded with wavy lines of black. Under portions, pale buffy-red, lighter on flanks and abdomen, with partly concealed spots of dark-brown on breast. Axillaries, white.

Young. Similar to the adult but the feathers beneath are edged with whitish. Bill, black, iris, brown, and feet, greenish-yellow, in all stages.

OBSERVATIONS.

Known from all others by the slender, straight bill, uniform buffy tints below, peculiar marblings to the inner webs of primaries, and colors as described. Distributed, in summer, throughout the Arctic Regions; wintering south of the United States.

DIMENSIONS.

Average measurements of specimens from Eastern North America. Length, 8.45; stretch, 16.65; wing, 5.20; tail, 2.39; bill, .80; tarsus, 1.25. Longest specimen, 8.90; greatest extent of wing, 17.40; longest wing, 5.43; tail, 2.64; bill, .85; tarsus, 1.35. Shortest specimen, 8.00; smallest extent of wing, 15.75; shortest wing, 4.95; tail, 2.15; bill, .75; tarsus, 1.15.

DESCRIPTION OF NESTS AND EGGS.

Eggs, placed on the ground in a slight depression of the soil, on a little grass, etc. They are from two to four in number, pyriform in shape, varying from ashy-yellow to greenish-brown in color, spotted and blotched irregularly and thickly with umber-brown of varying shades. Dimensions from 1.02 x 1.40 to 1.10 x 1.50.

HABITS.

The Buff-breasted Sandpipers occur during the autumnal migration, in New England, and although they cannot be called rare, they are never very common. They make their appearance from the North, about the middle of August, frequenting the elevated sections near the coast. Occasionally a flock of half a dozen of these birds, may be seen, flying swiftly along the hill sides, but it is more common to find solitary individuals in company with the preceding species which they somewhat resemble in habit; or they may sometimes be seen with Black-breasted and Golden Plover, and like all this class of birds, appear to be attracted to the hill tops by the locusts, upon which they feed, though I have found beetles, as well as other insects, in their crops. These handsome Sandpipers do not appear to be found south of New Jersey, and north of this point, they occur as autumnal migrants, the last one disappearing by the first of October. As they winter quite south of the United States, they must, consequently, pass over the more southern portion of our country, and they either do so without alighting, or their presence has been overlooked by the ornithologists who have collected there. The note of the Buff-breasts is a clear whistle, given at intervals as they fly. They breed along the coast of Arctic America, from Anderson River, eastward.

GENUS X. TRINGOIDES. THE TILTING SANDPIPERS.

GEN. CH. *Bill, about as long as head, slender, not curved nor expanded at tip. Gape, not wide. Head, not large, and neck, moderate. Marginal indentations, two.*

The sternum is narrow, about as wide as height of keel which does not exceed the length of coracoids. The two marginal indentations are wide and deep. Legs, short and there is a prominent membrane between the outer and middle toes. Tail, moderate. Other characters do not differ strikingly from those given under the two preceding genera. Sexes, similar. There is but one species within our limits.

TRINGOIDES MACULARIUS.

Spotted Sandpiper.

Tringoides macularius GRAY, List; 1819.

DESCRIPTION.

SP. CH. Form, rather slender. Size, medium. Tongue, long, thin, not horny, narrowing gradually to tip which is pointed.

COLOR. *Adult.* Above, dark greenish-brown, having a greenish gloss, banded and spotted, excepting on primaries, with dark-brown. Base and tips of secondaries, inner primaries, tips of greater wing coverts, line from bill over eye, and under parts, white, the latter marked everywhere with rounded spots of greenish-brown. Tail, tipped with white and banded on outer feathers with dark-brown.

Young. Ashy-brown above, with every feather edged with white, preceeding, excepting on primaries, by a band of dark-brown. Beneath, white, tinged with ashy across breast.

Nestlings. Above, ashy, marked with black, and beneath, white. Bill, brown, yellow at base, iris, brown, and legs, greenish-yellow, in all stages.

OBSERVATIONS.

Readily known by the presence of the membrane between the outer and middle toes, straight bill, the peculiar ashy color above, glossed with greenish, and round spottings below. Distributed, in summer, from the Carolinas, northward; wintering from this point, southward.

DIMENSIONS.

Average measurements of specimens from Eastern North America. Length, 7.60; stretch, 13.35; wing, 4.25; tail, 2.05; bill, 1.00; tarsus, .92. Longest specimen, 8.00; greatest extent of wing, 13.75; longest wing, 4.10; tail, 2.30; bill, 1.10; tarsus, 1.00. Shortest specimen, 7.10; smallest extent of wing, 13.00; shortest wing, 4.10; tail, 1.80; bill, .90; tarsus, .85.

DESCRIPTION OF NESTS AND EGGS.

Eggs, placed on the ground in a slight depression of the soil, on a little grass, etc., three or four in number, decidedly pyriform in shape, varying from creamy to buff in color, spotted, blotched, and dotted, with reddish-brown of varying shades, with the usual shell markings of lilac. Dimensions from .90 x 1.30 to .95 x 1.40.

HABITS.

There are few who do not recognize the peculiar *peet-weet* of the spotted Sandpipers, as they skim about the fields with their peculiar flight, or stand on some stone in the brook, teetering briskly up and down, as they examine the intruder. I have always found them common wherever I have been, whether on the sandy beaches at the foot of the high cliffs on the Magdalen Islands, in the fields of New England, along the water courses of the Middle and Southern States, or on the partly submerged islands which lie in the Gulf of Mexico, and they always appear as much at home when running along the sandy shores of the far North, or jumping from root to root of the mangroves in the South, as they do in the cultivated fields of Massachusetts. The Spotted Sandpipers are common during winter, from the Carolinas to Key West, but migrate northward in spring, arriving in Massachusetts about the first of May. They breed early in June, often placing the nest on the margin of a grain field, in a potato patch or strawberry bed. On Grand Menan, where they are very numerous, they nest in the grassy fields near pools, and along the sea coast of Massachusetts, they build in the beach grass, just above high water mark. The females sit

closely and when driven from the nest, will often feign lameness. The young appear during the latter part of June and follow their parents as soon as hatched. Later in the season, little groups gather on the banks of the rivers, or may be seen with the southward-going shore birds on the coast, in company with which they depart early in September.

GENUS XI. TOTANUS. THE TATTLERS.

GEN. CH. *Bill, much longer than head, slender, but not expanded at tip. Hind toe, present. Marginal indentations, four*

The sternum is narrow, about as wide as height of keel which does not exceed the length of the coracoids. The outer marginal indentations are at least twice as deep as inner. Legs, long and slender, with tibia feathered for less than half its length. The stomach is oval or cuboid in form, quite muscular, and lined with a hard, finely rugose membrane. The proventriculus is large. The intestines are short and large, and the caeca short, or rather long, with blind ends dilated. The sterno-trochlearis is quite stout and there is a weak bronchialis, but no other laryngeal muscles. Tympaniform membrane, present but there is no os transversale. Sexes, similar. There are four species within our limits.

TOTANUS SOLITARIUS.

Solitary Tattler.

Totanus solitarius A. D. Syn.; 1839, 242.

DESCRIPTION.

SP. CH. *Form, slender. Size, small. Tongue very long, thin, and gradually tapering toward tip which is pointed. Membrane between toes, small. Inner marginal indentations, small, inclosed in adult. Ceca, 1.30 long.*

Color. *Adult*. Above, dark-brown, streaked on head and neck, spotted on back, and widely banded on tail, with white. Beneath, white, streaked on neck and breast, and banded on sides, under wing coverts, abdomen, and under tail coverts, with dark-brown.

Young. Similar, but more ashy, and the head and neck are spotted, not streaked. There is a white line from bill to eye, and the neck and breast are tinged in obscurely defined spots of ashy. Bill, black, iris and feet, brown, in all stages.

OBSERVATIONS.

Easily known from the preceding by the large size and absence of spots below, and from the succeeding by the smaller size and broad bandings on tail. Distributed, in summer, from Massachusetts, westward; wintering south of the United States.

DIMENSIONS.

Average measurements of specimens from Eastern North America. Length, 9.00; stretch, 17.00; wing, 5.00; tail, 2.00; bill, 1.42; tarsus, 1.35. Longest specimen, 10.00; greatest extent of wing, 18.00; longest wing, 5.25; tail, 2.25; bill, 1.25; tarsus, 1.40. Shortest specimen, 8.00; smallest extent of wing, 16.00; shortest wing, 4.75; tail, 1.75; bill, 1.00; tarsus, 1.30.

DESCRIPTION OF NESTS AND EGGS.

Eggs, placed on the ground in a slight depression of the soil on a little grass, etc.; from two to four in number, varying from creamy to pale buff in color, spotted and blotched with amber-brown of varying shades, with the usual pale shell markings. Dimensions from .95 x 1.35 to 1.00 x 1.40.

HABITS.

The Solitary Tattlers are rightly named, for it is quite rare to see more than two together, especially in spring; and in autumn, single individuals are frequently met with, feeding along the border of some pool in the interior. They are always unsuspecting and will sit and gaze at the intruder, until he approaches within a few feet, when they will rise with a shrill cry, fly a short distance, and leisurely settle down again to resume their avocations. On the sea shore, where they are very common in fall, they seldom mingle with other shore birds, but feed by themselves, either by the borders of pools or on the beaches.

There are few birds, the eggs of which have remained so long unknown, as the present species. At first ornithologists were inclined to believe that these birds would be found breeding in the deserted nests of Crows or Hawks, after the manner of the closely allied,

European species, and such may be the case at times. I am inclined to think, however, that these Solitary Tattlers generally place their eggs on the ground. The late Dr. T. M. Brewer described an authenticated egg, in the Bulletin of the Nuttall Ornithological Club, taken about the middle of May, 1878, by Mr. Jenness Richardson, in Castleton, Vermont. The bird which was sitting on the nest, was secured; thus the identification of the egg was proved beyond a doubt, yet I think from the description, that the specimen will prove unique among its kind. The eggs from which I have taken my description, came from Utah and, as I have every reason to believe, are authentic. The Solitary Sandpipers make their appearance in the North, about the first of May, remain a week or two, then pass to their breeding grounds. They reappear early in September but shortly after migrate south.

TOTANUS FLAVIPES.

Lesser Yellowlegs.

Totanus flavipes VIEILL., NOUV. DICTIONNAIRE; 1816, 400.

DESCRIPTION.

SR. CU. Form, slender. Size, medium. Tongue, long, thin, and horny, tapering gradually toward the tip which is rounded. Membrane between toes, small. Inner marginal indentations, small, inclosed in adult. Legs, very long. Cæca, 1.20 long.

COLOR. *Adult.* Above, dark-brown, lined, spotted, and banded, with white. Rump and upper tail coverts, white, faintly banded with dark-brown. Tail, finely banded with white. Beneath, white, streaked on neck and breast and banded on sides, with dark-brown.

Young. Similar to the adult, but more ashy above, and the streakings beneath are not as well defined. Bill, black. Iris, brown, and feet, yellow, in all stages.

OBSERVATIONS.

Known from the preceding species by the larger size and white rump, and from the succeeding by the smaller size, and from all others by the colors as described. Distributed, in summer, from Labrador, northward; wintering from the Carolinas, southward.

DIMENSIONS.

Average measurements of specimens from Eastern North America. Length, 10.25; stretch, 20.42; wing, 6.35; tail, 2.75; bill, 1.42; tarsus, 2.15. Longest specimen, 10.80; greatest extent of wing, 21.00; longest wing, 6.80; tail, 2.75; bill, 1.60; tarsus, 2.25. Shortest specimen, 9.50; smallest extent of wing, 19.25; shortest wing, 5.90; tail, 2.00; bill, 1.25; tarsus, 1.90.

DESCRIPTION OF NESTS AND EGGS.

Eggs. placed on the ground in a depression of the soil on a little grass. They are from two to four in number, decidedly pyriform in shape, varying from creamy to ashy-buff in color, spotted and blotched irregularly with amber-brown of varying shades, with the usual shell markings of lilac. Dimensions from 1.15 x 1.60 to 1.20 x 1.80.

HABITS.

The clear whistle of the Lesser, or Summer, Yellowlegs, is heard early in July, for these birds are among the first of their kind, to bid adieu to their northern home and proceed southward. They are very abundant and may often be seen flying in large, straggling flocks, but they also associate with other shore birds. They are fond of the marshes and at low tide, may be found feeding in the creeks which intersect the low lands; then when the rising water forces them to leave their banquet, they will proceed to the dryer spots to rest, when they will occasionally catch a few grasshoppers, but generally remain quiet, until the next ebb exposes their feeding grounds, covered with a fresh supply of small mollusks, aquatic worms and many other insects. I found these birds very common from the Carolinas, southward, even to Key West; and in the interior of Florida, they were accustomed to wade in the shallow pools, in company with the Black-necked Stilts

The Lesser Yellowlegs remain in Massachusetts until late in September, when they all depart southward, and although very abundant in autumn, they are seldom seen in this section in spring, evidently reaching their northern breeding grounds by migrating through the interior. They are not strictly confined to the coast in autumn, however, but are found throughout the West.

TOTANUS MELANOLEUCUS.

Greater Yellowlegs.

Totanus melanoleucus VIEILL., Nouv. Diet.; 1816, 400.

DESCRIPTION.

Sp. Cn. Form, slender. Size, large. Tongue, long and thin, tapering toward tip which is horny and pointed. Membrane between toes, not large. Inner marginal indentations large and never inclosed. Legs, very long. Cæca, small, only 40 long.

Color. *Adult.* Above, dark-brown, streaked, spotted, and banded, with white. Rump and upper tail coverts, white, faintly banded with dusky. Tail, finely banded with white. Beneath, white, streaked on neck and breast and banded on sides, with dark-brown.

Young. Similar to the adult, but more ashy above, and the streakings beneath are not as well defined. Iris, brown, bill, black, and feet, yellow, in all stages.

OBSERVATIONS.

Readily known from all others by the large size, straight, slender bill, long yellow legs, white, slightly banded rump, and colors as described. Distributed, in summer, throughout Arctic America. Winters from the Carolinas, southward.

DIMENSIONS.

Average measurements of specimens from Eastern North America. Length, 13.20; stretch, 21.25; wing, 7.95; tail, 3.15; bill, 2.30; tarsus, 2.15. Longest specimen, 14.25; greatest extent of wing, 25.50; longest wing, 8.70; tail, 3.30; bill, 2.56; tarsus, 2.70. Shortest specimen, 12.15; smallest extent of wing, 23.50; shortest wing, 7.15; tail, 2.95; bill, 2.05; tarsus, 2.25.

HABITS.

Although resembling the preceding species in many habits, the Greater Yellowlegs do not appear in Massachusetts until, at least six weeks, after the first Summer Yellowleg has come, and they remain late in the season; consequently are sometimes termed Winter Yellowlegs. They frequent much the same grounds as the smaller species and associate with them; but are much shyer birds and when approached, will sound their loud, whistling cry, raise their long wings once or twice, then rise, whistling as they go, generally followed by all their smaller companions. In the South, they are particularly abundant, and may be seen wading in the pools or shallow margins of the rivers and lagoons, feeding upon small fishes, crustaceans, etc. On their way north, the Greater Yellowlegs pass Massachusetts, and their loud, cheery whistle, coming to the ear from over the marshes, which are just showing a tinge of green, proclaims that the pleasant summer days are rapidly approaching. Although both Yellowlegs are classed among the game birds, I cannot say that I consider their flesh particularly fine eating, as it is apt to be dry and strong. Well authenticated eggs of the Greater Yellowlegs, appear to be rare and I have never had an opportunity of examining one.

TOTANUS SEMIPALMATUS.

Willet.

Totanus semipalmatus TEMM., Man. Orn. II: 637.

DESCRIPTION.

Sp. Cn. Form, robust. Size, large. Bill, stout. Tongue, long, thin and slender, tapering gradually toward tip which is pointed. Membrane between toes, large. Legs, long and stout. Marginal indentations, small, but never inclosed.

Color. Adult in summer. Above, yellowish-ash, lined, spotted, and banded with dark-brown. Tail, ashy, and also banded. Upper tail coverts, white, banded on tips with brown. Secondaries and primaries, white, the outer of the former, and all of the latter, broadly tipped with dark-brown, while the greater upper coverts and spurious wing are of the same color. Beneath, white, tinged with reddish, spotted on neck and banded everywhere, excepting on abdomen, with dark-brown. Axillaries and under wing coverts, very dark-brown.

Adult in winter. Clear ashy-gray above, unspotted; and white beneath, without bandings, but tinged on breast and sides with ashy, finely streaked with darker; otherwise similar to the above.

Young. Similar to the winter adult, but slightly mottled with white above and tinged on both surfaces with yellowish. Bill and iris, brown, and feet bluish, in all stages.

OBSERVATIONS.

Known from all others by the large size, straight bill, prominent webs between toes, white rump, and very dark-brown under wing coverts and axillaries. Distributed, in summer, from New Jersey, southward; rather rare in Massachusetts in autumn. Winters from the Carolinas, southward.

DIMENSIONS.

Average measurements of specimens from Eastern North America. Length, 14.00; stretch, 26.25; wing, 8.55; tail, 3.27; bill, 2.45; tarsus, 2.35. Longest specimen, 15.00; greatest extent of wing, 28.00; longest wing, 8.90; tail, 3.56; bill, 2.90; tarsus, 2.60. Shortest specimen, 13.50; smallest extent of wing, 24.50; shortest wing, 7.25; tail, 3.00; bill, 2.00; tarsus, 1.95.

DESCRIPTION OF NESTS AND EGGS.

Eggs, placed on the ground in a slight depression of the soil, on a little grass, etc. They are from two to four in number, rather pyriform in shape, varying from creamy to greenish-ash in color, spotted and blotched irregularly and thickly with brown, amber, and lilac, of varying shades. Dimensions from 1.45 x 2.10 to 1.50 x 2.25.

HABITS.

Of all our shore birds, the Willets are, perhaps, the most noisy and restless, for they are not only constantly on the move themselves but endeavor to communicate their uneasiness to other species. I have, on many occasions, been creeping cautiously to some rare Heron or other wading bird, when some wandering Willet would discover me; up it would start, screaming loudly, then not satisfied with this, off it would go, over the heads of the very birds that I wished to secure, vociferating loudly all the while, and thus starting them; then would not rest contented until it had flown along the entire beach, inducing every bird on it to rise and join in the out-ery. This much is often accomplished by a single bird, and a flock of a half dozen Willets, keep a mile of shore in a constant uproar, and as they are very common in the South, the collector is constantly wasting words and often shot upon these disturbers of his peace. Willets are particularly abundant in Florida and I have seen them equally common on both coasts. I even found them feeding about the small ponds in the piney woods, and have observed that these birds had a singular habit of perching on the limbs of pine trees, forty or fifty feet from the ground, and sometimes, a dozen birds would sit side by side on a single branch, presenting a novel appearance.

These birds were changing from the gray winter plumage to the mottled summer dress, at Dummett's, about the first of April, at which time they became more quiet, and a little later, appeared to be mating. During the first week of May, I found them breeding among the low scrub, just back of the beach ridge, and secured the eggs. The nests were placed in the midst of low bushes and were quite difficult to find. When approached, the birds quietly left them and, quite unexpectedly, did not appear at all solicitous for the safety of their eggs. Further north, the Willets breed a week or two later. This species is now quite rare in Massachusetts but is said by old gunners, to have been much more common in years past.

GENUS XII. LIMOSA. THE GODWITS.

GEN. CH. *Bill, more than twice as long as head, slender, not expanded at tip, but slightly curved upward. Coracoids, exceeding in length the height of keel. Marginal indentations, four in young, two in adult.*

The stomach is cuboid in form, quite muscular, and is lined with a hard rugose membrane. The legs are stout and there are prominent membranes between toes; but, excepting these differences and those given above, members of this genus resemble the preceding in anatomical and other characters. Sexes, quite similar. There are two species within our limits.

LIMOSA HUDSONICA.

Hudsonian Godwit.

Limosa Hudsonica Sw., F. B. A., II; 1831.

DESCRIPTION.

Sp. CH. Form, robust. Size, medium. Toes, slightly margined. Tongue, long, somewhat fleshy, narrowing gradually to tip which is pointed.

Color. *Adult.* Above, dark-brown, spotted and banded with reddish. Wings, dark-brown, with base of primaries and secondaries, and tips of greater wing coverts, white. Smaller wing coverts, ashy. Upper tail coverts and base of tail, white, remainder of latter very dark-brown, tipped with reddish-ash. Beneath, yellowish-red, banded on breast, sides, and under tail coverts, with dark-brown. Axillaries and under wing coverts, black.

Young. Yellowish-ash above, streaked and spotted with dark-brown. Beneath, ashy-white, darkest across breast; otherwise similar to the adult. Bill, brown, yellow at base, iris and legs, brown, in all stages.

OBSERVATIONS.

Winter birds are sometimes mottled beneath with red. Readily known by the white upper tail coverts, very dark tail, long, upturned bill, and black axillaries and under wing coverts. Distributed, in summer, throughout Arctic America. Not uncommon on the coast of the Northern States in autumn. Winters south of the United States.

DIMENSIONS.

Average measurements of specimens from Eastern North America. Length, 14.82; stretch, 26.40; wing, 8.25; tail, 2.75; bill, 2.25; tarsus, 2.92. Longest specimen, 15.25; greatest extent of wing, 27.80; longest wing, 8.50; tail, 3.00; bill, 2.30; tarsus, 3.05. Shortest specimen, 14.50; smallest extent of wing, 26.00; shortest wing, 8.00; tail, 2.50; bill, 2.20; tarsus, 2.80.

DESCRIPTION OF NESTS AND EGGS.

Eggs, placed on the ground in a slight depression of the soil, on a little grass, etc., three or four in number, pyriform in shape, very dark greenish-brown in color, somewhat obscurely spotted and blotched with dark-brown. Dimensions from 1.35 x 2.15 to 1.40 x 2.20.

HABITS.

The Hudsonian Godwits are not of uncommon occurrence along our New England coast in autumn, generally arriving late in September and often remaining until November. They frequent sandy shores, resting on sand spits, from which they rise when approached, with a loud cry, characteristic of both members of the genus, and fly swiftly away, when the white upper tail coverts appear quite prominently, gaining for them the name of Spot Rumps among sportsmen. Birds found with us, are either plain ashy white below or mottled with red, but when in their full spring dress, in which they never visit us, however, as they pass to their far northern breeding grounds, through the West, they are very handsome birds. I have never met with Hudsonian Godwits in Florida, and if they occur there at all, it is as rare migrants.

LIMOSA FEDOA.

Marbled Godwit.

Limosa fedoa Ord, ed. Wils., VII; 1825.

DESCRIPTION.

Sp. CH. Form, robust. Size, large. Toes, well margined. Tongue, very long, thin, and slender, gradually tapering toward tip which is pointed.

COLOR. *Adult.* Above, dark-brown, streaked and banded with reddish-yellow. Wings, reddish-yellow, with greater coverts, and outer webs and tips of primaries, brown, and remainder of feathers finely sprinkled with the same color. Tail, also reddish-yellow, spotted and banded with dark-brown. Beneath, yellowish-red, palest on throat, streaked on neck and banded everywhere below this, excepting on abdomen, with dark-brown.

Young. Similar to the adult, but much paler, and there are few or no markings beneath. Iris and feet, brown, and bill, brown, yellow on basal half, in all stages.

OBSERVATIONS.

Readily known by the large size, upturned bill, and general reddish colors as described. Distributed, in summer, in North-eastern Florida and throughout the region west of the Mississippi; wintering from the Carolinas, southward.

DIMENSIONS.

Average measurements of specimens from Eastern North America. Length, 18.50; stretch, 31.00; wing, 9.50; tail, 3.50; bill, 1.10; tarsus, 2.70. Longest specimen, 19.50; greatest extent of wing, 32.00; longest wing, 10.00; tail, 4.00; bill, 1.70; tarsus, 2.80. Shortest specimen, 17.50; smallest extent of wing, 30.00; shortest wing, 9.00; tail, 3.00; bill, 3.50; tarsus, 2.60.

DESCRIPTION OF NESTS AND EGGS.

Eggs. placed on the ground in a slight depression of the soil on a little grass, etc.; from two to four in number, long oval in form, varying from creamy to pale buff in color, spotted and blotched, rather sparsely, with yellowish-brown of varying shades, with the usual pale shell markings. Dimensions from 1.45 x 2.20 to 1.50 x 2.25.

HABITS.

The Marbled Godwits are very common in the South in winter, but they are particularly abundant in Florida. Back of Amelia Island, just south of St. Mary's River, thus lying on the extreme northern confines of the State, are extensive flats, on which are pools that become partly dry during winter. These were the familiar resorts of the Godwits, and flocks of hundreds would gather around them. They were quite wild while here, rising with deafening clamor when approached, but they had become so attached to the locality, that they would merely circle about and alight on the borders of some neighboring pool. From this point, southward along the eastern coast, as far as Merritt's Island, they were very numerous, but were not common at Miami, and I did not see them on the Keys. On the west coast, however, they occurred in large numbers, especially on the muddy flats about Cedar Keys. On Indian River, I found the Godwits very unsuspecting, inasmuch so, that I have frequently killed them with dust shot. When one is wounded so as to be unable to fly, it utters loud cries which attract the attention of its surviving companions, and they will frequently circle about until many are killed. Late in spring, I found the Marbled Godwits on the marshes of the west side of Matanzas River, and at this season, they uttered peculiar, abruptly given, shivering notes which, I was assured by the inhabitants, were only given when the birds were about to breed, and that they would deposit their eggs on the on the dryer portions of the marshes in a week or two. At this time, the Godwits were accustomed to perch on the dead mangroves, near the edge of the water. The eggs which I have described and which are well authenticated specimens, were taken near Salt Lake City, where the birds appear to breed quite commonly.

GENUS XIII. NUMENIUS. THE CURLEWS.

GEN. CH. *Bill, longer than head, slender, not expanded at tip, and well-curved downward. Hind toe, present. Marginal indentations, four, outer considerably deeper than inner.*

The stomach is oval and flat in form, very muscular, and lined with a hard, rugose membrane. Cæca, long and slender, with the blind ends pointed. With the exception of the above given characters, members of this genus resemble those of the two preceding genera. Sexes, similar. There are three species within our limits.

NUMENIUS LONGIROSTRIS.

Long-billed Curlew.

Numenius longirostris Wils., *Am. Orn.*, VIII; 1814, 24.

DESCRIPTION.

Sp. Cn. Form, robust. Size, large. Bill, greatly elongated, about four times as long as head. Tongue, very short, only 1.20 long, triangular in form with the tip pointed.

Color Adult. Above, dark-brown, lined, spotted, and banded, excepting on outer webs of primaries, with yellowish red. Beneath, yellowish-red, darkest under wings, streaked on neck and breast and banded on sides and flanks, with dark-brown.

Young. Similar to the adult, but paler throughout. Iri and feet, brown, and bill, brown, lighter on basal third of lower mandible, in all stages.

OBSERVATIONS.

Known from all others by the large size, very long, curved bill, and colors as described. Distributed, in summer, throughout the West; wintering from the Carolinas, southward.

DIMENSIONS.

Average measurements of specimens from Eastern North America. Length, 24.15; stretch, 39.00; wing, 10.50; tail, 4.00; bill, 7.50; tarsus, 3.50. Longest specimen, 26.00; greatest extent of wing, 10.00; longest wing, 11.00; tail, 4.50; bill, 9.00; tarsus, 4.00. Shortest specimen, 22.25; smallest extent of wing, 38.00; shortest wing, 10.00; tail, 3.50; bill, 5.65; tarsus, 3.00.

DESCRIPTION OF NESTS AND EGGS.

Eggs. placed on the ground in a depression of the soil on a little grass. They are from two to four in number, rather oval in shape, varying from ashy-yellow to greenish in color, spotted and blotched irregularly with brown and amber of varying shades, with the usual shell markings of lilac. Dimensions from 1.80 x 2.40 to 1.90 x 2.88.

HABITS.

I well remember when I first caught sight of a living Long-billed Curlew. I was standing on a sandy shore, just north of Cape Ann, when a single individual flew slowly past, along the beach over the water, but just out of gun-shot. As soon as it perceived me, it uttered one of those almost startling cries, for which these birds are noticeable, and changed its course further out to sea, then continued its swift flight southward. After this, on other occasions, I saw several, but was always obliged to content myself with the same distant view, and it was not until I first went to Florida, that I made a closer acquaintance with these fine birds. One day, some thirteen or fourteen years ago, I was walking along a lonely stretch of shore, which lies between the head of Indian River and Mosquito Lagoon. I had reached this point which was then quite distant from civilization, as there were but two houses, or rather shanties, between New Smyrna, a small place consisting of two or three dwellings, situated twenty-five miles to the northward, and the light-house at Cape Canaveral, about as far to the southward, while below this point, there was not a single residence on that side of the lagoons and bays, for a hundred miles. Thus it may be understood, that the place of which I am speaking, was, without exaggeration, lonely. I had been some time in reaching this point, and in order to do so, had encountered not a few difficulties, for travelling in Florida then, could not be accomplished with as much ease as at present. Although conscious that I was in a wilderness, I did not at first fully understand how remote this particular place was from settlements, and how seldom it was visited by man, until coming suddenly to a small creek, the banks of which were high, I saw a very large Long-billed Curlew, not a dozen yards away, standing on a sand bar, with his head drawn in, apparently asleep. When I approached, the bird merely looked up, and it was not until I walked within, perhaps, twenty feet of him, that he concluded to fly, which

he did quite leisurely, going only a short distance and, alighting in the shallow water, began to feed. I passed quite a large number during that tramp, all equally tame, besides Ducks and other shore birds in almost countless numbers. Five or six years later, I walked over the same ground, but then it was no unusual thing to hear the crack of the breech-loader, where before, the sound of a gun was scarcely known, and when I got a Long-billed Curlew this time, it was only by stalking it with as much caution as if it had been a deer.

The Long-billed Curlews are abundant from the Carolinas, southward, in winter, frequenting the muddy flats which are left exposed by the tide, and probing in them with their long bills, in search of animal food; but how they manage to eat with a bill, often over eight inches long, with the aid of a tongue which but little exceeds an inch in length, is a mystery. These Curlews migrate along the Atlantic coast during September, but I never saw one in the North in spring. They breed throughout the West.

NUMENIUS HUDSONICUS.

Hudsonian Curlew.

Nunenijs Hudsonicus LATH., Ind. Orn., II.: 1790, 712.

DESCRIPTION.

SP. CH. Form, robust. Size, medium. Tongue, short, 1.20 long, somewhat fleshy, and narrowing gradually to tip which is pointed.

COLOR. *Adult.* Above, dark-brown, lightest on rump, streaked and spotted, on neck and body, and banded on tail and inner webs of primaries, with ashy-yellow. Top of head, dark-brown, with a central line and one from bill over eye, ashy-yellow. Beneath, ashy-yellow, streaked on neck and breast and banded on sides and under wings, with dark-brown.

Young. Similar, but paler and the markings are not as well defined. Bill, brown, yellow at base of lower mandible, iris and feet, brown, in all stages.

OBSERVATIONS.

Readily known from preceding species by the smaller size and paler colors and from the succeeding by the large size and banded inner webs to primaries. Distributed, in summer, throughout Arctic America. Not uncommon on the coast of the Northern States in autumn. Winters south of the United States.

DIMENSIONS.

Average measurements of specimens from Eastern North America. Length, 17.50; stretch, 32.25; wing, 9.85; tail, 2.90; bill, 3.50; tarsus, 2.25. Longest specimen, 18.00; greatest extent of wing, 33.50; longest wing, 10.50; tail, 3.05; bill, 4.00; tarsus, 2.35. Shortest specimen, 17.00; smallest extent of wing, 33.00; shortest wing, 9.25; tail, 2.80; bill, 3.00; tarsus, 2.15.

DESCRIPTION OF NESTS AND EGGS.

Eggs placed on the ground in a slight depression of the soil, on a little grass, etc., three or four in number, oval in form, varying from ashy-yellow to greenish in color, spotted and blotched irregularly, and thickly, with brown and amber of varying shades. Dimensions from 1.50 x 2.20 to 1.60 x 2.30.

HABITS.

The Hudsonian, or Jack Curlews of Sportsmen, make their appearance in Massachusetts, early in September, and frequent the hill-tops, in company with the Plovers and Esquimaux Curlews. Although they are far from being abundant, they cannot be considered rare, as quite a number are taken every season. I do not think that they are much more common than the Long-billed Curlews, but many more are killed each season, as they are not nearly as shy. The Hudsonian Curlews occur on the coast of New Jersey, but do not seem to be taken regularly south of this point, and I never met with them in Florida. These Curlews appear to resemble the Long-billed more than the Esquimaux, in habits, being rather solitary, and seldom associating in flocks of any size.

NUMENIUS BOREALIS.

Esquimaux Curlew.

Numenius borealis LATHL., Ind. Orn. II; 1790, 712.

DESCRIPTION.

Sp. Ch. Form, robust. Size, small. Bill, but little longer than head. Tongue, short, thin, and gradually tapering toward tip which is acutely pointed.

Color. *Adult.* Above, dark-brown, streaked on head and neck, spotted on back, and banded on rump upper tail coverts and tail, with ashy-yellow. Primaries, brown, without bandings on either web. Beneath, ashy-yellow, becoming reddish under wings, streaked on neck and breast and banded on sides and flanks with dark-brown.

Young. Similar to the adult but paler and the markings are not as well defined. Bill, brown, yellow at base of lower mandible, iris and legs, brown, in all stages.

OBSERVATIONS.

Known from all others by the small size, curved bill, absence of bands on primaries, and colors as described. Distributed, in summer, throughout Arctic America. Common in autumn on the coast of the Northern States. Winters south of the United States.

DIMENSIONS.

Average measurements of specimens from Eastern North America. Length, 13.50; stretch, 26.50; wing, 8.25; tail, 2.75; bill, 2.25; tarsus, 1.50. Longest specimen, 14.00, greatest extent of wing, 27.00; longest wing, 8.50; tail, 3.00; bill, 2.50; tarsus, 1.75. Shortest specimen, 13.00; smallest extent of wing, 26.00; shortest wing, 8.00; tail, 2.50; bill, 2.00; tarsus, 1.25.

DESCRIPTION OF NESTS AND EGGS.

Eggs. placed on the ground in a slight depression of the soil, on a little grass, etc. They are from two to four in number, rather oval in form, varying from yellowish-ash to greenish-brown in color, spotted and blotched coarsely with brown and amber of varying shades. Dimensions from 1.30 x 1.90 to 1.45 x 2.00.

HABITS.

The Dough Bird, as the Esquimaux Curlews are almost universally called, are eagerly sought after and, consequently, bring a high price in the market. In autumn, they are very fat and are considered fine eating, being far superior to either of the other species, the flesh of which is apt to be strong and dry. During certain seasons, when a severe storm occurs about the middle of September, at which time these birds are migrating, they are driven in from the sea in large flocks. Then the hill-tops are fairly covered with them and in years past, gunners would frequently reap a rich harvest, but of late years, although they occasionally appear in quantities, they never remain long, for they are quickly driven away by the numerous sportsmen who are constantly on the lookout for them. The Esquimaux Curlews feed upon berries and insects, especially grasshoppers which they find in quantities on the hills.

CHARADRIUS PLUVIALIS.

European Golden Plover.

DESCRIPTION.

SP. CH. Size, form and general color of the American Golden Plover, differing only in having the under wing coverts and axillaries white instead of ashy brown. Occurs accidentally in Greenland.

NOTES ON THE BLACK-BELLIED PLOVER. I found this species in both young and adult plumages, the latter predominating, on Andros, Bahamas, from April 17 to May 6, 1884, also a few at Middle Bight and Fresh Creek in November and December, 1887, and on January 31 of the same year saw a large flock on the shore of Inagua.

NOTES ON THE KILDEER PLOVER. In March 1884, I observed a large flock of this species in the grounds about the Government House at Nassau, Bahamas. Found a few on the beach at Fresh Creek, Andros, in April of the same year. On November 15, 1887, saw three on the beach near my house in Nassau and during the last week in November saw a few again at Fresh Creek, and, in February, 1888, found a few on Inagua.



FIG. 41. ADULT MALE, WILSON'S PLOVER.

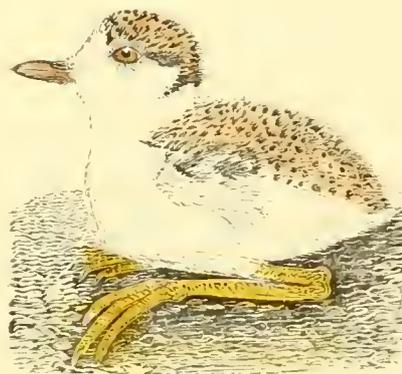


FIG. 42. WILSON'S PLOVER, TWO DAYS OLD.

NOTES ON WILSON'S PLOVER. This species is abundant throughout the Northern Bahamas as a constant resident, breeding from the first week in April until the first week in May. Like most of the smaller species of shore birds they are exceedingly tame, but do not differ in habit from the same species in Florida. The number of eggs deposited is from two to three.

A downy young, two hours old, hatched from an egg obtained on Little Golden Key, Andros, April 30th, 1893 has the lower parts, forehead, ring around neck, narrowing behind, and outer portion of the wing, pure, snowy white. There is a spot behind the eye, an elongated patch below this, and two spots on wings above, near body, black. Feet, yellowish. Bill, black. The bill is about the same form as that of the adult. (See fig. 42, where I have given a life-sized cut of this young specimen and compare with that of adult male, fig. 41, also life size. What is remarkable about the young is the entire absence of an egg tooth, the egg being hatched by the young bird breaking away the shell with the tip of its bill, the head being placed across the egg, as the bird lies within it. (See Notes on Young Birds, Contributions to Science, Vol. II, page 34.)

NOTES ON THE RING-NECK PLOVER. This is a winter visitor to the Bahamas, where it is quite common remaining until late in April. I also found it as late as April 15th on Cayman Brae.

EUROPEAN OYSTER-CATCHER.

AGIALITIS MELODUS CIRCUMCINCTUS.**Belted Piping Plover.**

DESCRIPTION.

SUB. SP. CII. Similar to the Piping Plover in every way excepting that the belt on neck is continuous in front. This is an interior form described by Mr. Ridgway from specimens obtained at the head waters of the Platte in Nebraska in July. I think this form quite within the range of individual variation of eastern specimens as wholly belted Piping Plover are of not very unusual occurrence here in Massachusetts. Although the Piping Plover is abundant on Key West in winter, I never saw a specimen in the Bahamas.

AGIALITIS HIATICULA.**European Ring Neck.**

DESCRIPTION.

SP. CII. Size and general form about that of the American Ring Neck; but there is no web between the inner and middle toe, and that between outer and middle toe only reaches to the first joint of the latter. **COLOR.** Head markings about as in *A. semipalmatus* but with spots of white on eyelids and the markings are somewhat heavier. Underparts, pale brown. Primaries, dark brown, with the outer four or five with white on the shafts and marks for a space near the ends. There is more white on the secondaries than in *A. semipalmatus*, but the tail is similar. Young quite similar to those of *A. semipalmatus*, but readily distinguished in all stages of plumage by the lack of the webbings to the toes.

OBSERVATIONS.

This species, so abundant in the Old World, is not uncommon in Greenland and at Cumberland Sound.

VANELLUS CRISTATUS.**Crested Lapwing.**

DESCRIPTION.

SP. CII. Size rather large, legs long, tarsus longer than middle toe and claw, a web between outer and middle toes, and there is a small hind toe. Wings, long. Head crested, feathers two and three inches long.

COLOR. Adult male, top of head including crest, thick line and large patch on breast, glossy black. Sides of head and neck, white mixed with gray on back of neck. Upper parts iridescent green, becoming violet purple and steel blue on wings. Upper and under tail coverts, chestnut. Underparts not described, white. Wings, blue black, white on base of primaries. Bill, black. Feet, red.

OBSERVATIONS.

This beautiful bird is readily distinguished by the crest and lustrous plumage described. It occurs in Europe, but is accidental in Greenland.

NOTE ON AMERICAN OYSTER-CATCHER. This species occurs all winter on the Bahamas and may possibly remain and breed, as I saw a specimen on Norman's Key as late as June 7, 1884.

HAEMATOPUS OSTRALEGUS.**European Oyster Catcher.**

DESCRIPTION.

SP. CII. Smaller than the American Oyster Catcher, color similar, but the back is glossy black like the head and neck, with no decided contrast between them. Rump and upper tail coverts white, not black, as in *H. palliatus*. Length, 16.00; bill, 3.00; wing, 9.50; tail, 4.30; tarsus, 2.00.

OBSERVATIONS.

This species occurs in Europe, Asia and Africa, also in Greenland.

NOTE ON THE TURNSTONE. I found a few Turnstones on Inagua, in February, 1888, and this is the only instance where I have seen the bird in any of the West Indies in winter. I have, however, found them common, and at times abundant, during the migrations, both on the Caymans and throughout the Bahamas, in April and May. I also found specimens as late as June 7th, 1884, on Seal Key, Bahamas.

NOTES ON THE BLACK-NECKED STILT. I found this species abundant on the Green Key to the eastward of the Tongue of Ocean on June 6th, 1884, when they were evidently preparing to breed. There was a large flock in a brackish water pond on Cayman Brac in April, 1888, and they were said to remain there all summer.

NOTES ON HABITS:

On April 10th, 1895, I wing-tipped a female on Merritt's Island, Florida. This bird I captured and she became very tame, remaining in the tent, without attempting to escape, although the door was constantly open. She ate bits of meat quite readily which were placed in water for her, but was especially fond of small fishes, catching them quite expertly as they swam about in a basin of water. We succeeded in bringing this bird north but she did not long survive the journey. In spite of her long legs this Stilt was one of the most graceful birds in movement that I ever saw, never appearing awkward in any position that she assumed.

NOTES ON THE VOCAL ORGANS OF THE AMERICAN WOODCOCK. The following notes appeared in Vol. I, Contributions to Science, but are of sufficient interest to be reproduced here. For years there has been a controversy among sportsmen and ornithologists, as to whether the whistling notes of the Woodcock, made when rising, are produced by the peculiarly attenuated first primaries, or in some other manner with the wings, or whether this sound is vocal. Much evidence is given in support of both views, but although I have nothing new to offer on either side, yet I may say, after carefully reading the testimony given on the subject, that I am inclined to think the preponderance of evidence is in favor of the sound being produced with the wings.

I shall, however, add in the following article, a grain of evidence in favor of the vocal notes, as I can prove most conclusively that the notes can be produced by the laryngeal muscles and membranes.

The main object of this paper is to illustrate how the fine warbling notes given during the breeding season, so admirably described by Messrs. Nuttall, Brewster, Torrey and others, are produced.

The trachea, or windpipe, of this bird is considerably flattened and widened at the superior, or upper, larynx becomes narrower and rounder as it descends, then once more widens as it approaches the lower larynx, and here it is also flattened.

The lower larynx is peculiar; the sterno trachealis is present, and is well developed and there are tympaniform membranes that extend the entire length of the bronchial tubes. There is no os transversale and consequently no semiluna membrane. Thus at first sight, it would seem that all of the notes that this species is capable of uttering must be caused by the vibrations of the tympaniforms. This was the view of the case that I took in an account of the structure of the larynx of the Woodcock, published in the first edition of my Birds of Eastern North America, in 1881. In there making the statement that all of the notes given by the Woodcock are produced by the tympaniforms, I overlooked an important factor which I have since found plays a prominent part in the vocal apparatus of these birds. This is a small vibrating membrane that lies on the side of the larynx, between the half rings of the bronchial tubes and the lower bones of the larynx. See Fig. 41, where a life size, side view, of the apparatus is given; t, trachea; u, a portion of the bronchial tube, and the shaded portion between c and n is the laryngeal vibrating surface. This surface is rendered tense or is loosened by the action of two pairs of strap like muscles. One, the remnants of the broncho-trachealis, ib, b, is not well

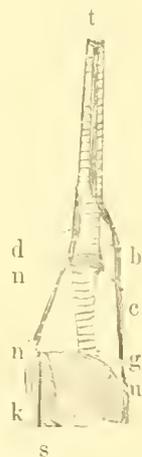


FIG. 41.

developed, extending to the upper half ring only, the other, the bronchialis, *ib. d.*, is better developed, and exercises control over three half rings. These two pairs of muscles slightly oscillate the thin bones of the upper portion of the bronchial tubes, and thus tighten or loosen the laryngeal vibrating membrane to the minute degree necessary to cause it to produce a portion of the melodious notes given by the Woodcock. I say a portion of the sounds, for, after all, the tympaniforms perform their share of the labor of vocalization.

Of course the principal relaxors for the tympaniforms are the well developed sterno-trachealis, Fig. 43, *g.*, but these membranes are rendered tense, to some degree, by the actions of the muscles *ib. b* and *d.*, which thus perform a double part. The tympaniforms, however, have another contractor in the form of a membranous muscle that extends from the larynx to the manubrium of the sternum, and spreading downward and backwards, adheres to the bronchials near the junction of the tympaniforms; *ib. n.*, is the laryngeal origin of this muscle, and *m* its termination on the manubrium; *k* being a portion of the keel, *s*, a portion of the sternum. Only a part of this sternal laryngeal muscle is represented, the thicker, for it sends backward a thinner section that occupies the triangular space indicated between *u*, *m*, *n*.

Fig. 44 gives another view of the larynx, seen from below; *t*, trachea; *t. d. d.*, the bronchialis muscle; *m. d. d.*, the lower portion of the membrane which extends upward and backward to the bronchial tubes which are not represented.

I should say that the harsh notes of the Woodcock given when on the ground is produced by the vibration of the entire broad surface of the tympaniforms, whereas the more melodious warbling of the nuptial song, and possibly also the whistling twitter of flight, are from the laryngeal membrane, and from portions of the tympaniforms that are tensified partly by the muscles *b* and *d.*, Fig. 43, and partly by the membranous sternal laryngeal muscle, *ib. n. m.*, and fig. 44, *m. d. d.*

Mr. Brewster says that the notes of the male Woodcock made in the spring "are sweet and musical, recalling the sound produced by a water whistle such as boys sell in the streets of our cities." ("Forest and Stream," Aug. 1st, 1889.) Now as this most clearly indicates that the sounds are liquid in their character, or in other words, that there is nothing of the stridulous shrillness in them so noticeable in many species of birds that possess a well developed semiluna membrane, goes far toward proving the theory, that I have advanced, that the shrill notes of birds are produced wholly by the semiluna membrane, aided by the laryngeal muscles.

As supplementary to Mr. Brewster's idea, which is given in a most interesting article on the Woodcock, in a more recent number of the "Forest and Stream," quoted above, that the whistle of the Woodcock when on the wing, is used as a call to indicate its whereabouts to its mate and fellows, with which idea I quite agree, I would also suggest that a modification of this note is also used as an alarm. Thus when a Woodcock is suddenly disturbed the whistling is given with considerably more vehemence than when it rises without being forced to do so, and this more rapid whistling must instantly inform every Woodcock within hearing that one of their number has encountered an enemy of some description.

Since writing the concluding sentence in the article on the sound-producing organs of the Woodcock, I have had an additional experience with this species, that tended to confirm the idea that the whistling sound is used as a note of alarm or warning. Early in April, I was walking in company with my dog, near an alder swamp, once a famous breeding ground for Woodcocks, but which has long since been abandoned by them for this purpose, on account of its present proximity to a number of houses. Wishing to see if any ever alighted there now, I sent in my dog, and in a moment he had a fine male on the wing. The bird rose within fifteen feet of me, and whistled most vehemently as it got up and continued whistling until it was some distance above the bushes. Judging from the size and color, as well as its whistling, that this bird was a male, I once more sent the dog into the swampy patch. He went directly to the place where he started the other bird, and came to a stand within a few feet of it, when a smaller, paler Woodcock rose, as far as I could hear, silently, and noiselessly, and flitted away. I have not seen it mentioned that the female Woodcock never made the whistling, and I think they do at times, but in this instance the female had received a most emphatic warning from her mate that danger was near, and after remaining in concealment till the dog's

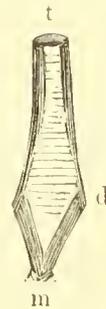


FIG. 44.

nose was within a few feet of her, got up as silently as possible, her idea evidently being to steal away unobserved.

GALINAGO MEDIA.

European Snipe.

DESCRIPTION.

SP. CII. Form, size and general markings similar to Wilson's Snipe, but the under wing coverts are white, with faint indications only of bandings, and the sides are not as regularly banded. Occurs in Europe and in Greenland. Eggs do not differ from those of the Wilson Snipe.

Macrorhampus griseus scolopaceus.

Western Red-breasted Snipe.

DESCRIPTION.

SUB. SP. CII. Similar to the Red-breasted Snipe, but with a decidedly larger and longer bill. This is the only difference in winter and in immature birds, but adults in summer are cinnamon throughout, beneath, not whitish on the abdomen as in the eastern form, and there are few or no spots on the breast. Occurs west of the Mississippi to the Pacific but not uncommon in migration along the Atlantic sea board. Winters in Florida. Since writing the remarks made under Observations in the first edition of this book I have examined additional material and have decided that the status of the Western Red-breasted Snipe as a subspecies is correct.

DIMENSIONS.

Length, 11.25 to 12.50; extent of wing, 18.50 to 19.50; wing, 5.65 to 5.85; tail, 2.65 to 2.70; bill, 2.90 to 3.25; tarsus, 1.51 to 1.65.

SCOLOPAX RUSTICULA.

European Woodcock.

DESCRIPTION.

SP. CII. Form similar to that of the American Woodcock, excepting that the outer primaries are not attenuated. Size, large. COLOR. Top and back of head brown of a dark and light shade, crossed transversely by three or four bands of pale brown. Above each feather is varied with black and chestnut, the black usually forming a large sub-terminal spot. There is a tendency to form yellowish gray scapular stripes. Wings, blackish brown, banded with dark chestnut bars. Upper tail coverts, rich chestnut. Tail, black tipped with grayish. Brownish white beneath, banded with dusky.

OBSERVATIONS.

Distinguished at once from our common Woodcock of the large size, lack of attenuation on the outer primaries, and banded under parts. This bird is a well known European species but has been taken in Eastern North America upon several occasions. First recorded from New Jersey and Rhode Island by George W. Lawrence, in 1866; by Lewis, from New Jersey, 1868; Rand, Newfoundland, 1866; Coues, Virginia, 1876. Thus it becomes entitled to a place in our fauna. Eggs, are similar to those of the American Woodcock but larger and possibly redder in shade. Size, 1.50 and 1.30.

DIMENSIONS.

Length, 12.50; wing, 7.00; tail, 3.50; bill, 2.75; tarsus, 1.25.

NOTES ON THE STILT SANDPIPER. The first week in April, 1886, I found this bird common on Indian River and about the flats at the head of Mosquito Lagoon, Florida. They were associating with other shore

birds or were occasionally in flocks by themselves. The largest flock that I saw consisted of nearly or quite a hundred specimens. Many at this date were in full spring dress.

TRINGA OCCIDENTALIS.

Western Sandpiper.

DESCRIPTION.

SP. CH. Form and general color similar to those of the Semipalmated Sandpiper, but the size is larger and the bill is longer. Young birds and autumnal specimens do not differ in color, but spring birds have the top of head and line through eye chestnut red, but these are seldom without grayish feathers intermixed.

OBSERVATIONS.

This species occurs throughout Western North America, often, however, appearing on the Atlantic seaboard, and is abundant in Florida during the migrations. Eggs similar to those of the Semipalmated Sandpiper.

DIMENSIONS.

Length, 6.80; stretch, 12.75; wing, 4.15; tail, 1.80; bill, 1.00; tarsus, .98.

HABITS.

I have elsewhere remarked that the Indian River and Mosquito Lagoons are, excepting near the inlets without true tides, yet the water rises and falls in them according to the wind. Thus a north wind of some days duration, lowers the water at the head of Indian River and raises it at the head of Mosquito Lagoon, while a south wind blowing for any length of time reverses this system.

About the first week in April, 1886, we had a strong south wind in Florida, for a number of days and as a consequence the water was driven completely out of the creeks which make into the land at the head of Mosquito Lagoon, and also exposed a large area of the shallow flats at their mouths.

This section of newly-exposed bottom proved very attractive to the wading birds and thousands of Herons, Sandpipers, and allied species resorted to this section to feed. Among this vast array of Marsh birds were large flocks, often consisting of hundreds of individuals of the Western Sandpipers. They appeared to have the same general habits as the allied species, and I could detect no difference in their notes.

TRINGA ALPINA.

European Dunlin.

DESCRIPTION.

SP. CH. Similar in form and color to *Tringa Americana*, Red-backed Sandpiper, but smaller. Length, 8.00; bill, 1.40, and the tarsus is but little, if any, longer than the middle toe and claw. Occurs in Europe, but stragglers have reached Greenland.

TOTANUS INORNATA.

Western Willet.

DESCRIPTION.

SUB. SP. CH. Similar to the Common Willet, but larger, with a decidedly longer and more slender bill, less spotting below, and the dark markings above are less, and not regular, the middle tail feathers

being very faintly banded or entirely unmarked. Wing, 8.00; tail, 3.30; tarsus, 2.60; bill, 2.25 to 2.70.
Occurs west of the Mississippi River, wintering in Florida and other Gulf States.

TOTANUS GLOTTUS.

Green Shanks.

DESCRIPTION.

Sp. Cn. Form and color almost exactly similar to the Winter Yellow Legs, but smaller, with the bill and legs greenish. The rump and lower back as well as the tail and its coverts are white, with variable markings, usually broken bars on the tail feathers.

LIMOSA LIMOSA.

Black-tailed Godwit.

Sp. Cn. Size, form, and general coloration of the Hudsonian Godwit, but has the under wing coverts and axillaries white, not black, as in *L. hudsonica*. A well known European bird, which also occurs in Greenland.

NUMENIUS PHAEOPUS.

Whimbrel.

Sp. Cn. Size, form and general coloration of the Hudsonian Curlew, but has the rump white and the under wing coverts and axillaries banded with dusky. An Old World species, but occurs in Greenland.

ORDER XII. GALLINAE. GROUSE. ETC.

Posterior margin of sternum, much rounded. Inner marginal indentations, deeper than outer and very wide. Furcula, with prominent terminal expansion. Naked space above nostrils, hard.

This order embraces many families and the species are distributed throughout the world. These birds are not unlike the Doves and Pigeons but differ from them greatly in many very important characters. The sternum is quite long, exceeding twice its width in length. The marginal indentations are four but the two inner are not inclosed, being wide and deep and occupying more than one half of the length of the sternum. The keel is high but does not extend the entire length of the sternum. There is quite a prominent manubrium. The furcula, although long, is quite weak but has a prominent terminal expansion. Scapula, truncated but not pointed. The œsophagus is dilated into a single crop which is not provided with any special glands, and the young are not fed by regurgitation for they run at birth. The tympaniform membrane is present but there is no semilunar membrane, although there is an os transversale. The proventriculus is remarkably well developed. The stomach is very muscular and is lined with a hard, rugose membrane. The fold of the duodenum is not long and incloses a large double pancreas. The intestines are quite small and long and the cœca are remarkably long. The tail is not only rounded and pointed but is sometimes forked. The eggs are usually more than two in number and the young, when first hatched, are covered with down.

FAMILY I. MELEAGRIDIDÆ. THE TURKEYS.

Head and neck, destitute of feathers. Top of keel, not equaling in length the depth of the inner marginal indentations, and the tip is not produced forward. Terminal expansion of furcula, not wide, and approximating very closely to the sternum. Upper process of manubrium, not produced forward.

The costal process of the sternum is narrow and truncated, and the bone of the extreme outer edge, beyond the outer marginal indentation, is widened and produced forward. There is also a large perforation through the manubrium and the sternum in front of the keel is furrowed, while the depression is provided with a central ridge.

GENUS I. MELEAGRIS. THE TURKEYS.

GEN. CH. *Forehead, provided with a fleshy cone which is extensible. Tarsus, spurred. Tail, rather long and rounded. Breast of males, usually provided with a long tuft of bristles.*

This genus contains but few species, and all of them are of a large size, with well marked characters, as given above. There is but one species within our limits.

MELEAGRIS GALLOPAVO.

Wild Turkey.

Melagris gallopavo LINN. Syst. Nat., I: 1766, 265.

DESCRIPTION.

SP. CH. *Form, robust. Size, large. Sternum, stout. Head and neck, destitute of feathers but sprinkled with fine bristles. Feathers, broad at tip and abruptly truncated.*

COLOR. *Adult male.* Body throughout, black, each feather is crossed with a sub-terminal, iridescent band of bluish which has greenish and bronze reflections. Rump and upper tail coverts, banded with deep chestnut. Wings, very dark-brown, finely banded with yellowish-white. The tail is deep chestnut tipped with lighter, there is a broad, subterminal band of dark-brown and the remainder of the feathers are finely mottled and banded with chestnut, while the flanks and under tail coverts are tipped with the same color. Abdomen and tibia, yellowish-brown with the feathers tipped with lighter. Head and neck, blue and red. Feet, red. Bill, red, yellow at tip. Iris, brown.

Adult female. Quite similar to the male, but differs in being somewhat smaller, and less brilliant in color. The spurs on the legs and bristles on the breast are usually absent.

OBSERVATIONS.

This species may be at once recognized by its resemblance to the well-known domestic Turkey, from which the wild birds differ, however, in being more brilliant in color. Distributed, as a constant resident, in favorable localities, throughout Eastern United States. Probably extinct in New England.

DIMENSIONS.

Average measurements of specimens from Eastern United States. Length, 42.00; stretch, 62.50; wing, 19.50; tail, 16.50; bill, 1.12; tarsus, 6.50. Longest specimen, 50.00; greatest extent of wing, 68.00; longest wing, 21.00; tail, 17.50; bill, 1.25; tarsus, 7.00. Shortest specimen, 34.00; smallest extent of wing, 57.00; shortest wing, 18.00; tail, 15.50; bill, 1.00; tarsus, 6.00.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground. They are not very elaborate structures, being composed of leaves, weeds, or other convenient material.

Eggs, from ten to twenty in number, short oval in form, creamy or buff in color, spotted and dotted, usually quite thickly, with reddish-brown. Dimensions from 1.85 x 2.45 to 2.00 x 2.50.

HABITS.

The Wild Turkey which has received as much, if not more, attention from writers, than any other species of American birds, is rapidly becoming exterminated. There has

not been a specimen taken in New England for many years and the same is quite true of many other sections of country equally large. Turkeys are, however, still common in Florida, so common, in fact, that I have several times observed flocks from the deck of the steamers that run up the St. Johns, and there is scarcely a hummock in the state, that is not inhabited by them. They are, however, wary birds and know well how to take care of themselves.

The Wild Turkeys of this section, feed about the dry hummocks all day but at night, usually return to the swamps, often flying some distance to reach a favorite roost. When feeding, during the early morning, they may be approached quite closely, and if surprised in this way, they will often conceal themselves; then one may nearly tread upon them before they will rise. I once landed from my boat upon a heap of debris on the banks of the St. John's River, to pick up a Great Carolina Wren which I had shot, leaving my gun behind me, when a large Gobbler rose from directly beneath my feet, so near, that I could feel the wind caused by the motion of his wings, and disappeared in the swamp. When aware of the approach of an intruder, they will merely run away and, at such times, will not take wing, even if shot at.

During the winter, the Turkeys of Florida remain in flocks but toward spring, they become separated, and at this season, near the middle of the day, I have frequently seen solitary individuals sitting upon the lower limbs of some cypress which overhung the river, evidently enjoying a noontime siesta. At this season, the males gobble and call from the swamps before leaving in the early morning, and also after arriving upon their feeding ground. These fine birds breed in May in Florida, placing the nests in some secluded locality, usually in a dry hummock or along its edge, and the females sit closely, seldom rising until approached quite nearly.

Observations which I have made upon this species, tend to show that they were the ancestors of the Domestic Turkeys; at least, the two varieties breed freely together, producing fertile offspring which are everywhere in the South, regarded as superior to the domestic stock. Those which I have seen which were of mixed races, were fine looking birds and retained much of the dark, iridescent plumage of their wild progenitors.

FAMILY II. TETRAONIDÆ. THE GROUSE, ETC.

Head and neck, completely feathered, while the tarsus is more or less covered. Top of keel, equaling in length the depth of the inner marginal indentations. The tip is produced forward.

The terminal expansion of the furcula, is wide, rounded posteriorly, and does not approximate close to the sternum. Upper process of manubrium, produced forward. The costal process is narrow, tapering toward point which is, however, rounded. The bone at the extreme outer edge of sternum, beyond the outer marginal indentation, is not very wide. There is a large perforation through the manubrium, and the sternum in front of keel, is furrowed, but there is no very prominent central ridge. Nostrils, feathered, and there is a naked space above eye. Toes, provided with scale-like fringes on the sides.

GENUS I. TETRAO. THE WOOD GROUSE.

GEN. CH. *Posterior margin of sternum, between indentations, quite wide, slightly indented in the middle, with the edges rounded. Tip of keel, projecting well forward. Costal process, tapering to a rounded point. Tarsus, fully feathered, as is also the spaces between the toes, but the latter are naked. No elongated feathers on neck.*

Members of this genus inhabit heavily wooded country, usually living among evergreens. They are all dark in color. There is but one species within our limits.

TETRAO CANADENSIS.

Spruce Grouse.

Tetrao Canadensis LINN., Syst. Nat. I; 1766, 274.

DESCRIPTION.

SP. CH. Form, robust. Size, not large. Tongue, triangular in form, fleshy, and pointed. Cæca, 17.00 long, small at base, measuring about .10 in diameter for 3.75, then suddenly enlarging to about .30 in diameter and continues this size to the blind end, the termination of which is rounded. It is greenish in color, with eight longitudinal lines of a lighter shade. Number of tail feathers, sixteen. Sexes, not similar.

COLOR. *Adult male.* Black throughout, excepting wings which are dark-brown, becoming much lighter on the tips of secondaries and outer edge of primaries. Upper surface, excepting tail, and collar, finely banded with reddish-brown and ashy blue, the latter predominating. Spots on tertiaries, line of spots behind eye, line along cereals, meeting on the throat, white; band across breast and abdomen, under tail coverts, sides, flanks, and under wing coverts, also banded with white, and the feathers of the three last named portions are finely barred with ashy-brown. The tail is tipped with yellowish-brown, and the tibia and tarsus are dusky, mottled with white.

Adult female. Banded above, including tail, with yellowish-red, ahy-blue, and black, with the white markings of the male, on the scapularies. Below, banded as far as the breast, with yellowish-red and black; remaining under parts, banded with yellowish-red, black, and white, in equal proportions.

Young. Are much redder above and below than the adult; this is especially noticeable in the female, where there is nearly as much red below the breast as above it.

Nestlings. Are at first lined, mottled, and spotted with yellowish-red, black, and white, both sexes being then similar, but they soon assume the plumage last described. Naked space over the eye, scarlet. Iris, bill, and feet, dark-brown in all stages.

OBSERVATIONS.

There is a little variation in plumage but this species may be readily known in all stages, by the predominating dark color as described. Distributed, as a constant resident, from Northern New England to the Arctic Circle.

DIMENSIONS.

Average measurements of male specimens from Maine. Length, 15.50; stretch, 21.50; wing, 6.32; tail, 4.22; bill, .63; tarsus, 1.37. Longest specimen, 16.00; greatest extent of wing, 22.00; longest wing, 6.75; tail, 4.75; bill, .70; tarsus, 1.50. Shortest specimen, 15.00; smallest extent of wing, 21.00; shortest wing, 6.00; tail, 4.00; bill, .55; tarsus, 1.25.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground; they are not elaborate structures, being composed of twigs, leaves, moss, or any other convenient material.

Eggs, from eight to fourteen in number, oblong oval in form, deep buff in color, spotted and splashed with brown of varying shades. Dimensions from 1.20 x 1.68 to 1.22 x 1.75.

HABITS.

Those who have visited the dark evergreen forests of Northern New England, which are mainly composed of giant spruces and hemlocks that raise their huge branches high in air but that are so closely interlaced as to nearly exclude every vestige of sun-light, thus the ground about the roots of the trees is in perpetual shadow, yet vegetation thrives in this half-light, and even flowers bloom in profusion at the proper season, enlivening with their varied hues a scene which otherwise would appear strikingly gloomy; those who have seen all this, I say, can form some idea how the Spruce Grouse live, for this is their home.

Here they spend their entire lives, feeding upon berries in summer and subsisting largely on the leaves of their favorite spruce and hemlock, during winter; so largely, in fact, that their feathers are redolent with the odor of the crushed leaves, while their flesh is quite bitter.

Audubon states that these birds were so tame, they could be knocked down with sticks and this same fact is true at the present time, for I have known of instances where this has been accomplished. The Spruce Grouse assemble in flocks through the autumn and winter, but are at this time quite local in distribution, while they are more or less migratory, moving from place to place; then as spring advances, break up into pairs. They breed about the middle of May, placing the nest in some secluded locality. The young are fully fledged by September, but do not acquire the size of their parents until late in the following month.

GENUS II. LAGOPUS. THE PTARMIGANS.

GEN. CH. *Edges of posterior margin of sternum, not rounded. Costal process, truncated. Tip of keel, not projected well forward. Tarsus, feathered to the toes. No elongated feathers on neck.*

Members of this genus inhabit either mountainous or cold barren regions. They are white in winter, but become darker in summer. There are two species found within our limits.

LAGOPUS ALBUS.

White Ptarmigan.

Lagopus albus Aud., Syn.; 1839, 207.

DESCRIPTION.

SP. CH. Form, robust. Size, quite large. Sternum, stout and quite wide at posterior margin. Tail and wings, long. Bill, short, equaling in length, measured from nostril to tip, to height at base. Sexes, quite similar in color.

COLOR. *Adult in winter.* White throughout, excepting tail which is black with the central feathers and tips of all, white. Shafts of primaries, dark-brown in the center.

Adult in summer. Head and neck, yellowish-red. Back, black, barred rather finely with yellowish-brown and chestnut, otherwise as in winter. Bill, black, iris, brown, feet, horn color, in all stages.

OBSERVATIONS.

A winter bird before me, taken at St. John's Lake, Saguenay, Canada, has four or five narrow, black, transverse bars back of the eye. For difference between this and the following, see observations under that species.

DIMENSIONS.

Average measurements of specimens from Eastern North America. Length, 15.00; stretch, 21.50; wing, 7.70; tail, 5.50; bill, .86; tarsus, 1.47. Longest specimen, 16.00; greatest extent of wing, 25.00; longest wing, 8.25; tail, 6.00; bill, .88; tarsus, 1.55. Shortest specimen, 14.00; smallest extent of wing, 24.00; shortest wing, 7.45; tail, 5.00; bill, .75; tarsus, 1.40.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground. They are not very elaborate structures, being composed of leaves, weeds, or other convenient material.

Eggs, from eight to fifteen in number, rather oval in form, reddish-buff in color, spotted and mottled, usually quite thickly, with large, confluent blotches of purplish-brown. Dimensions from 1.15 x 1.80 to 1.20 x 1.85.

HABITS.

Among the first birds for which I inquired when I visited the Magdalen Islands, were the White Ptarmigans, but found that they did not occur there, excepting as rare winter

visitants. They are, however, found commonly on Newfoundland and in Labrador, migrating thence, during winter, into Canada, reaching, perhaps, the New England States very rarely. The Willow Grouse, as they are sometimes called, inhabit the barren heaths and cold swamps of the countries of which I have spoken, and from these are distributed northward into the Arctic Zone. As mentioned, they are partly migratory during certain winters, being induced to come southward, probably, from lack of food, for this governs the migration of nearly all birds.

LAGOPUS RUPESTRIS.

Rock Ptarmigan.

Lagopus rupestris LEACH, Zool. Misc., II, 290.

DESCRIPTION.

SP. CH. Form, robust. Size, large. Tail and wings, long. Bill, rather slender, exceeding in length, measured from nostril to tip, the height at base. Sexes, quite similar.

COLOR. *Adult in winter.* White throughout, excepting tail which is black with the central feathers and tips of all white, and there is a black line from bill through eye.

Adult in summer. Above, black, barred and spotted with yellowish-red; lighter below and broadly and regularly banded with yellowish-red; otherwise as in the male. Bill, black, iris, brown, claws, horn color, in all stages.

OBSERVATIONS.

Known from the closely allied *albus* by the black band through eye and more slender bill, this being longer than high at base. Both species of Ptarmigans may be known from all other Grouse by the wholly feathered tarsus and feet. Distributed in summer, throughout Arctic America, south, according to Audubon, about Bras d'Or.

DIMENSIONS.

Average measurements of specimens from Arctic America. Length, 13.75; stretch, 23.50; wing, 7.40; tail, 4.65; bill, .63; tarsus, 1.22. Longest specimen, 14.50; greatest extent of wing, 24.00; longest wing, 7.50; tail, 4.85; bill, .70; tarsus, 1.35. Shortest specimen, 12.80; smallest extent of wing, 23.00; shortest wing, 7.00; tail, 4.50; bill, .65; tarsus, 1.10.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground. They are not very elaborate structures, being composed of leaves, grass, or any other convenient material.

Eggs, from eight to fifteen in number, oval in form, reddish-buff in color, spotted and mottled with irregular blotches of purple-brown. Dimensions, from 1.10 x 1.55 to 1.12 x 1.65.

HABITS.

The Rock Ptarmigan, according to Audubon, was common about the Bras d'Or during the cold season but retreated into the interior of the country during summer to breed, nesting in June. There appears to be some confusion regarding the distribution of this species, for it has frequently been confounded with the preceding, perhaps with good reason. It is probable, however, that these birds have much the same range, especially in summer, although the one under consideration appears to be much less common in Canada, for out of a large number of white Ptarmigans which I have examined from that section, I never saw an undoubted specimen of the Rock Ptarmigan. The habits of both are described as being similar, excepting that Audubon is inclined to believe that the present species inhabits more open ground than does the one last described.

GENUS III. CUPIDONA. THE PRAIRIE GROUSE.

GEN. CH. *Posterior margin of sternum, between indentations, widened and rounded. Tip of keel, projecting forward. Costal process, narrow and rounded at point.*

Members of this genus inhabit prairie lands or open country, seldom, if ever, being found in the woods. The tail is short and the wings are long. The sterno-trachealis is large but there are no other laryngeal muscles. Tympaniform membranes, present but short, measuring .25, and the bronchial tubes beneath are connected by a muscle. Os transversale, present and supports a semilunar membrane. Tarsus, completely feathered. Feathers on side of neck, elongated. Head, crested.

CUPIDONA CUPIDO.

Prairie Grouse.

Cupidona cupido BARN, Birds N. A.; 1858, 628.

DESCRIPTION.

SP. CH. Form, robust. Size, large. Sternum, stout. Terminal expansion of scapula, large and rounded. Cœca, 20.00 long, with the blind end pointed. Tongue, short, thick, fleshy, and triangular in form, with the tip pointed. There is a tuft of long, lanceolate feathers on each side of neck, beneath which is a naked space.

Color. *Adult male.* Above, dark-brown, becoming lighter on wings, barred, excepting on inner webs of primaries and on tail, with yellowish-red and yellowish-white. Beneath, white, becoming buffy on throat, sides, and flanks, finely barred, excepting on throat, with dark-brown. Line from gape, passing beneath eye, dark-brown, beneath which, along cheeks, is a line of spots of the same color. There are concealed bars of chestnut across upper breast. The elongated neck feathers are dark-brown, with yellowish-white centers which are edged above with yellowish-red.

Adult female. Similar to the male but the neck tufts are not as long nor as dark and the tail is barred. Iris, bill, and feet, dark-brown in all stages. Naked space over eye and on neck, orange.

OBSERVATIONS.

Specimens vary but little in plumage, occasionally the chestnut barring on the breast will be quite conspicuous. This species appears to be subject to a peculiar kind of albinism, being creamy-white, with the darker markings showing indistinctly. Known from all others by the short tail and elongated tuft of lanceolate feathers on neck. Distributed, at present, on the Western plains, east of the Rocky Mountains, in favorable localities in the states that border the Mississippi River on the east, south to Louisiana, and occasionally eastward to Pennsylvania; rare on Naushon Island, Massachusetts.

DIMENSIONS.

Average measurements of specimens from the West. Length, 18.75; stretch, 29.00; wing, 8.75; tail, 4.42; bill, .70; tarsus, 1.95. Longest specimen, 19.00; greatest extent of wing, 30.00; longest wing, 9.00; tail, 4.25; bill, .75; tarsus, 2.10. Shortest specimen, 17.50; smallest extent of wing, 28.00; shortest wing, 8.50; tail, 4.00; bill, .65; tarsus, 1.75.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground in hollows scratched in the soil, composed of grass, leaves, weeds, or any other convenient material.

Eggs, from eight to fifteen in number, rather oval in form, varying from dirty white to greenish-yellow in color, often dotted finely with reddish-yellow. Dimensions from 1.20 x 1.60 to 1.30 x 1.71.

HABITS.

There is no doubt but that prior to the settlement of this country and for some time after the advent of the Whites, the Prairie Grouse had an extensive range, being found throughout New England, the Middle States, and the western of the Southern States. As these fine Grouse are unfortunate enough to be excellent eating, they were soon exterminated in the more settled districts. Yet they held their own much longer than one would suppose possible under the circumstances, and in 1834, Audubon says, "On the eastern declivities of our Atlantic coast, the districts in which the Pinnated Grouse are still to be met with, are some portions of the State of New Jersey, the 'brushy' plains of Long Island, Martha's Vineyard, the Elizabeth Islands, Mount Desert Island in the State of Maine, and a certain tract of Barreny country in the latter State, lying not far from the famed Mar's Hill."

In 1858, Prof. Baird gives these birds as occurring in much the same places, but adds that they are found on the Pocono Mountains, Pennsylvania. Mr Lawrence included them in his list of the birds of Long Island in 1866. Nuttall says that they were found in Westford, Connecticut, in 1832, and ten years later, Linsley said that they were not to be found in the State. There has not been a wild specimen in Maine for many years and aside from a few which are, perhaps, to be found on Martha's Vineyard, there are now none in Massachusetts, for I do not think that there are any on the Island of Naushon; it will also be safe to say that there are none on Long Island. Dr. Turnbull, in his list of the birds of East Pennsylvania and New Jersey, written in 1869, states that within a year or two, they have been taken on the Jersey Plains, but none are there now. He also says, "A few are still met with in Monroe and Northampton Counties, Pennsylvania, where I have shot the species." Thus it will be seen, if any remain in the latter named section now, which is not improbable, it is the only locality, aside from Martha's Vineyard, where the species is found at any distance east of the Mississippi, for they have disappeared from the intervening sections.

I know but little, from actual observation, of the habits of these interesting birds, for the only specimens that I ever saw living, were three or four that I purchased in the Boston Market some years ago. These were exceedingly wild and although I gave them the best of care, lived but two or three months.

Since the above was put in type, I learn from my friend, Mr. Purdie, that he has ascertained through reliable sources that there is still quite a little colony of these Grouse living on Martha's Vineyard, but that, in spite of the very stringent laws, enacted by our Legislature, for their protection, some are shot every year. This is certainly deplorable, and the ornithologists of the State ought to make some effort to save these fine birds from the total extermination which will ultimately be their fate unless the law is very strictly enforced.

GENUS IV. BONASA. THE BRUSH GROUSE.

GEN. CH. *Posterior margin of sternum, between indentations, quite narrow and rounded. Tip of keel, not projected forward as far as the depth of the inner indentations. Costal process, widened and rounded at point. Tarsus, not fully feathered. Neck feathers, elongated.*

Members of this genus inhabit wooded or brushy country, usually preferring the latter. The tail is long but the wings are short. Head, crested. The sterno-trachealis is large but there are no other laryngeal muscles. Tympaniform membrane, present, but short. There is but one species within our limits.

BONASA UMBELLUS.

Ruffed Grouse.

Bonasa umbellus STEPH., Shaw's, Gen. Zool., XI; 1824, 300.

DESCRIPTION.

SP. CH. Form, robust. Size, quite large. Sternum, not stout and the terminal expansion of scapula is not large and is extended backward. There is a tuft of broad, abruptly truncated feathers on sides of neck beneath which is a naked space. Tongue, triangular in form, fleshy, and pointed. Oesoph., 20.06 l. ng., small at base, measuring about .10 in diameter, then gradually enlarging to about .30 in diameter, then tapering to the blind end, the termination of which is pointed. They are brownish in color, with ten longitudinal lines of a lighter shade. Number of tail feathers, eighteen. Sexes, not similar.

COLOR. Adult male. Upper surface, excepting wings which are dark-brown with the outer edge of primaries banded with yellowish-white, reddish-brown with the feathers edged, spotted, and mottled with dark-brown and ashy-white. There is a band of reddish-brown across breast, and the remaining under portions, are white, becoming yellowish on the throat, sides, flanks, and under tail coverts; banded throughout with brown. The tail is tipped with ashy and has a sub-terminal band of brown, above which is one of ashy. Tibia and tarsus, yellowish-brown. Neck tufts, black, with a bluish iridescence.

Adult female. Quite similar to the male, but with the tail shorter and the general markings less distinct, while the neck tufts are either brown or tipped with it.

Young. Not unlike the female, being quite dull with a general diffusion of color while the feathers are short and are marked like the other plumage. Iris, bill, and feet, brown, in these three stages.

Nestlings. Are at first covered with yellowish-red down which is lighter below, having a central line on top of head, brown and also one behind eye of the same color, while the remainder of body is lined, mottled, and spotted with it. The wings and tail are yellowish, banded with lighter and brown. From this they gradually assume the plumage last described. Bill, iris, and feet, light brown, in this stage.

OBSERVATIONS.

There is considerable variation in plumage but this species may be readily known by the tuft of truncated feathers on sides of neck, long tail, and colors as described. Nestlings evidently moult the wing quills two or three times before acquiring the full plumage. The tail, however, is retained until autumn. Albinos are not unfrequent in this species. Distributed, as a constant resident, throughout Canada and Eastern United States, south among the mountains of the Carolinas. I am indebted to the Bangs Brothers and Mr. A. Thorndike for skins of Grouse.

DIMENSIONS.

Average measurements of specimens from Eastern North America. Length, 18.00; stretch, 23.00; wing, 6.95; tail, 6.45; bill, .72; tarsus, 1.55. Longest specimen, 19.00; greatest extent of wing, 23.50; longest wing, 7.25; tail, 6.90; bill, .80; tarsus, 1.70. Shortest specimen, 17.00; smallest extent of wing, 22.50; shortest wing, 6.75; tail, 5.90; bill, .65; tarsus, 1.45.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground. They are not very elaborate structures, being composed of leaves, weeds, or other convenient material.

Eggs, from eight to twelve in number, rather oval in form, creamy-white or buff in color, occasionally spotted with a darker buff. Dimensions from 1.08 x 1.15 to 1.20 x 1.65.

HABITS.

There are few who live in the sections inhabited by the fine Grouse now under consideration, and ever handled a gun, who are not more or less familiar with the ways and doings of the Partridge, as it is called in the North, or Pheasant, in Pennsylvania and southward. Every sportsman knows the exciting whirl of their wings as they rise, and the straight forward, onward dash of the birds, for, regardless of such small obstacles as bushes or tree tops, they go crashing through them, then sail smoothly across some neighboring swamp, to alight on the next elevation. All this is so familiar to every one who is interested in birds, that I will not enlarge on the general habits of these Grouse but merely give some special facts which I have observed concerning them.

Early in autumn, the Ruffed Grouse are to be found in companies of from six to ten, which are usually made up of a single family, and if not scattered by the sportsman, will continue thus to associate through the winter. At first, they may be seen in the chestnut or oak woods, gathering nuts and acorns, or at this season, they will venture into the corn fields, especially if these be in the neighborhood of brushy pastures. If surprised when feeding where not much hunted, they will seldom rise but will only run through the bushes, uttering a chuckling note, and will not take wing until hard pushed, when they will

fly but a short distance. As winter approaches, they leave the high lands and enter the swamps, choosing thick evergreens as roosting places; then, when the weather becomes very severe, especially if the wind be blowing strong from the north or west, they may be found enjoying the brief sunlight on the southern exposures which rise from the lower levels. At this season, especially after the snow falls, they gain a precarious living by picking off laurel buds, dried barberries and other fruit. After heavy snow-storms, when the weather is extremely cold, they have the singular habit of dropping, or diving, into snow-drifts and will often remain there for some length of time; then if the snow chances to crust over so that they cannot escape, they perish from starvation.

As soon as the genial influence of the coming spring has caused the buds to swell on the birch and other trees, the Ruffed Grouse eat them in large quantities. They will also visit the orchards and bud the apple trees. They do considerable mischief in this way, in sparsely settled districts, inasmuch so, that at one time, a bounty of twenty-five cents each was offered by certain towns in Massachusetts for their heads. It is almost incredible, what a vast amount of buds a single Grouse will eat; thus, I once took one hundred and eighty apple buds from the crop of a bird that I had shot about ten o'clock in the morning, and as this was but a single meal, it can well be understood that a flock of ten or a dozen, would completely denude a small orchard in a short time.

About April, the Ruffed Grouse are to be found in pairs, and in May the females construct the rude nests, choosing a situation beneath a brush heap, under a fallen tree-top, by the side of a log, or under the overhanging branches of a bush. The female sits closely and one may almost walk on her before she will rise. She will not often feign lameness when driven off her eggs, unless they be well advanced; but when the young appear, especially if they be very small, she will droop her wings, spread her tail, and running up to the intruder, will drop nearly at his feet, at the same time, uttering a peculiar cackling. Taking care, however, to just elude his grasp, she will use every endeavor to induce him to pursue her and leave her helpless young which, in the mean time, warned by the voice of their mother, run into the nearest place of concealment; thus some hide beneath leaves, some under logs, some in clumps of grass; in short, in a moment's time, not one is to be seen, and then the old Grouse suddenly takes wing and also disappears. I have, like many others, often been a witness to a scene, much as I have described, but I remember upon one occasion, I concluded to wait after the disappearance of the mother, and see what the young would do. This was in June, in the woods of White Deer Valley, Pennsylvania, and I had come suddenly upon the little family as they were crossing a space destitute of bushes. The old Grouse gave her alarm and as her progeny were about a week old, they were not long in scattering and concealing themselves, when I quietly stepped behind the trunk of a huge tree which grew near. I waited without motion or sound for about ten minutes, during which time, I did not see a single young, when the mother bird which had flown some distance, came running back, uttering as she came, a series of chuckling notes, quite different from any I ever heard before. She did not appear to take the slightest notice of me, although I was in plain sight for I had unwittingly chosen the wrong side of the tree for concealment, but continued to approach, passing within a foot of me, all

the time continuing her call. Then occurred one of the prettiest sights that I ever witnessed, for a dozen or more of the young Grouse came suddenly into life, all appearing in the area of a few square feet. So quickly did they spring up, that every leaf seemed transformed into a little brown Partridge and although I watched carefully to see where they had hidden themselves, I was no wiser when all were out than before. The little brood gathered about their parent and she led them away at a fast rate to the nearest thicket, evidently thinking the neighborhood dangerous. In fact, she was in so much haste to leave it that the little ones could not keep up with her by running, some being obliged to use their wings, and I was surprised to see that, even at that early age, they could fly two or three yards, especially when they started from a slight elevation.

The young follow their parent and are cared for by her, until they are nearly or quite fully grown; then all remain in company until the following spring, as related.

The drumming of the Ruffed Grouse has attracted the attention of nearly all ornithologists and several explanations have been given, regarding the method by which this singular sound is produced. Some say that the bird strikes a log or stone with its wings; others, that it strikes its body; then again, it has been asserted that the wings are struck together over the back. Mr. Brewster who is a very careful observer, says that when drumming, the bird sits upright with its tarsus horizontal to the log or surface on which it rests, with the wings extended, and that it does not strike anything, perceptible, with these members, but that the sound is produced by the out-spread wings being brought suddenly downward against the air. This is certainly quite a plausible theory, but I am inclined to think that the sound is vocal; that the wings merely aid in producing it or are beaten downward as accessories to the note, just as a rooster crows, flapping its wings at the same time. The laryngeal muscles are certainly constructed in a manner similar to those of the Pinnated Grouse, the toolings of which are vocal. I have heard the Ruffed Grouse drum from early spring until late in autumn.

FAMILY III. PERDICIDÆ. THE QUAILS, ETC.

Head and neck, completely feathered, but the tarsus is naked, as is also the space above the nostrils. Top of keel, not equalling in length the depth of the inner marginal indentations.

The terminal expansion of the furcula is narrow, produced downward, and approximates quite closely to the sternum. Upper process of manubrium, not produced forward. The costal process is very narrow, tapering toward point which is not rounded. The bone at the extreme outer edge of sternum, beyond the outer marginal indentation, is not very wide. There is a moderately large perforation through the manubrium, and the sternum in front of keel, is deeply furrowed, but there is no very prominent central ridge.

GENUS I. ORTYX. THE CRESTLESS QUAILS.

GEN. CH. *Head, without any prominent crest. Tail and wings, rather short. General colors, light reddish-brown, varied with white, black, and buff.*

Members of this genus usually inhabit open country or that which is covered with a low growth of bushes. There is but one species wild in our limits.

ORTYX VIRGINIANUS.

Quail. Partridge.

Ortyx Virginianus Bon., Obs. Wils.: 1825.

DESCRIPTION.

SP. CH. Form, robust. Size, large. Sternum, stout. Tongue, thick, fleshy, horny at extreme tip which is pointed. The sterno-trachealis is absent, but a stout lateral muscle, which is probably a modification of this, emerges from the trachea about .25 from the larynx and passing back of it, without adhering to it, becomes attached to the inside of the bronchial tubes near their junction with the larynx. A portion of the tympaniform membrane is to be seen above this junction and the tubes below it are joined by a rather thick membrane. Coeca, 4.00 long, small at base, measuring about .66 in diameter, then gradually enlarging to about .20 in diameter, then tapering to the blind end, the termination of which is pointed. Feathers of head, slightly elongated.

Color. *Adult male.* Light chestnut throughout, becoming yellowish on the rump with the feathers above edged with buff, and barred and spotted throughout with black and white, while the central under portions are yellowish-white. The throat is white, encircled by a line of black. Line passing from bill over eye and down neck, also white, becoming buffy posteriorly and preceded above by a line of black. Wings and tail, brown, the latter having a bluish tinge, and both are barred and spotted with yellowish and white.

Adult female. Similar to the male, but the white markings of the head are replaced by buff and the black linings are not as prominent.

Young. Not unlike the adult but are darker as the black markings are much broader. In a transitional stage, between this and the down, the feathers are all lined with white. Iris, bill, and feet, brown, in these three stages.

Nestlings. Are at first covered with yellowish-red down which is lighter below, having a central line of brown on the head, three down the back, and one behind eye, of the same color. From this, they gradually assume the plumage last described. Bill, iris, and feet, light reddish-brown, in this stage.

OBSERVATIONS.

There is considerable variation in plumage, Florida Quails being much darker than Northern birds, especially below, where the markings are continuous and wide. Known from all others by the peculiar markings about the head and colors as described. Distributed, as a constant resident, throughout Eastern United States, south of the latitude of Northern Massachusetts.

DIMENSIONS.

Average measurements of specimens from Eastern North America. Length, 9.35; stretch, 14.60; wing, 4.55; tail, 2.65; bill, .55; tarsus, 1.12. Longest specimen, 10.20; greatest extent of wing, 15.45; longest wing, 5.10; tail, 3.00; bill, .65; tarsus, 1.25. Shortest specimen, 8.50; smallest extent of wing, 13.75; shortest wing, 4.00; tail, 2.30; bill, .50; tarsus, 1.00.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground. They are not very elaborate structures, being composed of leaves, weeds, or other convenient material.

Eggs, from eight to twenty in number, decidedly pyriform in shape, pure white in color, unspotted. Dimensions from .95 x 1.30 to 1.00 x 1.35.

HABITS.

The bird now in question, is, as almost every one knows, called Quail in the North and Partridge in the South, but wide-spread as they are, I think there is but little difference in their habits, even in the extremes. Thus Quails which I have found at Miami in Southern Florida, did not behave much differently from those that I have seen in some sections of Massachusetts. It is true, that the Florida birds were tamer than those which generally occur in Massachusetts, yet I have seen Quails in the latter named section, which were as unsuspecting as those in Florida. Thus at Miami, it is difficult to make these birds rise, for a bevy will merely run in front of its pursuer, until its members become so scattered in the thick growth of saw palmettos which cover the ground everywhere, that it is impossible to follow them, as when one has left the main body, it ceases to utter the pecu-

liar twittering note which is quite noticeable when they are together. In Pennsylvania, I have driven a bevy some distance in the same manner; this was, however, when they were not fully grown but a pair which lived near my place during an entire season, and which I used to see nearly every day, would allow me to follow them for some hundred yards along a lane, finally taking refuge in a stone wall or thicket. Although seemingly loath to rise, when once on the wing, Quails are, as every sportsman knows, swift fliers and he who can shoot one out of a bevy and, turning, drop another which rose at the same time but which flew in exactly the opposite direction from the first, performs a feat which is not easily accomplished.

The Quails of Florida are fond of the open piney woods but I have seen them in hummocks, and have even met with them feeding in the swamps along the margin of streams. In the more settled districts, they resort to the plantations, especially in Georgia and the Carolinas. In Pennsylvania, they prefer old stubble fields, especially in autumn. At this season and during winter, they keep in bevies of from five to twenty or more, and wander about the country, often moving miles in a single day without rising. When a bevy is disturbed at such times and forced to rise, if it has not been much hunted, the birds will all proceed together in a straight line until they have reached the nearest cover, when one will alight, then another, until all are down. Then they will soon get together without much calling, but if further pursued, they will scatter widely, when, after a time, they will sound their note in order to ascertain the direction which their companions have taken.

During the breeding season, the song of the male is heard most frequently; it usually consists of two notes, sounding like *bob-white*, or, as some have it, *more-wet*, and when our gamy friend reiterates this cry frequently, the farmers say, that it foretells rain; but should the bird, influenced by some whim, add another syllable, as he sometimes does, he is understood to say *no-more-wet*, as a certain prognostication of fair weather. I think, however, that three syllables are almost always given but that the first is usually uttered so low as not to be audible a short distance away.

The nest is, as a rule, placed in some thicket or on its border and is well-covered; so well, in fact, that it is often impossible to find it without starting the bird. Thus I once saw one that was not only completely hidden under grass and weeds but which had a covered passage-way that extended for twelve or fifteen inches before emerging.

The young follow their parents as soon as hatched and behave much like the little Grouse, but unlike these birds, do not wander much, contenting themselves with remaining in a very limited area until fully grown. Like the Ruffed Grouse, Quails are liable to be killed during certain winters in the North, by the crusting of the snow under which they take refuge.

ORTYX VIRGINIANUS FLORIDANUS.**Florida Quail.**

DESCRIPTION.

SUBSP. CII. Form and general color about similar to the northern Quail, but with heavier markings beneath, these being continuous and wider than the wide interspaces. The size is smaller, but the bill is proportionately larger.

OBSERVATIONS.

In the former edition of this book, as seen on page 234 of this edition, I mention the fact that the Florida Quail is darker than the northern bird, and this is a constant character. Occurs in Florida. Eggs are a little smaller than those of the northern Quail.

DIMENSIONS.

Length, 9.50; stretch, 14.50; wing, 4.25; tail, 2.50; bill, .58; tarsus, 1.15.

HABITS.

The Florida Quails appear to be rather more fond of particular spots than the northern Quails and it is not unusual to start a bevy day after day from the same clump of saw-palmettos or other cover. When started the Florida Quails rise some five feet in air and fly as a rule in a perfectly straight line until they drop into some other cover.

ORTYX VIRGINIANUS CUBANENSIS.**Cuban Quail.**

SUB SP. CII. Size and form quite similar to that of the Florida Quail, but much darker, the male having the black bandings of the breast fuse into a large patch which is often an inch or more in width. Occurs in Cuba and also at Miami in Southern Florida.

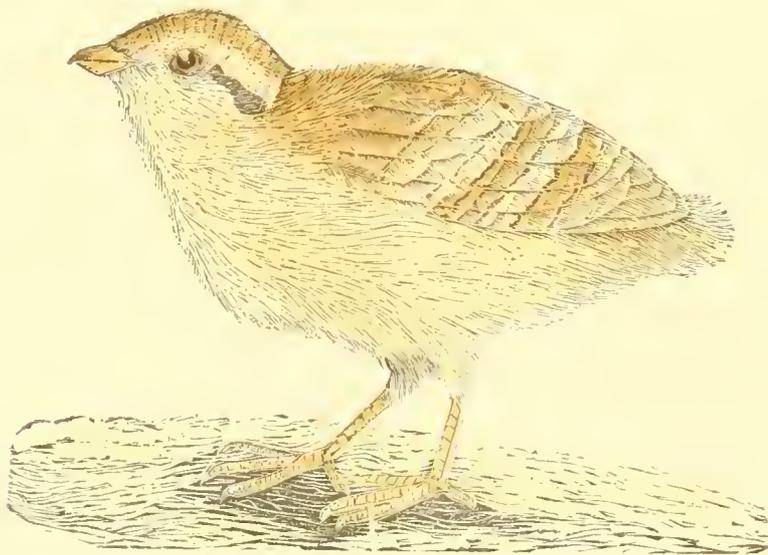


FIG. 45. Young Quail, ten days old.

NOTES ON THE RUFFED GROUSE. The young of this species acquire the wings quite rapidly and fly when only a few days old whereas the young Quails of the same age are entirely without wing quills and consequently cannot fly at all at this early age. Compare fig. 45 where I figure a young Grouse about ten days old with fig. 46 which is a figure of a Young Quail of the same age.

For further notes and description of additional species of Grouse and Ptarmigan, see Appendix.

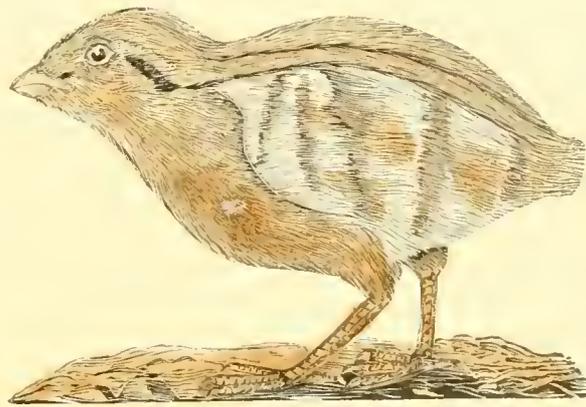


FIG. 46. Young Quail, ten days old.

ORDER XI. COLUMBAE. PIGEONS. ETC.

Posterior margin of sternum, rounded. Outer marginal indentations, deeper than inner. Furcula, without any prominent terminal expansion. Naked space above nostrils, soft

Although the members of the present order resemble those of the succeeding in form, they all differ from them in some important anatomical structures. The sternum is short,

seldom exceeding twice its width in length. The marginal indentations are four but the two inner are often inclosed and do not occupy more than one third of the length of the sternum. The keel is high and extends nearly or quite the entire length of the sternum. There is no manubrium. The furcula is short and weak. Scapula, not truncated but pointed. The œsophagus is dilated into a large double crop which, during the nesting season, is provided with a coating of glands from which exudes a kind of milky fluid which is mixed with the macerated grain, and the young are fed with the mixture by regurgitation. This crop is supported by a muscle which extends from the middle to the skin of the neck. The sterno-trachealis is not especially strong and there are one or two pairs of other laryngeal muscles which, however, do not extend over all the half rings. The tympaniform membrane is present but there is no semilunar membrane, although there is an os transversale. The proventriculus is remarkably well developed. The stomach is very muscular and is lined with a hard, rugose membrane. The fold of the duodenum is not long and incloses a large double pancreas. The intestines are quite small and long but the cœca is either absent or very small. The tail is either square, rounded, or pointed but never forked. The eggs are seldom more than two in number and the young, when first hatched, are naked.

FAMILY I. COLUMBIDÆ. THE DOVES.

The sternum is wide, exceeding one half the length. The tip of the keel is considerably rounded.

The size is usually large. Head, small. The tail has either twelve or fourteen feathers and the tarsus is slightly feathered in front. This is a large family and the members are generally distributed throughout the world.

GENUS I. COLUMBA. THE DOVES.

GEN. CH. *Bill, rather short and stout. Tail, short, and rounded or square. Sternum, rather narrow. Cœca, moderately well developed.*

Members of this genus are quite large, rather dull in color, but occasionally have some conspicuous white markings. There is but one species within our limits.

COLUMBA LEUCOCEPHALA.

White-headed Dove.

Columba leucocephala LINN. *Syst., Nat., I: 1766, 281.*

DESCRIPTION.

SP. CH. *Form, robust. Size, quite large. Sternum, stout. Tongue, long, rather thin, broadening toward tip which is horny and pointed. Cœca, small. Tail, rounded.*

COLOR. *Adult male.* General color throughout, dark slaty-blue, becoming very dark on the tail above and black beneath. Top of head, from bill to nape, pure white, margined behind with bluish which rapidly becomes rich purplish-brown on the hind neck. The neck on sides and lower portions is iridescent green, with golden reflections, while each feather is margined with black.

Adult female. Quite similar to the male, but differs in having the white head slightly overwashed with dusky and the remaining colors somewhat duller.

Nestlings. Are at first nearly black, then gradually assume the adult plumage. Bill, red, bluish-white at tip, feet, purplish-red, and iris, yellowish-white, in all stages.

OBSERVATIONS.

There is little or no variation in plumage in specimens which I have examined. Readily known from all allied species by the white head and colors as described. Occurs in summer on the Florida Keys; resident in the Bahamas and West Indies.

DIMENSIONS.

Average measurements of male specimens from Florida. Length, 13.12; stretch, 21.75; wing, 5.50; tail, 5.45; bill, .74; tarsus, 1.05. Longest specimen, 14.25; greatest extent of wing, 23.50; longest wing, 7.50; tail, 5.50; bill, .76; tarsus, 1.10. Shortest specimen, 12.00; smallest extent of wing, 20.00; shortest wing, 6.50; tail, 5.40; bill, .70; tarsus, 1.00.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in low trees or bushes; they are not bulky structures, being composed of sticks carelessly arranged, and are without lining.

Eggs, one or two in number, oval in form, pure creamy-white in color, with the surface very smooth. Dimensions, from 1.02 x 1.10 to 1.05 x 1.45.

HABITS.

During my visit to the Florida Keys in 1870-71, I searched eagerly for the White-headed Pigeons, but I did not find them upon my arrival, early in November, although I was assured by the inhabitants of Key West that some had been shot only a few days previous, nor was I so fortunate as to meet with them late in spring although I remained until the last of May. I heard from them repeatedly, however, for nearly every one was familiar with the wild Pigeons, as they are called, for these birds are still quite common, especially in autumn. They breed abundantly on certain small keys which lie between the chain of larger keys and the outer reef. Here they are quite tame and I was informed by the wife of one of the wreckers, that they bred in the thick bushes which grew not far from her door. They were never disturbed when nesting and, consequently, became so familiar that her little boy was accustomed to play with the young squabs as they sat in the nest, while the parent Doves would alight near and unconcernedly watch the proceeding. Later in the season, these birds are represented as being very wild.

In the middle of June, 1874, my assistants, when I was prevented from accompanying them through sickness, visited the small keys mentioned and found the birds breeding on them. At this season, the heat so far south is perfectly stifling; add to this the fact that clouds of mosquitoes constantly rise from the rank vegetation to greet the intruder with numberless stings, and one can readily understand that a collector must be very enthusiastic to prosecute his researches very far in such a region. In spite of these difficulties, however, one of the party succeeded in finding several nests and in shooting about a dozen birds, many of which he was unable to find in the thick and thorny jungle, especially when tormented to such an extent by his insect assailants. The nests were built low in the thickest part of the scrub, from which it was difficult to dislodge the birds.

In flight and note, the White-headed Pigeons resemble the Domestic Dove. They arrive on the Florida Keys about the first week in June and depart late in October. During the autumn, their numbers are considerably augmented by migrants from the Bahamas which are attracted to the Keys by the abundance of the fruit of the sea grape, upon which the Doves feed. They are shot for food by the wreckers in autumn, but are now little disturbed when nesting, and although they are far from being as abundant as described by Audubon, they are still quite common.

GENUS II. ECTOPISTES. THE PIGEONS.

GEN. CH. *Bill, rather long and slender. Tail, very long and pointed or graduated. Sternum, rather wide. Cæca, small.*

Members of this genus are quite large, not very dull in color, with conspicuous white markings on the long tail. There is but one species within our limits.

ECTOPISTES MIGRATORIA.

Wild Pigeon.

Ectopistes migratoria SWAIN, Zool. Jour., III; 1827, 355.

DESCRIPTION.

SP. CH. Form, robust. Size, large. Sternum, stout. Tongue, moderately long, thin, narrow at tip which is pointed. Cæca, very small. Tail, long and graduated.

COLOR. *Adult male.* Head all around, neck, chin, back, upper wing coverts, upper tail coverts, under wing coverts, sides, and flanks, ashy-blue, lightest on the three latter named portions. Wings, including scapularies, brown, the latter spotted with large patches of black and the tips of secondaries and outer edges of primaries are nearly white. Tail, bluish-ash, becoming darker toward the tips of the middle feathers, and much lighter, gradually fading into white, on the tips and outer webs of the others. There is a spot of cinnamon near the basal portion of the inner webs of all the feathers excepting central pair, which is followed, after a short interval, by an oblique band of black. Sides and back of neck, glossed with violet which has green and golden reflections. Beneath, purplish-red, darkest anteriorly and fading into white on the abdomen. Under tail coverts, pure white. Tibia, purplish.

Adult female. Quite similar to the male, but browner above, is less iridescent on the neck, and is pale ashy-yellow beneath.

Young. Are not unlike the adult female, but are much browner above and are dark-brown on the neck below, while the feathers of these parts are edged with white. The chin is white, and the wing feathers are edged with rufous. Iris, red, bill, black, and feet, yellow, in all stages.

OBSERVATIONS.

Occasionally the head is blue all around, but otherwise there is little variation in plumage. This species may be at once recognized by the pointed tail, cinnamon spots at its base, which are present in all stages, large size, and colors as described. Distributed, as a summer resident, throughout Middle and Northern North America, wintering in the section south of New England.

DIMENSIONS.

Average measurements of specimens from North America. Length, 16.62; stretch, 23.50; wing, 8.25; tail, 8.25; bill, .70; tarsus, 1.05. Longest specimen, 17.25; greatest extent of wing, 24.00; longest wing, 8.50; tail, 8.50; bill, .80; tarsus, 1.10. Shortest specimen, 16.00; smallest extent of wing, 23.00; shortest wing, 8.00; tail, 8.00; bill, .60; tarsus, 1.00.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in trees. They are not very elaborate structures, being composed of twigs and sticks, without any lining whatever.

Eggs, one or two in number, varying from elliptical to oval in form, pure white or creamy in color. Dimensions from 1.00 x 1.50 to 1.12 x 1.55.

HABITS.

The Wild Pigeons are now far from being common in Eastern Massachusetts and it has been many years since I have seen a flock of any size here. Solitary individuals or small groups are to be found regularly in autumn and occasionally a pair will breed in the wilder sections, and Mr. W. W. Eager found a nest a year or two since in Weston. My friend, Mr. August Koch, of Williamsport, of whom I have spoken before as an enthusiastic sportsman and ornithologist, kindly sends me the following notes on this species.

“Should severe weather or late snow-storms come on in March, after the Wild Pig-

cons have arrived on their breeding grounds in the beech-wood, the birds will return south, and at such times they seem to be in a great hurry, but I have known them to stop when compelled by hunger. On such an occasion, a small flock alighted in our orchard, when we scattered some food on a space of ground. The Pigeons readily went to feeding, then left, and in a short time, returned, accompanied by a large number of others, and we caught some three hundred under a lath frame. Single pairs, a dozen, or several dozens of the Wild Pigeons will sometimes nest anywhere in the mountains and pairs can be observed flying very swiftly back and forth from the mountains to the Susquehanna River, especially in the morning and evening. Several years ago, I noticed a small flock staying late in spring, about the same vicinity, within sight of the city; later in the summer, during a warm day in June, I noticed a small flock of females resting among the hemlocks in a swamp and probably the males were sitting on the nests while the females were enjoying themselves. One of our neighbors, a very truthful man and enthusiastic Pigeon-catcher, has told me that when netting these birds, in Clearfield County, during the breeding season, not far from the breeding grounds, he caught all females one part of the day and all males the other part.

“During August, I have met with these Pigeons by twos and threes on the mountain-tops, eating huckleberries. I have killed the young on the raspberry bushes and have also seen them eating cherries from the cherry-tree. During September, the Wild Pigeons feed a great deal on green acorns, later in the month, on gumberries, and early mornings, especially when foggy and damp, they may be observed on high gum-frees which grow at the foot of the mountains. They sit near the top of the tree and generally close together, their bills resting on their breasts and their feathers puffed out, apparently without a motion; at such times, these birds may, with caution, be approached very closely but should the Pigeons have the slightest suspicion of one’s approach, they will give a note of alarm, sounding something like a laugh made with a child’s trumpet; this same note is occasionally used when not in danger. When frightened, they will dart with great velocity from the limbs, by far surpassing Wilson’s Snipe in the twisting motion, and should the hunter be an instant too late, he will be obliged to look elsewhere for his pot-pie, as the many birds will not alight again within sight. At this season, autumn, flocks or small parties may be observed in the river bottoms, on warm afternoons, resting quietly among shady trees; at such times, they may be quite easily approached.”

I am also greatly indebted to my life-long friend, Mr. Edward H. Bowers, who has always been a close observer of birds, for the following valuable notes.

“Observations made in Benzie County, Michigan, from 1870 to 1880, show that the Wild Pigeons visit this section every alternate year. The birds breed in the valley of the Betsey River and these nesting places occupy several square miles of country. The Pigeons usually make their appearance the first of March and begin to build early in April if the season will permit. They prefer deciduous woods in which to breed and from ten to twenty nests are placed on a tree.

“At the head of Frankfort Harbor which is formed by the widened mouth of the Betsey River, is an extensive marsh, at the head of which, in the cedar timber, is an open space

about one hundred feet in diameter, called the Salt Spring, where brackish water rises, which, in time, has formed a sort of mound, a foot or two high and thirty or forty feet in diameter, covered with a thin growth of grass. During the nesting season, this spot is visited in the morning by countless numbers of Pigeons. At day-break, a single bird appears from the nesting, some miles distant, to reconnoiter and, after circling around a moment, disappears. In an incredibly short time, the birds begin to come; first in small numbers, then increasing rapidly until, in a few moments, they come in a living avalanche, covering the trees until the branches break with their numbers. Then one ventures cautiously, with a downward swoop as if to settle, but circles over the ground and returns to his perch. This is repeated several times by others, when finally one alights on the mound and others follow slowly, until at last, a perfect torrent falls upon the spot, covering it so deeply as to endanger the lives of many of them by suffocation; then the whole enormous body suddenly rises with a deafening roar and alights on the trees. This is repeated until all are satisfied unless they are disturbed.

“This peculiar spot was discovered in 1870 by the professional Pigeon-hunters and now this little space brings a good income to the owners who lease it to parties engaged in netting Pigeons, and one of the above mentioned parties, caught with one spring of the net, in 1870, three hundred and forty-two birds. At regular intervals during the day, the male birds relieve the females in the process of incubation and at these times, the whole heavens, as far as eye can reach, is literally filled with small flocks going to and from the nesting; then after a few moments, not a bird can be seen until the change again takes place. I think the changes are at nine o'clock in the morning and four in the afternoon. Millions of young birds are killed in the nest and the lazy Red Man is particularly the cause of their destruction. The old birds are said to leave the beech-nuts in the immediate vicinity of the nesting for the young, going great distances, themselves, to feed, for the whole of Northern Michigan is thickly covered with beech-trees.”

Although I have, on one or two occasions, seen Wild Pigeons even as far north as Massachusetts in winter, this is beyond their usual range at this time, for the greater portion pass the cold season in the South.

FAMILY II. ZENAIDIDÆ. THE MOURNING DOVES.

The sternum is rather narrow, not exceeding one half the length of the top of the keel, the tip of which is pointed.

Members of this family are usually quite small or of medium size. The tarsus is longer than that of the preceding family and is entirely naked, as all the species spend a great portion of their time upon the ground.

GENUS I. ZENAIDURA. THE TURTLE DOVES.

GEN. CH. *Bill, weak, slightly rounded. Tail, very long, equaling the wings; it is pointed and the number of feathers is fourteen.*

Members of this genus are remarkable on account of having fourteen tail feathers, as other Pigeons and Doves occurring within our limits, have only twelve. There is but one species in North America.

ZENAIIDURA CAROLINENSIS.

Carolina Dove.

Zenaidura Carolinensis Bon., Consp. Av. II; 1851, 81.

DESCRIPTION.

SP. CH. Form, slender. Size, medium. Sternum, not very stout. Tongue, long, thin, and narrow, horny at tip which is pointed. Cæca, wanting. Tail, long and graduated.

COLOR. *Adult male.* Top of head, excepting forehead, and remainder of upper parts, excepting primaries, secondaries, and tail, bluish-ash, pure only on the top of head and on greater wing coverts, strongly overwashed elsewhere with olivaceous-brown. Scapularies, broadly spotted with black. Wings, brown, slightly edged with whitish. Tail, ash-blue, overwashed with olivaceous on the middle pair of feathers, and all, excepting these, are tipped with a lighter shade which becomes white on the outer margins of the first pair; while all, excepting middle pair, have a subterminal band of black. Under wing coverts, sides, and flanks, pale bluish-ash. Remainder of under parts, forehead, sides of head, and neck, purplish-brown, overwashed with bluish on the breast, and becoming light yellowish on the throat, abdomen, and under tail coverts. Sides of neck, glossed with a violet iridescence which has greenish and golden reflections. There is a small, black spot on the side of the head which has a bluish gloss.

Adult female. Quite similar to the male, but differs in being much browner above and below, and there is less iridescence on the neck.

Nestlings. Not unlike the adult, but with the feathers edged with lighter. Top of head, spotted with black, and the black markings on the back are much more extended. The throat is destitute of feathers in the younger stages. Feet, pink, bill, black, iris, brown, in all stages.

OBSERVATIONS.

Specimens from Florida are much redder below, darker above, and are somewhat smaller than more northern birds. Readily known from the preceding species by the small size and absence of cinnamon spots on the base of tail, and from other Doves by the pointed tail which has fourteen feathers. Occurs in summer throughout the United States, wintering from Massachusetts southward but not common at this season north of the Carolinas.

DIMENSIONS.

Average measurements of male specimens from Eastern United States. Length, 11.85; stretch, 17.12; wing, 6.05; tail, 5.25; bill, .60; tarsus, .85. Longest specimen, 12.75; greatest extent of wing, 18.25; longest wing, 5.60; tail, 6.00; bill, .70; tarsus, 1.00. Shortest specimen, 11.00; smallest extent of wing, 16.00; shortest wing, 6.75; tail, 4.50; bill, .50; tarsus, .70.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in low trees or bushes; they are not bulky structures, being composed of sticks carelessly arranged, and are without lining.

Eggs, one or two in number, varying from elliptical to oval in form, pure creamy-white in color, with the surface very smooth. Dimensions, from .75 x 1.02 to .90 x 1.23.

HABITS.

The Turtle Doves have a wide distribution, being found from Massachusetts to Key West, Florida, and they breed in all the localities in which they occur. They are, however, much more abundant in some localities than in others; thus in Massachusetts, they occur on Cape Cod much more commonly than in the interior, and in Pennsylvania, they are very abundant along the fertile valleys of the Susquehanna and its tributaries. In the South, they have a much more general distribution for they are found in large numbers among the plantations, in the hummocks, and in the piney woods, while they are very common on the Keys. They appear to adapt themselves to circumstances quite readily; thus, when alarmed at Key West, they will instantly alight in the midst of the thickest jungles, where they are effectually concealed, while in the piney woods, they invariably fly to the high tops of dead trees when startled, where they can watch the approach of the intruder;

then further north, when surprised in an open field, they will dart upward into air and will not rest contented until they have put considerable distance between themselves and the object of their annoyance. These Doves are more or less gregarious, breaking up into pairs, however, during the breeding season, at which time they have a peculiarly loud cry consisting of two notes given in a minor tone, and when heard in the wilderness, it has a singularly mournful effect, especially in coming from a distance, when it somewhat resembles one of the plaintive moans of the puma. When rising from the ground, the wings of this species produce a whistling sound which is quite noticeable.

The Carolina Doves breed late in June, placing the nests in bushes in secluded localities. The young appear in due time but do not leave the nest until late in August, when they accompany their parents and are fed by them after the manner of all Pigeons, by regurgitation. These birds are migratory and although they may occasionally be seen as far north as Massachusetts, the greater portion spend the winter south of this point.

GENUS II. ZENAIDA. THE SHORT-TAILED DOVES.

GEN. CH. *Bill, rather short. Tail, rounded and short, not equaling the wings which are moderately long. Tarsus, not long.*

Members of this genus have the tail noticeably short. The colors are reddish with no conspicuous markings. There has been but one species taken within our limits.

ZENAIDA AMABILIS.

Zenaida Dove.

Zenaida amabilis Bon., List; 1838.

DESCRIPTION.

SP. CH. Form, slender. Size, not large. Tail, short and rounded. Wings, very long. Tarsus, moderately short and stout. Sexes, quite similar in color.

COLOR. *Adult.* Above, yellowish-red, overwashed with ashy and becoming purplish on the top of head. Wings, dark-brown, with the secondaries tipped with white, and the greater coverts are like the back, but are overwashed with bluish. Inner tail feathers, like the back, but the remainder are bluish, tipped with lighter which becomes nearly white on the outer webs, and there is a subterminal band of black. Concealed spots on wing coverts, black, but these become more visible on scapularies. Under wing coverts, sides, and flanks, bluish-ash. Remaining lower portions, sides of head and neck, light reddish-brown, becoming lighter on chin, throat, and abdomen, and fading into bluish-gray on the under tail coverts. There is a small black spot, glossed with bluish, behind eye and a larger one on side of neck, and the sides of neck are iridescent with a purplish luster, having greenish reflections.

OBSERVATIONS.

This species may be readily known by the short tail, white tippings to secondaries, and colors as described. Found by Audubon, only, on the Florida Keys; resident in the Bahamas and West Indies.

DIMENSIONS.

Average measurements of specimens from the West Indies. Length, 10.90; stretch, 17.75; wing, 5.50; tail, 4.35; bill, .58; tarsus, .92. Longest specimen, 11.50; greatest extent of wing, 18.10; longest wing, 6.00; tail, 4.70; bill, .60; tarsus, .95. Shortest specimen, 10.40; smallest extent of wing, 17.50; shortest wing, 5.00; tail, 4.00; bill, .55; tarsus, .90.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground or in trees or bushes and when in the two latter named situations, they are composed of sticks, carelessly arranged; when on the ground but little material is used.

Eggs, one or two in number, varying from elliptical to oval in form, and pure white in color, with the surface very smooth. Dimensions from 1.00 x 1.20 to 1.05 x 1.30.

HABITS.

Although the Zenaida Dove is a well-known bird on the Bahamas and in the West Indies, no one appears to have observed it among the Keys, excepting Audubon who found it quite common there. When on the Keys, I questioned the inhabitants concerning this Dove but they knew nothing about it, yet it may possibly occur as a rare visitor; but I did not see it nor did my assistants meet with it, therefore I can add nothing new relative to it. Audubon says that it spends the greater portion of its time on the ground and that its habits are not dissimilar to those of the Ground Dove.

GENUS III. CHAMÆPELIA. THE LITTLE DOVES.

GEN. CH. *Size, very small. Bill, slender. Tail, short and rounded, not exceeding the wings in length. Sternum, not wide. Feet, small.*

Members of this genus are very small, not very dull in color, with no conspicuous white markings anywhere. There is but one species within our limits.

CHAMÆPELIA PASSERINA.

Ground Dove.

Chamæpelia passerina SWAIN, Zool. Jour., III; 1827, 358.

DESCRIPTION.

SP. CH. Form, rather slender. Size, small. Sternum, not stout. Tongue, short, moderately thick and fleshy, furrowed above, but horny at tip which is provided with coarse cilia. Sexes, not similar.

COLOR. *Adult male.* Top of head and occiput, bluish-ash, with the edges of the feathers darker. Remainder of upper portions, excepting secondaries and primaries, brownish-ash, while the outer wing coverts are edged with purplish-red. There are rounded spots of black, glossed with violet, on the the latter named, and oblique patches on the scapularies of the same color. The tail feathers are slightly tipped with white, and the entire terminal portion, excepting central pair, is purplish-black, which extends to the base beneath. Wings, dark-brown, with the base beneath, under wing coverts, and inner webs, excepting tips, cinnamon-red. Forehead, sides of head and neck, and under portions, purplish-red, lighter on the throat, and becoming browner on the abdomen and under tail coverts, where the feathers are tipped with white. Partly concealed spots on the breast are dark-brown and the feathers of this part are very narrowly edged with dark purplish-red.

Adult female. Differs from the male in being paler above and below, while the blue of the head is overwashed with brownish.

Nestlings. Are not unlike the adult but are duller and decidedly rufous beneath, especially on the abdomen. Iris, red, yellow, or red and yellow mixed, bill, yellow, black at tip, and feet, yellow, in all stages.

OBSERVATIONS.

Specimens are very uniform in color, and although skins from Key West are a little smaller in size, they do not appear darker than those from further north. Known by the small size, rounded tail, and colors as described. Distributed, as a constant resident, throughout the Carolinas and southward.

DIMENSIONS.

Average measurements of sixty specimens from Florida. Length, 7.00; stretch, 11.00; wing, 3.60; tail, 2.32; bill, .52; tarsus, .65. Longest specimen, 7.50; greatest extent of wing, 11.50; longest wing, 3.80; tail, 2.60; bill, .58; tarsus, .80. Shortest specimen, 6.50; smallest extent of wing, 10.50; shortest wing, 3.40; tail, 2.05; bill, .45; tarsus, .52.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in trees or bushes or on the ground. They are rather elaborate structures, being composed of twigs and weeds, lined with Spanish moss.

Eggs, one or two in number, varying from elliptical to oval in form, pure white or creamy in color. Dimensions from .63 x .80 to .65 x .90.

HABITS.

On my trip south during the winter of 1876-77, I did not find the Ground Doves at all until I arrived in South Carolina, and here they were quite common on the cotton plantations of the Sea Islands. This point is about their northern range, for they are not migratory but are abundant below this section as far as Key West. In habit, these little Doves resemble Quail for they spend the greater portion of their time upon the ground, and usually associate in small flocks, feeding upon the seeds of weeds and grass. If startled at such times, they rise with a whistling noise of the wings and conceal themselves in the nearest thicket from which it is difficult to dislodge them; then, when forced to leave this place of refuge, they will instantly dart into the first available patch of shrubbery. They appear to be general favorites with all classes and even the negroes seldom shoot the Mourning Doves, as they call them; consequently the birds become quite tame, often frequenting the streets and gardens of the towns.

They breed rather late and I did not find the eggs until the first week in May in Florida. I have always found the nests in orange groves which appear to be the chosen resorts of these pretty, little Doves. The neat domiciles are placed in the lower limbs of trees, and when approached, the female will quickly slip off her eggs and feign lameness, behaving just as I have seen the Bay-winged Bunting or other Sparrows do under similar circumstances. The male will also fly round and round the place, becoming quite excited but never approaching very near; both birds, however, evince much more solicitude for their eggs than is usually manifested by Pigeons.

Like all members of the order, the Ground Doves are very tenacious of life, and as the feathers become loosened very easily, it is difficult to secure perfect specimens, especially as the birds often lose a large portion of their plumage in struggling if not killed outright. The collector is, therefore, obliged to exercise great care when handling a wounded bird or he will find himself surrounded by a small cloud of feathers which come from the bird when it is held too tightly.

The coo of the Ground Doves is particularly mournful and is given by the males when courting the females, which they do by strutting before them, bowing the head, and puffing out their feathers. These Doves occur much more abundantly on the sea-shore than in the interior but they are also found some distance from the coast.

GENUS IV. GEOTRYGON. THE GROUND DOVES.

GEN. CH. *Bill, weak, long, and slender. Tail, rather short and well rounded. Wings, not pointed. Tarsus, quite short and stout.*

Members of this genus are of medium size and of rather dull colors but often have prominent white markings on the head. There is but one species within our limits.

GEOTRYGON MARTINICA.

Key West Dove.

Geotrygon martinica Bon., Consp. Av. II; 1854, 74.

DESCRIPTION.

SP. CH. *Form, rather slender. Size, medium. Tail, short and slightly graduated, while the feathers are broad, as are also those of the wings.*

Color. Adult. General color of upper parts, brownish-red, with the outer margins of the feathers of primaries and tail edged with greenish. There is a purplish iridescence on the head, neck, back, rump, and upper wing coverts, which has greenish reflections on the last two. Forehead and line behind eye, purplish-red, which is followed by a line of white, bordered below by one of purplish, and the throat is white. Remainder of under parts, light purplish-red, becoming white on the abdomen and under tail coverts.

Nestlings. Dark ashy-brown, becoming considerably lighter below. Feet, pink, bill, yellow, red at base, iris, red, in all stages.

OBSERVATIONS.

Readily known from other Doves by the prominent white markings as described. Occurs in summer on Key West, but is constantly resident in the West Indies.

DIMENSIONS.

Average measurements of male specimens from the West Indies. Length, 11.15; stretch, 17.25; wing, 6.05; tail, 4.34, bill, .73; tarsus, 1.13. Longest specimen, 11.75; greatest extent of wing, 17.50; longest wing, 6.15; tail, 4.58; bill, .75, tarsus, 1.15. Shortest specimen, 10.60; smallest extent of wing, 17.00; shortest wing, 5.90; tail, 4.20; bill, .70; tarsus, 1.12.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in low bushes or on the ground; they are not bulky structures, being composed of sticks carelessly arranged, and are without lining.

Eggs, are, according to Audubon, two in number, oval in form, pure white in color, and about the size of those of the White-headed Dove.

HABITS.

When I visited Key West in 1870, one of the first birds for which I searched, was the Key West Pigeon. Having read Audubon's account of these birds, I had some idea where to look for them and therefore, I started for the scrub, back of the town, a day or two after my arrival. I found the thickets very dense but fortunately, they were traversed by certain paths along which I walked cautiously, keeping a sharp lookout for something new, when upon turning a corner suddenly, a Dove rose unexpectedly, with noiseless wings, from the dust in front of me and, in a twinkling, vanished in the thicket. I promptly turned to follow him, confident that I was about to secure a prize, for I could see that he had alighted not far away. I am tolerably familiar, through a life-long experience, with all kinds of woodland, but when I entered this thicket at Key West, I found that I had a new lesson to learn, for a more impenetrable jungle, it was never my lot to see. It was made up of small shrubbery, about ten feet in height, and, at least, three fourths of the species were furnished with long hooked thorns, and the branches of them all were closely interlaced from top to bottom with thorny vines. Several species of large cacti, armed with long, sharp spines, grew plentifully among the luxuriant vegetation, and the way was further impeded by triangular pieces of coral rock with which the surface of the ground was strewed; add to this array of obstacles, the fact that the weather was intolerably hot and that mosquitoes were very abundant, and one can judge that, although a jungle of this description is quite picturesque when viewed from the outside, a closer inspection is not so pleasant. Through these obstacles, then, I slowly wended my way, endeavoring to preserve the utmost silence, but just as I caught sight of the wished for Dove which was running along the ground, not far away, I stumbled over a pointed stone; the bird rose and disappeared deeper in the thicket, where all my searching failed to discover him. A few days later, I started another Dove but a similar misfortune prevented me from secur-

ing it, and a short time after, while looking for them again, I had the ill luck to run a cactus spine, some three inches long, into my knee, the point entering between the small bones, where it broke; as a consequence, I was confined to the house for nearly two weeks. This occurred during the second week in November and when I recovered sufficiently to again enter the resort which I have described, I could not find the Doves, so concluded that they had migrated.

Although I was not near enough to identify these birds beyond a doubt, I am convinced that they were the Key West Doves. Shortly after this, I was informed by Mr. Joseph Brown who was then mayor of the city of Key West and who had lived on the place for many years, that he had known Audubon when he was on the island and that this ornithologist had taken the Key West Pigeons near the place where I saw the Doves in question. Mr. Brown also informed me that Doves of all the species which now occur on the island, were much more common then than now, for the island was thickly covered with a heavy growth of timber, whereas, at the present time, there is scarcely a tree in the wilder section, over twenty feet high.

GENUS V. STARNOENAS. THE QUAIL DOVES.

GEN. CH. *Bill, very short. Tail, but little rounded, short, and broad. Wings, also short and not pointed. Tarsus, not long.*

Members of this genus closely resemble the Quails in general appearance, being stout and round in form, with short wings and tail. There has been but one species taken within our limits.

STARNOENAS CYANOCEPHALA.

Blue-headed Dove.

Starnoenas cyanocephala BON., List; 1838.

DESCRIPTION.

SP. CH. *Form, robust. Size, quite large. Tail, short and but little rounded. Wings, short. Tarsus, moderately short and stout. Sexes, quite similar in color.*

COLOR. *Adult.* Above, and on sides and flanks, chocolate-brown, overwashed with olivaceous. Top of head, blue, banded below with a line of black which becomes quite wide on occiput and narrow in front. Sides of head and forehead, black, with a white line passing from chin, beneath eye, to occiput. Throat, black, bordered with white below. Remaining lower portions, reddish-brown, becoming lighter on the middle of breast and darker on the under tail coverts. The tail feathers are overwashed with bluish on outer webs.

OBSERVATIONS.

This species may be readily known by the short tail, robust form, and colors as described. Found only by Audubon on the Florida Keys; resident in the West Indies.

DIMENSIONS.

Average measurements of specimens from the West Indies. Length, 11.60; stretch, 17.25; wing, 5.50; tail, 4.40; bill, .55; tarsus, 1.30. Longest specimen, 12.50; greatest extent of wing, 17.50; longest wing, 5.60; tail, 4.50; bill, .60; tarsus, 1.35. Shortest specimen, 10.70; smallest extent of wing, 17.00, shortest wing, 5.40; tail, 4.30; bill, .50; tarsus, 1.25.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground or in trees or bushes and when in the two latter named situations, they are composed of sticks, carelessly arranged; when on the ground but little material is used.

Eggs, one or two in number, varying from elliptical to oval in form, and pure white in color, with the surface very smooth. Dimensions from 1.05 x 1.40 to 1.10 x 1.43.

HABITS.

Audubon appears to be the only ornithologist who has ever met with this singular Dove on the Florida Keys and he never procured a specimen but merely saw a pair early in May, 1832; yet he was informed by the inhabitants that they occurred on the Mule Keys, where, however, he failed to find them. I never saw a specimen there nor heard of them and think that they must be very rare now on the Keys, if they occur there at all. Out of the five species of Doves which Audubon found on the Keys, but two, the White-headed, and Ground, Doves, occur at all commonly. This diminution in the number of these birds, may be due to the persecution to which they are subjected during autumn, for nearly all the species are killed for food, but it is probably largely due to the fact, that the Keys are not as heavily wooded now as formerly, thus they do not present as many available places of shelter for the birds. It will be observed that I say that Audubon only found five species of this order on the Keys, for he evidently never saw the Carolina Dove there, for when speaking of the Zenaida Dove, he says, "The cooing of this species so much resembles that of the Carolina Dove, that, were it not rather soft, and heard in a part of the world where the latter is never seen, you might easily take it for the notes of that bird." This is worthy of notice, for the Carolina Doves are now common on all the Keys, and when taken in connection with the fact, that they prefer more open country than is inhabited by the other Doves which I have described, tends to show that they have extended their range to these islands since the time of Audubon's visit.

NOTES ON THE WHITE-HEADED PIGEON, HABITS:

This species is common on all of the Bahama Islands in winter, quite a number occurring still on New Providence, and they are not unfrequently met with near Nassau. These Pigeons usually resort to the wilder keys during the breeding season, usually choosing the rocky islets as nesting places.

The first nest of the White-Headed Pigeon that I ever saw was on the South Shore of Andros on April 29th, 1884. This was placed in a buttonwood tree about ten feet from the ground, and was merely a flat platform of sticks on which were placed a few leaves. Although the female was sitting near the nest it contained no eggs.

One of the most remarkable sights that I ever witnessed as regards numbers of birds' nests was on one of the Washerwomen Keys off the South shore of Andros. These are small rocky islets, lying on the barrier reef, and are some twenty-five feet high. On one of these little keys, which did not contain over an acre of land, there were at least ten thousand nests of the White-headed Pigeon. The rocks were mostly covered with a scanty growth of low bushes and with a more luxuriant growth of cacti, and upon both plants and bushes the birds had placed their nests, and some were upon elevated portions of rock, while a few were placed upon the naked ground. So completely covered was the southern and northern portion of the key that the nests were nowhere over two feet apart and often nearer together than that. Unfortunately, however all of these nests were of the previous year, only a single dove being seen.

My boatmen informed me that this rookery was occupied by many thousand birds during the past year, and that the spongers were accustomed to visit the place at night and capture the sitting birds. This statement was confirmed by the remains of torches which were scattered about the island. Many nests contained egg shells, the contents of which had been removed by Buzzards, Man-of-war birds or Gulls. The time of this visit was May 8th, 1884.

On June 7th of the same year, I visited the Green Key lying to the eastward of the Tongue of Ocean, a large island containing many acres, and a noted breeding ground of the Pigeons. At this time there were perhaps a thousand birds on the island and they were preparing to breed, several nearly completed nests being found but none contained fresh eggs. Judging from my experience with the Pigeons here and elsewhere, I should say that in the Bahamas, as on the Florida Keys, the time of breeding for the White-headed Pigeon is the middle of June.

About the first week in July, previous to 1884, sportsmen from Nassau had been in the habit of visiting Green Key and shooting the breeding Pigeons as they flew from their nests to cross to Andros Island, some fifteen miles distant, where they are said to go daily for food and water. Many of the nests of the previous season which I had examined on Green Key contained broken eggs that contained the remains of half formed young, and in some of the nests were the skeletons of newly-hatched young; the parents of both eggs and young had doubtlessly been killed as they left the nests. This sight was a most piteous appeal to humanity. I was informed by one of my boatmen, who had accompanied hunting parties to the key, that so great was the slaughter of Pigeons that many more were killed than were needed, and that he had frequently seen hundreds of birds buried in the sand of the beach near where they were shot.

Upon my return to Nassau I promptly stated the facts as I had observed them to the Governor, Sir Henry A. Blake, and as I have elsewhere stated in this work, through his ready and sympathetic co-operation a law was enacted protecting these Pigeons during the breeding season.

During two subsequent visits to the Bahamas I was happy to see that this law had the desired effect and that it has afforded absolute protection to the Pigeons from May until September.

It seems singular that the White-headed Pigeons should resort to a key so far from their supply of food and water, yet they have nested upon this key for many years, and upon the time of my visit flocks consisting of about a dozen or fifteen individuals were constantly rising and leaving the key in the direction of Andros.

The notes of this Pigeon are very loud and characteristic, sounding something like "wof, wof, wo, co-woo." The first three notes are repeated several times, then the "co-woo," is long drawn out; all being in as low a key as the hoot of an owl. The entire cry is cleverly imitated by the Creoles when they wish to decoy the bird within gun shot, but there is a certain tremulousness in the real notes which cannot be imitated by the human voice.

The White-headed Pigeons are thoroughly at home among the thick branches of the trees and shrubbery of the Bahamas, moving about among them as easily as do the smaller perching birds, and they make very little noise. When surprised by an intruder they will remain perfectly quiet until approached within a few yards, when they will spring rapidly into air, rise to the tips of the woodland, and dart off with an exceedingly rapid flight, in fact, few, if any birds, can fly any more quickly than do these Pigeons. I have shot several in air, as they rose from the bushes and darted away, but I never attempted to shoot one as it passed me at full speed at right angles. When dashing along at this headlong speed they will suddenly alight upon a branch or on the ground, without the beating or fluttering of the wings which usually attends a similar abrupt stoppage in most birds of a similar size, and which is so noticeable in our domestic pigeon.

NOTES ON THE ZENIADA DOVE. This dove possesses one of the most singular sound-producing apparatus that I have ever seen.

The trachea is straight, some 3.50 long, is cylindrical on its upper portion, but is slightly flattened as it approaches the inferior larynx. The most marked peculiarity in the trachea is a hollow, which beginning by a slight depression, increases in width and depth gradually, until it approaches the larynx, when it becomes gradually smaller. The walls of this depression are very thin and may possibly serve as a vibrating membrane. See fig. 47, A, A, where is given a life-sized figure of the upper side of the trachea, showing this peculiarity.

The sterno trachealis arises about .30 above the larynx and is quite well developed. Besides this on either side arises a thin narrow strip, evidently the remains of a broncho trachealis. These muscles extend over about eight rings of the trachea and then extend over the inferior larynx near the lower side.

In the lower larynx is anearily circular orifice, about .12 in diameter across which stretches a thin, nearly transparent membrane, to the side of which the broncho trachealis is attached. See *ib.*, B, M, being the membrane. At C, I have given an enlarged view of the membrane, lettered as at B.

The bronchial tubes are rather thin, with nine half rings, and with a normally developed tympaniform membrane.

This dove, as might be expected from such a musical apparatus, has a singular note. The male perches upon a limb of a tree, swells out his throat, and utters his cooing song, which he repeats at rather regular, but protracted, intervals.

This song begins with two notes, the first uttered with a falling inflection, the second with a rising. The second follows the first rather quickly, and is not as prolonged. Both are in a low key. Then follows three other notes, sounding like "Who, who, who," but there is a decided pause between the first two; the last three are given in the same time and in the same key. The notes are all loud, but when softened by distance have a singularly mournful effect.

On the islands of Cayman Brac and Little Cayman I encountered a dove which closely resembles the Zeniada and which coos in much the same manner, but which differs somewhat in the laryngeal structure.

The hollow is present in the trachea above, much as in *Z. amabilis*, but the trachea is a little wider. See fig. 47, D, where I give a slightly enlarged view of this side of the trachea, the lettering being the same as in *Z. amabilis* in all the figures.

The sterno trachealis has a peculiar origin, as both branches of it emerge from one point close together on the lower side of the trachea. See *ib.* D, s. The broncho trachealis is slightly enlarged at the end near the membrane in the lower larynx and this membrane is rather more oval in form than in the allied species. See *ib.* D and E, m. There are eight half rings to the bronchial tubes, and the tympaniform membrane extends its entire length. In spite of this variation in the form of the sound producing organs I could not perceive any difference in the notes uttered by this species and those given by *Z. amabilis*. The Cayman Doves were exceedingly tame and I have frequently watched them feeding within a yard of my feet.

NOTES ON HABITS:

The Zanaida Dove is an exceedingly common species on the Bahamas, excepting in the immediate neighborhood of settlements. They are particularly fond of the small, outlying keys, and very small islets will frequently form the home of two or three pairs. The Zanaida Dove is not at all gregarious in habit, and I do not remember seeing more than two together anywhere, in fact, after the breeding season, it is quite usual to find solitary individuals in the thickets. This Dove lives most of the time on the ground and often, according to report, breeds there. On May 11, 1884, as I was standing on a little

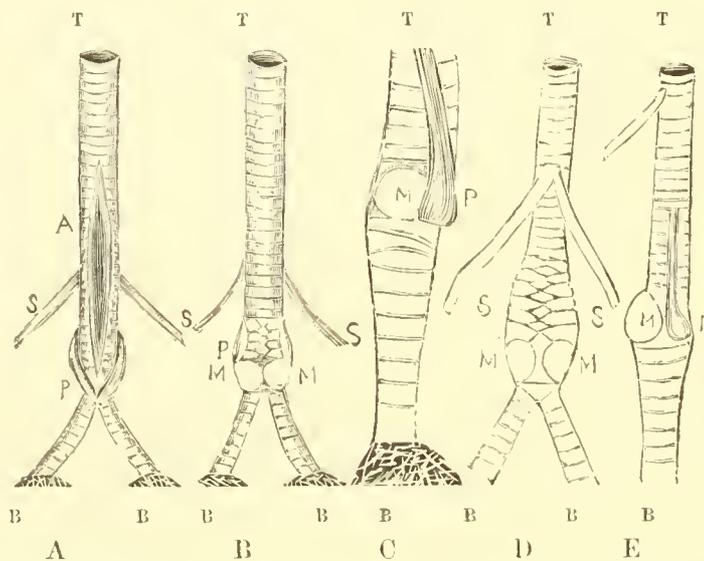


FIG. 47. Illustrating the inferior larynx of the Bahama and Cayman Zanaida Doves. A, B, C, Bahama, D, E, Cayman. A, hollow in trachea; s, sterno trachealis; p, broncho trachealis; m, vibrating membrane; b, bronchial tubes; t, trachea, in all figures.

sand spit on the west side of Golden Key, a Least Tern began flying over a grassy patch near, uttering its shrill cry. This started a Zanaida Dove from her nest. She rose with a fluttering flight and flew to the shore, then afterwards ran along the rocks. I went to the place from which she started and found the nest on the ground in open sight. There were two eggs in an advanced stage of incubation. These were deposited on a few sticks which were laid on the sand. The bird made no outcry as she rose.

The notes of this bird which I have described above are very loud and on a still morning can be heard for a long distance. The males begin to coo with the first indication of the dawn, and begin to fly about some time before sunrise. They also coo at sunset and continue to utter their mournful notes until darkness fairly begins.

Chamaepelia bahamensis.**Bahama Ground Dove.**

DESCRIPTION.

SP. CH. Similar in form and general coloration to the Ground Dove but somewhat smaller and paler; the color on the lower parts and on the wings above being much less ruddy and the top of the head is more

ashy this color often extending well down on to the neck above. The bill is wholly black, not red at base.

OBSERVATIONS.

Readily distinguished from the common Ground Dove, by the distinctively black bill and paler colors. In 1887 I described this species (See American Exchange and Mart, Vol. III, No. 4, page 69, Feb. 5th, 1887,) and about that time I examined Mr. Cory's large series of Ground Doves and among them I found a single specimen of a Bahama Ground Dove taken in Florida, I think at Enterprise, but at what time I do not remember, thus the Bahama Ground Dove should be included in our fauna. The eggs do not differ from those of our common species excepting in being smaller.

DIMENSIONS.

Length, 6.50; wing, 3.25; tail, 2.20; bill, .50; tarsus, .62.

HABITS.

This is an exceedingly common and familiar bird throughout all of the Bahama Islands which I have visited, being equally abundant in the grounds about the houses, even in the city of Nassau, in the open spaces in the scrub remote from settlements, as well as on the most desolate and unfrequented keys, provided they are sufficiently wooded to afford the birds shelter. In the city of Nassau, and in other towns and settlements, they are very tame, feeding about the houses either in pairs or in small flocks of from half a dozen to a dozen individuals.

The Bahama Ground Dove breeds everywhere about the more open portions of the scrub. The nest, as far as I have observed, is always placed on trees or bushes, the latter being most often chosen as a nesting site. The Doves breed quite irregularly, as will be seen by the following notes:

On January 25, 1884, I secured a female with eggs nearly ready to deposit. On January 26th found a nest containing two eggs well advanced in incubation. The nest was placed on an orange tree, about four feet from the ground, on a deserted plantation. As I approached, the female dropped to the ground and instantly disappeared in the neighboring scrub, without uttering a note. January 28th: Today secured another nest with eggs not as far advanced. This was placed on the top of a bunch of vines, that lay on a bush, that grew near a deserted plantation. The bird was setting, but behaved in a similar manner to that of the first nest found. On the same day I got a newly feathered bird just able to fly. February 23d: Nestlings fully grown are common.

March 16th. Had a nest brought in containing two newly hatched eggs, and on the same day I started a bird from a nest, which was placed in a bush about as high as my hand, that contained a fully fledged young, that flew from the nest as I put my hand into it. My attention was attracted to this nest by seeing the male, which was moving about in a circle on the ground in the thicket, which was near, with his wings spread out, counterfeiting lameness. Later in the day I found a nest containing one fresh egg, that was placed in the edge of the scrub. Later still procured a nest built on the top of a broken branch of an orange tree, in a negro's yard, that contained two eggs nearly hatched, and still later found another nest which contained eggs in the same condition.

The notes of the Bahama Ground Dove appear to be similar to those of the common

Ground Dove, but are, if anything louder. In regard to this I find the following in my note book: Nassau, May 28. Ground Doves are unusually abundant and noisy, especially early in the morning, insomuch so as to be a perfect nuisance, for we can hear nothing else but their mournful notes.

NOTES ON THE KEY WEST DOVE. HABITS:

I found this Dove quite common on Andros, in May, 1884, their peculiar long drawn and mournful note being frequently heard in the scrub. This note is given by the males when sitting on a tree, but so shy are they that when I endeavored to approach them, even with the greatest caution, they would become alarmed, drop to the ground and make their way quickly through the nearly impenetrable undergrowth. At this time I found the Key West Doves all along the Eastern shore of Andros from Fresh Creek southward to Grassy Creek, but did not see a single specimen at Fresh Creek nor at Middle Bight in November and December, 1887, nor in the same section in May, 1893, nor did I find it at Inagua in February, 1888.



FIG. 48. Young of Florida Mottled Owl.

ORDER X. FALCONI. HAWKS, ETC.

Sternum, stout and arched. Keel, high. Furcula, very strong and considerably arched. Head, not large.

Although some of the members of this Order resemble the Owls somewhat in external form, they differ widely from them in many internal characters. The eyes in the Owls are quite large but among the present birds, they are not directed quite so well forward, neither are they especially adapted for seeing by night. The bill, as in the Owls, is strong and curved but is not often concealed by bristly feathers. Usually there is no disk of feathers surrounding the face but this is occasionally present, notably among the species in *Circus*, in which genus the cavity of the ear is also large; yet this is not so remarkable in other Hawks. The tarsus is usually rather long and naked but is occasionally feathered, even to the toes. The wings are long and well formed but the plumage is compact, especially that by which flight is produced. The sternum is always strong, with either an unbroken margin or two or four marginal indentations. These are either closed or open but they differ widely in this respect, as will be seen under family and generic characters. The keel is quite high as a rule, although it does not always equal in height one half the width of the sternum and seldom exceeds it. The costal process is much smaller than in the preceding order. The coracoids are stout and of medium length, as in the Gulls, and are set on at a wide angle but, unlike the latter named order, where the furcula is noticeably weak and without a terminal expansion, in these birds, it is very strong, well arched, and has a slight terminal expansion. The scapula is similar in form to that of the Owls but is more inclined backward toward the sternum than in the latter named order, where it is set on at nearly a right angle with the coracoid. The manubrium is usually present but small. All this sternal structure indicates that its possessors are not only endowed with powerful flight but that they are capable of making very rapid and abrupt aerial evolutions.

As in the Owls, the œsophagus is wide but in these birds, it is dilated into a crop of considerable size. The proventriculus is very well developed. The stomach is large but not muscular. Although the fold of the duodenum is quite long, the pancreas is not very large. There are two cœca but they are not very well developed, often, in fact, being rudimentary. The females are larger than the males.

FAMILY I. MILVIDÆ. THE KITES.

The sternum, about equals in width the length of the coracoids and the scapular process of the latter does not meet the furcula. Marginal indentations, two, included.

In this family, I have included a number of genera which, although they vary greatly in external form, agree in sternal characters as given above. The manubrium is moderately well developed but is not forked. The furcula is stout, flattened by lateral expansion, wide and thick near the base which is abruptly truncated, not being produced into a point. The terminal expansion is small and the furcula near it is contracted, furrowed above,

and bent downward to a point at about one half the height of the keel. The marginal indentations are large in the young stages, but are always inclosed, becoming smaller in the more adult birds.

GENUS I. CIRCUS. THE HARRIERS.

GEN. CH. *Bill, not long, well curved, with the cutting edge of upper mandible slightly lobed. Tarsus, long and nearly naked. Tail, long, but is not equal in length to the wings which are considerably elongated. Lower portion of face, surrounded by a ruff.*

Members of this genus not only resemble the owls in having a ruff, or facial disk, but the ear cavities are large and the plumage is somewhat downy. The leg is strikingly long and the tarsus is naked to the heel behind, but is slightly feathered in front. Four outer quills are incised on the inner webs. The trachea is flattened throughout. The sterno-trachealis is short, having its origin about 25 from the larynx, and there is a slender bronchialis extending over all the half-rings, but no other laryngeal muscles. The tympaniform membrane is present and although there is a thin os transversale, it does not support a semilunar membrane. The walls of the oesophagus are thin; this is at first nearly straight, then is dilated into an oblong crop near the middle, after which it is again straight until it opens into a rather small proventriculus with simple, oval glands arranged in a zonal band which measures 1.00 in *cyaneus*, from which this and the following dimensions were taken. The stomach is of medium size, somewhat globular in form, with thin but soft walls and is lined with a soft membrane. The fold of the duodenum is long, measuring 3.50, inclosing a narrow pancreas which extends its entire length. The coeca are merely represented by slight swellings on either side of the intestine. The spleen is an elliptical body lying directly on the proventriculus. Both lobes of the liver are equal in size and are short and thick. The heart is large, bent slightly to the right and not very pointed. Sexes, not similar in color. There is but one species within our limits.

CIRCUS CYANEUS.

Marsh Hawk.

Circus cyaneus BOTE, Isis: 1822, 549.

DESCRIPTION.

Sp. CH. Form, long and slender. Size, medium. Sternum, rather stont, with the marginal indentations varying with age. Tongue, short, not very fleshy, and about the same width for nearly its entire length, then abruptly rounded but not bifid. Bill and claws, not long.

Color. *Adult male.* Above, including upper wing coverts, sides of head, and breast, pale bluish-ash, becoming rufous on the back of the head and upper neck. Upper tail coverts, white. Wings, brown, edged on the outer webs with ashy and barred with darker. Two middle tail feathers and outer webs of remainder, bluish-ash, and inner webs, rufous, barred across the feathers with dark-brown. Under portion of tail, silky white. Beneath, including under wing and tail coverts and tibia, white, spotted with pale reddish. Iris, pale yellow.

Adult female. Above, brown, with the feathers more or less ashy, edged on the head and neck and spotted on the remaining portion with rufous. Beneath, including under wing and tail coverts, reddish-white, darkest on the tibia, with every feather having a central spot of reddish-brown, broadest and darkest on the breast, narrower on the neck, smaller, rounder and more decidedly rufous on the posterior portions and tibia; otherwise as in the male.

Young male. Similar to the adult female but decidedly darker above, where there is no trace of ashy but there is more rufous on the spottings and edgings. Beneath, very dark rufous, not much spotted, often being wholly immaculate on the posterior portion and tibia. Iris, brown.

Young female. Quite similar to the young male but somewhat lighter throughout, especially below, where the darkening of the rufous is only seen on the tibia.

Nestlings. Are at first covered with a reddish down, then gradually assume the plumages last described. Iris, brown. Bill, bluish-black, cere, greenish, feet, yellow, and claws, brown, in all stages.

OBSERVATIONS.

There appears to be considerable variation in specimens, some being darker than others and more heavily spotted, but this may be due to age and sex. Known from all other species by the peculiar ruff about the face combined with the white of the upper tail coverts, which is noticeable in all stages. Distributed, as a summer resident, throughout North America. Constantly resident in the more southern portions.

DIMENSIONS.

Average measurements of male specimens from Eastern United States. Length, 19.00; stretch, 40.00; wing, 13.50; tail, 7.50; bill, .90; tarsus, 2.90. Longest specimen, 20.00; greatest extent of wing, 42.00; longest wing, 15.00; tail, 9.00; bill, 1.00; tarsus, 3.00. Shortest specimen, 18.00; smallest extent of wing, 41.00; shortest wing, 14.90; tail, 8.00; bill, .80; tarsus, 2.80.

Average measurements of female specimens. Length, 23.00; stretch, 45.50; wing, 13.00; tail, 8.50; bill, 1.00; tarsus, 3.25. Longest specimen, 24.00; greatest extent of wing, 48.00; longest wing, 15.50; tail, 10.00; bill, 1.10; tarsus, 3.50. Shortest specimen, 22.00; smallest extent of wing, 43.50; shortest wing, 14.50; tail, 9.00; bill, .90; tarsus, 3.00.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground or near it. They are not very bulky structures and are composed of sticks, twigs, weeds, etc., lined with grass and leaves.

Eggs, four to six in number, rather oval in form, greenish-white in color, either immaculate or faintly spotted with pale brown or lilac. Dimensions from 1.42 x 1.80 to 1.45 x 1.88.

HABITS.

The Hawks, now under consideration, have been rightly named as far as the appellation by which they are commonly known, is concerned, for it will be difficult to find a marsh, either salt or fresh, of any extent, which is not more or less hunted over by these birds. It makes but little difference as to the situation of these low-lying tracts of country so long as they form the homes of mice, small birds, frogs, or even snakes, for the presence of any of these animals is sufficient to induce the Marsh Hawks to visit the sections in which they occur, in order to prey upon them. Thus they may be seen hovering over the cold, heath-covered bogs in the far north, searching for mice or small birds; they are common along the fresh water meadows of New England, are abundant in the middle districts, and fairly swarm among the rice fields and along the rivers of the Carolinas and Georgia, extending their range even to the vast savannas of Southern Florida, in all of which places the abundant mammalian, avian, and reptilian life offers them an ample and varied diet.

Thus it will be seen that all sections are alike to the Marsh Hawks and scarcely any thing that has life, comes amiss to them by the way of food. Perhaps I ought to have said, however, any thing that lives or has lived, for these Hawks will not only eat mice, small birds, frogs, snakes, or insects, which they catch and kill, but will also eat dead animals. On several occasions, I have known of them eating Ducks which have been killed by gunners, or some animal, and either lost or abandoned. The Marsh Hawks are, as a rule, not very bold but I once knew an exception to this and, while in Florida, some years ago, repeatedly saw one of these birds rob a Peregrine Falcon of Ducks which it had captured. This appears almost incredible but I was once quite near when the Marsh Hawk took possession of the booty of the Falcon that was sitting on the ground, and I distinctly saw the latter give up his prey, almost without a struggle, to the venturesome Hawk which coolly began to eat it, utterly disregarding the screams of the Falcon that was darting about a few yards above him. Nor would he quit his meal until I had approached quite near, when he flew reluctantly away. On the two occasions when I took the trouble to examine the half-eaten Duck, I found that it was a Scaup, a species which was too heavy for either the Falcon or Hawk to carry away with ease; therefore they were obliged to leave it when attacked and when surprised.

The Marsh Hawks hunt by flying a short distance above the ground, when, upon perceiving their prey, will poise for a moment in air upon vibrating wings, then drop suddenly downward; but they are not quick enough to be sure of their victim every time they try to catch it and will often make several attempts before they succeed.

These Hawks are very methodical in their habits and will hunt over certain portions of a marsh or meadow every day, passing a particular point about the same time. This is especially noticeable in summer when they are securing food for their young.

The Marsh Hawks breed about the first week in May in the North, usually placing the nest on the ground in some secluded bit of meadow. When the female is sitting, the male is very watchful, guarding the immediate locality with great assiduity, and whenever he perceives an intruder, he gives notice to the female by uttering short, shrill screams, when she stealthily leaves her eggs. Thus the nest is not easy to find but by watching the male when he is flying about, one may judge of the approximate position of it; for he will frequently pause a moment, when he thinks he is unobserved, to hover over the spot or will swoop down toward it, evidently to assure the female of his presence. The young are cared for by the parents until they have left the nest, after which they soon begin to forage for themselves and by the middle of October, both young and old migrate southward.

GENUS II. ROSTRHAMUS. THE CURVE-BILLED HAWKS.

GEN. CH. *Bill, long, well curved, with the cutting edge of upper mandible not lobed. Tarsus, not long and nearly naked. Tail, slightly emarginate, about equal in length to one half the length of the wings which are considerably elongated. There is no ruff on the face.*

Members of this genus have no ruff, or facial disk, nor are the ear cavities strikingly large. The leg is short and the tarsus is naked to the heel behind, but is slightly feathered in front. The claws are very long and pointed. Four outer quills are incised on the inner webs. Sexes, not similar in color. There is but one species within our limits.

ROSTRHAMUS SOCIABILIS.

Everglade Kite.

Rostrhamus sociabilis BAIRD, Birds N. A.; 1858, 32.

DESCRIPTION.

Sp. CH. Form, rather slender. Size, medium. Sternum, rather stout, with the marginal indentations varying with age. Tongue, short, not very fleshy, and about the same width for nearly its entire length, then abruptly rounded but not bifid. Bill and claws, long.

COLOR. *Adult male.* Above, including upper wing coverts, sides of head, and upper throat, dull black, tinged with pale bluish-ash, which is brightest on the back of the head and upper neck. Upper wing coverts, shoulders, and scapularies, overwashed with reddish-brown. Upper and under tail coverts, white. Wings, black, edged on the outer webs of secondaries and tertiaries with rufous. Tail, black, with the basal portion of one half the four outer, and two thirds of the remaining, feathers, white, and all the feathers are broadly tipped with reddish-brown, while a band of the same color precedes the basal white above. Under portion of wings and tail, whitish. Beneath, including under wing coverts and tibia, dark-brown, becoming reddish on the latter. Cere, naked space before eye, commissure, base of lower mandible, and feet, bright-orange. Claws and remainder of bill, black.

Adult female. Above, dark-brown, more or less tinged with ashy, with the feathers of the back and wing coverts edged with rufous. Beneath, including under wing coverts and tibia, dark-brown, streaked and spotted with rufous. Narrow band on the forehead, upper portion of throat, and under tail coverts, yellowish-white, with the shafts of the feathers of the two former, black. Cere, etc., yellow. Otherwise as in the male.

Young male. Similar to the adult female but with the throat whiter and the stripes on under surface lighter and a little broader. Superciliary line, extending from base of bill to occiput, and spaces on sides of neck, also white. Cere, etc., pale orange. Iris, ruby-red in all stages.

OBSERVATIONS.

There appears to be but little variation in specimens of the same age and sex. Known from all other species which occur within our limits by the long, curved bill and claws and by the colors as described. A skin of an adult female, from the Smithsonian Collection (No. 53,081), taken in Buenos Ayres, and kindly loaned by Prof. Baird, does not differ essentially from Florida birds, excepting in being, perhaps, a little darker. Distributed, as a constant resident, throughout the marshy sections of Middle and Southern Florida and in some portions of South America.

DIMENSIONS.

Average measurements of male specimens from Southern Florida. Length, 17.00; stretch, 41.75; wing, 13.75; tail, 6.85; bill, 1.00; tarsus, 1.85. Longest specimen, 18.00; greatest extent of wing, 45.00; longest wing, 11.00; tail, 7.00; bill, 1.04; tarsus, 2.00. Shortest specimen, 16.00; smallest extent of wing, 44.25; shortest wing, 13.50; tail, 6.75; bill, .95; tarsus, 1.75.

Average measurements of female specimens from Southern Florida. Length, 17.05; stretch, 45.30; wing, 14.25; tail, 7.50; bill, .93; tarsus, 1.65. Longest specimen, 17.10; greatest extent of wing, 45.90; longest wing, 11.50; tail, 7.50; bill, 1.00; tarsus, 1.80. Shortest specimen, 17.00; smallest extent of wing, 41.75; shortest wing, 14.50; tail, 7.50; bill, .95; tarsus, 1.43.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in bushes. They are not very bulky structures and are composed of sticks, twigs, weeds, etc., lined with grass.

Eggs, one or two in number, rather oval in form, bluish-white in color, spotted and blotched irregularly with brown and amber of varying shades. Dimensions from 1.40 x 1.55 to 1.55 x 1.76.

HABITS.

The Everglades! Nearly every intelligent individual looks with interest on these words, but to him who loves to study the works of Nature, they express volumes of untold wonders; for long has this section of Florida been an unknown land to the naturalist. Owing to their remote situation, but a few white men ever enter their limits; indeed, I will venture to state that it would be difficult to find a hundred individuals who have stood within their borders and few among this number would possess any great degree of intelligence, while perhaps none would be students of Nature. I had long desired to see this far-famed spot and was, therefore, much pleased to find myself on the banks of the Miami River and learn that this beautiful stream was one of the numerous thoroughfares used by the Seminoles in passing to and from their homes in Pi-i-o-kee, the Indian name for the Everglades.

Not long after our arrival, four of us entered a small dingey with the intention of visiting these extensive marshes. This attempt, however, proved unsuccessful, for we were unable to stem the swift current with the boat so heavily laden.

But a few days later, on the eighteenth of February, accompanied only by a single individual, I again made the attempt. We started early in the morning and rowed up the winding river, the margins of which were bordered for some distance with mangroves. Leaving these, we came into a more open country and caught sight of the pine barrens. Still we pushed onward, passed the only houses, or rather shanties, that disgrace the bank, and entered the unbroken wilderness beyond. The river's edges were now overhung by a dense growth of flowering shrubs from which rose an occasional palmetto that hung its

graceful fronds high in air, while here and there a dead live-oak stretched its whitened arms over the stream, and these leafless branches were chosen by the Anhingas as perches. Here they sat in silence, moving their long, outstretched necks with graceful gesture, until we approached almost within gun-shot, when they rose and flew quickly up-stream. Large water oaks also overhung the river with their evergreen foliage thickened with numerous parasitic plants and creepers which grew upon the huge branches or twined in graceful festoons over them. These secluded places were the chosen retreats of the Yellow-crowned Night Herons which, as we drew near, rose in flocks, with discordant screams, and followed in the wake of the Anhingas. Small companies of White Ibis flew swiftly over, and high above us, on motionless wings, circled an Osprey, ever drawing nearer the head of the river. Several Kingfishers dashed past, rattling merrily as they flew to their fishing grounds above.

The stream, however, grew narrower and the current very rapid, but everything seemed to invite us onward and, by redoubling our efforts, we were enabled to proceed slowly. After a row of six miles, we reached the foot of some rapids. This declivity was quite abrupt, with steep, rocky sides, and the water rushed down in a furious manner. Stimulated by the thought that the unexplored region was beyond, we concluded to attempt the difficult passage and landed on the rocky bank which was destitute of vegetation for some feet from the water and, by means of the painter, I drew the boat slowly up the foaming river, while my companion kept it off the rocks with an oar. In this laborious manner, we advanced for several hundred yards, passing a few tributary torrents, and at last reached the top and launched our boat on the quiet waters of the Everglades.

Our earliest recollections of this famous locality were taken from engravings by artists whose pencils were prompted solely by the imagination. These pictures represented a gloomy swamp overhung with dark-leaved cypress, the roots of which were submerged in black and slimy water. In these sombre retreats, amid rank and noxious weeds, crawled great alligators and clammy serpents, fit inhabitants of this dismal region, the silence of which was described as being unbroken save by the harsh cry of the Heron or the hoot of an Owl.

But a far different scene met our gaze as we emerged from the canon and glided smoothly over the bright and sunlit waters. Directly in front lay an immense plain of saw-grass, which the fresh breeze caused to rise and fall in huge emerald billows. This sea of verdure was bounded on the west by some distant islands, while on either hand appeared rich and fertile hummocks covered with a very thick growth of lovely trees and shrubs. Our ears were greeted with the familiar song of the Red-winged Blackbird, a Blue Heron sprang chattering briskly from the margin of the stream, and flocks of snowy-plumaged Ibis rose from the grass, Anhingas and Cormorants darted through the clear air, while the marshes resounded with the musical pipings of thousands of frogs.

We pushed onward through this picturesque scene for nearly a mile, over waters teeming with fishes of varied hues; then the stream narrowed and we paused for a time before turning back. While here, our attention was attracted by a bird that resembled a Marsh Hawk, sailing low down over the grass and, as it approached us, we perceived that

it held a round object in its talons. It drew nearer and finally settled on a magnolia bush a few rods away, when I saw that it was a bird that was new to me and I instantly shot at it without effect. It rose and flew away and I anxiously watched it as it hawked about the marsh after the manner of our common Harrier. Then it dropped upon something and returned to its former perch with its prey which was a round object, similar to the first, when I once more fired, but only succeeded in loosening a few feathers, for the bird got up leisurely and went in search of more game, apparently unharmed. It soon returned again but was shy of the bush and would not settle; thus I was obliged to shoot at it on the wing but unaccountably missed it a third time. Thinking, no doubt that we were in earnest, it then flew away and did not return, although we waited a long time for it. We then turned homeward, somewhat disappointed, darted down the rapids with the speed of an arrow, and reached the bottom without accident. As I had seen but a single Kite I concluded that some accident had brought it to the Everglades at that time and that I should see no more of it. This hypothesis was, in a measure confirmed by my visiting the locality afterward without seeing it.

On the first of March, I entered the Everglades accompanied by Mr. Henshaw; then we were in search of Anhingas and, as they were very shy and difficult to procure, I concluded to use stratagem to obtain a shot at them. Therefore my companion landed me in a small cypress island to the right of the main stream, where I concealed myself beneath a tree that was thickly hung with long streamers of Spanish moss. My companion then rowed up the river for the purpose of driving the Snake Birds down, and as they were accustomed to alight on the trees on the island they would be within range of my gun. After a time, several came down as expected, and I had killed one, when I heard the report of my friend's gun. I was wondering what he had killed, when he appeared with a beaming countenance.

He pushed the prow of the skiff into the reeds that grew at my feet, and in reply to my question, "What have you got?" held up a Kite that I recognized at once as the same species that I had vainly endeavored to obtain upon a former visit to this place. It was an adult male and Mr. Henshaw stated that he had seen another. Upon hearing this, the Anhingas were forgotten and leaping into the boat, we pushed off. As we approached the spot where I had seen the bird before we perceived one sitting on a bush. By carefully pushing along the marshy banks of the tortuous stream under cover of the high grass, we came within gun-shot, and a second Kite was giving its death struggle in the top of the bush. Just at this moment we saw another coming, and its attention being attracted by the motions of the one already shot, it hovered over it a moment, then as it received a charge of shot, sailed gracefully downward and fell in the dense grass only a short distance from us.

I immediately left the boat, entered the grass, sinking to my knees in water and thus easily secured the first Kite that proved to be another adult male. The second required a longer search, and I experienced considerable difficulty in making my way through the dense growth of grass upon such an insecure footing, for the bottom was not only submerged but also quite spongy. After a time, however, I found the Kite, and was turning to

go back, when I discovered a partly completed nest a short distance from me, that was without doubt owned by one of the birds just killed. It was small, flat in form, composed of sticks somewhat carelessly arranged, and was placed on the top of the grass which supported it and which grew so luxuriantly at this point that it bore me up as I was endeavoring to reach the nest. Although disappointed at not obtaining eggs, we were much pleased at having procured three birds, the last of which proved to be a young male.

The twenty fourth of March found Mr. Henshaw and myself once more in the Everglades, searching for Kites. We had killed two males and a female, when upon picking up the latter, I found that she was incubating. Before shooting her she had behaved strangely, and I was certain that she had eggs near, therefore I commenced a long, systematic search, during which time I was obliged to exercise great caution to avoid treading upon water moccasins, for they were very abundant, but at last I discovered the nest in a magnolia bush. It was placed about four feet from the water, was quite flat, about a foot in diameter, was composed of sticks quite carelessly arranged, lined with a few dry heads of saw-grass, and contained one egg. Upon dissecting the female we found an egg just ready to be laid, but unspotted, being blue in color throughout.

Previous to this time we had become acquainted with the Seminoles. The knowledge which these people possess of Natural History is surprising, inasmuch as they probably never saw a naturalist, and if they had would not have learned much from him, for they speak but little English. Among those particularly noticeable was Tiger Tail, the son of a renowned chief of the same name who so bravely withstood the whites during the last Seminole wars. Tiger, as we familiarly called him, was a stalwart, finely formed man, about thirty years of age, with a handsome, expressive countenance, and bright, intelligent looking eyes. Besides being a man of influence in his tribe he was a fine hunter, and his wigwam never lacked venison. He not only knew the different mammals of the country, but also readily distinguished and named the various species of birds that we showed him. Every one, excepting a few of the smaller Warblers that only winter in Florida, had its Seminole name. Even insects were known by particular appellations, and Tiger has frequently showed me the chrysalis of some butterfly or moth and afterwards pointed out, in my collection, the species that came from it.

The Everglade Kite was at once recognized as So-for-fun-i-car, and its place of residence said to be Pi-i-o-kee. We explained to Tiger that we were anxious to procure So-for-fun-i-car sos-ta-ku (Kites' eggs) and he promised to look out for them. The other Indians, who visited us and exhibited much interest in our pursuits were also made to understand that we wanted eggs.

After discovering the nest, as narrated, we were slowly returning homewards, when we perceived a Black-necked Stilt standing on the margin of the river, near the rapids. We shot at it and as the report of our guns rang out we heard the friendly whoop of an Indian. We were accustomed to this cry and immediately answered it, then turning in the direction from whence the sound came we saw a canoe containing the lithe form of a Seminole glide out from a neighboring cypress swamp and as he came rapidly toward us we recognized Billy, a son-in-law of the old chief Ellick. When he came near enough for us

to discern his face, we saw that he had something to tell. He pushed up and we exchanged the usual salutations. After this, I showed him our precious nest and egg and explained where we had found them; then asked if he could procure any like them. He listened gravely until I had finished and then said simply, "Me got um." "What!" we both exclaimed. "So-for-fun-i-kar sos-ta-kar," he quietly answered. "Where?" we asked. Billy said nothing but led the way to the bow of his canoe and pointed to an old tin dipper. We looked into it and saw two Everglade Kites' eggs lying on the bottom. It may be assumed that I was not long in transferring them to a much safer place, while my companion gave vent to his delight in some whoops and a dance which caused the Indian to gaze at him in speechless admiration. Billy said that he found the eggs in a nest built in a bush. The next day, Tiger also brought me two eggs from a nest which was built in a similar situation.

I think two eggs are the usual number laid by this bird, for in three instances, no more were found and, in the last eggs, the embryos were considerably advanced; I also questioned the Indians concerning it and they said that two were all that the bird ever laid. The Everglade Kites appear to be very irregular in the time of depositing their eggs, as may be seen by the preceding account. This species is, unlike most other Kites and Hawks, very sociable in its habits and I have frequently seen six or eight specimens, at one time, flying over the marshes in company or sitting together on the bushes. In flight, they resemble the common Marsh Hawk and, as they are unsuspecting, they may be approached quite readily.

I have remarked that the first Everglade Kite I saw, was carrying a round object in its talons, and afterwards, I frequently saw others doing the same thing. What these objects were was explained upon dissecting the specimens taken, for all their stomachs contained the animal of a species of fresh-water shell. This shell (*Pomus depressa* of Say) which was, only a few years ago, considered quite rare, appears to be restricted to the fresh waters of Florida, where it abounds. It is round in form, about two inches in diameter, and dark, glossy green in color. I observed empty shells floating on the waters of the Everglades, long before I had the slightest idea that they were cleaned by the Kites, but after I dissected the birds, I searched around the bushes where they roosted and found the shells scattered about quite abundantly. The Indians call it Shal-ly-bung-kar. Shortly after our first visit to the Everglades, bunches of eggs, about the size of those of the Humming Bird, began to appear on the stalks of the saw-grass. They increased in number rapidly until there were millions of them. I could not imagine what they were until Tiger informed me that they were Shal-ly-bung-kar sos-ta-kar (*Pomus depressa* eggs.)

Although the Kites subsisted entirely upon the animals contained in these shells and appeared to find them readily, I never saw a single living specimen. I have, however, found them on the Indian Hunting Grounds, when freshly killed by a fire which spread over a drier portion of the Glades. The talons of the Everglade Kite are curved just enough to grasp the shell readily and its long, abruptly curved upper mandible is peculiarly fitted for removing the animal and it is not uncommon to find specimens of the shell with a hole punched in the side by this hook. I have never met with this bird, except on the

marshes of the Everglades, where it resides throughout the year, but it also occurs in all the fresh water marshes of Middle and Southern Florida.

GENUS III. NAUCLERUS. THE FORK-TAILED KITES.

GEN. CH. *Bill, short, well curved, with the cutting edge of upper mandible not lobed. Tarsus, not long and nearly naked. Tail, very deeply emarginate, exceeding in length one half the length of the wings which are considerably elongated. There is no ruff on the face.*

Members of this genus have no ruff, or facial disk, nor are the ear cavities strikingly large. The leg is short and the tarsus is naked to the heel behind, but is slightly feathered in front. The claws are quite short but pointed. Only one outer quill is noticeably incised on the inner webs.

The trachea is flattened throughout. The sterno-trachealis is short, having its origin about .25 from the larynx, and there is a slender bronchialis extending over all the half-rings, but there are no other laryngeal muscles. The tympaniform membrane is present and although there is a thin os transversale, it does not support a semilunar membrane. The walls of the oesophagus are thin; this is at first nearly straight, but is *not* dilated into a crop, thus forming a striking exception to the rule among birds of this order. It opens into a rather small proventriculus with simple, oval glands arranged in a zonal band which measures 1.00 in *forficatus*, from which this and the following dimensions were taken. The stomach is of a large size, somewhat globular in form, with thin but soft walls, and is lined with a soft membrane. The fold of the duodenum is long, measuring 3.00, including a narrow pancreas which extends its entire length. There are no traces whatever of any caeca on either side of the intestine. The spleen is an elliptical body lying directly on the proventriculus. Both lobes of the liver are short and thick, but the left is larger than the right. The heart is large and not very pointed. Sexes, similar in color. There is but one species within our limits.

NAUCLERUS FORFICATUS.

Swallow-tailed Kite.

Nauclerus forficatus Ridgw., B. B. R., N. A. Birds, III; 1874, 192.

DESCRIPTION.

Sp. CH. Form, rather slender. Size, medium. Sternum, rather stout, with the marginal indentations varying with age. Tongue, short, not very fleshy, and about the same width for nearly its entire length, then gradually rounded and bifid. Bill, rather short. Feet, comparatively weak, with short claws. Tail, very deeply forked, the outer being nearly twice the length of the middle.

Color. *Adult.* Head and neck all around, under portions, including under wing coverts, under tail coverts, and tibia, middle of back, basal portion of a large part of tertiaries and of a small part of secondaries, white, with the shafts of the feathers on the head, neck, and breast, black. Remainder of upper portions, including wings, upper tail coverts, and tail, black, glossed with green.

Young. Similar to the adult but somewhat less green on the black above which is also a little duller, and the tail is not as long.

Nestlings. Are at first covered with a yellowish down, then gradually assume the plumage last described. Bill, black, cere, green, eyes, dark-brown, feet, light-blue, in all stages.

OBSERVATIONS.

There appears to be but little variation in specimens of the same age. Known from all other species which occur within our limits by the long, very deeply forked tail and by the colors as described. Distributed, as a summer resident, throughout the Southern States, north to Virginia. Rare in the Middle States and accidental in Western Massachusetts. Winters in Central and South America.

DIMENSIONS.

Average measurements of male specimens from Southern United States. Length, 22.00; stretch, 46.00; wing, 15.00; tail, 12.50; bill, 1.00; tarsus, 1.10. Longest specimen, 23.00; greatest extent of wing, 47.00; longest wing, 16.00; tail, 13.00; bill, 1.25; tarsus, 1.20. Shortest specimen, 21.00; smallest extent of wing, 45.00; shortest wing, 14.00; tail, 12.00; bill, 1.10; tarsus, 1.15.

Average measurements of female specimens from Southern United States. Length, 24.50; stretch, 51.00; wing, 16.00; tail, 13.00; bill, 1.00; tarsus, 1.15. Longest specimen, 25.50; greatest extent of wing, 51.50; longest wing, 17.00; tail, 14.00; bill, 1.25; tarsus, 1.35. Shortest specimen, 23.50; smallest extent of wing, 50.00; shortest wing, 15.00; tail, 12.00; bill, 1.10; tarsus, 1.20.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in high trees. They are not very bulky structures and are composed of sticks, twigs, and Spanish moss, lined with weeds, grass, etc.

Eggs four to six in number, rather oval in form, white or greenish-white in color, spotted and blotched irregularly with brown and number of varying shades. Dimensions from 1.48 x 1.87 to 1.50 x 1.90.

HABITS.

About the first week in April, in the more southern portions of Florida, and a little later in the more northern sections, quantities of Swallow-tailed Kites may be seen coursing through the air. They come like the Swallows; first a solitary individual appears, then one or more, until, at length, they are to be seen in all directions, often in companies of a dozen or more. It is, perhaps, difficult to find more graceful birds on the wing than these Kites and their elegant aerial gyrations do not fail to attract the attention of even the casual observer. Not only in migrating do they resemble the Swallows but, as their name implies, in form, and also in flight; for they circle high over head, at such a giddy height that they appear like mere specks against the blue sky, when their long, broadly expanded tail is scarcely visible; then something below attracts their attention, so down they come, only to glide smoothly and swiftly over the tree tops. Their flight, when near the surface of the ground, is particularly noticeable, for although they move in a sinuous course and frequently double upon their tracks, all these evolutions are performed with a graceful ease which is seldom excelled by other birds. They have an object in thus traversing about, over the tops of the shrubbery, for they may be observed to swoop suddenly downward, pause a moment, almost on the ground, then mount quickly upward, bearing a writhing snake in their talons. This they eat as they fly, bending the head downward to secure each mouthful; thus devouring the entire reptile quite leisurely while sailing quietly about in ever broadening circles, until the meal is finished.

The Swallow-tailed Kites appear to spend the greater portion of their time upon the wing and even when gathering material for the nest, they do not alight but fly through the trees and pluck off twigs or pick up bunches of Spanish moss. They present a singular appearance when carrying this latter named material which, in Florida, is largely used in the composition of the nest, and I once saw one with such a long piece that it trailed, for at least two yards, behind the Kite as she flew swiftly through the air.

Nest building, with these beautiful Kites, begins, in Florida, about the first week in May and the domiciles are placed in the tops of high pines or oaks which grow in situations remote from settlements; thus the eggs are quite rare in collections. The young make their appearance in due course, are carefully reared by their parents, and in early autumn, they all depart for the South, passing quite out of the country to spend the winter in the Tropics.

GENUS IV. ICTINIA. THE PRAIRIE KITES.

GEN. CH. *Bill, short, broad, well curved, with the cutting edge of upper mandible, lobed. Tarsus, not long and nearly naked. Tail, square and slightly emarginate, not exceeding in length one half the length of the wings which are considerably elongated. There is no ruff on the face.*

Members of this genus have no ruff, or facial disk, nor are the ear cavities strikingly large. The leg is short and the tarsus is naked to the heel behind, but is slightly feathered in front. The claws are quite short but pointed. Only two outer quills are noticeably incised on the inner webs.

The trachea is much flattened throughout. The sterno-trachealis is short, having its origin about .25 from the larynx, and there is a slender bronchialis extending over all the half rings, but there are no other laryngeal muscles. The tympaniform membrane is present and although there is a thin os transversale, it does not support a semilunar membrane. The walls of the oesophagus are thin: this is at first nearly straight, and is dilated into a crop, then is again straight and opens into a rather small proventriculus with simple, oval glands arranged in a zonular band which measures 1.50 in *Mississippiensis*, from which this and the following dimensions were taken. The stomach is of a medium size, somewhat globular in form, with thin but soft walls, and is lined with a soft membrane. The fold of the duodenum is long, measuring 3.00, inclosing a narrow pancreas which extends its entire length. The cæca are present but are small. The spleen is an elliptical body lying directly on the proventriculus. Both lobes of the liver are short and thick. The heart is large and not very pointed. Sexes, similar in color. There is but one species within our limits.

ICTINIA MISSISSIPPIENSIS.

Mississippi Kite.

Ictinia Mississippiensis Wilson, Am. Orn., III: 1811, 80.

DESCRIPTION.

Sp. Ch. Form, rather robust. Size, medium. Sternum, rather stout, with the marginal indentations varying with age. Tongue, short, not very fleshy, and about the same width for nearly its entire length, then gradually rounded and bifid. Tail, square and slightly emarginate. Wings, very long.

Color. *Adult*. Head and neck all around, under portions, including under wing coverts, under tail coverts, and tibia, dark bluish-ash. Remainder of upper portions, including wings, upper tail coverts, and tail, black, glossed with green. There is a longitudinal stripe extending over the middle portion of each primary, occupying the whole of the inner web and part of the outer, of bright chestnut. The tips of the secondaries are ashy-white. Lores and the narrow ring around eye, black.

Young. Mixed with dull rufous and white above. Head and under parts, yellowish-white, with longitudinal stripes of reddish-brown, which are darker and more numerous on the head, and brighter and broader on the abdomen.

Nestlings. Are at first covered with a yellowish down, then gradually assume the plumage last described. Bill and cere, bluish, iris, ruby-red, feet, orange, in all stages.

OBSERVATIONS.

There appears to be but little variation in specimens of the same age. Known from all other species which occur within our limits by the square tail, taken in connection with the peculiar, bright chestnut markings on the primaries, and the other colors as described. Distributed, as a common summer resident, up the Mississippi Valley as far as Southern Illinois. Rare in Florida and other Eastern Southern States, north as far as South Carolina. Winters in Central and South America.

DIMENSIONS.

Average measurements of male specimens from Southern United States. Length, 14.00; stretch, 36.00; wing, 11.00; tail, 6.00; bill, .95; tarsus, 1.75. Longest specimen, 14.50; greatest extent of wing, 35.50; longest wing, 11.50; tail, 6.50; bill, 1.00; tarsus, 1.80. Shortest specimen, 13.00; smallest extent of wing, 35.00; shortest wing, 10.50; tail, 5.50; bill, .85; tarsus, 1.60.

Average measurements of female specimens from Southern United States. Length, 15.00; stretch, 35.00; wing, 11.50; tail, 6.50; bill, 1.00; tarsus, 1.85. Longest specimen, 15.50; greatest extent of wing, 36.75; longest wing, 11.60; tail, 7.00; bill, 1.10; tarsus, 1.95. Shortest specimen, 14.50; smallest extent of wing, 35.50; shortest wing, 11.40; tail, 6.00; bill, .95; tarsus, 1.80.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in trees. They are composed of sticks, carelessly arranged, intermingled with bunches of Spanish moss and lined with strips of bark and leaves.

Eggs, two or three in number, rather spherical in form, greenish-white in color, thickly spotted and blotched with deep chocolate-brown and black. Dimensions from 1.30 x 1.50 to 1.32 x 1.52.

HABITS.

The Mississippi Kites are, with the exception of one other species, the only members of the present order, which I have not seen living. This is, perhaps, partly due to accident but is probably attributable to the fact that the birds are quite rare and only inhabit a limited area of the section over which I have collected. Which ever way it is, however, I have never seen, as before stated, a living specimen and therefore, the remarks which I now make upon their habits, must be brief.

Mr. Ridgway informs me that he found these Kites not uncommon on the prairies of Southern Illinois; indeed, this bird appears to be restricted to the more open sections of the country, avoiding the heavily wooded districts. As intimated, the Mississippi Kites are rare east of the valley from which they take their name but Mr. Charles Nauman writes me that he has seen the species once in Florida, while Audubon and more recent authors state that they occur in the Carolinas. According to Audubon, these birds make their appearance in Louisiana about the middle of April, breed early in May, the young leave the nest in July, and, accompanied by their parents, depart for the Tropics by the fifteenth of August.

GENUS V. ELANUS. THE WHITE-TAILED KITES.

GEN. CH. *Bill, short, well curved, with the cutting edge of the upper mandible slightly lobed. Tail, rounded and slightly emarginate, not exceeding in length one half the length of the wings which are quite long. There is no ruff whatever on the face.*

Members of this genus usually have the colors very light with the tail white. The tarsus is short and naked to the heel behind, but is feathered in front for half its length. The toes are short and thick but the claws are well curved and pointed. Only two outer quills are incised on the inner webs. Sexes similar in color. There is but one species within our limits.

ELANUS LEUCURUS.

Black-shouldered Kite.

Elanus leucurus VIEILL., NOUV. DIET., XX; 1818, 563.

DESCRIPTION.

SP. CH. Form, rather robust. Size, medium. Bill, short. Feet, comparatively stout, with short claws. Tail, not very long.

COLOR. *Adult.* Head and neck all around, under portions, including under wing coverts, under tail coverts, and tibia, white. Smaller upper wing coverts, glossy black. Tail, white, with the two central feathers ashy-gray. Remainder of upper portions, including wings and upper tail coverts, ashy-gray.

Young. Similar to the adult but overwashed with brownish above. The wing coverts are tipped with white and the black on the shoulders is considerably duller.

Nestlings. Are at first covered with a yellowish down, then gradually assume the plumage last described. Bill, black, cere and feet, yellow, iris bright ruby, in all stages.

OBSERVATIONS.

There appears to be but little variation in specimens of the same age. Known from all other species which occur within our limits by the white tail, black shoulders, and general light tints. Distributed, as a summer resident, up the Mississippi Valley as far as Southern Illinois. A rare resident in Florida and other Eastern Southern States, north as far as South Carolina.

DIMENSIONS.

Average measurements of male specimens from Southern United States. Length, 15.50; stretch, 39.50; wing, 12.50; tail, 7.50; bill, .95; tarsus, 1.25. Longest specimen, 16.60; greatest extent of wing, 40.00; longest wing, 13.00; tail, 7.75; bill, 1.00; tarsus, 1.30. Shortest specimen, 15.00; smallest extent of wing, 39.00; shortest wing, 12.00; tail, 7.00; bill, .90; tarsus, 1.20.

Average measurements of female specimens from Southern United States. Length, 16.00; stretch, 41.00; wing, 13.00; tail, 7.75; bill, 1.05; tarsus, 1.35. Longest specimen, 16.50; greatest extent of wing, 41.50; longest wing, 13.50; tail, 8.00; bill, 1.10; tarsus, 1.40. Shortest specimen, 15.50; smallest extent of wing, 39.00; shortest wing, 12.50; tail, 7.50; bill, 1.00; tarsus, 1.30.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in low trees. They are not very bulky structures and are composed of sticks and twigs, lined with weeds, grass, etc.

Eggs, four to six in number, rather spherical in form, white in color, spotted and blotched irregularly with brown and amber of varying shades. Dimensions from 1.62 x 1.41 to 1.64 x 1.48.

HABITS.

The White-tailed Kite is probably one of the rarest of the order in the section of which I write and I never had the good fortune to meet with one. The first specimen that was ever noticed by ornithologists in North America, was obtained by Mr. Titian Peale, in East Florida, many years ago. Yet few, if any, have been taken there since; indeed, only one instance has come to my knowledge of it having been observed there, and in this instance, a specimen was seen on or near the upper St. John's River by my correspondent, Mr. Charles Nauman. Audubon makes record of it having been occasionally seen in the Eastern portion of South Carolina but no one appears to have found it at all common east of the Mississippi River, although it is not uncommon in Texas, where it may, perhaps, spend the winter.

The White-tailed Kites did breed in South Carolina, for Audubon says that some nests were taken early in March, from low trees which grew on the banks of the Santee River. Very few eggs, however, have been obtained and consequently they are very rare in collections. This early time of nesting would indicate that this bird is constantly resident in the more southern sections but is, without doubt, migratory when it occurs much further north.

FAMILY II. FALCONIDÆ. THE FALCONS.

The sternum does not equal in width the length of the coracoids but the scapular process of the latter meets the furcula. Marginal indentations, two, inclosed.

This family, in our section, is represented by a single genus, as I restrict it. The manubrium is moderately well developed but is not forked. The furcula is stout, much flattened by lateral expansion, wide and thick near the base which is rounded but not produced into a point. The terminal expansion is small but the furcula near it is not contracted nor furrowed and is only bent downward to a point at about two thirds the height of the keel. The marginal indentations, although varying in size with age, are always inclosed.

GENUS I. FALCO. THE TRUE FALCONS.

Sp. Cu. *Bill, short, broad, well curved, with the cutting edge of upper mandible, distinctly toothed, and the lower, notched. Tarsus, not long and nearly naked. Tail, slightly rounded, not exceeding in length one half the length of the wings which are considerably elongated and pointed. Nostril, with central tubercle.*

Members of this genus have the leg short, and the tarsus is usually naked to the heel behind, but is slightly feathered in front. The toes are long and the claws are quite short but pointed. Only one or two outer quills are noticeably incised on the inner web.

The oesophagus is a little flattened throughout. The sterno-trachealis is short and stout, having its origin quite near the sternum, and there is a slender bronchialis extending over all the half rings, but there are no other laryngeal muscles. The diaphragm membrane is present and although there is a thin os transversale, it does not support a semilunar membrane. All of the oesophagus are thin: this is at first nearly straight, then is dilated into a crop, and is again straight and narrow into a rather large proventriculus with numerous small, simple, oval glands arranged in a zonular band which measures 70 in *columbarius*, from which this and the following dimensions were taken. The stomach is of a rather small size, somewhat globular in form, with thin but soft walls, and is lined with a soft membrane. The fold of the duodenum is long, measuring 3.00, inclosing an irregularly formed pancreas which only extends about one half its entire length. The coeca, when present, are very small. The spleen is an elliptical body lying on or near the proventriculus. Both lobes of the liver are short, thick, and nearly equal in size. The heart is large and not very pointed. There are four species within our limits.

FALCO SPARVERIUS.

Sparrow Hawk.

Falco sparverius LINN., Syst. Nat., I: 1766, 128.

DESCRIPTION.

Sp. Cu. Form, rather slender. Size, small. Sternum, stout, with the marginal indentations quite large. Tongue, short, not very fleshy, and about the same width for nearly its entire length, then rounded, bifid, and grooved beneath. Tail, considerably rounded. Wings, with two outer quills incised. Tarsus, slightly feathered in front. There are no traces of any coeca.

Color. *Adult male.* Top of head, upper wing coverts, and secondaries, bluish-ash, with the two latter more or less spotted and barred with black, which usually extends over the middle of the secondaries. Back, rump, upper tail coverts, and basal portion of tail, excepting outer webs of outer feathers, bright cinnamon. Tip of tail, outer web of outer feather, and sometimes the entire feather, white, with a subterminal band of varying width, extending across the entire tail, and bandings on outer feather, black. Primaries, dark-brown, barred on the inner webs with white. Throat and sides of head, white, the latter having two black spots, one in front of the ear coverts, nearly reaching the eye, and the other back of them. There is a narrow line of black crossing the occiput, and the back is more or less banded with it. Under wing coverts, white, barred and spotted with black. Remainder of under parts, including under tail coverts and tibia, white, overwashed, to a greater or less extent, with cinnamon, spotted on the sides and flanks with black. The top of the head is marked with a spot of cinnamon.

Adult female. Similar to the male in general coloration but lack the bluish-ash of the upper wing coverts and secondaries, which are pale cinnamon, barred with black, and these markings extend over the back and tail. The tints below are paler, and are streaked, excepting on the throat, under tail coverts, and tibia, with reddish-brown.

Young. Quite similar to the female but are more finely barred above and these markings extend over the rump and upper tail coverts.

Nestlings. Are at first covered with a yellowish down, then gradually assume the plumage last described. Bill, black, blue at base, cere and feet, orange, iris brown, in all stages.

OBSERVATIONS.

There are, perhaps, few birds which show a greater amount of variation in markings than the present species. This is especially noticeable in the males. Two specimens, shot in Southern Florida, present the extremes; one being nearly white on the under portions, and the other, deep-cinnamon even on the under tail coverts and tibia. The dark one has but little cinnamon on the head yet the whiter specimen has this color extending over a greater part of the crown. Sometimes the bluish-ash of the wings is extended on to the back and in a skin from Miami, this tint crops out in patches on the upper tail coverts and tail. Notwithstanding these variations, this species may be at once known by the cinnamon-red and other colors as described. Distributed, as a summer resident, throughout North America. A constant resident south of Massachusetts, where they are not as large as those from further north.

DIMENSIONS.

Average measurements of male specimens from Eastern United States. Length, 9.70; stretch, 20.75; wing, 6.75; tail, 4.00; bill, .50; tarsus, 1.25. Longest specimen, 10.25; greatest extent of wing, 22.00; longest wing, 7.25; tail, 4.75; bill, .60; tarsus, 1.30. Shortest specimen, 9.10; smallest extent of wing, 19.50; shortest wing, 6.25; tail, 3.25; bill, .40; tarsus, 1.15.

Average measurements of female specimens from Eastern United States. Length, 10.15; stretch, 21.85; wing, 7.00; tail, 4.50; bill, .50; tarsus, 1.27. Longest specimen, 11.25; greatest extent of wing, 22.75; longest wing, 7.50; tail, 5.00; bill, .60; tarsus, 1.40. Shortest specimen, 9.10; smallest extent of wing, 21.00; shortest wing, 6.50; tail, 4.00; bill, .40; tarsus, 1.15.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in holes of trees, either natural cavities or the deserted holes of Woodpeckers; but little or no material is used in constructing the nest.

Eggs, four to six in number, rather spherical or broadly oval in form, ashy-white or reddish in color, spotted, dotted, and blotched, with reddish-brown, dark-chocolate, and occasionally with lilac, frequently so thickly as to obscure the ground color. Dimensions from 1.00 x 1.25 to 1.05 x 1.35.

HABITS.

Although the little Sparrow Hawks are quite common almost anywhere in Pennsylvania and southward, I never found a locality where they were so abundant as about Miami in Southern Florida. They perfectly swarm here; in fact, it is not uncommon to see twenty pairs in an hour's walk. In the North, they are very shy; indeed it was difficult to procure specimens at Jacksonville; but at Miami, I was quite surprised to find them as unsuspecting as any of the small birds, for they would permit me to walk directly under them as they sat on the low limb of a pine, not more than twenty feet above my head. This tameness is, probably, largely due to the fact that, previous to my visit, they had never been hunted but I could not help thinking that they were affected the by enervating climate in which they lived. It is true, they had the same abrupt, rattling cry, so characteristic of this species every-where, but this was given with less vim, the birds exhibiting but little excitement when uttering it, as they usually sat on a branch, only occasionally jerking their tails. Even this latter named movement, so noticeable in members of this species, was seldom made; in fact, much of the almost startling energy usually displayed by the Sparrow Hawks in the North, appears to have nearly deserted these inhabitants of the Sunny South.

After all, the change in the birds is but comparative and the difference is not striking, for everything, in the almost perfect climate about Miami, is in keeping with quietude and repose. Then, too, the Sparrow Hawks of Southern Florida, gain a livelihood quite easily, for grasshoppers which form the greater part of their food, are very abundant throughout the year; so numerous, in short, that a Hawk may live, and live well, all its life in an area of a few square rods, and it is extremely probable that many individuals pass their entire lives within sight of the tree in which they were hatched.

Thus the history of a particular pair of Sparrow Hawks of Miami, is easily written. When the first rays of the morning sun touches the tops of the huge, weather-beaten pine that has greeted his appearance many thousand times, the happy pair awake, stretch themselves, give a cry or two, and take their breakfast of grasshoppers; they lunch lightly on the same insects, arrange their feathers at their leisure, then watch the flocks of Warblers,

Nuthatches, etc. that go trooping past; not with evil eye, however, for what do they want with feathered bipeds?—grasshoppers are more to their liking; so they dine heartily upon them. After the noon-time siesta, if it chances to be in the spring, they take a look at the hole where they have deposited their eggs for years past; then taking a short flight to some neighboring stub, they sup upon grasshoppers and return to roost in the old tree. This, without variation, is their lives: this, without variation, is their diet: a blue sky overhead; gentle, refreshing breezes blowing across the green woodland; nothing to do but to pick up grasshoppers of which they appear never to tire. It is true that they can find green grasshoppers and brown grasshoppers, grasshoppers with wings and wingless grasshoppers, but still, as far as any distinctive taste is concerned, there must be but little variation; yet to all appearances, the Hawks are satisfied, for I never saw one take any other kind of food.

With the Sparrow Hawks in the bleak North, all this is quite different; here they are obliged to work for a living and, although insects form a part of their food, they do not, in fact, cannot, subsist on this kind of diet alone; mice and other small mammals, little birds, and even reptiles are obliged to contribute to their larder. Nor are these always easily gained; thus it is not infrequent to see a Sparrow Hawk hovering over a field, suspending himself on rapidly vibrating wings, and darting downward many times before his hunger is fully appeased.

The Sparrow Hawks of Florida breed in the natural cavities of trees or in the deserted holes of Woodpeckers, often in trees which are inhabited by these latter named birds, and all live together upon good terms. The eggs are deposited by the middle of April, in this section, and a little later further north. The young leave the nest early in July and accompany their parents for some time, then separate into pairs. These Hawks are rather uncommon in Massachusetts, even in summer, and are quite rare in winter, for the greater part migrate south of us.

These little Hawks are quite gentle in confinement, when used well, making pretty as well as interesting pets and several that I had, became so familiar as to perch on my finger in order to take food from my hand.

FALCO COLUMBARIUS. ✓

Pigeon Hawk.

Falco columbarius LINN., Syst. Nat., 1: 1766, 128.

DESCRIPTION.

Sp. Ch. Form, rather robust. Size, medium. Sternum, stout, with the marginal indentations quite large. Tongue, short, thick, quite fleshy, about the same width for nearly its entire length, horny at tip, where it is rounded, bifid, and grooved beneath. Tail, moderately rounded. Wings, with two outer quills incised. Tar-us, slightly feathered in front. There are usually no traces of any cæca.

COLOR. *Adult male.* Above, including upper wing coverts, secondaries, and upper tail coverts, dark bluish-slate, every feather having a narrow, central, longitudinal line of black. Primaries, black, tipped with ashy-white. Tail, light bluish-ash, becoming nearly white on the inner webs; it is tipped with ashy-white and crossed by a wide subterminal band of black, and also by several other narrower bands of the same color. Forehead and throat, white. Remainder of under parts, including under wing coverts, under tail coverts, and tibia, pale buff, streaked with dark-brown.

Adult female. Quite similar to the male in general coloration but overwashed above, to a greater or less extent, with brown, and the markings below are broader and the tints darker.

Young. Differs from the adult female in having but little ashy above. The wings are barred on the inner webs with reddish-white and there is a line of the same color extending over the eye. The tail is dark-brown, tipped with white, and barred with reddish.

Young of the year. Show no traces of ashy above, and the top of the head is overwashed with reddish, especially on the forehead and occiput. The inner webs of the wings are barred with deep red and spotted on the outer with it, while the markings below are a little broader.

Nestlings. Are at first covered with a yellowish down, then gradually assume the plumage last described. Bill, black, blue at base, cere and feet, yellow, iris brown, in all stages.

OBSERVATIONS.

There is some variation in specimens of the same age, especially below, where the brown markings occasionally broaden out into transverse bands on the sides. The under tail coverts are sometimes immaculate. Known from *sparverius* by the superior size and absence of any cinnamon-red, and from *communis* by the inferior size, absence of any dark markings on the sides of the head, and in having the two outer quills incised on the inner webs. Distributed, as a summer resident, throughout North America, north of latitude 42°, and in winter, south of this point, into South America and the West Indies.

DIMENSIONS.

Average measurements of male specimens from Eastern United States. Length, 11.50; stretch, 23.75; wing, 7.75; tail, 5.15; bill, .55; tarsus, 1.40. Longest specimen, 12.00; greatest extent of wing, 24.00; longest wing, 8.00; tail, 5.25; bill, .60; tarsus, 1.50. Shortest specimen, 11.00; smallest extent of wing, 23.25; shortest wing, 7.50; tail, 5.10; bill, .50; tarsus, 1.30.

Average measurements of female specimens from Eastern United States. Length, 12.00; stretch, 25.25; wing, 8.25; tail, 5.50; bill, .70; tarsus, 1.45. Longest specimen, 12.50; greatest extent of wing, 26.50; longest wing, 8.50; tail, 5.70; bill, .80; tarsus, 1.55. Shortest specimen, 11.25; smallest extent of wing, 24.00; shortest wing, 8.00; tail, 5.10; bill, .60; tarsus, 1.35.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on rocky cliffs, on the branches, or in holes, of trees. They are composed of sticks and grass, lined with feathers.

Eggs, four to six in number, rather oval or spherical in form, varying from whitish to deep reddish-brown in color, spotted, dotted, and blotched, irregularly, and usually very thickly, with reddish-brown of varying shades. Dimensions from 1.25 x 1.75 to 1.30 x 1.80.

HABITS.

The Pigeon Hawks may be met with almost anywhere in New England during the autumnal migrations which occur in September and October. Not that they are particularly abundant then but their appearance is not uncommon, and they may often be seen dashing through the woodlands, coursing over the meadows, or hunting along the shore. When on the wing in search of prey, they are full of energy, but Falcon like, when satiated, will sit for hours silent and apathetic, regardless of the multitudinous avian life that is constantly sweeping by them within easy reach. What a lesson is here presented to the sportsman who destroys until he is weary, often leaving his victims to decay where they fall!

As the Pigeon Hawks usually spend the greater portion of their time in sections remote from man, or rather, in sections where every urchin is not armed with a cheap breech-loader, they are not very shy when passing us and, in the unsettled portions of the South, they are very tame; thus I found two or three pairs on the northern end of Key West, where there are no houses, that were so unsuspecting that I walked within twenty-five feet of them before they attempted to fly.

These handsome birds do not usually hover, like the Sparrow Hawk, when hunting but course rapidly along and pounce upon their victim without giving it an instance's warning of their presence; thus they appear to capture their prey with great certainty. Their cry, when moving, is shrill and loud but different from the well-known rattle of the Sparrow Hawk.

Although these Hawks usually breed considerably north of Massachusetts, I am confident that the eggs will yet be taken in the state, for I once had a female which was shot during the breeding season, early in June, and which exhibited every mark of incubation, while other instances of a similar nature have come to my knowledge. As remarked, however, the Pigeon Hawks occur with us, more abundantly during the autumnal migration than at any other season, although they are tolerably common in spring.

FALCO COMMUNIS.

Peregrine Falcon.

Falco communis Gm., Syst. Nat., I; 1788, 270.

DESCRIPTION.

Sp. Cn. Form, robust. Size, large. Sternum, stout, rather narrow, with the marginal indentations quite large. Tongue is short, thick, quite fleshy, about the same width for nearly its entire length, horny at tip, where it is rounded, bifid, and grooved beneath. Tail, slightly rounded, with the feathers somewhat acuminate. Wings, with only one outer quill incised. Tarsus, slightly feathered in front. Cœca, present but very small.

Color. *Adult male.* Above, including upper wing coverts, secondaries, and upper tail coverts, dark bluish-slate, transversely banded with dark-brown which becomes lighter on the rump. Primaries and tail, dark-brown, the former banded on the inner webs with yellowish-white; the latter tipped and banded with ashy-yellow. Under parts, including sides of head, under wing coverts, under tail coverts, and tibia, yellowish-white, spotted on the breast and abdomen, and transversely banded on the remaining portions with black. There is also a black patch on the cheeks. Forehead, white.

Adult female. Quite similar to the male in general coloration but darker above, and tinted below with buff. In the adult stages, the feet are yellow and the cere, green.

Young. Much browner above than in the adult female. The under parts are tinged with reddish and longitudinally streaked with dark-brown. The cheek patches are broader and the wing feathers are tipped with yellowish-white.

Young of the year. Show no traces of ashy above, and the top of the head is overwashed with yellowish-rufous, especially on the forehead and occiput. There is a line of reddish extending over the eye, while every feather above is edged with it. The tail is tipped with white, barred on inner webs with deep rufous and the same color pervades below. The under tail coverts are barred.

Nestlings. Are at first covered with white down, then gradually assume the plumage last described. In this and the last two stages, the cere is dark-green and the feet, blue. Bill, black, blue at base, and iris brown, in all stages.

OBSERVATIONS.

Specimens of the same age exhibit the usual amount of variation regarding intensity of color, size of spots, width of bands, etc., but the species may be known at once by the large size, dark cheek patch, and other colors as described. Distributed, as a summer resident, among the mountains or along rocky sea-boards, throughout Eastern North America, above latitude 38°. Winters in the more Southern portions.

DIMENSIONS.

Average measurements of male specimens from Eastern United States. Length, 17.50; stretch, 38.50; wing, 14.25; tail, 7.25; bill, .72; tarsus, 1.72. Longest specimen, 18.00; greatest extent of wing, 39.00; longest wing, 14.50; tail, 7.50; bill, .75; tarsus, 1.75. Shortest specimen, 17.00; smallest extent of wing, 38.00; shortest wing, 14.00; tail, 7.00; bill, .70; tarsus, 1.70.

Average measurements of female specimens from Eastern United States. Length, 19.00; stretch, 41.00; wing, 15.00; tail, 7.75; bill, .78; tarsus, 1.75. Longest specimen, 20.00; greatest extent of wing, 42.00; longest wing, 15.50; tail, 8.00; bill, .80; tarsus, 1.80. Shortest specimen, 18.00; smallest extent of wing, 40.00; shortest wing, 14.50; tail, 7.50; bill, .75; tarsus, 1.90.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on rocky cliffs. Although the eggs are occasionally placed on the naked rock, there is usually a rudely constructed nest composed of sticks and moss.

Eggs, two to four in number, rather oval or spherical in form, varying from creamy-white to reddish-brown in color, spotted, dotted, and blotched, with reddish-brown and chocolate of varying shades, usually so thickly as to nearly, or even completely, obscure the ground color. Dimensions from 1.60 x 2.00 to 1.85 x 2.32.

HABITS.

The Peregrine Falcons are among the most noted of the order, for they are the swiftest fliers of them all, not only surpassing all others in speed but also excelling them in the ease with which they perform rapid, aerial evolutions. It is a well-attested fact, that Ducks move at the astonishing rate of upward of a hundred miles an hour, yet I have repeatedly seen this fine Falcon pursue and capture them when on the wing. While camping near the Haulover Canal in Eastern Florida, some years ago, my attention was attracted by the movements of a Peregrine Falcon which was accustomed to perch on the top of a dead tree, not far away, in order to watch for Ducks that were constantly flying past this point, on their way in from sea to rest on the quiet waters of Indian River. A flock of Scaups would come booming along before a stiff, easterly breeze, crossing directly in front of the Falcon and perhaps fifty yards from him, but at a considerable elevation. He would wait until the Ducks were nearly opposite him, then launching into air, would meet them at nearly right angles. When the bird left the branch, he was plainly visible but in his passage over the intervening space between his perch and the track of his prey, he was absolutely invisible, as he moved so quickly that the eye was unable to follow him, and when he struck the Duck at which he aimed, I could fairly hear its bones crack, so great was the shock; while it was apparently killed as instantaneously as if it had been shot. In spite of his skill in capturing Ducks, this Falcon would tamely allow a Marsh Hawk to rob him, as I have related in the previous pages. I have also seen the Peregrine Falcon pursue the swiftly flying Shore Birds and capture them when on the wing.

The Peregrine Falcons breed early in the season, in March in the more southern sections, about the middle of April in Western Massachusetts, and in May on Grand Menan and northward. The nests are, according to my experience, always placed on the rocky shelf of a perpendicular cliff, in a situation nearly or quite inaccessible and often in exposed places. There is a pair which nest every year at Grand Menan in a niche on the face of a peculiar precipice, known as the Seven Days' Work, that rises some three hundred feet above the water. The eyrie is situated about midway between the top and bottom of the steep wall and doubtless many ornithologists have watched the birds, as I have done, with longing eyes as they circled quietly about their well-chosen home. Watching, however, is the only feat that any one has yet accomplished, and if the stories regarding the longevity of the Peregrine Falcons be true, collectors of a coming generation will have the same opportunity afforded them, without being able to place their hands on the coveted eggs.

These Hawks are rarely found far from their breeding grounds in summer but, during the migrations, disperse over the country, at which time they are particularly common

near the sea shore. I do not, however, think that they occur much north of New Jersey during winter.

FALCO CANDICANS.

Jer Falcon.

Falco candicans Gm., Syst. Nat., I; 1788, 275.

DESCRIPTION.

SP. CU. Form, robust. Size, very large. Sternum, stout, with the marginal indentations quite large. Tongue, long, not very fleshy, and about the same width for nearly its entire length, then is rounded, slightly bilid, and grooved beneath. Tarsus, feathered in front for more than half its length. Wings, with two outer quills incised. Cæca, present and comparatively well developed. Sexes, similar in color.

LIGHT STAGE.

COLOR. *Adult.* White throughout with regular and irregular confluent bands and spots of dark-brown above, and sparsely spotted below with the same color. Primaries and tail, transversely banded with brownish and the former is tipped with it.

Young. Quite similar to the adult in general coloration but tinted with bluish above and below. The bandings are also broader and the spots larger.

Young of the year. Are overwashed with brown above, and every feather is spotted and edged with reddish. The under parts are tinged with yellowish-white and longitudinally streaked with dusky.

Nestlings. Are at first covered with white down, then gradually assume the plumage last described, which they keep for a year.

DARK STAGE.

COLOR. *Adult.* Sooty black, throughout, becoming lighter below, but not conspicuously barred or spotted anywhere. Bill and cere, pale blue, iris, dark-brown, feet, slaty-blue, in all stages.

OBSERVATIONS.

This species is subject to various changes of plumage which are merely due to a predominance of the lighter or darker tints. The different plumages have been described by authors under several names, either as species or races; thus the light types are either *candicans*, *Islandicus*, or *sacer* and the dark types, *Labradoria*. To be consistent with my views already published, however, I must consider them all one species. Readily known from all other species by the large size, preponderance of white in the light stage and peculiar Falconine form, as well as uniform tints when dark. Distributed as a constant resident, throughout North America, above latitude 50°. Rare in New England during winter.

DIMENSIONS.

Average measurements of male specimens from Eastern North America. Length, 21.75; stretch, 48.50; wing, 15.75; tail, 9.75; bill, 1.20; tarsus, 1.95. Longest specimen, 22.50; greatest extent of wing, 49.00; longest wing, 16.00; tail, 10.00; bill, 1.30; tarsus, 2.00. Shortest specimen, 21.00; smallest extent of wing, 48.00; shortest wing, 15.50; tail, 9.50; bill, 1.00; tarsus, 1.80.

Average measurements of female specimens from Eastern North America. Length, 23.50; stretch, 50.00; wing, 16.50; tail, 10.50; bill, 1.30; tarsus, 2.05. Longest specimen, 21.00; greatest extent of wing, 51.00; longest wing, 17.00; tail, 11.00; bill, 1.40; tarsus, 2.10. Shortest specimen, 23.00; smallest extent of wing, 49.00; shortest wing, 16.00; tail, 10.00; bill, 1.10; tarsus, 1.95.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on rocky cliffs. Although the eggs are occasionally placed on the naked rock, there is usually a rudely constructed nest, composed of sticks, moss, and sea weeds.

Eggs, two to four in number, rather oval or spherical in form, varying from creamy-white to yellow-brown in color, profusely sprinkled with reddish-brown of varying shades, usually so thickly as to nearly, or even completely, obscure the ground color. Dimensions from 1.71 x 2.12 to 1.90 x 2.45.

HABITS.

The Jer Falcon are, to my taste, the handsomest of the order. Perhaps, however, this fancy of mine may be due to the fact that, as these birds are very rare in the sections

where I have chanced to have been, I have never shot one; indeed I have seen it but once. On the fourth of November, 1868, I was crossing one of the mountain passes of Northern New Hampshire, in the teeth of a biting wind, for the weather was unusually cold, when glancing upward, I saw one of these noble Falcons, flying high over the mountain tops, steering northward over the unbroken forests which were, even thus early in the season, covered deeply with snow and almost a solitude, being deserted by nearly all the feathered tribes.

The Jer Falcons breed much like the Peregrine Falcons, on inaccessible cliffs in the far North and they spend the greater portion of their time in these inhospitable regions, even remaining there through the severe winter weather, only occasionally visiting us; so rarely, that their occurrence may be regarded as merely accidental. Those in the dark plumage, described by Audubon as the Labrador Falcon but now regarded by nearly every one as only a melanistic stage of the lighter species, appear to favor us with their presence rather more frequently than their lighter colored brethren. The Jer Falcons have been taken as far south as Connecticut but their normal range is north of Canada.

FAMILY III. ACCIPITRIDÆ. THE SHORT-WINGED HAWKS.

The sternum does not nearly equal in width the length of the coracoids, nor does the scapular process of the latter meet the furcula. Marginal indentations, two, inclosed.

This family, in our section, is represented by a single genus, as I restrict it. The manubrium is moderately well developed but is not forked and is either pointed or abruptly truncated. The furcula is stout, much flattened by lateral expansion, wide and thick near the base which is rounded and not produced into a point. The terminal expansion is small and the furcula near it is only slightly contracted and furrowed above, and is bent downward to a point at about two thirds the height of the keel. The marginal indentations, although varying in size with age, are always inclosed.

GENUS I. ACCIPITER. THE TRUE HAWKS.

GEN. CH. *Bill, short, broad, well curved, with the cutting edge of upper mandible distinctly lobed, but the lower is not notched. Tarsus, long and nearly naked. Tail, well rounded, considerably exceeding in length one half the length of the wings which are short and not pointed. Nostril, without central tubercle.*

Members of this genus have the leg long and the tarsus is usually naked to the heel behind, but is slightly feathered in front. The toes are long and the claws are quite long and pointed. Five outer quills are noticeably incised on the inner webs.

The trachea is a little flattened throughout. The sterno-trachealis is short and stout, having its origin quite near the larynx, and there is a slender bronchialis extending over all the half rings, but there are no other laryngeal muscles. The tympaniform membrane is present and although there is a thin os transversale, it does not support a semilunar membrane. The walls of the œsophagus are thin; this is at first nearly straight, then is dilated into a crop, and is again straight and opens into a medium sized proventriculus with numerous small, simple, oval glands arranged in a zonular band which measures 1.00 in *Cooperi*, from which this and the following dimensions were taken. The stomach is of a rather small size, somewhat globular in form, with thin but soft walls, and is lined with a soft membrane. The fold of the duodenum is long, measuring 3.00, inclosing an irregularly formed pancreas which only extends about one half its entire length. The cœca, when present, are very small. The spleen is an elliptical body lying on or near the proventriculus. Both lobes of the liver are short, thick, and nearly equal in size. The heart is large, triangular in form, and not very pointed. There are two species within our limits.

ACCIPITER FUSCUS.

Sharp-shinned Hawk.

Falco fuscus Gr., Syst. Nat., I; 1788, 280.

DESCRIPTION.

Sp. Ch. Form, slender. Size, not large. Sternum, not very stout, rather narrow, with the marginal indentations quite large. Tongue, long, narrow, quite fleshy, rounded at the tip and somewhat bifid. Tarsus and toes, long and slender, with the middle toe considerably exceeding in length the outer toe and claw. Oocca, present but very small.

Color. *Adult male.* Above, including secondaries and upper wing coverts, slaty-blue, darkest on the head, with tertiaries spotted on both webs, secondaries barred on inner webs, and base of feathers on occiput, white. Primaries, dark-brown banded on inner webs with ashy-brown and white. Tail, ashy-brown, tipped with white and barred with dark-brown. Beneath, including under wing coverts, tibia, and under tail coverts, white, the former, spotted with dark-brown and the latter, immaculate, but all the remaining feathers below have a narrow, central line of dark-brown and are transversely banded, excepting on throat, with reddish-brown. Sides of head, yellowish-rufous, streaked with dusky.

Adult female. Quite similar to the male in general coloration but lighter above, where the feathers show central lines of darker, and the tints below are much lighter.

Young. Browner above than in the adult and there are some traces of rufous on the head. Longitudinally and broadly streaked below with pale reddish-brown.

Young of the year. Brown above, with every feather edged with reddish. The markings below are also narrower and darker. There is a whitish line over the eye. Otherwise similar to the above.

Nestlings. Are at first covered with a yellowish down, then gradually assume the plumage last described which they keep for a year. Bill, dark-brown, bluish at base, cere, greenish, feet, yellow, iris, reddish, in all stages.

OBSERVATIONS.

Specimens of the same age are quite uniform in pattern of coloration but vary a little in intensity of tintings; thus the white of the throat is occasionally overwashed with reddish and the under tail coverts are tinged with it. Known from the closely allied *Cooperi* by the small size, more slender tarsus, and comparatively long middle toe which considerably exceeds in length the hind toe and claw, and from all others by the long tail, short wings, and colors as described. Distributed as a summer resident, throughout North America. Winters in the portions south of latitude 42°.

DIMENSIONS.

Average measurements of male specimens from Eastern North America. Length, 11.35; stretch, 21.25; wing, 6.75; tail, 5.40; bill, .40; tarsus, 1.70. Longest specimen, 11.75; greatest extent of wing, 21.75; longest wing, 7.00; tail, 5.60; bill, .45; tarsus, 1.90. Shortest specimen, 10.00; smallest extent of wing, 20.00; shortest wing, 6.50; tail, 5.30; bill, .35; tarsus, 1.80.

Average measurements of female specimens from Eastern North America. Length, 13.00; stretch, 24.50; wing, 7.50; tail, 6.10; bill, .45; tarsus, 2.10. Longest specimen, 13.50; greatest extent of wing, 25.00; longest wing, 7.65; tail, 6.25; bill, .50; tarsus, 2.25. Shortest specimen, 12.50; smallest extent of wing, 21.00; shortest wing, 7.25; tail, 6.00; bill, .40; tarsus, 2.00.

DESCRIPTION OF NESTS AND EGGS

Nests, placed in trees. They are not very bulky structures, composed of sticks, lined with strips of bark, leaves, weeds, and grass.

Eggs, three or four in number, rather spherical in form, bluish-white in color, coarsely spotted and blotched with brown and number of varying shades. Dimensions from 1.17 x 1.45 to 1.20 x 1.60.

HABITS.

The little Sharp-shinned Hawks are easily recognized when on the wing, by the peculiar flight which differs somewhat from other birds of this order already described, for they fly with a quick, flapping motion of the wings, alternated with short intervals, when they move with extended pinions. In spite of this singular mode of progression, they manage to travel very rapidly and will dart through a thicket or around it with almost the speed of thought, causing a great panic among the little birds for they are well aware of the fact,

that these Hawks seldom enter their favorite retreats in this headlong manner without meaning mischief; and they generally accomplish their object. A few quick turns, a tumble or two, during which the wings, tail, and long legs of the Hawk appear to be tangled together in an inextricable manner; he knows what he is about, however, for he quickly rights himself, emerges from the thicket, and the next moment, the feathers of the plucked Sparrow are floating in the wind. When we consider that scenes, such as I have described, are being repeated every day many thousand times, throughout the length and breadth of our continent, we can understand how destructive the Sharp-shinned Hawks must be to bird life.

These small Hawks are very bold and will not hesitate to attack birds which are larger than themselves, and I once saw one strike down a fully grown Night Heron that chanced to be abroad by day. The Heron was flying from one island to another across some marshes, when the Hawk darted out of a neighboring wood and pounced upon him. The force of the shock was so great that the slowly moving Heron fell to the ground at once but, fortunately for him, in falling, he gave vent to one of those discordant squawks which only a bird of this species is capable of uttering, and which so astonished and frightened the Hawk, that it completely forgot to take advantage of its prostrate prey, but darted away; while the Heron regained its feet, shook itself, and mounting in air, flew wildly into the nearest thicket.

The Hawks and Kites of which I have been writing, are about neutral as regards the interests of man but the Sharp-shins are most decidedly a nuisance, not only on account of their propensity to destroy small birds but they are also extremely fond of young Chickens, Turkeys, etc., and will not hesitate to capture them whenever a suitable opportunity occurs. These destructive qualities are greatly augmented by the fact, that when they have once discovered a brood of Chickens, they will constantly forage upon them until the last one is gone, unless the farmer interferes with his gun.

The Sharp-shinned Hawks breed rather late, usually about the first week in May in Massachusetts, placing the nest in the fork of a tree, often not twenty feet from the ground. The parents are not particularly solicitous for the safety of their eggs, merely alighting on some neighboring tree, where they silently watch the collector as he robs their nest. The young appear in due course and, after accompanying their parents a short time, disperse about the country. These Hawks usually migrate southward in winter but I have occasionally seen them as far north as Massachusetts during this season.

ACCIPITER COOPERI.

Cooper's Hawk.

Falco Cooperi BONN., Am. Orn., II: 1828, 1.

DESCRIPTION.

SP. CH. Form, robust. Size, large. Sternum, stout but rather narrow, with the marginal indentations not large. Tongue, quite fleshy, rounded and bifid at the tip. Tarsus and toes, short and stout, with the middle toe about equal in length to the hind toe and claw. Cecca, present but very small.

Color. Adult male. Above, including secondaries and upper wing coverts, slaty-blue, darkest on the head, with tertiaries spotted on both webs, and primaries and secondaries barred on inner webs, with white, also the base of feathers on occiput, white. Primaries, brown, and, with the secondaries, are barred on both webs with dark-brown. Tail, ashy-brown, tipped with white and barred with dark-brown. Beneath, including under wing coverts, tibia, and under tail coverts, white, the former, spotted with dark-brown and the latter, immaculate, but all the remaining feathers below have a narrow, central line of dark-brown and are transversely banded, excepting on throat, with reddish-brown.

Adult female. Quite similar to the male in general coloration but lighter above, where the feathers show central lines of darker, and the tints below are much lighter.

Young. Browner above than in the female and there are some traces of yellowish-rufous on the head and neck. Longitudinally streaked below with dark yellowish-brown.

Young of the year. Dark-brown above, with every feather edged with reddish. The markings below are also broader and darker. Otherwise similar to the above.

Nestlings. Are at first covered with a pale reddish down, then gradually assume the plumage last described which they keep for a year. Bill, dark-brown, bluish at base, cere, greenish, feet, yellow, in all stages.

OBSERVATIONS.

Although specimens of the same age are quite uniform in pattern of coloration, they vary somewhat in tintings, especially below. Known from the closely allied *fuscus*, by the larger size, shorter tarsus, and comparatively short middle toe which only about equals in length the hind toe and claw, and from all others, by the short wings, long tail, and colors as described. Distributed as a summer resident, throughout temperate North America. Winters in the portions south of latitude 42°.

DIMENSIONS.

Average measurements of male specimens from Eastern North America. Length, 17.00; stretch, 23.00; wing, 9.50; tail, 8.25; bill, .65; tarsus, 2.55. Longest specimen, 18.00; greatest extent of wing, 29.00; longest wing, 10.00; tail, 8.50; bill, .70; tarsus, 2.69. Shortest specimen, 16.00; smallest extent of wing, 27.00; shortest wing, 9.00; tail, 8.00; bill, .60; tarsus, 2.50.

Average measurements of female specimens from Eastern North America. Length, 19.00; stretch, 30.00; wing, 10.50; tail, 8.95; bill, .70; tarsus, 2.65. Longest specimen, 20.00; greatest extent of wing, 31.00; longest wing, 11.00; tail, 9.75; bill, .71; tarsus, 2.70. Shortest specimen, 18.00; smallest extent of wing, 29.00; shortest wing, 10.00; tail, 8.10; bill, .68; tarsus, 2.50.

DESCRIPTION OF NESTS AND EGGS.

Nests, usually placed in high trees. They are somewhat bulky structures, composed of sticks, lined with strips of bark, leaves, weeds, and grass.

Eggs, from two to four in number, rather spherical in form, pale bluish-white in color, usually spotted with pale reddish-brown. Dimensions from 1.90 x 1.50 to 2.10 x 1.60.

HABITS.

Cooper's Hawks are not only similar to the Sharp-shins in color and general form, but also closely resemble them in flight; so closely, in fact, that it is often quite difficult to decide to which species a particular specimen belongs when seen upon the wing at a distance. This similarity, however, is not as noticeable in the habits of the two species; it is true, that both exhibit the same rapidity of movement and both are equally bold in their forays upon the poultry-yard, but in this respect, the species now under consideration, must bear away the palm, for their larger size and comparatively greater strength enable them to not only capture the young fowls and hens but the lord of the seraglio, Chanticleer, himself, is not safe from their attacks, for his attempts to punish the bold intruders, are too often met with defeat and his lifeless body is born away to the nearest thicket to be devoured by the conquering Hawk.

When hunting for prey, Cooper's Hawks fly, as a rule, rather higher than the Sharp-shins but when they perceive their booty, they dart down upon it with almost incredible speed, generally striking with a certain aim. Thus they scour woodland, plain, and river

valley, and when they are hungry, nothing of a suitable size, which has life, is safe from their attacks. They not only catch Grouse, squirrels, and rabbits but will also capture Ducks upon the water, and I have frequently seen them searching for Snipe along the marshy edges of the rivers in Florida.

These Hawks, according to my experience, usually place their nests in the tops of high pines, breeding about the middle of May in New England and a little earlier in Pennsylvania. The parents are quite solicitous for the safety of their young, even after they have left the nest and I once witnessed an instance where this trait was displayed in a somewhat peculiar manner. A young Hawk in endeavoring to cross from a piece of woodland, where it had evidently spent its short life, to a grove not far distant, had miscalculated its ability to fly so far and its strength giving out, it fell against a building, when it was captured by a boy who, after examining it for a time, concluded to liberate it and carrying it to a neighboring field, set it free. The little fellow rose promptly in air but, exhausted by its struggles when in captivity, was only able to fly a short distance, when it fell toward the ground. Just at this moment, however, the adult female which, without doubt, had watched the whole proceeding, emerged from the adjacent woods, flew rapidly to her offspring, and, as near as I could make out, passed beneath it and supported it upon her back until she reached the shelter of some pines, where I lost sight of her.

As these Hawks are partly migratory, they are much more abundant in New England in spring and autumn than at any other season, yet they are far from being uncommon during summer but are quite rare in winter as the majority then pass south of us.

GENUS II. ASTUR. THE BLUE HAWKS.

GEN. CH. *Bill, short, broad, well curved, with the cutting edge of upper mandible slightly lobed, but the lower is not notched. Tarsus, moderately long and well feathered in front. Tail, not rounded, considerably exceeding in length one half the length of the wings which are short and not pointed. Nostril, without central tubercle.*

Members of this genus do not have the leg strikingly long and although the tarsus is usually naked to the heel behind it is feathered in front for half its length. The toes are long and the claws are quite long and pointed. Five outer quills are noticeably incised on the inner webs.

The trachea is a little flattened throughout. The sterno-trachealis is short and stout, having its origin quite near the larynx, and there is a slender bronchialis extending over all the half rings, but there are no other laryngeal muscles. The tympaniform membrane is present and although there is a thin os transversale, it does not support a semilunar membrane. The walls of the œsophagus are thin: this is at first nearly straight, then is dilated into a crop, and is again straight and opens into a large sized proventriculus with numerous small, simple, closely packed, oval glands arranged in a zonular band which measures 1.15 in *atricapillus*, from which this and the following dimensions were taken. The stomach is of a small size, somewhat globular in form, with thin but soft walls, and is lined with a soft membrane which lies in longitudinal ridges. The fold of the duodenum is long, measuring 3.25, inclosing a small, irregularly formed pancreas which only occupies a small portion of its length. The coeca, when present, are very small. The spleen is a spherical body lying on the proventriculus or near it. Both lobes of the liver are short, thick, and nearly equal in size. The heart is large and triangular in form. There is but one species within our limits. N. B. In 19th line, page 302, for a single genus read two genera.

ASTUR ATRICAPILLUS.

Goshawk.

Astur atricapillus JARD. & SELBY, Illus.: 1825, pl. 121.

DESCRIPTION.

SP. CH. Form, robust. Size, large. Sternum, stout but rather narrow, with the marginal indentations quite large. Tongue, quite horny, rounded but not bifid at tip. Coeca, present but small. Sexes, similar in color.

Adult. Above, including upper wing and tail coverts, bluish-ash, with the feathers lined next the shaft and edged with sooty-brown. Wings, very dark sooty-brown, with the outer webs of the secondaries, bluish-ash, while the outer edges of the outer webs of the primaries show traces of it. The inner webs of primaries and a portion of secondaries are broadly barred with whitish. The upper tail coverts are bluish-ash, slightly tipped with white. Tail, bluish-ash, barred with spots of dark-brown and tipped with white. Beneath, everywhere, uniform bluish-white, every feather streaked in the center and barred irregularly with slaty. Top of head and line on side of it back of eye, black. Lores, bluish and dusky. Superciliary line, white, streaked with black. Nearly concealed patch on occiput, white. Iris, bright reddish-orange.

Young. Entire upper surface, dark-brown, becoming reddish on the wings which are barred with dusky and white, ashy on the tail which is barred with sooty black, and darker on the shoulders, neck, and head, the two latter, streaked with dark-brown.

Young of the year. Quite similar to the above but decidedly rufous on both surfaces. In the last two stages, the cere and feet are greenish, the iris is yellow, and the bill, dark-brown.

OBSERVATIONS

There is considerable variation in specimens in the adult plumage, particularly in regard to the width of the markings below, thus in some they are much broader and darker than in others, but the species may be at once recognized, in the adult stage, by the general ashy-blue color, and in younger stages, by the peculiar form, large size, and colors as described. Distributed, as a summer resident, throughout North America, north of Canada, migrating in winter south, at least, to Pennsylvania.

DIMENSIONS

Average measurements of female specimens from Eastern North America. Length, 23.00; stretch, 45.00; wing, 13.50; tail, 10.50; bill, .72; tarsus, 2.90. Longest specimen, 24.00; greatest extent of wing, 46.00; longest wing, 14.00; tail, 11.00; bill, .75; tarsus, 3.00. Shortest specimen, 22.00; smallest extent of wing, 44.00; shortest wing, 13.00; tail, 10.00; bill, .70; tarsus, 2.80.

Average measurements of male specimens from Eastern North America. Length, 21.00; stretch, 41.00; wing, 12.50; tail, 9.50; bill, .70; tarsus, 2.75. Longest specimen, 22.00; greatest extent of wing, 43.00; longest wing, 13.00; tail, 10.00; bill, .72; tarsus, 2.80. Shortest specimen, 20.00; smallest extent of wing, 40.00; shortest wing, 12.00; tail, 9.00; bill, .68; tarsus, 2.70.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in trees, they are very bulky structures composed of sticks, twigs, and weeds, lined with strips of bark and grass.

Eggs, three or four in number, rather spherical in form, bluish-white in color, either immaculate or finely mottled with pale reddish-brown. Dimensions from 1.82 x 2.30 to 1.92 x 2.32.

HABITS.

In flight and general habits, the Goshawks are not unlike Cooper's Hawk but I think that they are rather more inclined to hunt in the woods than the latter named species, being, in fact, very nearly as arboreal in this respect as the Broad-wing. On account of frequenting wooded districts, the Goshawks become very expert in flying through the trees and I have seen them dashing along at full speed, avoiding the numerous limbs and obstacles which hang in their path, with the greatest ease. This facility for passing through the trees, together with the power of turning almost instantly, enables them to capture squirrels, rabbits, etc., and I have even seen them take Ruffed Grouse; in short, in some sections of New England, they hunt this latter named bird so persistently that they are called Partridge Hawks.

During the summer of 1868, a pair of these fine Hawks remained throughout the season in the town of Weston, Massachusetts, and I frequently saw them sailing over the meadows but was unable to discover the nest although I searched for it carefully in the adjacent woods. If this pair had a nest in the vicinity, which was quite probable, such

an event was quite uncommon as these birds usually breed much further north, only visiting New England late in autumn and departing early in spring.

FAMILY IV. BUTEONIDÆ. THE BUZZARD HAWKS

The sternum is short, wide, and nearly equal in width to the length of the coracoids, but the scapular process of the latter does not meet the furcula. Marginal indentations, two, inclosed.

This family, in our section, is represented by two genera. The manubrium is moderately well developed, abruptly truncated, and not forked. The furcula is stout, much flattened by lateral expansion, wide and thick near the base which is rounded and not produced into a point. The terminal expansion is rather small and the furcula near it is only slightly contracted and furrowed above, and is bent downward to a point, closely approximating the top of the manubrium. The marginal indentations, although varying in size with age, are always inclosed. Bill, strong, well-curved, with the cutting edge of upper mandible slightly lobed. The tarsus is short, stout, and naked to the heel behind, but more or less feathered in front. The toes are stout, with strong, well-curved claws. The wings and tail are moderately long, the former are not pointed and the latter is usually slightly rounded.

GENUS I. BUTEO. THE NAKED-LEGGED HAWKS.

GEN. CH. *Sternum, rather narrow and long, only being about as wide as it is high, including the keel. Tarsus, not feathered to the toes in front.*

There is quite a thick sterno-trachealis, a stout bronchialis, but no other laryngeal muscles. The trachea is a little flattened throughout. The oesophagus is dilated near the middle into quite a large crop, and the walls are very thin. The proventriculus is rather large, with quite small, simple, oval glands, arranged in a zonular band which measures from .75 to 1.00 in width. The stomach is somewhat globular in form, with quite thin walls, lined with a soft membrane. The fold of the duodenum is long, inclosing a small, irregularly formed pancreas which only occupies a short portion of its entire length. The ceca are very small. Both lobes of the liver are about equal in size, and the heart is large and pointed. The spleen is an oval shaped body situated on the proventriculus. There are six species within our limits.

BUTEO BOREALIS.

Red-tailed Hawk.

Buteo borealis VIEILL. Nonv. Dict. d'Hist. Nat., IV; 1816, 478.

DESCRIPTION.

Sp. CH. Form, robust. Size, large. Sternum, stout, but rather narrow; marginal indentations quite large. Tongue, quite fleshy, rounded at the tip and slightly bifid. Tarsus, feathered in front for more than half its length. Four outer quills are incised on the inner webs. Sexes, similar in color.

COLOR. *Adult.* Sides of head and entire upper surface, excepting tail and outer portion of tail coverts, dark-brown, with the feathers edged with whitish and yellowish-rufous; barred on scapularies with whitish and on the remainder of wings with dusky. Tail, cinnamon-red, white at extreme base and tip, and provided with a subterminal band of black. Outer portion of upper tail coverts, white, barred with cinnamon-red and dusky. Beneath, yellowish-white everywhere, deepest on the tibia, heavily streaked on throat with dusky, across breast with reddish-brown, where the spots frequently become so broad as to form a band; there are also broad streakings of dusky-brown in a band across the middle of the body, and the remainder of under portions, excepting under tail coverts, are finely streaked with reddish-brown. There is a broad line of dusky-brown on the cheek.

Young. Quite similar to the adult above, but the tail lacks the cinnamon, being light red, marked with twelve, or more, bands of dark-brown. Beneath, nearly white, with a slight tinge of yellowish; no streakings on the throat or breast, but barred as in the adult. The tibia is not streaked but is banded in spots with dark-brown. In these two stages, the iris is dark-brown and feet are yellow.

Young of the year. Not unlike the young; darker above, especially on the tail, and showing more reddish on the top of the head. There is also a general suffusion of buff below, particularly on the breast.

Nestlings. Are at first covered with a pale reddish down, then gradually assume the plumage last described which is retained for a year. In the last two stages, the iris is pale brownish-yellow and the feet are pale yellow. In all stages, the bill is black and the cere, greenish.

OBSERVATIONS.

Although this species varies greatly in the West, often assuming very dark colors, it is quite constant in this respect in our section. The pure cinnamon-red tail is usually characteristic of the adult plumage but it is frequently barred with black in specimens which are fully adult. On the other hand, I am informed by Mr. William Perham of Tyngsborough, who has beyond doubt landed more Hawks of this species than any one else, that he has, on several occasions, taken the young from the nest with perfectly red tails. Adult birds sometimes have the tibia unspotted. This species may be recognized in all stages by the large size, light tints beneath, and other colors as described, together with the half-feathered tarsus. Distributed, during summer, throughout North America; wintering south of latitude 42°.

DIMENSIONS.

Average measurements of female specimens from Eastern North America. Length, 23.00; stretch, 47.00; wing, 16.00; tail, 8.75; bill, .95; tarsus, 3.25. Longest specimen, 24.00; greatest extent of wing, 50.00; longest wing, 17.00; tail, 9.50; bill, 1.00; tarsus, 3.00. Shortest specimen, 22.00; smallest extent of wing, 48.00; shortest wing, 15.00; tail, 8.00; bill, .90; tarsus, 3.50.

Average measurements of male specimens from Eastern North America. Length, 20.50; stretch, 47.00; wing, 11.50; tail, 7.50; bill, .95; tarsus, 2.95. Longest specimen, 21.00; greatest extent of wing, 48.00; longest wing, 15.00; tail, 8.00; bill, 1.00; tarsus, 2.90. Shortest specimen, 19.00; smallest extent of wing, 46.00; shortest wing, 14.00; tail, 7.00; bill, .90; tarsus, 3.05.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in trees. They are bulky structures, composed of sticks and twigs, lined with leaves, weeds, and strips of bark.

Eggs, three or four in number, varying from elliptical to oval in form, bluish-white in color, spotted and blotched with brown and amber of varying shades. Dimensions, from 1.65 x 2.10 to 1.80 x 2.25.

HABITS.

Many years ago, when Florida was a wilderness and but sparsely inhabited by the whites, the Indians were accustomed to burn over large tracts of the piney woods in order to form pasture grounds for the deer. Later, the settlers followed their example and in the wilder portions, this is practiced at the present time. The fire not only spreads over the woodland but also encroaches upon the drier portions of the savannas and, as the grass in these latter named sections form the refuge of many small mammals as well as reptiles, there is a general stampede when the flames approach. Vultures and Hawks speedily become aware of the fact, that their prey is much more easily obtained when the fires are raging, and consequently flock to the vicinity in numbers. The Red-tailed Hawks are nearly always present upon such occasions; indeed, I do not remember of ever having seen a fire of any extent in Middle and Northern Florida, when there were not one or more pairs of these birds, circling around a short distance above the ground or plunging downward through the smoke to secure some animal which was endeavoring to save its life by flight.

The Red-tailed Hawks spend only the winter in Florida for I do not think that any remain to breed but, as spring approaches, they migrate northward, passing through Massachusetts about the first week in April. In migrating, the Red-tailed Hawks move in

large, straggling flocks at such an elevation as to be nearly invisible. They appear to follow river valleys in their course, avoiding the more elevated districts. Mr. Will Perham, to whom I am indebted for valuable facts relative to the movements of Hawks, captures many of these birds during the spring, often securing in a single season, more Red-tailed Hawks than a casual observer would suppose were to be found in the whole state; thus during two weeks in April, 1878, he took about three hundred of these fine birds and a number of other species.

About the first week in May, the Red-tailed Hawks having become dispersed throughout the country, begin to breed. The nest is placed on a high pine or other tree, in some secluded locality, often in a thick swamp. The young leave the nest by the first of July and soon after learn to forage for themselves. In hunting, these Hawks keep at a considerable height, sailing in circles with broadly extended wings; then, upon perceiving their prey, they will plunge obliquely downward and seize it. They capture rabbits, squirrels, Grouse, Ducks, and other wild game but are particularly fond of domestic fowls, visiting the farmer's poultry-yard with such persistent regularity that they have received the name of Hen Hawk. When pressing onward in a straight line, the flight of the Red-tails is steady, the wings being moved regularly, but rather quickly. They remain north until late in October when they pass southward much as they come, but the flocks are not as large for the birds are more generally distributed and thus occupy a greater extent of country.

BUTEO HARLANI.

Harlan's Hawk.

Buteo Harlani AUD., SYN. Birds N. A.; 1839, 6.

DESCRIPTION.

Sp. Ch. Form, robust. Size, large. Tarsus, feathered in front for more than half its length. Four outer quills are incised on the inner webs.

COLOR. *Adult.* General colors throughout, dark sooty-brown, with the wings, excepting tips of primaries, finely, but irregularly barred with ashy-brown and whitish. The tail is mottled with ashy-brown which becomes decidedly rufous next the shaft of the subterminal portions of the feathers. Below, the feathers of the flanks and under tail coverts are obscurely banded with ashy-brown. The basal two thirds of the feathers on head, neck all around, and breast to middle of body, are pure white.

Young. Much browner than the above described, with the feathers edged with ashy; in fact, the whole bird is occasionally spotted with this latter named color. Iris, brown. Cere and feet, greenish. Bill, black.

OBSERVATIONS.

The description of the adult of this rare Hawk, is taken from a fine specimen, now in my possession, which was shot at Watsonstown, Pennsylvania, on the thirtieth of March, 1875. The young stage is from a skin which I have seen in the collection of Mr. William Brewster, which came, I think, from Texas. Readily known from all stages of *borealis*, by the pure white on the base of the feathers of the anterior portions, and from other Hawks in the melanistic condition, by the feathering of the tarsus and incision of the quills. I had long suspected that the white of the basal portion of the feathers of the anterior parts, would, in some specimens, become extended so as to occupy nearly the whole of the feathers; thus I was not surprised when I learned from the Bulletin of the Nuttall Ornithological Club for January, 1880, page 51, that Mr. Ridgway actually had a specimen in hand where the lower anterior portions were nearly white; but the white tail of this specimen, as described, was certainly unexpected. Distributed throughout Southern United States, north to Pennsylvania, but is more common in Texas.

DIMENSIONS.

Average measurements of male specimens from Eastern North America. Length, 23.74; stretch, 51.98; wing, 15.25; tail, 9.45; bill, 1.12; tarsus, 2.85. Longest specimen, 23.52; greatest extent of wing, 53.15; longest wing, 15.75; tail, 10.12; bill, 1.20; tarsus, 3.15. Shortest specimen, 22.00; smallest extent of wing, 51.06; shortest wing, 15.12; tail, 8.95; bill, 1.00; tarsus, 2.75.

Average measurements of male specimens from Eastern North America. Length, 20.55; stretch, 46.15; wing, 11.50; tail, 8.50; bill, 1.05; tarsus, 2.65. Longest specimen, 21.12; greatest extent of wing, 48.15; longest wing, 15.00; tail, 8.95; bill, 1.15; tarsus, 2.75. Shortest specimen, 20.00; smallest extent of wing, 45.00; shortest wing, 11.85; tail, 8.00; bill, .98; tarsus, 2.50.

HABITS.

Audubon discovered the fine Hawk which we now have under consideration, fifty years ago in Louisiana and named it in honor of his friend, Dr. Richard Harlan of Philadelphia. Two specimens were secured by the great ornithologist at that time, both of which were presented to the British Museum, but one was subsequently lost. The remaining specimen was, for a long time, the only one in existence and the validity of the species was doubted by many of the more recent writers upon ornithology, but was fully re-established by Mr. Ridgway in *North American Birds*, in 1874, and I fully endorse this latter named gentleman when he says that it is "a most excellent species". There is a specimen in the Philadelphia Academy of Sciences, obtained some years ago, if I remember rightly, in Pennsylvania. An adult male was taken in Kansas about 1872 and two have been secured in Texas since that time, one of which is now in the possession of Mr. William Brewster. I have a fine adult female which was shot by Mr. Walter Van Fleet in Watsontown, Pennsylvania, on the thirtieth of March, 1875. This bird was sitting on the top of a high tree at long gun-shot distance from a road, along which its captor was walking, when he observed it; but, thinking it was a common Red-tail, he fired a careless shot at it, which by good fortune, brought it down. Mr. Van Fleet afterward saw the mate in the vicinity but was unable to secure it. Mr. Greene Smith of Peterborough, New York, also has a fine specimen of the dark type in his collection. This specimen, as seen by the above, makes the seventh which has been captured to my knowledge and one of these, Audubon's, has been lost. I have, however, heard of others but will venture to state that, at the present time, January, 1880, there are not a dozen birds of this species in existence in collections. As may readily be inferred, but little is known of the habits of Harlan's Hawk but they doubtless closely resemble the Red-tail in this respect. The nest and eggs are also unknown.

BUTEO LINEATUS.

Red-shouldered Hawk.

Buteo lineatus AUD. Syn. Birds, N. A.: 1839, 7.

DESCRIPTION.

SP. CH. Form, robust. Size, medium. Sternum, stout, not very narrow, with the marginal indentations quite small. Tongue, quite fleshy, rounded and slightly bifid at tip. Coeca, present but small. Tarsus, feathered in front for less than half its length. Four outer quills are incised on the inner webs. Sexes, similar in color.

Color. Adult. Above, dark-brown everywhere, lightest on the head and darkest on the wings and tail, with the feathers on top of head, neck, back, and shoulders, edged with yellowish-rufous which becomes quite reddish on the latter. The wings are barred with white and the tail is crossed with five bars of it and is tipped with the same color. Sides of head and throat, dusky, streaked with yellowish-rufous. Remaining under portions, yellowish, barred with deeper rufous and more or less streaked on the breast and middle of body with dusky.

Young. Quite similar to the adult but with the outer webs of primaries edged with yellowish-rufous and the wings are barred with it. The tail is also rufous finely banded with dusky. There are no rufous bandings below but there are broad drop-shaped marks of brown distributed over the entire surface.

Young of the year. Similar to the young but there is much more rufous above, excepting on the outer edges of primaries, where there is less, and there is a stronger tinging of rufous beneath.

Nestlings. Are, at first, covered with a pale yellowish down, then gradually assume the plumage last described. Bill and iris, brown, cere, greenish, and feet, yellow, in all stages.

OBSERVATIONS.

There is considerable variation in plumage in specimens of the same age, some being much darker than others. There is also a pale form with unmarked tibia. Florida birds are smaller and darker than those from the North. Readily known by the four incised quills, feathering of the tarsus, and tints as described. Distributed, as a summer-resident, from Canada to Florida. Winters in Massachusetts and southward.

DIMENSIONS.

Average measurements of female specimens from Eastern North America. Length, 21.94; stretch, 41.25; wing, 13.82; tail, 8.50; bill, .95; tarsus, 2.75. Longest specimen, 21.00; greatest extent of wing, 43.12; longest wing, 11.75; tail, 9.50; bill, .89; tarsus, 2.95. Shortest specimen, 19.05; smallest extent of wing, 39.12; shortest wing, 13.05; tail, 7.50; bill, .92; tarsus, 2.45.

Average measurements of male specimens from Eastern North America. Length, 20.05; stretch, 35.15; wing, 12.00; tail, 8.42; bill, .80; tarsus, 2.65. Longest specimen, 23.00; greatest extent of wing, 38.00; longest wing, 12.50; tail, 9.75; bill, .90; tarsus, 2.90. Shortest specimen, 16.00; smallest extent of wing, 32.50; shortest wing, 11.00; tail, 8.00; bill, .75; tarsus, 2.23.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in trees; they are very bulky structures composed of sticks, twigs, and weeds, lined with strips of bark and grass.

Eggs, three or four in number, varying from spherical to elliptical in form, bluish-white in color, spotted and blotched irregularly with brown and amber of varying shades. Dimensions from 1.70 x 2.20 to 1.80 x 2.30.

HABITS.

That civilization has an influence upon various members of the feathered tribes, has been frequently shown in the preceding pages and the influence has, as a rule, been beneficial, not only to the birds but also to man; but in the species now under consideration, this is quite different. In former days, when the country was a wilderness, these Hawks were contented to feed upon mice, frogs, lizards, snakes, and other vermin, seldom molesting birds for they are too slow in movement to capture them readily; but with the settlement of the country, poultry-yards were introduced, and Red-shouldered Hawks were not long in learning that the occupants could be as easily captured as the animals which had hitherto formed their food. This lesson, once learned, has never been forgotten and today, there is not a more troublesome Hawk than the Red-shouldered.

In the wilder sections, however, these Hawks still retain the primitive habits of their ancestors; thus in Florida, I found them feeding upon small mammals, reptiles, crabs, and other crustaceans. These birds were constantly resident in Florida and were of the small race, characteristic of the South, but in the vicinity of Jacksonville, during winter, I found the larger northern form which were evidently migrants and which were as troublesome to the planters as they are to the farmers, for they would steal chickens whenever a suitable

opportunity occurred. These winter sojourners were also very wild, while on the other hand, the small southerners were very tame, allowing one to approach within a few yards of them; in fact, upon a certain occasion, one alighted on a low tree within a few feet of me and gazed at me fearlessly while I walked slowly past.

Like the Red-tailed, these Hawks are accustomed to circle about, high in air, watching for their prey; at such times, both species resemble each other somewhat, as they both have the same general movements, but the Red-shouldered may be distinguished, even when at a long distance, by the form, for they are shorter in proportion to the spread of wing, than the allied species. To make it clearer, an imaginary circle drawn around the bird, touching the tips of the wings, would pass outside the tip of the tail, while with the Red-tailed, this line would pass through the terminal portion of the tail.

When moving about as described, the Red-shouldered Hawks occasionally give vent to shrill screams which become louder and harsher when their nesting places are approached. When the male is paying court to the female, he utters a peculiar chucking sound and is very assiduous in his attentions to her, offering her food and seldom leaving her. Even when she is sitting, he not only provides her with all she wants to eat but, like nearly all other Hawks, shares the duties of incubation with her. When not otherwise engaged, he guards the vicinity of the nest vigilantly and, upon the approach of an intruder, gives notice to his mate, and she silently leaves the nest. I observed the Red-shouldered Hawks nesting in Florida early in February and obtained three young from a nest, built in a cypress tree which stood in a small pond in the piney woods in the vicinity of Salt Lake. This was on the tenth of April and then the young were two or three weeks old, for the feathers were just starting. Judging from this instance, the eggs must be deposited about the first of March in the South. Further north, however, they breed a little later, from the first of April until May, the time of nesting being regulated, apparently, by the season. According to my experience, these Hawks prefer deciduous trees which grow in swampy land, in which to build, but I have occasionally taken the nest from pines. They do not select particularly large trees; in fact, I have more than once taken the eggs from nests, not over twenty feet from the ground; that, too, in woods where there was an abundance of trees of a much larger size.

The Red-shouldered Hawks are only partly migratory, at least in Massachusetts and southward, for they remain with us all winter, frequenting the vicinity of meadows in which there are open springs, in order to feed upon the frogs which resort to such places during the cold season.

BUTEO SWAINSONI.

Swainson's Hawk.

Buteo Swainsoni Bon., List: 1838, 3.

DESCRIPTION.

Sp. Cn. Form, not very robust. Size, medium. Tarsus, feathered in front for less than half its length. Only three outer quills are incised on the inner webs. Sexes, not similar in color in the adult stage.

LIGHT STAGE.

COLOR. *Adult male.* Above, dark-brown everywhere, lightest on the head, becoming darker on the wings and ashy on the tail, with the feathers more or less edged with rufous, especially on the neck. The wings are obscurely barred with dusky and the tail is tipped with whitish and is crossed with about twelve wavy lines of dusky. Concealed patch on occiput, white. Sides and base of upper tail coverts, white, barred with rufous and sooty-brown. Beneath, everywhere, white, pure on the throat but tinged on the remaining under portions with yellowish-rufous, while the breast is banded with reddish-brown, which has an ashy overwashing, but every feather of this portion is streaked in the centre with dark-brown. The sides, flanks, and under tail coverts, are barred with rufous. There is a spot of black on the tips of the under wing coverts.

Adult female. Much darker above than the above described and the lower portions are strongly tinged with rufous, barred with a deeper shade of the same color. The flanks are barred and streaked with dark-brown. Otherwise as in the male.

Young. Quite similar to the adult above but much more decidedly rufous, and the outer webs of primaries and tail are edged with ashy. Below, yellowish-rufous, tinged with ashy, thickly marked with drop-shaped spots of brown which crowd together on the breast so as to form a band. The flanks are also barred with dusky.

DARK STAGE.

COLOR. *Adult.* The throat, under wing and under tail coverts are as in the light stage but the remaining portions are very dark-brown, or nearly black, but the bandings on the wings and tail are as described. There are occasionally rufous markings below, especially in the female.

Young. Very dark, but showing strong traces of rufous on both surfaces. Bill and iris, brown, cere, greenish, and feet, yellow, in all stages.

OBSERVATIONS.

The young is the "*Bairdi*" of authors, while the dark type is "*insignatus*". There is considerable variation in plumage, for specimens occur in all gradations between the light and dark stages; but this species may be recognized by the white throat, incision of but three outer quills, combined with the size and colors as described. Distributed throughout Western North America. Rare in Illinois and accidental in Canada and Massachusetts.

DIMENSIONS.

Average measurements of male specimens from Western North America. Length, 19.55; stretch, 47.85; wing, 15.25; tail, 7.00; bill, .82; tarsus, 2.52. Longest specimen, 20.63; greatest extent of wing, 48.50; longest wing, 15.50; tail, 8.50; bill, .85; tarsus, 2.60. Shortest specimen, 18.75; smallest extent of wing, 47.25; shortest wing, 15.00; tail, 7.50; bill, .80; tarsus, 2.45.

Average measurements of female specimens from Western North America. Length, 20.25; stretch, 49.25; wing, 16.00; tail, 8.50; bill, .95; tarsus, 2.60. Longest specimen, 21.50; greatest extent of wing, 51.00; longest wing, 16.50; tail, 9.32; bill, 1.00; tarsus, 2.70. Shortest specimen, 18.83; smallest extent of wing, 47.00; shortest wing, 15.50; tail, 8.25; bill, .85; tarsus, 2.50.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in trees or bushes; they are quite bulky structures, composed of sticks and twigs, arranged in a compact manner.

Eggs, four to six in number, varying from spherical to oval in form, yellowish-white in color, spotted and blotched irregularly and rather faintly with reddish-brown, with occasional markings of purplish. Dimensions from 1.75 x 2.30 to 1.82 x 2.32.

HABITS.

The first record of the occurrence of this species east of the Mississippi, was made from a specimen taken in the vicinity of Montreal, Canada, about the year, 1854, nothing more being heard of it in this section until one was obtained in Salem, Massachusetts, in 1873. Then Mr. E. W. Nelson found them breeding on Fox Prairie, Illinois, in 1875 and obtained four specimens, and Mr. William Brewster makes record of a specimen which was taken at Wayland, Massachusetts, in September, 1876. Thus we are obliged to give Swainson's Hawk a permanent place in our fauna, although it is yet very rare east of the Mississippi.

The Canadian specimen and the one taken at Salem were in the melanistic condition as given in the dark stage of the description, and the one obtained at Wayland, was in a transitional or intermediate stage. According to descriptions, Swainson's Hawk does not differ strikingly in habit from other allied species, excepting that they occasionally build their nests in shrubbery.

BUTEO PENNSYLVANICUS.

Broad-winged Hawk.

Buteo Pennsylvanicus Bon. Syn.; 1828, 29.

DESCRIPTION.

Sp. Cr. Form, rather slender. Size, small. Tarsus, feathered in front for much less than half its length. Sternum, stout, not very narrow, with the marginal indentations quite large. Tongue, rather thick and fleshy, not very horny at tip where it is rounded but not bifid. Only three outer quills are incised on the inner webs. Cere, present but short and thick. Sexes, similar in color.

Color. *Adult.* Above, dark-brown everywhere, lighter on the head and darker on the wings and tail, with the feathers edged with rufous. Wings, white on the edges of inner webs and very obscurely barred with blue. Tail, white at base and tip and crossed with four bars of ashy-brown, which become lighter on the inner webs. Sides of head and neck streaked with black. Beneath, everywhere pale yellowish-rufous, streaked on the throat with dark-brown and heavily marked on the breast with broad streakings of red-fish-brown, while the remaining under portions are spotted with unobscured marks of the same color. Concealed spot on occiput, white.

Young. Similar to the adult above, but lighter on the head, and the tail is crossed with numerous obscure bands of dark-brown. Beneath, also similar but the spots are rounder, not as large, nor as numerous, only occurring on the breast, flanks, and tail.

Young of the year. Not unlike the young but more rufous below where the spots are rounder and darker, being, in fact, nearly drop-shaped.

Nestlings. Are, at first, covered with a yellowish down, then gradually assume the plumage last described which is retained for a year. Iris and bill, brown, cere, greenish, and feet yellow, in all stages.

OBSERVATIONS.

There is a little variation in plumage, some specimens being darker than the type, but this species may be at once recognized by the small size, incision of only three quills, nearly naked tarsus, and colors as described. Distributed, during summer, throughout Eastern United States, wintering in the more southern portions.

DIMENSIONS.

Average measurements of female specimens from Eastern North America. Length, 16.50; stretch, 34.75; wing, 10.25; tail, 6.55; bill, .68; tarsus, 2.25. Longest specimen, 18.00; greatest extent of wing, 36.00; longest wing, 11.55; tail, 7.12; bill, .74; tarsus, 2.45. Shortest specimen, 15.00; smallest extent of wing, 33.45; shortest wing, 10.11; tail, 6.15; bill, .62; tarsus, 2.15.

Average measurements of male specimens from Eastern North America. Length, 15.35; stretch, 34.75; wing, 10.15; tail, 6.25; bill, .63; tarsus, 2.15. Longest specimen, 16.50; greatest extent of wing, 35.00; longest wing, 10.55; tail, 6.59; bill, .65; tarsus, 2.40. Shortest specimen, 14.20; smallest extent of wing, 32.15; shortest wing, 9.75; tail, 6.00; bill, .58; tarsus, 2.05.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in trees. They are bulky structures, composed of sticks and twigs, lined with leaves, weeds, and strips of bark.

Eggs, three or four in number, varying from elliptical to spherical in form, dirty-white in color, spotted and blotched with brown and amber of varying shades. Dimensions, from 1.68 x 2.15 to 1.70 x 2.20.

HABITS.

The first time that I ever saw a living Broad-winged Hawk to recognize it, was many years ago. I was driving along a street in Newton, when I saw a small Hawk perched on

the limb of a large elm directly over the road. It did not appear to pay the slightest attention to me, for it allowed me to approach very near it and just as I was passing beneath the tree, it launched into air, flew over me, darted into a brush heap on the opposite side of the way, and, taking a few quick turns, emerged bearing a Brown Thrush in its talons. It flew a short distance with its prey and, alighting on a small tree near, coolly began to devour it. This, I say, was my first acquaintance with the species and the peculiarities displayed by this individual, I have since found to be characteristic of the Broad-winged Hawks wherever they occur. They seldom hunt by circling in air, like the Red-shouldered and other allied species, but pounce upon their prey from some elevation, or hawk about, close to the thickets. They are also more agile than the species just mentioned and are much tamer; indeed, it would be difficult to find Hawks more unsuspecting and the following instances, with the one related, will illustrate this trait. I was searching for birds on Key West one day and when crossing a clearing, I observed a small Hawk perched on a tree not far away. As I approached, it darted downward and disappeared behind a large hedge of oleanders, then in full bloom. I cautiously made my way among the shrubbery until I reached the opposite side, then I carefully examined the bushes and adjacent ground in search of the Hawk, but not seeing it, concluded that it had escaped, so stepped carelessly out into the open; and was proceeding on my way, when, glancing downward almost at my feet, I was astonished to see the Hawk quietly engaged in eating a mouse that it had captured in a bunch of weeds near. I was obliged to make a movement with my gun in order to make the bird rise, when I shot it. Last summer, when in company with the Bangs Brothers at Tyngsborough, I noticed a small Hawk perched on top of a dead stub in a wood. While I was endeavoring to obtain a shot, it flew a short distance, alighting in a spot where I could not see it, but I continued to walk in the direction that it took and, after going as far as I thought it had flown, stopped to examine the branches of the trees, when I was surprised to see the object of my search, sitting on a low limb a few yards away, gazing quietly at me.

The Broad-winged Hawks breed a little later than members of the same genus, nesting about the first week in May in New England, usually choosing pines in which to build their domiciles. The young appear in due course and accompany their parents for a short time, after which they learn to hunt for themselves. Like most Hawks, these birds moult in August, and in October, migrate southward.

GENUS II. ARCHIBUTEO. THE FEATHER-LEGGED HAWKS.

GEN. CH. *Sternum*, rather wide and short, being much wider than it is high, including the keel. *Tarsus*, feathered to the toes in front.

The sterno-trachealis varies in thickness and there is a small bronchialis, but no other laryngeal muscles. The trachea is a little flattened throughout. The oesophagus is dilated near the middle into quite a large crop, and the walls are very thin. The proventriculus is rather large, with quite small, simple, oval glands, arranged in a annular band which measures from 1.60 to 1.25 in width. The stomach is somewhat globular in form, with very thin walls, lined with a soft membrane. The fold of the duodenum is long, inclosing a small, irregularly formed pancreas which only occupies a short portion of its entire length. The caeca are very small. Both lobes of the liver are about equal in size, and the heart is large and pointed. The spleen is an oval shaped body situated on the proventriculus. There is but one species found within our limits.

ARCHIBUTEO LAGOPUS.

Rough-legged Hawk.

Archibuteo lagopus GRAY, List Genera of Birds, 1855, 3.

DESCRIPTION.

Sp. Ch. Form, very robust. Size large. Sternum, stout, rather wide, with the marginal indentations quite small. Tongue, quite fleshy, widening toward tip which is rounded but not bifid. Sterno-trachealis, weak. The glands of the proventriculus are arranged in five longitudinal, pyramid-shaped ridges. Cæca, very small. Sexes, similar in color.

LIGHT STAGE.

COLOR. *Adult.* Above, everywhere uniform dark-brown, with the feathers more or less edged with whitish and rufous. Outer edges of primaries, ashy, while the inner webs and under surface are white, and the entire wing is obscurely barred with dusky. The tail is tipped with yellowish-white, and the base and nearly all the lower portion are white, the whole being banded with dark-brown. Sides and base of upper tail coverts, also white, and the remaining portions are banded with it. Sides of head, yellowish-white, streaked with sooty-brown. Beneath, everywhere pale yellowish-white, broadly streaked in a band on the breast with dark-brown. There is a broad continuous band of dark-brown crossing the middle of the body, and the under wing coverts are streaked with dusky and the tips are black. The tibia is finely barred with wavy lines of rufous and dark-brown. The throat is also streaked with dark-brown.

Young. Quite similar to the adult but much more decidedly rufous above and below. The top of the head is very light, only being narrowly streaked with brown.

DARK STAGE.

COLOR. *Adult.* Uniform sooty-black everywhere, excepting under portions of wings, base of tail, and irregular markings on it, all of which are white.

Young. Very dark, like the above described, but more or less streaked, spotted, and mottled on both surfaces with brown and rufous. Bill, black, orange at base of lower mandible, cere and feet, orange, iris, brown, in all stages.

OBSERVATIONS.

It is extremely difficult to give an idea of the variable plumage of this species. I have described the extremes, but there are all gradations between and in some specimens the three colors, black, white, and rufous, are almost indescribably mixed and in others, appear in patches. Sometimes the tibia is unspotted, being either yellowish-rufous or decidedly reddish. The light stage is the typical *lagopus* of authors and previous to 1873 the dark stage was considered a species, and called "*Sancti Johannis*". In spite of this variation in plumage, no one in our section will fail to recognize this fine bird by the wily feathered tarsus, size, and colors as described. Distributed as a summer resident throughout North America, north of latitude 45°; wintering in New England and southward, at least into Pennsylvania.

DIMENSIONS.

Average measurements of female specimens from Eastern North America. Length, 22.30; stretch, 53.15; wing, 16.55; tail, 9.25; bill, .95; tarsus, 2.75. Longest specimen, 23.25; greatest extent of wing, 53.80; longest wing, 17.25; tail, 9.75; bill, 1.00; tarsus, 3.00. Shortest specimen, 21.15; smallest extent of wing, 52.00; shortest wing, 16.00; tail, 9.00; bill, .90; tarsus, 2.50.

Average measurements of male specimens from Eastern North America. Length, 20.35; stretch, 52.00; wing, 16.15; tail, 8.45; bill, .95; tarsus, 2.65. Longest specimen, 21.15; greatest extent of wing, 52.25; longest wing, 16.25; tail, 8.50; bill, 1.00; tarsus, 2.75. Shortest specimen, 19.50; smallest extent of wing, 51.75; shortest wing, 15.85; tail, 8.35; bill, .85; tarsus, 2.40.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in trees or on rocky cliffs; they are very bulky structures, composed of sticks and twigs, arranged in a compact manner, lined with leaves etc.

Eggs, four to six in number, varying from spherical to oval in form, ashy or yellowish-white in color, spotted and blotched irregularly and rather faintly with reddish-brown and amber, with frequent markings of purplish. Dimensions from 1.75 x 2.12 to 1.82 x 2.26.

HABITS.

When the brighter and warmer days of early November have past and the icy winds, blowing from the northward, constantly remind us, with ever increasing force, that the

pleasantest season of our New England climate has past; when the brown, frost-bitten land and darkening sea looks dreary and cold in the early light of morning, it is not uncommon to see a large Hawk perched on the topmost limb of some solitary tree that overlooks a wide extent of country. The bird looks sluggish and half-frozen but if one attempts to approach too near, it launches downward and flies heavily to some distant tree, disclosing as it goes, the white on the under portion of the wings, by which even the amateur will not fail to recognize the Rough-legged Hawk. These birds frequent the shores almost constantly during autumn and winter, feeding upon fish and other dead animals which are cast up by the sea, or they will occasionally catch a mouse, suspending themselves over it, after the manner of the Sparrow Hawk, before pouncing upon it. The flight of these Hawks is quite heavy and they seldom circle about high in air, but when hunting, fly along about twenty feet above the ground.

As intimated, the Rough-legged Hawks are quite sluggish in habit and may oftener be seen sitting than flying, yet they appear to fare well in spite of their indolence, for I do not remember handling one that was not in good condition; in fact, they are usually very fat. Although quite powerful birds, they are very gentle in captivity when treated well. Almost all Hawks become tame if captured when young, though they are seldom gentle when taken after they become fully grown, but the Rough-legged readily become familiar and make excellent pets.

As related, these Hawks prefer the sea-shore to the interior and are found along the entire New England coast during winter, but they are particularly abundant in New Jersey and I have seen several in sight at one time. Like most migrants, they make their appearance quite suddenly, remain through the cold weather, then depart as they come, without warning. According to authors, they breed in the far north, placing their nests in trees or on rocky cliffs.

FAMILY V. AQUILIDÆ. THE TRUE EAGLES.

The sternum is long, exceeding its width, wide, about equaling the length of the coracoids, but the scapular process of the latter does not meet the furcula. Marginal indentations, two, inclosed.

This family, in our section, is represented by a single genus. The manubrium is quite well developed, abruptly truncated, and not forked. The furcula is stout, much flattened by lateral expansion, wide and thick near the base which is not rounded but produced into a point. The terminal expansion is quite prominent and the furcula near it is contracted and deeply furrowed above, and is bent downward to a point, closely approximating the top of the manubrium. The marginal indentations, although varying in size with age, are always inclosed. Bill, strong, well-curved, with the cutting edge of upper mandible nearly straight. The tarsus is short, stout, and thickly feathered to the toes, which are stout, with strong, well-curved claws. The wings are long and pointed. The tail is moderately long, and considerably rounded.

GENUS I. AQUILA. THE EAGLES.

GEN. CH. *Posterior margin of sternum, indented with a wide, shallow scollop. Bill, strong and curved, with the cutting edge of upper mandible slightly lobed. Tail, considerably rounded.*

Members of this genus are very large and strong and the colors on both surfaces are generally dark with few or no conspicuous markings. There is but one species found within our limits.

AQUILA CHRYSÆTUS.

Golden Eagle.

Aquila chrysaetus LINN., Syst. Nat., I; 1766, 125.

DESCRIPTION.

SP. CU. Form, very robust. Size, large. Tarsus, feathered to the toes. Sternum, stout, with the tip of keel rounded. Bill, strong and well-curved. Sexes, similar in color.

COLOR. *Adult.* General color throughout, dark-brown, with a purplish tinge, lightest on the head, neck, shoulders, tibia, and tarsus; darkest on the wings, tail, and under portions. Feathers of head, neck, tibia, and tarsus, tipped and edged with deep yellowish-rufous. Base of tail, white.

Young. Similar to the adult, but lighter everywhere and the basal two thirds of the tail is white. Iris and bill, brown, cere and feet, yellow, in all stages.

OBSERVATIONS.

There is a little variation in plumage, some specimens being darker or lighter than the type. In the transitional dress between the adult and young, the tail is occasionally mottled with white. The young with the wide band of white on the tail is the Ring-tailed Eagle of the older authors. This species may be recognized by the large size, wholly feathered tarsus, and colors as described. Distributed, as a constant resident, throughout the mountainous portions of North America.

DIMENSIONS.

Average measurements of female specimens from Eastern North America. Length, 37.45; stretch, 85.00; wing, 24.00; tail, 15.00; bill, 1.65; tarsus, 4.52. Longest specimen, 38.60; greatest extent of wing, 86.50; longest wing, 25.00; tail, 16.00; bill, 1.75; tarsus, 4.60. Shortest specimen, 36.25; smallest extent of wing, 81.25; shortest wing, 23.00; tail, 14.00; bill, 1.50; tarsus, 4.00.

Average measurements of male specimens from Eastern North America. Length, 32.50; stretch, 83.00; wing, 21.75; tail, 13.00; bill, 1.55; tarsus, 3.75. Longest specimen, 35.00; greatest extent of wing, 84.00; longest wing, 23.50; tail, 14.00; bill, 1.65; tarsus, 4.00. Shortest specimen, 30.00; smallest extent of wing, 82.00; shortest wing, 20.50; tail, 12.00; bill, 1.40; tarsus, 3.50.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on rocky shelves of steep cliffs. They are bulky structures, composed of sticks and twigs, arranged in a compact manner.

Eggs, one, two, or three, in number, varying from elliptical to spherical in form, dirty-white or creamy in color, occasionally immaculate, but usually spotted and blotched with pale reddish-brown to which is sometimes added a faint tinge of purplish. Dimensions, from 2.18 x 2.65 to 2.52 x 3.30.

HABITS.

There are few birds of a large size upon which the settlement of the country has had so little effect as upon the Golden Eagles. As a rule, the inroads of civilization cause a perceptible decrease in the numbers of rapacious birds but this is true only to a very limited extent with the species now under consideration; indeed, it may be questioned if there are less Golden Eagles today in Eastern North America than there were when the Pilgrims landed at Plymouth. Nor has their distribution changed much, if any, for they have ever inhabited almost inaccessible mountain cliffs. They seldom leave their rocky fastnesses and when they do move from point to point, it is at a great elevation; and in addition to this, when we consider that there are few birds in the world, which are more wary, we can

readily understand why these noble Eagles have so long held their own; neither are they in any present danger of being exterminated, for the sections which they inhabit, will long remain unoccupied by man. I have, on several occasions, seen these fine birds circling high in air over the mountains of Northern New England and Pennsylvania but I never yet obtained a shot at one. Even the Indians considered it a notable feat to kill one of this species and, as these birds are certainly no less wary today, he who shoots a Golden Eagle may mark the date as an extra red-letter day in his calendar, resting assured that he will not have occasion to repeat it many times, at least in our section.

The Golden Eagles hunt along the mountain sides, catching Grouse, rabbits, etc. and perching upon trees or high cliffs in order to devour their prey. Their nests are placed on the rocky shelves of steep precipices, where it is almost impossible to reach them. Mr. William Brewster in making some notes for me, some years ago, of the birds that occurred on the White Mountains, says of this species, "A pair have bred for years on a cliff, directly over the Profile House. They could be seen at almost any hour in the day, sealing about their eyrie, uttering loud screams, but were especially noisy and active from sunset to dark".

FAMILY VI. HALIAETIDAE. THE FISH EAGLES.

The sternum considerably exceeds twice its width in length, but there are no marginal indentations.

The manubrium is quite well developed, abruptly truncated, and not forked. The furcula is stout, much flattened by lateral expansion, wide and thick near the base which is rounded and not produced into a point. The terminal expansion is not present, as in the last family, nor is it produced as far forward, but extends backward beneath the bone; the furcula near it is contracted but only slightly furrowed above and is bent downward to a point quite near the manubrium. The posterior border is entire and produced backward somewhat. The bill is strong, well-curved, with the cutting edge of upper mandible slightly lobed. The tarsus is short, stout, and naked to the heel behind but is feathered in front for about half its length. The toes are stout, with strong, well-curved claws, but differ from those of the True Eagles in having but two bones in the inner toe, instead of three. The wings are very long and pointed. The tail is quite long and considerably rounded.

GENUS I. HALIAETUS. THE SEA EAGLES.

GEN. CH. *Sternum, about as wide as it is high, including the keel. Keel, not reaching the posterior border which is considerably rounded*

The sterno-trachealis is thick and there is a small bronchialis, but no other laryngeal muscles. The trachea is a little flattened throughout. The oesophagus is dilated near the middle into quite a large crop, and the walls are very thin. The proventriculus is very large, with quite small, simple, oval glands, arranged in a zonular band which measures from 2.00 to 2.25 in width, but in four pyramid-shaped ridges. The stomach is small, somewhat globular in form, with very thin walls, lined with a soft membrane. The fold of the duodenum is very long, measuring 7.00, much twisted, and incloses a small, irregularly formed pancreas which only occupies a short portion of its entire length. Cæca, very small. Both lobes of the liver are about equal in size, and the heart is large but not pointed. The spleen is an oval shaped body situated on the proventriculus.

HALIAETUS LEUCOCEPHALUS.

White-headed Eagle.

Haliaetus leucocephalus SAVIG.—Cuv., R. A. 2d. ed.: 1838, 326.

DESCRIPTION.

Sp. Ch. Form, very robust. Size large. Sternum, stout, with the top of the keel rounded. Tongue, long, fleshy, grooved for its entire length, horny at tip, where it is rounded but not bifid. Bill, strong and well-curved. Tarsus, feathered in front for half its length. Sexes, similar in color.

Color. *Adult.* Head, and neck all around, tail, with its upper and lower coverts, white. Remaining plumage, very dark-brown, with the feathers more or less edged with whitish. Bill, cere, feet, and iris, yellow.

Young. Lacks the white head and tail and the feathers above are edged with yellowish-rufous and whitish. The tail and under surface are streaked with white.

Young of the year. Very dark-brown everywhere, with the feathers on the top of the head very narrowly edged with rusty or rufous.

Nestlings. Are at first covered with a whitish down which becomes darker as the birds grow older, then they gradually assume the plumage last described. In the last three stages, the iris and bill are brown, the feet are yellow, and the cere is greenish.

OBSERVATIONS.

Specimens of the same age and sex exhibit but little variation in plumage. Readily known when adult by the white head and tail, and in all stages by the partly feathered tarsus. Florida birds are smaller than those from further north. Distributed as a constant resident throughout North America.

DIMENSIONS

Average measurements of female specimens from Eastern North America. Length, 37.00; stretch, 82.70; wing, 21.00; tail, 12.25; bill, 2.15; tarsus, 3.40. Longest specimen, 40.25; greatest extent of wing, 85.00; longest wing, 25.00; tail, 14.00; bill, 2.60; tarsus, 3.80. Shortest specimen, 34.00; smallest extent of wing, 79.00; shortest wing, 23.00; tail, 11.33; bill, 1.90; tarsus, 3.00.

Average measurements of male specimens from Eastern North America. Length, 32.00; stretch, 76.00; wing, 21.40; tail, 11.85; bill, 2.25; tarsus, 3.12. Longest specimen, 34.00; greatest extent of wing, 80.25; longest wing, 22.83; tail, 12.00; bill, 2.50; tarsus, 3.30. Shortest specimen, 30.00; smallest extent of wing, 72.00; shortest wing, 20.00; tail, 11.60; bill, 1.75; tarsus, 2.90.

DESCRIPTION OF NESTS AND EGGS.

Nests, usually placed in trees or occasionally on rocky cliffs; they are very bulky structures, composed of sticks, arranged in a compact manner.

Eggs, usually two in number, varying from spherical to oval in form, ashy or dirty-white in color, unspotted. Dimensions from 2.75 x 3.00 to 2.82 x 2.85.

HABITS.

Although the White-headed Eagles constantly occur in the wilder portions of New England, they are rare in the vicinity of Boston; thus I do not remember of having seen more than three or four, within the past fifteen years, at Newton, and the last one that I observed was a fine adult which flew slowly by a few days ago, early in February, 1880. I have little doubt but that these fine birds breed even in Massachusetts but such instances are very rare and in order to study this species to perfection, one must visit Florida, where there are more nests in a given area than in any other section, and I have several times found three or four eyries, all occupied, within the radius of a mile.

These birds begin to breed in Florida very early in January, and the nest is usually placed in a huge pine, many feet from the ground. The first nest that I found was at Lake Harney, during my earliest visit to the state and as I was desirous of seeing what it contained, I determined to cut down the tree, for all my efforts to climb the huge bole,

which was, at least, four feet in diameter, proved fruitless. Aided by an assistant, we succeeded in accomplishing the long, difficult task and the huge tree which had defied the gales of hundreds of years, fell with a resounding crash to the earth. We hastened to the nest which had evidently been occupied for years, for it contained at least a cart-load of sticks, many of which were decayed. In falling, the material had become somewhat scattered and upon pulling it over, we discovered two downy young, about the size of a common fowl, both of which were dead, having been killed by the shock. It may be assured that I was not very much pleased with the result of this method of investigating the contents of Eagles' nests and I have never since taken the trouble to cut down a tree in which these birds had placed their domiciles.

When the nest is approached, the parent Eagles do not exhibit any great degree of solicitude, merely flying about at long rattle range and uttering a harsh cackling note. They have a singular habit of dropping, at such times, when shot at and uninjured, just as if they had been hit, and I have seen a female turn over several times, almost exactly like a Tumbler Pigeon. The male is particularly shy; in fact, he will often leave the vicinity when he perceives an intruder.

On the eighth of March, I obtained young partly fledged at South Lake and on the nineteenth of the same month, saw the young sitting outside the nest; although they were fully fledged and as large as their parents, they were unable to fly but made frequent efforts to rise in air, balancing themselves on one foot, while they flapped their wings violently, but they could not evidently muster sufficient courage to launch out.

I have intimated that the White-headed Eagles occupy the same nest for years, and that they also guard it throughout the year, may be seen by the following instance. On the twentieth of April, I discovered a nest built in a solitary pine which stood on the north end of Merritt's Island and, as the Eagles were flying about it, uttering the cackling note of alarm, I concluded that they had eggs, so I laboriously ascended to the nest which was at least fifty feet in air with but few intervening branches. When under the nest, however, I found that I could not get into it, as it was, at least, six feet in diameter and projected out over my head like a shelf. So I descended, but as the Eagles still continued to fly about and exhibit every mark of anxiety, I once more went up to their domicile and, after great exertions, succeeded in tearing away a portion of the nest so that I could look into it, when I found, much to my disgust, that it contained nothing but fish bones, the young having evidently left some time previous; in short, when I once more reached the ground, I saw them, in company with their parents, circling around the place and since that time, I have observed Eagles behaving in a similar manner late in the season.

As will be seen by the foregoing account, the nests are not very easy to get into, even when one succeeds in reaching them. I once ascended to a nest placed in a dead tree on one of those small keys which lie on the extreme south coast of Florida, and after making considerable effort, succeeded, by the aid of a limb, in getting into, or rather, on to the top. I found a perfectly flat platform, about six feet in diameter, solid in structure, where I could stand upright or even move about. It was empty, and after spending some time in examining the adjacent country, of which my elevated situation afforded an excellent

prospect, I attempted to descend but, to my astonishment, this was not an easy task as I could not see the limb by which I had ascended, for it was a mere stub and did not project above the edge of the nest which was, at least, four feet thick. I was alone, my men having gone to the yacht which was riding at anchor some two miles away, and I began to think that I was effectually eaged and that I should be obliged to throw down a greater part of the nest in order to reach the limb, and indeed, had begun to do this, when I unexpectedly came across it, swung myself over the edge, and was soon on the solid ground. This last nest which I have described, was not over thirty feet in air and I have seen them built even lower on the isolated keys of which I have been speaking.

These Eagles feed largely upon fish which they sometimes procure by robbing the Osprey but they often capture it for themselves by diving into the water. They will take wounded Ducks, and I once saw one swoop down and carry away a Buffle Head which I had just shot and which was lying on the water only a few yards distant.

While encamped on a small island in the Gulf of Mexico, near the mouth of the Swanee River, I heard, one morning, a loud squealing among the half-wild hogs, of which there was an abundance in the place and, taking my rifle, went out to ascertain the cause of the commotion. I found that three Eagles were attacking the newly born progeny of an old sow and she was endeavoring to defend them. The little grunners, of which there were several, had taken refuge under the top of a fallen tree which, however, only afforded them partial protection; thus the Eagles could see them and, tempted by the dainty titbits, would swoop downward and endeavor to grasp the little black and white pigs in their talons but were constantly repulsed by the anxious mother who bravely defended her offspring, at the same time giving vent to some of the most ear-splitting squeals that ever a distressed hog uttered. I do not know how the strife would have ended, had I not interfered with my rifle so effectually that two Eagles lay dead upon the ground and the third flew away badly frightened. The Bald-headed Eagles, as they are sometimes called, breed in the North late in February and on Grand Menan, where they sometimes nest on rocky cliffs, during the first two weeks in March.

FAMILY VII. PANDIONIDÆ. THE OSPREYS.

Sternum, about twice as long as wide, but not exceeding in width the length of the coracoids, and the scapular process of the latter does not meet the furcula. Marginal indentations, two, not inclosed.

This family, in our section, is represented by a single genus. The lower anterior surface is densely covered with feathers. The manubrium is small, abruptly truncated, and not forked. The furcula is stout, much flattened by lateral expansion near the base which is moderately wide and produced downward into a very long point, but toward the middle, the bone becomes rounded and the terminal expansion is quite prominent; while the furcula near it is slightly contracted but not furrowed above and is bent downward until it closely approximates the manubrium. The bill is strong, well-curved, with the cutting edge of upper mandible nearly straight. The tarsus is short, thick, only slightly feathered

in front, and is covered with small, circular scales. The toes are stout, with strong, well-curved claws. The wings and tail are long and pointed.

GENUS I. PANDION. THE FISH HAWKS.

Gen. Ch. *Posterior margin of sternum, between indentations, not rounded but cut away as far as the keel. Caracoids, short. Scapula, slender and considerably rounded at base.*

The sterno-trachealis is thick and there is a small bronchialis, but no other laryngeal muscles. The tympaniform membrane is present and although there is a thin os transversale, it does not support a semilunar membrane. The trachea is a little flattened throughout. The oesophagus is dilated near the middle into quite a large crop, and the walls are usually very thin. The proventriculus is very large, with the walls quite thick, and composed of small, simple, cylindrical glands, arranged in a zonular band which measures from 1.50 to 1.60 in width, but in four pyramid-shaped ridges. The stomach is small, somewhat globular in form, with very thin walls, lined with a soft membrane which emits an oily fluid. The fold of the duodenum is long, measuring 3.00, and incloses a small, irregularly formed pancreas which only occupies a short portion of its entire length, near stomach. The intestines are very small, only measuring .15 in diameter, but are very long, measuring 117.00 in length. Cæca, very short but thick. Both lobes of the liver are short, thick, and nearly equal in size. The heart is large and triangular in form. The spleen is an oval-shaped body situated on the proventriculus. There is but one species within our limits.

PANDION HALIAETUS.

Osprey. Fish Hawk.

Pandion haliaetus Cuv, R. A., I, 1817, 316.

DESCRIPTION.

SP. CH. Form, robust. Size, large. Sternum, stout, with the tip of keel rounded. Tongue, thick, fleshy, horny at tip which is rounded but not bifid, bluish in color.

COLOR. *Adult.* Sides of head and entire under parts, white, with numerous, circular spots of yellowish-brown in a band across the breast. Line through eye, top of head, and the remaining upper portions, very dark-brown, with the tail barred with dusky.

Young. Quite similar to the adult, but with every feather edged with whitish, and the under portions are slightly tinged with yellowish.

Young of the year. Not unlike the young but showing a strong overwashing of deep buff on the occiput and many of the feathers above are tinged with it.

Nestlings. Are, at first, covered with a whitish down, then gradually assume the dress last described. Iris, reddish-brown, cere and feet, bluish, and bill, brown, in all stages.

OBSERVATIONS.

There is a little variation in plumage, some specimens being darker or lighter than the type. This species may be recognized by the peculiar scaling of the tarsus, form and colors as described. Distributed, as a summer resident, throughout North America, wintering in the more southern portions.

DIMENSIONS.

Average measurements of female specimens from Eastern North America. Length, 23.25; stretch, 67.75; wing, 20.00; tail, 7.50; bill, 1.50; tarsus, 2.15. Longest specimen, 24.50; greatest extent of wing, 70.50; longest wing, 21.60; tail, 9.50; bill, 1.60; tarsus, 2.30. Shortest specimen, 22.00; smallest extent of wing, 65.50; shortest wing, 19.00; tail, 8.50; bill, 1.40; tarsus, 2.00.

Average measurements of male specimens from Eastern North America. Length, 21.25; stretch, 65.00; wing, 18.00; tail, 6.30; bill, 1.41; tarsus, 2.12. Longest specimen, 23.50; greatest extent of wing, 66.00; longest wing, 20.00; tail, 8.00; bill, 1.50; tarsus, 2.25. Shortest specimen, 21.00; smallest extent of wing, 64.00; shortest wing, 19.00; tail, 8.00; bill, 1.33; tarsus, 2.00.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in trees and bushes, or occasionally on the ground. They are bulky structures, composed of sticks and weeds, arranged in a compact manner.

Eggs, three or four in number, varying from elliptical to oval in form, yellowish-white or creamy in color, spotted and blotched with reddish-brown and amber, so thickly on the larger end as to completely obscure the ground color, and sometimes the entire egg is thus covered. Dimensions, from 1.68 x 2.21 to 1.85 x 2.58.

HABITS

There are none among the rapacious birds, that are better known throughout the country than the Fish Hawks, not only because they are very common but also because the birds have become famous through Wilson's history of their habits, especially his inimitable description of the manner in which the Ospreys are robbed by the Bald Eagles. In regard to this, I think, however, that the Ospreys are not great sufferers, for according to my experience which has been somewhat extended, for I have long been familiar with both of these birds, it is a rare sight to see an Eagle in pursuit of an Osprey. This is especially noticeable in Florida, where both species are remarkably abundant. There is a reach of Mosquito Lagoon, near the inlet on the west side, which is shut off from the main portion by a series of islands, and which is very shallow, especially at low tide; in fact, at such times, there is but a few inches of water remaining in it. Thus fishes, in attempting to go through the pass, are obliged to make their way very slowly, or to wait the rise of the tide; consequently they accumulate in large numbers in the deepest pools. The Ospreys appear to have learned this fact for they flock to the place in order to catch their comparatively helpless prey, and I have counted fifty in the air at one time, besides others sitting on trees near the water; yet I never saw an Eagle attempt to rob one more than twice and in both instances, the Osprey got off with its booty by actually outstripping the Eagle in flight.

Usually the Ospreys are certain of their prey when it is once grasped in their strong, well-curved talons but I once saw one completely puzzled. I was standing on the beach in front of my camp, near the Haulover Canal, on Indian River, one morning, when I observed an Osprey drop down in front of me, some two hundred yards distant, catch a fish, and rise slowly with it in air. I watched him as he paused to give the peculiar shiver, which is characteristic of this species, in order to shake off the water from his plumage, then he adjusted the fish to his liking, carrying it, as is usual, longitudinal with his own body, the head first. All this occupied but a few seconds and the bird was all the time moving forward toward me, when all at once, I observed that he was getting uneasy about something, for he bent his head, moved slowly, and was evidently trying to get a firm hold of the fish that appeared to be slipping from his grasp. All these efforts were in vain, however, for just as the Osprey reached a point nearly over my head, the fish freed itself and fell, striking the ground almost at my feet, while the Fish Hawk giving vent to his disappointment by loud, whistling screams, returned to try his fortune again. I stepped forward and picked up the fish, when the mystery was explained. It was a globe fish, a peculiar species which inhabits the waters of Florida, and which is not only provided with a tough, loose skin but is also endowed with the power of pumping air into the space between the skin and body until it becomes swelled like a ball or globe; whence the name. The Osprey had, perhaps by mistake, caught one of these fishes which, as soon as it had felt the talons of its captor, began to pump air into its receptacle, thus spreading apart the strong claws of the bird until it fell from his grasp. The moment of deliverance came just an instant too late, however, as it only escaped one danger to meet its death, for it was completely dead when I picked it up, it being killed by the fall.

The Ospreys breed early in February on the St. John's River, placing the nest in high cypress trees, and I also found fresh eggs about the middle of March at Clear Water Harbor on the west coast. The birds in these sections, were very unsuspecting, allowing one to pass directly under the nest without flying, and in one instance, my assistant was half-way up a tree in which a bird had her domicile, before she started. On the Keys, where the nests are frequently placed in low mangroves but a few feet from the ground, the birds breed earlier. Further north, where the Ospreys are migratory, they do not breed until the middle of April.

FAMILY VIII. POLYBORIDÆ. THE VULTURE EAGLES.

Sternum, more than twice as long as wide and the scapular process of the coracoids meets the furcula. Marginal indentations, two, inclosed.

This family, in our section, is represented by a single genus. The bill is strong, well-curved, with the cutting edge of upper mandible nearly straight. Lores and space around eye, naked. The tarsus is long and only slightly feathered in front. The toes are weak and the claws are small.

GENUS I. POLYBORUS. THE CARACARAS.

GEN. CH. *Bill, rather long, strong, and well-curved, with the cutting edge of upper mandible slightly lobed. Tail and wings, long, the former is rounded and the latter are pointed.*

The trachea is a little flattened throughout. The sterno-trachealis is short and stout, having its origin quite near the larynx, and there is a slender bronchialis extending over all the half rings, but there are no other laryngeal muscles. The walls of the œsophagus are thin; this is at first nearly straight, then is dilated into a crop, and is again straight and opens into a large sized proventriculus with numerous small, simple, closely packed, oval glands arranged in a zonular band which measures 1:15. The stomach is of a medium size, somewhat globular in form, with thin but soft walls, and is lined with a soft membrane. The fold of the duodenum is long, and is bent upon itself several times. The cœca, when present, are very small. The spleen is a spherical body lying on the proventriculus. The left lobe of the liver is slightly larger than the right. There is but one species found within our limits.

POLYBORUS THARUS.

Caracara Eagle.

Polyborus tharus Cass., Ills. I: 1854, 113.

DESCRIPTION.

ST. CH. Form, not very robust. Size, medium. Tongue, long, fleshy, horny at tip, where it is rounded and bifid. Occipital feathers, elongated. Space on breast, naked. Sexes, similar in color.

COLOR. *Adult.* Above, dark-brown everywhere, excepting upper tail coverts which are yellowish-white, banded with dusky. Tail, white at base, black at tip, and crossed with numerous bands of the same color. Concealed patch on hind neck, brownish-yellow. Wings, more or less banded with white. Beneath, everywhere white, with a broad band across abdomen and tibia, dark-brown, and the breast is transversely banded with fine lines of black.

Young. Similar to the adult but duller brown above which color also extends over the entire lower portions. The feathers above are edged with whitish and those beneath are longitudinally streaked with yellowish-white. Tail, nearly white, banded with ashy-brown and tipped with dark-brown. Bill, bluish, cere, red, feet, yellow, and iris, brown, in all stages.

OBSERVATIONS.

Specimens appear to present some variation of plumage but may be readily known by the form and colors as described. Distributed as a constant resident in Mexico and northward into the United State as far as Arizona and eastward into Louisiana and Florida.

DIMENSIONS.

Average measurements of female specimens from Eastern North America. Length, 24.50; stretch, 48.00; wing, 16.50; tail, 9.50; bill, 1.12; tarsus, 3.25. Longest specimen, 25.00; greatest extent of wing, 49.00; longest wing, 17.00; tail, 10.00; bill, 1.25; tarsus, 3.50. Shortest specimen, 24.00; smallest extent of wing, 47.25; shortest wing, 16.00; tail, 9.00; bill, 1.00; tarsus, 3.00.

Average measurements of male specimens from Eastern North America. Length, 23.50; stretch, 47.25; wing, 15.50; tail, 8.50; bill, .98; tarsus, 2.95. Longest specimen, 24.00; greatest extent of wing, 48.00; longest wing, 16.00; tail, 9.00; bill, 1.00; tarsus, 3.00. Shortest specimen, 23.00; smallest extent of wing, 46.50; shortest wing, 15.00; tail, 8.00; bill, .95; tarsus, 2.90.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in trees or bushes; they are bulky structures, composed of sticks, lined with roots, grass, etc., arranged in a compact manner.

Eggs, two to four in number, varying from spherical to oval in form, yellowish-white or creamy in color, blotched, spotted, and sprinkled with reddish-brown of varying shades, frequently so thickly as to nearly, or quite, obscure the ground color. Dimensions from 1.80 x 2.25 to 1.88 x 2.50.

HABITS.

Although the Caracara Eagles cannot be called rare in Florida, yet they are restricted to a comparatively limited area, being quite common on the prairies near the extreme headwaters of the St. John's, and on the broad Savannas which lie about Lake Okeechobee and northward along the Kissimee River. They are quite rare in other sections, being only stragglers, for I do not think that they breed elsewhere than in the sections named. They deposit their eggs in early spring, often placing their nests in the tops of palmetto trees or occasionally on pines.

Not only in form and odor are the Caracaras intermediate between the Eagles and Vultures but they also resemble both in habits. They catch some of their booty living but will feed readily upon dead animals. They are sluggish at times but fly well; when on the wing, moving in a direct line, they resemble the Black Vulture somewhat, flapping and sailing alternately, but when high in air, circle like a Hawk or Eagle.

There can be but little doubt that this species is the Sacred Vulture of Bartram who says that the feathers were greatly esteemed by the Indians as ornaments; a fact which might have been true enough in his time, 1791, but at the present day, the favorite decorations of the Seminoles, are the plumes of the Ostrich. Were it not for the high reputation for veracity, which one cannot avoid according to Mr. Bartram after reading his writings, I should say that he had been trying to palm off a purely mythical species upon the public, for much of his description does not correspond with the plumage of any known bird; but it is highly probable that the description of the bird which he terms the Sacred Vulture, was made from memory, some time after seeing the Caracaras, and thus the King Vulture of South America and the true Caracara Eagle which is also known in Florida as the King Buzzard, became somewhat confounded in his mind. This theory has, for its support, the fact that Bartram does not mention the true Caracara as an inhabitant of Florida.

FAMILY IX. CATHARTIDÆ. THE AMERICAN VULTURES.

Feet, small and weak; claws, not very stout. Sternum, wide; keel, not high. Marginal indentations, four.

This family, in our section, is represented by two genera. The manubrium is small, abruptly truncated, and not forked. The furcula is stout, much flattened by lateral expansion near the base which is moderately wide and produced downward into a very long point, but toward the middle, the bone becomes rounded and the terminal expansion is not very prominent, while the furcula near it is not contracted nor bent downward. The marginal indentations are always four, either open or inclosed. The bill is strong, well-curved, with the cutting edge of upper mandible nearly straight. The tarsus is long, naked for its entire length, and is covered with small, circular scales. The feet are small and the toes, weak, especially the posterior, and are without grasping power. The wings are long and pointed, and the tail is moderately long. There is no nasal septum.

GENUS I. CATHARTES. THE NAKED-BREASTED VULTURES.

GEN. CH. *Bill, short and thick. Head and neck, destitute of feathers, and there is a wide naked space on the breast. Tail, long and rounded. Sternum, short, not exceeding twice its width in length. The two outer marginal indentations are enclosed, but the inner are open. Furcula, very wide at base.*

The sterno-trachealis is quite thick, but there are no other laryngeal muscles. The inferior larynx is very small, and there are no tympaniform or semilunar membranes, while the lower portions of bronchials are membranous. The trachea is much flattened throughout. The esophagus is dilated near the middle into a very large crop, and the walls are usually very thin. The proventriculus is very large, with the walls quite thick, and composed of numerous, small, simple, glands, arranged in a zonal band which measures from 1.00 to 1.25 in width. The stomach is small, somewhat globular in form, with quite thick walls, lined with a hard, rugose membrane. There is a pyloric lobe, .50 in diameter. The fold of the duodenum is long, measuring from 3.00 to 5.00, and incloses a small, irregularly formed pancreas which only occupies a short portion of its entire length, near stomach. Coeca, wanting. Both lobes of the liver are short, thick, and nearly equal in size. The heart is large and triangular in form. The spleen is an oval-shaped body situated on the proventriculus. There is but one species within our limits.

CATHARTES AURA.

Turkey Buzzard.

Cathartes aura ILL., Prod.; 1811, 236.

DESCRIPTION.

SP. CH. *Form, robust. Size, large. Sternum, stout, with the keel slightly arched. Tongue, long, fleshy, concave above, and the edges are provided with numerous, hard papillae which point backward. The tip is rounded but not bifid. Sexes, similar in color.*

Color. Adult. Uniform dark-brown throughout, with a bluish iridescence on both surfaces, and the feathers of the wings are edged with yellowish-brown and whitish.

Young. Quite similar to the adult, but with the feathers less iridescent and more generally edged with whitish, and those beneath are lighter.

Nestlings. Are, at first, covered with a dirty-white down, then gradually assume the plumage last described. Head and neck, flesh color, and covered with short, black hairs, iris, and bill, whitish, feet, pinkish-brown, in all stages.

OBSERVATIONS.

There is a little variation in plumage, some specimens being darker or lighter than the type. This species may be recognized by the red head and colors as described. Distributed, as a constant resident, throughout North America, south of latitude 40; rare north of this point but straggling into New England and even as far north as Canada.

DIMENSIONS.

Average measurements of female specimens from Florida. Length, 27.25; stretch, 75.00; wing, 24.00; tail, 12.25; bill, 1.03; tarsus, 2.50. Longest specimen, 28.25; greatest extent of wing, 73.00; longest wing, 27.00; tail, 12.50; bill, 1.10; tarsus, 2.70. Shortest specimen, 26.50; smallest extent of wing, 68.00; shortest wing, 21.00; tail, 11.00; bill, .95; tarsus, 2.30.

Average measurements of male specimens from Florida. Length, 26.75; stretch, 67.00; wing, 21.00; tail, 10.85; bill, 1.47; tarsus, 2.37. Longest specimen, 27.25; greatest extent of wing, 72.00; longest wing, 22.00; tail, 11.50; bill, 2.00; tarsus, 2.75. Shortest specimen, 24.50; smallest extent of wing, 62.00; shortest wing, 20.00; tail, 10.10; bill, 1.00; tarsus, 2.03.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the tops of stumps, on logs, on ruined buildings, in hollow trees, or on the ground; but little or no material is used.

Eggs, one or two in number varying from elliptical to oval in form, dirty-white or creamy in color, spotted and blotched irregularly, but sometimes more thickly on the larger end, with reddish-brown and amber. Dimensions from 1.80 x 2.65 to 1.90 x 2.75.

HABITS.

When one sees the Red-headed Vultures for the first time and observes their various aerial evolutions, now sailing high in air on motionless wings or gliding rapidly along the surface of the ground, avoiding the numerous obstacles in their path, with the greatest ease; rising and falling with a flight so smooth that it is seldom excelled by other birds; in short, performing all their movements upon the wing with the utmost grace and elegance, I repeat, when one sees all this for the first time, he cannot help exclaiming, "What magnificent birds!" Then, if not ornithologist enough to recognize the species, he turns to inquire its name of the nearest native, he will be greeted, especially if the one he questions be a descendant of Ham, with a look of astonishment followed by a broad grin, at the apparent absurdity of the interrogative, while the immediate answer is given in a tone in which disgust is so very apparent as to create surprise—"Dat, why doan yer know what dat is? Dat yer is nothin but a dirty Buzzard." Although this appears to be quite like slander without a just cause, one soon learns to take the same view of the case and, after becoming intimately acquainted with the birds, one cannot help regarding them as "nothing but dirty Buzzards," and no matter how elegant and varied are their gyrations, one can never look upon them with quite the same admiration as he did before witnessing their disgusting habits. There is no denying this charge, they are most decidedly disgusting birds, not only being vile feeders on carrion but they eat it to excess, frequently becoming so crammed that they are unable to move, when they are obliged to disgorge a portion of their ill-smelling provender before they can take flight.

Turkey Buzzards are the greatest cowards that I ever saw among birds; when one is captured, which can be readily done by employing steel traps, it never makes the slightest attempt at defense, but merely hangs its head in the most abject manner, and if it has been eating anything recently, will discharge the contents of its stomach at its captor's feet, not because it wishes to get rid of the food but because it evidently intends to make a kind of peace-offering, which too often, however, proves more highly odoriferous than acceptable. This habit of relinquishing what they have eaten when attacked or frightened, is so strong with the Turkey Buzzards that they will always vomit when wounded and I have seen them do the same thing when I have been passing them as they sat on the low limb of a tree.

As a redeeming trait, however, of the Red-headed Vultures, I must say that they will eat fresh meat when they can get it and I think they prefer it to carrion for they would

gather around our camps to feed upon the bodies of birds that we threw out to them. They will also gather around the hunter when he shoots a deer in order to devour the intestines which he usually removes on the spot. This brings me to a point which I wish to mention, regarding Audubon's experiments upon these birds. For the benefit of those who may not chance to be familiar with them, I will merely say that this distinguished author had an idea that the Turkey Buzzards were deficient in the sense of smell, or at least, that they were not guided to their food by this sense. To prove this, he covered the carcass of a hog, or other animal, with brush or leaves and the Vultures would not trouble it although they frequently passed over the spot, only a short distance above the ground. Now it is a well-known fact with hunters in Florida, that whenever the body of an animal is covered over so lightly with brush or leaves, it will never be disturbed by the Buzzards. I have been a frequent witness to this and have, myself, seen the body of a freshly killed deer left for hours with a few palmetto leaves laid over it, which only partly concealed it, without it being troubled by the Vultures, although they gathered in such numbers as to almost instantly devour the intestines which had been removed, then sat around on the trees in the neighborhood with their hunger unappeased. Now there is but one way to explain this singular abstinence on the part of birds which are usually so rapacious that any meat left exposed is devoured very quickly. Whenever the puma (*Felis concolor*) leaves a portion of his food uneaten, he invariably covers it with a little grass, some leaves, or other debris, that he can scratch over it. He then conceals himself near the spot and watches the cache until he feels hungry. The remains of the feast are, as I have seen, not entirely concealed upon such occasions but are only partly covered, just enough, however, to taboo it for other animals, and woe befall the helpless bird or beast who, impelled by hunger, dares to break the puma's seal; he is so near that a single bound or two brings him upon them, when they are fortunate if they escape with their lives. Turkey Buzzards have some little sagacity, and instinctive, or inherited, sagacity is, as every naturalist knows, the strongest; thus meat covered by a puma is not to be lightly meddled with, and how are Turkey Buzzards, with their slight stock of wisdom, going to distinguish between booty covered by a puma and that concealed no less clumsily by man? As the olfactory nerves of these Vultures are as highly developed as those of other birds, I cannot avoid the conclusion that they enjoy the sense of smell to an equal degree with other species, especially as nothing in my experience with them tends to show that they do not.

Although the Red-headed Vultures congregate in great numbers in the vicinity of cities, towns, and other settlements, they are also abundant in the wilder sections, where they are generally much shyer than in localities in which they are protected. These Vultures breed about the first of April in the more southern sections, and a little later further north. The eggs are usually placed on the ground but Captain Dummett informed me that a pair nested for years on the top of the old Spanish lookout which stands on a small island in the Mantanzas River near the inlet. These birds are generally distributed and occur from Southern Pennsylvania to the extreme point of Florida and also on the Keys but in this latter named locality they are not to be found in such numbers as on the main land.

GENUS II. CATHARISTA. THE SQUARE-TAILED VULTURES.

GEN. II. *Bill, long and rather slender. Head, destitute of feathers, but the neck is covered behind, and there is no naked space on the breast. Tail, short and square. Sternum, long, at least equaling twice its width in length. The four marginal indentations are open. Furcula, not very wide at base.*

The sterno-trachealis is quite thick, but there are no other laryngeal muscles. The inferior larynx is very small, and there are no tympaniform or semilunar membranes, while the lower portions of bronchials are membranous. The trachea is much flattened throughout. The œsophagus is dilated near the middle into a very large crop, and the walls are usually very thin. The proventriculus is very large, with the walls quite thick, and composed of numerous, small, simple, glands, arranged in a zonular band which measures from 1.00 to 1.25 in width. The stomach is small, somewhat globular in form, with quite thin walls, lined with a soft membrane. There is a pyloric lobe, .75 in diameter. The fold of the duodenum is very long, measuring from 8.00 to 10.00, and incloses a small, irregularly formed pancreas which only occupies a short portion of its entire length, near stomach. Cœca, wanting. Both lobes of the liver are short, thick, and nearly equal in size. The heart is large and triangular in form. The spleen is an oval-shaped body situated on the proventriculus. There is but one species within our limits.

CATHARISTA ATRATA.

Black-headed Buzzard.

Catharista atrata GRAY, Hand List, I; 1869.

DESCRIPTION.

SP. CH. Form, robust. Size, large. Sternum, stout, with the keel considerably arched. Tongue, moderately long, fleshy, deeply concave above, and the edges are provided with numerous, fine soft papillæ which point backward. The tip is rounded but not bifid. Sexes, similar in color.

COLOR. *Adult.* Uniform dark brownish-black throughout, with a greenish iridescence on both surfaces, becoming lighter on the primaries, especially on the outer webs of two thirds of the basal portions, where the colors are very light, and the shafts are white.

Young. Quite similar to the adult, but less iridescent and the feathers extend up further on the back of the neck, reaching the occiput.

Nestlings. Are, at first, covered with a dirty-white down then gradually assume the plumage last described. Head and neck, black and covered with short, black hairs, iris, bill, and feet, dark-brown, in all stages.

OBSERVATIONS.

There is a little variation in plumage, some specimens being darker or lighter than the type. This species may be at once recognized by the square tail, black head and colors as described. Distributed, as a constant resident, throughout the Carolinas and southward, not very common north of this point but straggling into New England as far as Maine.

DIMENSIONS.

Average measurements of female specimens from Florida. Length, 26.00; stretch, 58.00; wing, 17.25; tail, 8.00; bill, 1.15; tarsus, 3.28. Longest specimen, 27.00; greatest extent of wing, 60.00; longest wing, 18.00; tail, 8.50; bill, 1.30; tarsus, 3.35. Shortest specimen, 25.00; smallest extent of wing, 56.00; shortest wing, 16.50; tail, 7.50; bill, 1.00; tarsus, 2.25.

Average measurements of male specimens from Florida. Length, 25.00; stretch, 57.50; wing, 16.75; tail, 7.45; bill, 1.10; tarsus, 3.15. Longest specimen, 26.00; greatest extent of wing, 59.00; longest wing, 17.50; tail, 7.75; bill, 1.20; tarsus, 3.20. Shortest specimen, 21.00; smallest extent of wing, 56.00; shortest wing, 16.00; tail, 7.60; bill, 1.00; tarsus, 3.00.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground or occasionally on prostrate logs, in the woods; but little or no material is used in constructing them.

Eggs, one or two in number, varying from elliptical to oval in form, yellowish-white or creamy in color, blotched and spotted with very dark-brown and umber. Dimensions from 2.05 x 3.00 to 2.10 x 3.10.

HABITS.

As will be seen by the description, the Black-headed Vultures differ greatly from the preceding species in form and anatomical structure, and they also differ widely in habit; so widely, in fact, that the two species scarcely have any peculiarities in common. It is

true, that they often assemble in large flocks but the present birds are much more locally distributed than the Turkey Buzzards. Thus, although they are particularly abundant in certain localities in the Carolinas, Georgia, Northern, Middle, and Western Florida, I never saw a specimen on the Keys, at Miami, nor in the Everglades. They were very rare in the neighborhood of Dummett's grove near Cape Canaveral although they were common at Salt Lake, only a few miles distant.

In flight, the Black-heads move quite heavily, with alternate flapping and sailing, but they soar at a great height, like the Red-heads, during the warm hours of the day; yet they do not appear to spend much time in air, being sluggish, often sitting with extended wings like the Turkey Buzzards. The Black-heads are more emphatically carrion feeders than the latter described species and will seldom eat fresh meat but prefer to wait until decomposition has set in before beginning their feast. Thus I have frequently seen the Turkey Buzzards gather around the freshly skinned carcass of an alligator, and eagerly devour the flesh, while the Black-heads would wait until it had lain for a day or two in the broiling sun before they would attack it; then, when the odor from the decaying mass became insufferable to human nostrils, they would eat to repletion. It is probable that the soft stomach with which this species is provided, digests this kind of food more readily than any other. They not only eat decomposed meat but feed upon animal excrement and various kinds of offal. In consequence of feeding so much on this highly seasoned food, these Vultures have a decidedly disagreeable odor which is noticeable in skins and mounted specimens, even after the lapse of years. It is possible, however, that this scent partly originates with the birds as the young smell strongly of musk.

The Black-heads are more gregarious than the Red-heads, inasmuch so, that I do not ever remember having seen a single specimen or even a pair unaccompanied by others, although I have often observed solitary individuals of the latter named species. Both Vultures become remarkably tame when not molested and I have frequently walked within a few feet of them when they have been feeding. As might be judged by the structure of the larynx, neither species are capable of uttering any thing in the way of sound more musical than a hiss or grunt.

The Black-heads breed quite early in Florida, for the eggs in the ovaries of some specimens killed about the middle of June, indicated that they would soon have been deposited. These Vultures choose dark swamps as breeding grounds, often nesting in communities, and there was, a few years ago, a large rookery of this description near Lake Worth in Southern Florida.

NOTES ON THE WHITE-TAILED KITE. There was a pair of this species about the northern end of Merritt's Island, Florida, in the spring of 1886 and I quite frequently saw them there, and Mr. Wm. Peterson sent me a pair which he procured near the same place the next year.

FALCO SPARVERIOIDES. ✓

Cuban Sparrow Hawk.

SP. CH. Form and size similar to the Sparrow Hawk, but differently colored. Above, excepting tail, dark plumbeous, with a blackish collar below neck. Beneath, deep reddish, with a tinging of plumbeous across breast. Throat, grayish white. The inner webs of the primaries are slaty with transverse cloudings of darker. The female differs from that of the Sparrow Hawk in being dark rufous below and in having dusky mottlings on the inner webs of the primaries. Excepting as above, both sexes resemble the American Sparrow Hawk.

OBSERVATIONS.

Known at once by the unbanded colors of both surfaces. Occurs in Cuba and Southern Florida.

NOTE ON PIGEON HAWK. In May, 1893, a nest of this species was obtained in a hole of a stub of an apple tree near my place in Newtonville, Mass. The female was caught on the nest and with the eggs was brought to me for identification. The tree in which this nest was found stood within two or three hundred yards of an inhabited house. It was a low stub and the hole from which the eggs were taken was not over ten feet from the ground. There were four of them, and they, with the female, are now in the collection of Mr. E. W. Parker, of this place.

A nest obtained by one of my collectors in the Magdalen Islands a few years ago was built of sticks and placed in a tree. This contained four eggs, which are in the collection of Mr. Wm. Brewster, of Cambridge.

FALCO RUSTICOLUS.

Gray Jer Falcon.

DESCRIPTION

SP. CH. Similar to the light stage described on page 275 but with the head and neck darker than the back. This is rather more northern in habitat than the dark form and also occurs in Iceland, but is found in North America in winter, sometimes even as far south as New England.

Falco rusticolus obsoletus.

Black Jer Falcon.

DESCRIPTION.

SUB. SP. CH. This is the dark phase described on page 275 and occurs in Labrador, and is the *Falco labradora* of Audubon. The extreme white form described as *F. candicanus* occurs in Greenland and is seldom found in North America.

Buteo lineatus alleni.

Florida Red-Shouldered Hawk.

SUB. SP. CH. Form and general coloration similar to that of the common Red-shouldered Hawk, but the size is smaller and the colors are darker, especially in adult specimens, the red on the shoulders being very deep and continuous. Length, 19.06 to 16.00; stretch, 39.12 to 32.50; wing, 13.05 to 11.00; tail, 7.50 to 8.00; bill, .92 to .75; tarsus, 2.45 to 2.23. Occurs in Florida. Nests and eggs similar to those of northern form, but the latter are smaller.

HALIAETUS ALBICILLA.

Gray Sea Eagle.

DESCRIPTION

SP. CU. Form and general color similar to those of the White-headed Eagle, but the head is never white, although adults have the tail wholly white, and the size is somewhat larger on the average. Occurs in Europe and in Greenland. Eggs similar to those of the Northern White-heads.

NOTES ON THE NESTING HABITS OF THE WHITE-HEADED EAGLE. This species, according to Mr. Wm. Peterson, who has collected large numbers of their eggs in Florida, begins to lay in that state as early as the second week in November but fresh eggs can be found as late as the second week in January.

ORDER IX. STRIGI. OWLS.

Sternum, usually with four marginal indentations. Keel, very low. Manubrium, wanting. Head, quite large.

The eyes are usually large, directed forward, and, in a great number of the species, constructed for seeing in the twilight or even at night. The bill is strong and curved but is partly concealed in bristly feathers. There is a more or less perfect disk of radiating feathers surrounding the face. The cavity of the ear is large. The tarsus is usually short and is nearly always feathered to the toes. The wings are long and well formed. The plumage is soft and lax, each feather, even of the wings, being tipped with downy filaments which insures noiseless flight, enabling the birds to take their prey with great certainty. The sternum is quite strong, usually with four marginal indentations, the two inner, shallower than the outer. The keel is low, not exceeding one half the width of the straight sternum in height. The coracoids are short, strong, and of medium length, and are often set on at a wide angle but the furcula is weak, not arched, and is provided with a terminal expansion. This sternal structure indicates that, although the birds may be able to fly quite well in a straight line, they are incapable of making any sudden turn or performing any rapid aerial evolutions. The œsophagus is wide but without any dilatation or crop. The proventriculus is well developed. The stomach is large but not muscular. Although the fold of the duodenum is long, yet the pancreas is generally small. There are two cœca of quite a large size with the blind ends dilated. The females are larger than the males.

FAMILY I. STRIGIDÆ. THE DISKED OWLS.

Marginal indentations, two, wide but not deep. Tarsus, long. Eyes, small. Facial disk, perfect.

The marginal indentations are simple, shallow scallops. The size is not very large. The bill is rather long. The tarsi are comparatively long and the feet large. The plumage is rather light in color and of a peculiar, soft, downy structure, not as observable in other families.

STRIX FLAMMEA.

GENUS I. STRIX. THE BARN OWLS.

GEN. CH. *The sternum is short and well arched, with the coracoids set on at an angle. Furcula, quite well developed. Tail, rather short. There are no ear tufts.*

Members of this genus have the plumage very soft and lax. The small eyes are dark in color. The sterno-trachealis is stout but there are no other laryngeal muscles. The œsophagus is straight, wide, and opens into a medium sized proventriculus with simple glands arranged in a zonular band. The stomach is large, globular in form, with rather thin walls. The cœca are long. Both lobes of the liver are nearly equal in size. There is but one species within our limits.

STRIX FLAMMEA.

Barn Owl.

Strix flammea LINN., Syst. Nat., I; 1766, 131.

DESCRIPTION.

Sp. CH. Form, rather slender. Size, medium. Sternum, stout, very broad, with the keel well arched, thick, and short, for it does not reach the posterior border. The marginal indentations are wide scallops, quite shallow, measuring in the specimen before me about .20 in depth.

COLOR. *Adult.* Above, including rump and upper tail and wing coverts, brownish-yellow, and nearly all the feathers have a central spot of deep-brown preceded terminally by a smaller one of white. Wings and tail, brownish-yellow, transversely banded with brown. Under parts, pale yellowish-white, with each feather tipped with a small, dark-brown spot. Under wing and tail coverts, white spotted with black. The face is white tinged with red near the angle of the eye. The edge of the facial disk is pale reddish-brown.

Young. Birds in this stage appear to be considerably yellower than the adult and are, perhaps, darker above; otherwise, similar.

Nestlings. Are covered with a yellowish down. Iris, dark-brown, bill, horn color, claws, brown, in all stages. Sexes, similar in color.

OBSERVATIONS.

The plumage described, gives the average but specimens vary in being much lighter above and below, while others are considerably darker on both surfaces. The feathers above are finely marked everywhere with brown which color often predominates on the middle of the back. The tibia and tarsus are often spotted, while the spots below vary greatly in size. The colored ring around the facial disk is always quite conspicuous and occasionally the eyes are entirely surrounded by chocolate-brown. Readily known from other species, by the colors as described and by the peculiar character of the plumage which is particularly soft and downy.

Distributed, as a constant resident, throughout the Southern portions of North America; not common in the Middle or Northern States and is quite rare in New England.

DIMENSIONS.

Average measurements of male specimens. Length, 17.00; stretch, 45.00; wing, 13.00; tail, 5.25; bill, 1.79; tarsus, 2.75. Longest specimen, 18.00; greatest extent of wing, 46.50; longest wing, 11.00; tail, 5.10; bill, 1.78; tarsus, 3.00. Shortest specimen, 16.00; smallest extent of wing, 41.00; shortest wing, 12.50; tail, 5.10; bill, 1.60; tarsus, 2.55.

Average measurements of female specimens. Length, 16.00; stretch, 44.25; wing, 12.00; tail, 5.00; bill, 1.70; tarsus, 2.65. Longest specimen, 17.00; greatest extent of wing, 45.00; longest wing, 13.00; tail, 5.20; bill, 1.74; tarsus, 2.80. Shortest specimen, 15.00; smallest extent of wing, 43.25; shortest wing, 11.50; tail, 4.85; bill, 1.55; tarsus, 2.40.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in natural cavities of trees, on the ground, or in deserted buildings, composed of a scanty supply of sticks, straws, etc.

Eggs, four or five in number, rather elliptical in form, yellowish-white in color, surface, not very smooth. Dimensions from 1.65 x 1.25 to 1.69 x 1.30.

HABITS.

The Barn Owls of the Old World almost invariably inhabit ruins and, although, with us, they often make use of deserted buildings in which to construct their nests, they do not always breed in such places; for example I knew of a pair which built year after year in

an old hollow stub which stood near a cracker's shanty just south of Hanlover Canal. It is true, that there were only two houses for twenty-five miles, on that side of Indian River and, as these were both occupied, the birds could not well find a suitable building in which to place their nests, even if they had been so inclined, but I think that breeding in cavities of trees or rocks must have been the original manner of nesting many years ago, while Audubon even found their eggs on the ground on some islands off Texas. The author just mentioned also states that they inhabited the old fort at St. Augustine, which is, without doubt, an established breeding ground with them for I found them inhabiting the place during my first visit to the Ancient City, in 1869, and Mr. L. L. Thaxter obtained a young bird, about the first of April, the same year, which, although fully fledged, was scarcely able to fly.

It will be remembered that this fort of which I speak, is very old for it was erected by the order of the Spanish Governor, Menendez, about the year 1565; therefore, it is one of the most time-honored structures of the kind in the United States. The walls are quite thick and a few years before my visit, a secret cell was discovered in them which, not only contained instruments of torture, but also the remains of a human skeleton; suggestive relics of the dark days of Spanish tyranny. Adjoining this gloomy inner prison, is a larger apartment, celebrated as being the cell in which the Seminole Chief, Wild Cat, was confined and from which he escaped by forcing his way through a window, so small, that, previous to his attempt, no one supposed that it was possible for a human being to gain an exit by it. This orifice forms a place of ingress and egress for the Barn Owls. How long these birds have used this opening as a passage to their homes is impossible to conjecture but, beyond a doubt, the ancestors of the present occupants heard the groans of the French Huguenots, who were confined in the dungeon by Menendez some three hundred years ago. These Owls, through a succession of generations, must have become accustomed to the sounds of war for the old fort has been besieged no less than seven times during the three centuries of its existence but has been taken only once, when the stars and stripes replaced the stars and bars during the last war. Another breeding place of these Owls is the Old Lookout, a deserted ruin which stands on a small island in the Mantanzas River, near the inlet, and which was erected about the same year that the fort was built.

The Barn Owls, though not noisy birds, are capable of producing cries so loud and shrill that they may be termed shrieks; sounds well calculated to awaken the fears of the ignorant. In fact, the uneducated class of Florida look upon the White Owls, as they call this species, with suspicious awe and will seldom disturb their nests or eggs. This species appears to see well by day and probably the same remark may be applied to all Owls; but this subject will be discussed to a greater length in the succeeding pages. I once startled one from a bunch of live-oaks in Smithville, North Carolina. It rose some distance from me, too far, in fact, to shoot, then, as if it wished to obtain a nearer view, turned to fly back again, when a friend who was accompanying me, fired, but, as the bird was then too far away for the shot to have any effect, it merely circled, and flew rapidly away, moving as steadily as does the Snowy or Great Horned in the daylight, for both of these birds can then fly remarkably well.

The Barn Owls are constantly resident wherever they occur but do not appear to be very common anywhere in the section which we have under consideration, yet, as they are of a retiring disposition, they may escape notice. They are southern birds, being rare north of Virginia and are found in Massachusetts and the other New England States only as occasional stragglers. One specimen was taken at Lynn and one or two in the vicinity of Springfield, some years ago.

The breeding habits of the Barn Owls are not very well known; Audubon states that they lay at irregular times throughout the year but my correspondent, Mr. Chas. Nauman, who has spent many years in Florida, says that they nest in March, April, and May. The pair of which I have spoken on the preceding page, which had a home in the hollow stub, brought out their young in the spring, depositing their eggs about the first of March, while the birds at the old fort appeared to breed in the spring. Thus we may judge that the majority begin their household duties about that time, bringing out, at least, two broods in a season.

FAMILY II. BUBONIDÆ. THE HOOTING OWLS.

Marginal indentations, four, quite wide but deep. Tarsus, short. Eyes, rather large. Facial disk, nearly perfect.

The marginal indentations are wide and deep but the two inner, are shallower than the outer. The size is usually quite large. The bill is not very long but is strong. The tarsi are comparatively short and the feet strong. The plumage is rather dark in color and, although soft and lax, is not of that peculiar, downy structure observable in the preceding family.

GENUS II. SYRNIUM. THE GRAY OWLS.

GEN. CH. *The sternum is short and well arched, with the coracoids set on at an angle. Furcula, not very well developed. Tail, rather long. There are no ear tufts.*

Members of this genus have the plumage very long and full. The eyes are rather large and dark in color. The sternotrachealis is stout but there are no other laryngeal muscles. The oesophagus is nearly straight, but is a little wider in the middle, and opens into a medium sized proventriculus with simple glands arranged in a zonular band. The stomach is large, globular in form, with rather thin walls. The coeca are quite long. Both lobes of the liver are nearly equal in size. There are two species within our limits.

SYRNIUM NEBULOSUM.

Barred Owl.

Syrnium nebulosum FOSTER, Trans. Philos. Soc. London, LXII; 1772, 386, 421.

DESCRIPTION.

Sp. CH. Form, robust. Size, medium. Sternum, stout, rather broad, with the keel well arched, thick, and short, but it reaches the posterior border which is emarginate. The marginal indentations are quite deep. Tongue, thick and fleshy, horny at the tip which is rounded and slightly bifid.

Color. *Adult.* Above, including rump and upper tail and wing coverts, dusky-brown and all the feathers are transversely banded with white. Wings and tail, dusky-brown, transversely banded with brown. Under parts, white, trans-

versely banded above the upper breast, and longitudinally striped below this, with dusky-brown. Under wing and tail coverts, flanks, tibia, and tarsus, reddish-yellow, the under tail coverts being striped with dusky and the tarsus mixed with it. The face is grayish-white barred with dusky and the edge of the facial disk is dark-brown.

Young. Birds in this stage are tinged with reddish-brown above, particularly on the white markings, while the same color pervades below.

Nestlings. Are covered with a yellow down. Iris, dark-brown, bill, yellow, cere, greenish, claws, horn color, in all stages. Sexes, similar in color.

OBSERVATIONS.

Readily known from the preceding by the smaller size and yellowish tinging to the feathers, and from other species by the colors as described. The wings and tail are, perhaps, more frequently barred with yellowish than with brown. Specimens from Florida are darker than those from the Northern States and are strongly tinged with reddish above and below, while the toes of southern birds are quite destitute of feathers. Distributed, as a constant resident, throughout Eastern North America.

DIMENSIONS.

Average measurements of male specimens. Length, 19.00; stretch, 41.00; wing, 13.60; tail, 8.00; bill, 1.35; tarsus, 2.00. Longest specimen, 23.00; greatest extent of wing, 45.00; longest wing, 14.00; tail, 8.50; bill, 1.45; tarsus, 2.25. Shortest specimen, 17.00; smallest extent of wing, 13.00; shortest wing, 12.50; tail, 7.00; bill, 1.25; tarsus, 1.90.

Average measurements of female specimens. Length, 20.00; stretch, 45.25; wing, 14.00; tail, 8.50; bill, 1.45; tarsus, 2.25. Longest specimen, 21.00; greatest extent of wing, 46.00; longest wing, 14.50; tail, 9.00; bill, 1.50; tarsus, 2.05. Shortest specimen, 19.00; smallest extent of wing, 44.00; shortest wing, 13.25; tail, 7.50; bill, 1.35; tarsus, 2.00.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in natural cavities of trees or on the branches. They are either remodelled on the old nests of other birds or composed of sticks and twigs, lined with a scanty supply of leaves, etc.

Eggs three or four in number, rather oval in form, white in color, with the surface very smooth. Dimensions from 1.60 x 2.00 to 1.75 x 2.20.

HABITS.

I have placed the birds now under consideration, among the Hooting Owls and they certainly proclaim their right to the title, most emphatically, for it would be difficult to find more noisy Owls. They are not only noisy, uttering their notes very frequently, but their cries are loud and are given with startling distinctness. A single prolonged hoot which is a preliminary to a series of lower sounds, is particularly noticeable, especially when heard near at hand, being uttered with such a peculiar intonation as to suggest supernatural origin; then, the notes which succeed the first outbreak, are so weird that they are not calculated to dispel the illusion, neither is a sight of the dark gray birds flying swiftly through the foliage on noiseless wings, at all reassuring for, in the dim twilight, nothing could well appear more ghostly to one who is inclined to believe in visitations from the unknown world. How different are the facts in this case from what a morbid fancy pictures them. The outcry is but the call of an awakening Barred Owl to its mate for whom he is seeking and for whose benefit he is singing his quaint love song as he goes. To me the notes, although given in a minor tone, are not even disagreeable, but then I have a particular liking for Owls and have at different times, kept almost all of our native species as pets. A pair of Barred Owls which I once had were particular favorites as they were very tame and notably gentle, never attempting to bite when I caressed them. They would take food from my hand and would frequently fly to meet me when I entered the room in which they were confined. The male was finally killed by a Great Horned Owl after which I gave the female her liberty, a favor which she doubtless appreciated.

more than the people in the neighborhood, for she remained in the vicinity for some time, committing considerable havoc by entering chicken coops and killing the occupants.

The Barred Owls are very common in all sections where they can find woods of sufficient extent to offer them shelter. They are numerous in all the Southern States but are particularly abundant in Florida, where they fairly swarm and I have started a dozen in a morning's walk through a swamp. Although they seldom enter holes, they are fond of dark, secluded localities from which they emerge only by night, seldom, if ever, voluntarily flying by day. They are quite unsuspecting in sections where they are not disturbed and I have often walked within a few yards of them; in fact, in Florida, during the evening, they would often alight on the trees over our camp fire.

The Barred Owls breed early in February in Florida but do not generally lay in New England until the latter part of March. In the former named locality, the eggs are, I think, placed in the cavity of some hollow stub in cypress swamps but in New England, they either remodel old nests of Crows or Hawks or construct a domicile for themselves. The Barred Owls are not generally migratory, as the term is usually applied, but in the North, are inclined to wander somewhat during winter.

SYRNIUM CINEREUM.

Great Gray Owl.

Syrnium cinereum Gm., Syst. Nat., I; 1788, 291.

DESCRIPTION.

Sp. Ch. Form, robust. Size, very large. Sternum, stent. The marginal indentations are quite deep. Tongue, thick and fleshy, horny at the tip which is rounded and slightly bifid.

Color. *Adult.* Above, including rump and upper tail coverts, sooty-brown, mottled and transversely banded with ashy-white. Wings and tail, dusky-brown, transversely banded with ashy-white. Under parts, including under wing and tail coverts, ashy-white, longitudinally streaked with sooty-brown, the streakings being more numerous on the breast, with transverse bands of the same color on the abdomen and under tail coverts. The face is grayish barred with dusky and the eyes are nearly surrounded by a ring of the same dark color.

Young. Similar to the adult but show more or less traces of reddish-brown above. Iris, yellow, bill, pale-yellow, cere, greenish, claws, horn color, in all stages. Sexes, similar in color.

OBSERVATIONS.

This species may readily be distinguished from all others by its superior size, it being the largest Owl within our limits, and by the color as described. Distributed, as a constant resident, throughout North America, north of the latitude of Canada, migrating into New England in winter.

DIMENSIONS.

Average measurements of male and female specimens. Length, 22.50; stretch, 54.00; wing, 18.00; tail, 13.50; bill, 1.50; tarsus, 2.50. Longest specimen, 30.00; greatest extent of wing, 56.00; longest wing, 19.00; tail, 15.00; bill, 1.75; tarsus, 3.00. Shortest specimen, 25.00; smallest extent of wing, 52.00; shortest wing, 17.00; tail, 12.00; bill, 1.25; tarsus, 2.00.

DESCRIPTION OF NESTS AND EGGS.

Nests. generally placed in high trees, composed of sticks, twigs, etc., and lined with feathers. They are usually bulky structures.

Eggs. three or four in number, rather oval in form, pure white in color, with the surface very smooth. Dimensions from 1.75 x 2.00 to 1.78 x 2.25.

HABITS.

One has but to glance at the long, downy plumage of the Great Gray Owls to understand that they are inhabitants of a boreal clime, and they do dwell in the Arctic regions, not only in summer but also remain there all winter, being protected from the ravages of the intense cold by the thick coat of soft plumage with which they are provided. They must find an abundance of food in those bleak and inhospitable sections for they seldom leave them, being quite uncommon even in the more northern of the New England States, while they are very rare in Massachusetts; so rare, in fact, that I never had the good fortune to meet with one living although I have searched diligently for them for many years. There are but a few instances on record of the capture of these desirable Owls in the state and the greater part of these occurred in the neighborhood of the sea shore, mainly at Lynn and Salem or in the vicinity. I do not think that they wander south of this point as a rule, but a single specimen was taken in Connecticut many years ago.

According to published descriptions, the Great Gray Owls resemble the Barred in habits, frequenting the densely wooded sections, hiding by day and flying about the country by night. This brings me to a point which I have mentioned before—the sight of Owls. Almost every one believes that these birds cannot see well during daylight, even ornithologists appear to have this opinion regarding certain species. Now, I have kept all but three of our native species in confinement and can thus affirm from actual observation that all of them are capable of discerning objects, far or near, in the brightest sunlight, as clearly as by night. Thus a Mottled Owl which I now have, watches the movements of insects as they fly about the room or crawl on the floor and, on several occasions, has alighted on them; striking them with his talons with as much adroitness as in the evening, even if the sunlight were shining on them. He also perceives objects at a distance; for example, he has a decided antipathy to cattle; thus when he sees one, he will utter a peculiar croak, indicative of alarm and I frequently hear him give this note as he sits on the sash of an open window, when there appears to be no cause for it, yet upon going to the window in order to observe the direction of his gaze, I often find that he is looking at a cow in a distant field, so far away as to be scarcely noticeable.

It is true that Owls see well by night but this is a faculty which is possessed, to a greater or less degree, by almost all birds although it is certainly brought to the greatest perfection in Owls as a class, yet the same power is possessed by nearly all the water birds, especially the swimmers. Thus, Ducks see well by night, as do also Cormorants, and a White Pelican which I once kept for four years, could see during the hours of darkness as well as any Owl.

The breeding habits of the Great Gray Owls are not very well known but authors state that they construct nests of their own that are thickly lined with feathers which is quite an unusual feature with Owls although both the Barred and Great Horned occasionally deposit some of their own plumage in their domiciles. The Great Gray Owls are not strictly migratory but, like the Barred, they wander somewhat during winter, especially during severe seasons.

GENUS III. BUBO. THE HORNED OWLS.

GEN. CH. *The sternum is not very short and not strongly arched, but with the coracoids set on at an angle. Furcula quite well developed. Tail, long. There are prominent ear tufts.*

Although members of this genus have the plumage long and full yet it is not as lax and downy as in the preceding group. The eyes are rather large and are usually yellow in color. The sterno-trachealis is not stout, and there is a slender bronchialis, but no other laryngeal muscles. The oesophagus is nearly straight, but is a little wider in the middle and opens into a small proventriculus with simple glands arranged in a narrow, zonular band. The stomach is quite large, globular in form, with moderately thin walls. The coeca are quite long with the blind ends dilated. The fold of the duodenum is long, inclosing a small pancreas. Both lobes of the liver are nearly equal in size. There is but one species within our limits.

BUBO VIRGINIANUS.

Great Horned Owl.

Bubo Virginianus GM., Syst. Nat., I: 1788, 287.

DESCRIPTION.

Sr. CH. Form, robust. Size, very large. Sternum, stout. Tongue, rather thick and fleshy, horny at the tip which is rounded and slightly bifid. The bill and claws are strong and well curved. The ear tufts are always present and usually quite prominent.

COLOR. *Adult.* Above, including wings and tail, dark-brown, with the feathers mottled, spotted, and barred with white and rufous, the bars being more distinct on the wings and tail. The base of the feathers are more or less rufous. There is a patch of white on the lower neck and upper breast but the remainder of the feathers, including under wing and tail coverts, is barred, mottled, and spotted, with black, white, and yellowish-rufous. The tibia and tarsus are rufous barred with dusky. The face is rufous, black, and white, mixed, but inclined to white on the feathers in advance of the eye. Ear tufts, dark-brown, edged on the inner margin with rufous and white.

Young. Similar to the adult but show much more rufous below and on the middle of the back, while the same color predominates on the wings and tail.

Nestlings. Are at first covered with a yellow down which, in time, becomes barred with dusky-brown. Chin and throat, white, also the ring entirely surrounding the bill, but the bristles at its base are black, terminally. The facial disk is edged with black. The ear tufts are at first wanting but soon appear as the birds gradually assume the second plumage. Iris, yellow, bill and claws, dark-brown, in all stages. Sexes, similar in color.

OBSERVATIONS.

It is extremely difficult to give an idea of the variable plumage of this species. Usually specimens from the far North are very light, often being creamy or even nearly white throughout; those from the Middle Region show a preponderance of rufous, while Owls from the South are decidedly darker. This is, perhaps, the rule, but there are many exceptions to it; for example, of two skins before me, one from Labrador and one from Florida, the northern skin is the darker. Keeping in mind, then, the fact, that either of the three colors, white, black, or rufous, may predominate nearly to the exclusion of the other two, or be mixed in all proportions, it will not be difficult to recognize this species by the form alone and especially by the prominent ear tufts combined with the large size. Distributed, as a constant resident, throughout the entire extent of North America.

DIMENSIONS.

Average measurements of male specimens. Length, 21.00; stretch, 40.00; wing, 14.00; tail, 8.00; bill, 1.50; tarsus, 1.25. Longest specimen, 23.00; greatest extent of wing, 45.00; longest wing, 15.00; tail, 9.00; bill, 1.60; tarsus, 1.30. Shortest specimen, 18.00; smallest extent of wing, 35.00; shortest wing, 13.00; tail, 7.00; bill, 1.40; tarsus, 1.20.

Average measurements of female specimens. Length, 23.00; stretch, 51.00; wing, 15.60; tail, 9.00; bill, 1.70; tarsus, 1.50. Longest specimen, 24.00; greatest extent of wing, 55.00; longest wing, 16.30; tail, 9.60; bill, 1.80; tarsus, 1.60. Shortest specimen, 22.00; smallest extent of wing, 53.00; shortest wing, 15.00; tail, 8.70; bill, 1.50; tarsus, 1.40.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in natural cavities of trees or on the branches. They are either remodeled on the old nests of other birds or composed of sticks and twigs, lined with a scanty supply of leaves, etc.

Eggs, three or four in number, quite spherical in form, white in color, with the surface very smooth. Dimensions from 1.80 x 2.00 to 2.00 x 2.30.

HABITS.

I have described the Great Horned Owls as possessing certain, strongly marked features by which they may be at once distinguished from all other members of the family. This is not only true regarding form, plumage, etc., but they also exhibit many characteristic habits, not observable in any other species of our native Owls. They are the wildest of the group and it is only by exercising the greatest caution that one can approach within gun shot of them. Even in the wilds of Florida, they are very shy, notably so during daylight, at which time they are extremely restless, especially during the breeding season, and about the first of January, I have frequently heard them hoot at intervals from morning until night. It is not unusual to meet them flying about the swamps at any hour at this time and I have even seen them in the piney woods at a considerable distance from a hummock. When thus wandering, if they perceive an intruder, they will at once start, flying as steadily as any of the diurnal birds of prey. They differ, however, from this class for they will make frequent pauses in order to look at the object of their dislike. This fear of man appears to be inherited for even the young, when scarcely able to fly, are very wild and I once spent an hour among the Alleghany Mountains endeavoring to obtain a shot at a Great Horned Owl which led me a chase of some miles and when I, at length, succeeded in obtaining it, I was surprised to find that the bird was only in the nestling plumage.

Unlike any other Owls which I have kept, the Great Horned are very difficult to tame; in fact, it will not be easy to find fiercer birds, for they will seldom permit one to caress them and scarcely appear to recognize their best friend. The only exception to this rule that ever came under my notice, is a fine specimen now in the possession of the Bangs Brothers which, although far from being good-tempered, does acknowledge his masters and will permit them to handle him on some occasions but will instantly attack all other intruders.

As already noted, the Great Horned Owls are not only variable in plumage but also in regard to their notes, yet no one would be apt to mistake an Owl of this species for any other when he saw it, no matter how singular the color; neither would any one fail to recognize the peculiar notes, even though there is considerable difference in the songs, if so we may call them, of different individuals. My extended experience in the woods of Florida has brought me in contact with very many of this species and I have spent many hours in listening to them. The usual cry consists of four notes which may be expressed as follows: *who-ho-ho-who*, the first two being given quite rapidly, then a pause of a second or two ensues and the third syllable comes out distinctly with emphasis, quickly followed by the last which is dwelt upon, often with a rising inflection just as though the birds were asking a question. Some Owls add another note and one which came about our camp at Blue Springs during the winter of 1872, gave eight distinct sounds. Besides this hoot, they emit other sounds and when the males are pursuing the females during the nesting season, they utter a series of guttural notes, sounding like *wack-wack-ho-ho-wa-who*, all delivered rapidly but dwelling on the last with the same rising inflection as when hooting.

As remarked, the full hoot is often given by day during the breeding season and on one or two occasions, I have heard it in winter in Maine, where the country people say that when the Owls hoot before sunset, it foretells a storm,

The Great Horned Owls are, with perhaps the exception of the Eagles, the very first in the season among our native birds to breed, depositing their eggs in Florida as soon as the first of January, but not laying in New England until the middle of February. The young grow slowly and do not leave the nest for, at least, three months. These Owls, like the Barred, almost invariably breed in hollow stubs in the South but further north, they frequently construct nests for themselves or remodel those of Hawks or Crows but they occasionally resort to holes in this section for I once found some eggs, all of which, excepting one, were broken, in a cavity of a prostrate log at Upton, Maine. The stub which contained the nest, must have been thrown down shortly after the eggs were deposited, for the whole one, although addled, showed no signs of incubation. The Great Horned Owls, like other species, wander considerably when not breeding, especially in the North during winter, but they are not strictly migratory.

FAMILY III. OTUNIDÆ. THE EARED OWLS.

Sternum, emarginate. Marginal indentations, four, not wide nor deep. Tarsus, very short. Feet, small. Eyes, rather small. Facial disk, nearly perfect. Ear tufts, always present.

The sternum is short and well arched, with the top of the keel considerably rounded. The outer marginal indentations are deeper than the inner. The size is medium with the form slender. The bill is strong but not very long. The plumage is long, full, and quite downy. The wings and tail are long, and although the ear tufts are always present, they are of varying length.

GENUS I. BRACHYOTUS. THE EARED OWLS.

GEN. CH. *The sternum is considerably arched, with a well rounded keel which equals in height one half the width of the sternum. Outer marginal indentations, but little deeper than the inner. Coracoids, rather short, not equal in length to the top of the keel and not set on at a very wide angle. Furcula, quite well developed. Tail and wings, long. There are very short ear tufts.*

Members of this genus have the ear tufts present but they are not particularly prominent. The plumage, although downy, is not strikingly long. The eyes are not large and are usually yellow in color. The sterno-trachealis is quite stout, and there is a slender bronchialis, but no other laryngeal muscles. The œsophagus is nearly straight, and opens into a small proventriculus with simple glands arranged in a narrow, zonular band. The stomach is not large, globular in form, with very thin walls. The cœca are quite long with the blind ends dilated. The fold of the duodenum is long, inclosing a small, but wide, pancreas. Both lobes of the liver are nearly equal in size. There is but one species within our limits.

BRACHYOTUS PALUSTRIS.

Short-eared Owl.

Brachyotus palustris GOULD., Pro. Zool. Soc., London; 1837, 10.

DESCRIPTION.

Sp. CH. Form, slender. Size, medium. Sternum, stout. The marginal indentations are not deep. Tongue, rather thick and fleshy, horny at the tip which is rounded and slightly bifid. Ear tufts, short.

COLOR. *Adult.* Above, dark-brown, with the feathers edged, mottled, spotted, and barred with yellowish-rufous. Rump, wholly yellowish-rufous, barred with dusky. Wings, dark-brown, barred with yellowish-rufous, which becomes lighter on the inner webs and nearly white below. Tail, also dark-brown, barred with yellowish-rufous which becomes lighter on the outer feathers and nearly white on the lower side. Beneath, including under wing and tail coverts, tibia and tarsus, yellowish-white, streaked with dark-brown on the body. There is a prominent spot of dark-brown on the under wing coverts near the outer edge. The face is white, mixed with dusky and a ring of dark-brown entirely surrounds the eye.

Young. Similar to the adult but show much more rufous on the upper surface while the same color predominates on the lower portions.

Nestlings. Are at first covered with a yellow down and, in time, gradually assume the second plumage. Iris, yellow, cere, greenish, bill and claws, dark-brown, in all stages. Sexes, similar in color.

OBSERVATIONS.

Specimens of the same age and sex are usually quite uniform in color, for Owls, but some skins obtained by Mr. Wm. Brewster and myself, in Summer at Muskeget, a sandy island off the South Shore of Massachusetts, are so much bleached as to appear nearly white in the distance. This is, however, merely the result of exposure to the sun in an unsheltered situation, where they were constantly resident. Readily known from the succeeding species by the short ear tufts and light tints, and from all others by the long wings, combined with the colors as described. Distributed, as a constant resident, throughout the entire extent of North America, also found in the Old World.

DIMENSIONS.

Average measurements of male specimens. Length, 11.25; stretch, 39.50; wing, 12.70; tail, 6.20; bill, .85; tarsus, 1.60. Longest specimen, 15.00; greatest extent of wing, 41.00; longest wing, 13.00; tail, 6.40; bill, 1.00; tarsus, 1.75. Shortest specimen, 11.50; smallest extent of wing, 38.00; shortest wing, 12.30; tail, 5.90; bill, .70; tarsus, 1.50.

Average measurements of female specimens. Length, 11.50; stretch, 40.00; wing, 13.00; tail, 6.30; bill, .90; tarsus, 1.80. Longest specimen, 15.50; greatest extent of wing, 42.00; longest wing, 13.50; tail, 6.60; bill, 1.10; tarsus, 1.90. Shortest specimen, 15.00; smallest extent of wing, 39.00; shortest wing, 12.50; tail, 6.00; bill, .80; tarsus, 1.70.

DESCRIPTION OF NESTS AND EGGS.

Nests, are often bulky structures placed either on the ground or in low bushes. They are composed of sticks, twigs, grass, etc., lined with grass and leaves.

Eggs, four or five in number, quite elliptical in form, white in color, with the surface very smooth. Dimensions from 1.20 x 1.50 to 1.25 x 1.56.

HABITS.

As a rule, Owls prefer wooded sections or, if they do not, as is the case of the Barn Owl, they will hide in holes of rocks or in deserted buildings but the species of which I am now writing, has a decided predilection for the open country, usually choosing marshes or barren sections near the sea shore; in fact, they are quite uncommon elsewhere and, although I have seen scores of Short-eared Owls, I have met with only one in the interior. They are fond of resorting to hill-sides, grown up to low bushes among which they hide, emerging by night to feed on mice or small birds which they procure by hawking over the marshes, flying at a considerable height, but when they perceive the object for which they are hunting, they will suspend themselves in air for a moment, after the manner of Kingfishers, then will drop perpendicularly upon their victims, seldom missing their aim, after which they will remain on the ground to eat them.

I had an excellent opportunity of studying the habits of these Owls when camping, in company with Mr. Brewster and another friend who has since passed away, on the island of Muskeget during the early part of July, 1870. This little islet which is situated between Nantucket and Martha's Vineyard, is low, sandy and, in places, quite destitute of vegetation, while a scant out-cropping of beach grass may be seen on the sides and tops of

the low hillocks of which a greater part of the surface is composed. The miniature valleys in which there is a slight accumulation of soil, support a somewhat luxuriant growth of poison ivy among which are scattered clumps of wild beach plums that, although, judging from their moss-covered stems and gnarled branches, they have withstood the storms of many winters, have only attained the height of three or four feet. During the first few hours of our visit, we discovered two or three huge nests placed in the tops of this dwarfed shrubbery but could not, at first, make out to what birds they belonged. The island was swarming with three species of Terns and, after a time, we saw a cloud of these birds gathering around some object which was suspended in air but the Terns were so numerous that we could not see what it was that engaged their attention, until it moved onward, when we saw that it was a Short-eared Owl. We afterwards found that there was quite a colony of them on the place; in fact, we secured four or five specimens.

A peculiar, bleached variety of the field mouse was very abundant on the island of Muskeget, living mainly on the surface, for they could not well burrow, and they furnished a never-failing supply of food for the Owls which were evidently constant residents. These birds, much to my surprise, would hunt almost constantly by day and, while so doing, were always surrounded by thousands of Terns all of which were screaming so loudly that it was quite impossible to hear any other sound, yet the Owls never appeared to pay the slightest attention to them but would fly about quietly and seemed to be as successful in capturing their prey as if alone. The reason for the antipathy displayed by the Terns was obvious when we came to dissect some of the Owls and found feathers of Terns in their stomachs, mingled with bones of mice. Well-cleaned skeletons of Terns were also numerous near the old nests which, we now knew, were built by the Owls, thus proving most conclusively that these birds occasionally varied their diet.

An examination of the nests of these Owls on Muskeget Island, showed that they were composed mainly of sticks but, as they were bulky structures, it was quite evident that they had been used year after year by the Owls. The eggs must be deposited here in April but further north, on Grand Menan, for example, they are laid a month later. The Short-eared Owls are migratory to a certain degree during the winter, passing, at least, south of Massachusetts. At this season, they are inclined to be gregarious, for they associate in small companies in their favorite resorts.

GENUS II. OTUS. THE LONG-EARED OWLS.

GEN. CH. *The sternum is considerably arched, with a moderately rounded keel which does not quite equal in height one half the width of the sternum. Outer marginal indentations, twice as deep as the inner. Coracoids, not very short, being equal in length to the top of the keel and are set on at a rather wide angle. Furcula, quite well developed. Tail and wings, long. There are very long ear tufts.*

All members of this genus have the ear tufts present and they are particularly prominent. The plumage, although downy, is not strikingly long. The eyes are not large and are usually yellow in color. The sterno-trachealis is quite stout, and there is a slender bronchialis, but no other laryngeal muscles. The cesophagus is nearly straight, and opens into a small proventriculus with simple glands arranged in a very narrow, zonular band. The stomach is large, globular in form, with very thin walls. The coeca are quite long with the blind ends dilated. The fold of the duodenum is long, inclosing a small, but wide, pancreas. Both lobes of the liver are nearly equal in size. There is but one species within our limits.

OTUS VULGARIS.

Long-eared Owl.

Otus vulgaris FLEM., British Animals; 1828, 60.

DESCRIPTION.

Sp. Ch. Form, slender. Size, medium. Sternum, not stout. The marginal indentations are quite deep. Tongue, rather thick and fleshy, horny at the tip which is rounded and slightly bifid. Ear tufts, long.

Color. *Adult.* Above, very dark-brown, with the feathers edged, mottled, spotted, and barred with yellowish-rufous, and ashy-white. Rump, wholly yellowish-rufous, barred with dusky. Wings, dark-brown, barred with yellowish-rufous, which becomes lighter on the inner webs and nearly white, below. Tail, also very dark-brown, widely barred with yellowish-rufous which becomes nearly white on the lower side. Beneath, including under wing and tail coverts, tibia, and tarsus, yellowish-white, broadly streaked with dark-brown on the body. There is a prominent spot of dark-brown on the under wing coverts near the outer edge. The face is white mixed with dusky, and a ring of dark-brown entirely surrounds the eye.

Young. Similar to the adult but show much more rufous on the upper surface while the same color predominates on the lower portions.

Nestlings. Are at first covered with a yellow down and, in time, gradually assume the second plumage. Iris, yellow, cere, greenish, bill and claws, dark-brown, in all stages. Sexes, similar in color.

OBSERVATIONS.

Specimens of the same age and sex are usually quite uniform in color, for Owls. This handsome Owl is readily known from the preceding species by the long ear tufts and dark tints, and from all others by the long wings, combined with the colors as described. Distributed, as a constant resident, throughout the entire extent of North America, and is also found in the Old World.

DIMENSIONS.

Average measurements of male specimens. Length, 11.50; stretch, 39.50; wing, 12.70; tail, 6.00; bill, .85; tarsus, 1.60. Longest specimen, 15.00; greatest extent of wing, 41.00; longest wing, 13.00; tail, 6.20; bill, 1.00; tarsus, 1.75. Shortest specimen, 11.00; smallest extent of wing, 37.00; shortest wing, 11.80; tail, 5.80; bill, .70; tarsus, 1.50.

Average measurements of female specimens. Length, 11.75; stretch, 40.00; wing, 13.00; tail, 6.30; bill, .90; tarsus, 1.80. Longest specimen, 15.50; greatest extent of wing, 42.00; longest wing, 13.50; tail, 6.60; bill, 1.10; tarsus, 1.90. Shortest specimen, 11.25; smallest extent of wing, 39.00; shortest wing, 12.50; tail, 6.00; bill, .80; tarsus, 1.70.

DESCRIPTION OF NESTS AND EGGS.

Nests, not very bulky structures, placed either on the ground, in low bushes, or in trees. They are composed of sticks, twigs, grass, etc., lined with grass and leaves, or occasionally remodeled on the nests of other birds.

Eggs, four or five in number, quite elliptical in form, white in color, with the surface very smooth. Dimensions from 1.30 x 1.40 to 1.40 x 1.65.

HABITS.

Although closely allied to the Short-eared Owls in many respects, the birds now in hand, differ widely from them in habits. As already shown in the preceding page, the Short-eared prefer the open country but the Long-eared Owls are almost exclusively inhabitants of the woods, seldom being found elsewhere; in fact, they rather choose the darkest swamps in which to roost by day but it is probable that they emerge from these secluded retreats by night in order to hunt mice and small birds which form the greater portion of their food. When surprised in these gloomy retreats, they will seldom start but will merely sit perfectly quiet and gaze at the intruder with half-closed eyes, erect ear tufts, and with the feathers drawn closely to the body, which gives them a most grotesque appearance. When captured, they are very gentle, seldom attempting to bite but will ruffle their feathers, expand their wings, and snap their bills fiercely, after the manner of all Owls when annoyed.

The Long-eared Owls are more strictly nocturnal than the preceding species, flying almost entirely by night when they move with a steady, though swift, flight, not far above the ground, pausing occasionally to pounce upon some unfortunate mouse which, careless of its safety, is taking a moonlight ramble. When hunting, these Owls are silent and I cannot definitely recall an instance when I have heard either the Long or Short-eared Owls utter a note but am under the impression that I have heard the former give a single cry during the breeding season. It is highly probable, however, that both species have a characteristic call as well as a love song, for the larynx is similar to that of other Owls but none of the order have these muscles so highly developed as to produce any great variety of modulated sounds.

According to authors, the Long-eared Owls occasionally place their nests in low bushes or even on the ground but instances of this kind are doubtless not common for, judging from the cases which have come to my knowledge, their domiciles are constructed in trees, often in dense swamps. Wilson mentions finding the nests of this species in a swampy thicket which was occupied as a breeding place by Night Herons. They appear to have a fondness for similar places and I know of four or five nests which have been taken from a heronry near West Newton during different years. The time of laying in Massachusetts is during the last week in April or first week in May, earlier in the South and later further north for I find in my note-book a record of a nest taken at Grand Menan on the twenty-second of May.

The Long-eared Owls are not apparently as common as the preceding species but this may be due to the fact that they are more retiring in habits, thus escaping observation and it is highly probable that many more inhabit a given section than one would suppose, judging from the few specimens actually seen or taken. I have met with them much less frequently of late years than formerly but this may be the result of accident or they may be driven away by the thinning of the forests; yet I scarcely think this can be a fact, for the Mottled Owl which would be affected by the same cause, is as abundant as ever. The Long-eared Owls are not apparently migratory being found with us throughout the entire year.

FAMILY IV. NYCTEINIDÆ. THE ARCTIC OWLS.

Sternum, quite emarginate. Marginal indentations, four, not wide but the outer is very deep. Tarsus, very short. Feet, large. Eyes, large. Facial disk, not perfect. Ear tufts, wanting.

The sternum is short and well arched, with the top of the keel well rounded. The outer marginal indentations are more than twice as deep as the inner. The feet are large and densely feathered to the toes. The head is not large but rounded. The size is large with a robust form. The bill is strong and quite long. The plumage is full, downy, and long. The wings and tail are quite long but well proportioned. The predominating color is white.

GENUS I. NYCTEA. THE WHITE OWLS.

GEN. CH. *The sternum is considerably arched, with a moderately rounded keel which does not equal in height one half the width of the sternum. Outer marginal indentations, more than twice the depth of the inner. Coracoids, short, not being equal in length to the top of the keel and are set on at a rather wide angle. Furcula, quite well developed. Tail and wings, long.*

Members of this genus are particularly noticeable on account of the prominent white markings to the plumage which is strikingly long and downy. The eyes are large and yellow in color. The sterno-trachealis is quite stout, and there is a slender bronchialis, but no other laryngeal muscles. The oesophagus is nearly straight, being a little wider in the middle, and opens into a small proventriculus with simple, oval glands arranged in a narrow, zonular band which measures about 1.00 in width. The stomach is small, flat in form, with somewhat irregular outlines, and with very thin walls. The cœca are quite long, small near the intestine, measuring .10 in diameter, with the blind ends dilated into long, oval sacs, .25 in diameter by 1.50 in length. The fold of the duodenum is long, inclosing a small, narrow pancreas. The spleen is an elliptical body lying directly on the proventriculus. Both lobes of the liver are nearly equal in size. There is but one species within our limits.

NYCTEA NIVEA.

Snowy Owl.

Nyctea nivea STERNA, Cont. of Shaw's Zool., XIII; 1826, 62.

DESCRIPTION.

SP. CH. Form, robust. Size, very large. Sternum, stout. Tongue, rather thick and fleshy, horny at the tip which is rounded but not bifid. The bill and claws are very strong and well curved, long, but are nearly concealed by long, bristly feathers.

COLOR. *Adult male.* Pure snowy-white, more or less mottled, spotted, and barred, especially above, with a very dark-brown, but the white predominates.

Adult female. White, as in the male, but with the dark markings much more prominent, frequently extending over both surfaces including wings and tail. The face, chin, throat, under wing coverts, tibia, and tarsus are always perfectly immaculate.

Young. Similar to the adult but much more widely barred with dark-brown, and also show a tinging of yellowish-rufous on the back. Iris, yellow, cere, greenish, bill and claws, greenish-brown, in all stages.

OBSERVATIONS.

There is considerable variation in amount of dark-brown markings but this is evidently the result of age and sex, otherwise specimens are quite uniform in color. Very old birds become nearly, or wholly white. Distributed, as a constant resident, throughout the more northern portions of both Continents, migrating southward in winter, in North America, regularly, at least, to New Jersey and rarely as far as South Carolina.

DIMENSIONS.

Average measurements of male specimens. Length, 22.50; stretch, 59.00; wing, 16.75; tail, 8.55; bill, 1.30; tarsus, 1.95. Longest specimen, 23.00; greatest extent of wing, 60.00; longest wing, 17.35; tail, 8.85; bill, 1.35; tarsus, 2.00. Shortest specimen, 22.00; smallest extent of wing, 58.00; shortest wing, 16.00; tail, 8.27; bill, 1.25; tarsus, 1.90.

Average measurements of female specimens. Length, 23.70; stretch, 60.54; wing, 17.25; tail, 9.35; bill, 1.45; tarsus, 2.25. Longest specimen, 25.00; greatest extent of wing, 62.25; longest wing, 17.50; tail, 9.85; bill, 1.50; tarsus, 2.50. Shortest specimen, 22.50; smallest extent of wing, 58.83; shortest wing, 16.90; tail, 8.85; bill, 1.40; tarsus, 2.00.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground, composed of sticks, twigs, grass, etc., lined with grass and weeds. They are bulky structures.

Eggs, three or four in number, oblong-oval in form, white in color, with the surface very smooth. Dimensions from 1.35 x 2.50 to 1.90 x 2.55.

HABITS.

Fortunate for admirers of the Snowy Owls, these beautiful birds are migratory. for if they did not choose to come to us we should seldom be gratified by a sight of their mag-

nificent feathers and lovely plumage as they pass the greater portion of their lives in regions so remote and inaccessible that they can be visited only with great difficulty and there are few ornithologists even who have seen the Snowy Owls on their northern breeding grounds.

Although some of these Owls visit us regularly every winter, they are much more frequently met with during some seasons than others, yet they are not usually very common but, on some occasions, are really abundant. They were remarkably numerous during the winter of 1877, when hundreds were taken in Eastern Massachusetts alone, and many more seen. These Owls have a decided predilection for barren reaches of sea-board and the place where I was always sure to find them was on the sand hills of Ipswich beach. When the wind was blowing so fiercely and cold that it was almost impossible to make one's way over the sand dunes, I would go in search of the Snowy Owls. I well remember the first specimen that I ever secured, although many years have past since then. I had started out early in the morning of one of those blustering days of which I have spoken, to look for birds and, about noon, had caught sight of an Owl sitting under the lee of a sand hill, but almost as soon as I saw him, he noticed me and apparently the recognition was mutual for, as I sunk down behind a hillock to creep nearer in order to obtain a shot, he rose and flew to a neighboring dune, where I followed him but could not get within range. Thus the wary bird led me on, up and down the beach, throughout the remainder of the day until sunset, when upon starting him from the beach near the water, he flew boldly out to sea while I watched him, sadly thinking that the chances of adding that specimen to my collection were exceedingly small; but after going about a mile, he turned, came directly back, and alighted on a high sand hill, not far from where I was standing. As I now had a favorable opportunity of creeping unseen within shot of him, I promptly availed myself of it and just as the sun was sinking in the west, the report of my gun broke the stillness and I had the satisfaction of seeing the bird roll down the declivity upon which he had been sitting.

While with us, as intimated, the Snowy Owls are very shy, hiding among the beach grass from which they keep a sharp lookout for intruders and, when once started, will take good care to keep a sufficient distance between themselves and their pursuers. Neither are they apparently much tamer in their northern homes for one that I met with on the Magdalen Islands, behaved in a similar manner. We had landed on the upper end of Grindstone, as this small islet is called, on a barren beach, in order to look for Tern's eggs, when I perceived a fine male Snowy Owl about a hundred yards away, perched on the top of a small building which had been formerly used for drying fish but now deserted. I at once stepped into the boat for my rifle when the bird started and flew some distance, alighting on the top of a sand hill where we pursued him but all our efforts to get near him were fruitless and he soon managed to elude us, escaping to a neighboring island. The wildness of this particular specimen may be partly accounted for by the fact that we had shot two Red-throated Divers just before landing and the Owl was probably alarmed by the report of our guns.

In spite of this propensity to avoid the presence of man while they are in a state of

nature, the Snowy Owls become very tame and gentle when in confinement and make most interesting pets. One that I had for some time, became so familiar that he would allow me to handle him, even playfully taking my finger in his large beak without attempting to injure it. He was also found of grasping my fingers in his powerful claws, allowing me to shake hands with him but he never attempted to harm me, excepting on one occasion, when he behaved in a singular manner. I was accustomed to enter the room in which he was kept and, upon doing so one morning, was surprised to see the Owl fly to meet me for he usually sat on his perch until I fed him. Although this procedure was unexpected, the next movement which he made, was much more astonishing and, to me, somewhat perplexing, for he alighted on my back, buried his talons in my clothing, of which I fortunately had on a good thickness, yet, as it was, I felt his claws scrape my skin, then extending his wings, he flapped them violently, evidently endeavoring to raise me from the ground, and it was only after making considerable effort, that I at length coaxed him to loosen his hold, when he returned to his perch. This bird emitted a whistling cry whenever I approached him, similar to that produced by the Sparrow Hawk, which was much higher than I ever heard any other Owl give, but this was the only note that I ever heard him utter. The food of these Owls appears to consist largely of small rodents which diet is occasionally varied by the addition of a few birds. The Snowy Owls make their appearance in Massachusetts, late in November, remaining all winter but departing with the snow in the spring.

FAMILY V. NYCTALINIDÆ. THE BIRD OWLS.

Sternum, quite emarginate. Marginal indentations, four, narrow, with the outer very deep. Keel, low, not exceeding one half the width of the sternum. Tarsus, variable but never long. Feet, small. Eyes, medium in size. Facial disk, not perfect. Ear tufts, present or wanting.

In this family, I have included three groups of Owls which may appear, at first sight, somewhat incongruous but they seem, to me, to be closely related and I have been induced to place them under one head on account of the peculiar form of the sternum which is somewhat flat, rather slight in structure, with a keel which is low in comparison with the width of the sternum, while the posterior margin is deeply emarginate, with the indentations deep, especially the outer. The furcula is never well developed and, in some of the genera, is not ossified for the entire length. The color is variable as is also the comparative length of the wings and tail.

GENUS I. SCOPS. THE SMALL EARED OWLS.

GEN. CH. *The sternum is somewhat arched, with a moderately straight keel which does not quite equal in height one half the width of the sternum. Outer marginal indentations, wider than the inner. Coracoids, short, not being quite equal in length to the top of the keel and are set on at a rather wide angle. Furcula, quite well developed, being ossified for its entire length. Ear tufts, present and well developed. Tail, short, less than one half the length of the wings which are considerably elongated.*

Members of this genus are not large but the plumage is long and downy. The eyes are quite large and yellow in color. The sterno-trachealis is stout, and there is a slender bronchialis, but no other laryngeal muscles. As in other Owls, the tympaniform membrane is present and although there is a thin os transversale it does not support a semilunar membrane. The oesophagus is nearly straight, being a little wider in the middle, and opens into a quite large proventriculus with thin walls and simple, oval glands arranged in a wide zonular band which measures .70, in *asio*, from which this and the following dimensions are taken; it is, however, encroached upon on the lower side by a scallop, .15 in depth. The stomach is of medium size, flat in form, with somewhat irregular outlines, and with thick, but soft, walls. The fold of the duodenum is not long, inclosing a narrow, irregularly formed, pancreas which extends its entire length. The coeca are quite long, .25 in length, small near the intestine, measuring .07 in diameter, with the blind ends dilated into balloon-shaped sacs, .15 in diameter. The spleen is an elliptical body lying directly on the proventriculus. Both lobes of the liver are nearly equal in size. There is but one species within our limits.

SCOPS ASIO.

Mottled Owl.

Scops asio BON., Geog. and Comp. List; 1838, 6.

Scops McCallii CASSIN, Birds of Cal. and Texas, I; 1851, 180.

DESCRIPTION.

Sp. Ch. Form, short and compact. Size, medium. Sternum, not stout. The marginal indentations are quite deep. Tongue, rather thick and fleshy, horny at the tip which is rounded and slightly bifid. Ear tufts, long. Bill and claws, not very long.

RED STAGE.

COLOR. *Adult.* Above, including upper wing and tail coverts, uniform yellowish-red, with a narrow central line of dark-brown on every feather. One half of the outer feathers of the scapularies and wing coverts are white, forming lines. Wings, yellowish-red, with the central portion of the feathers dusky, but becoming lighter on the outer edge, and barred with dusky which is tinged with reddish on the outer webs. Tail, yellowish-red, barred with dusky. Face, yellowish and white, mixed, with the former color predominating around the eye and the latter on the sides of the bill and in a line to the ear tufts, which are red. Line on sides of face, dark-brown. Beneath, white, with each feather, excepting on the chin, throat and abdomen, barred with yellowish-red and centrally lined with dark-brown, but much more widely on the breast. Under wing coverts, sulphury-yellow. Under tail coverts, white, with a central stripe of reddish-brown. Tibia and tarsus, yellowish, often mottled with a darker shade of the same color.

Young. Similar to the adult but the red is not as clear and the dark markings are much more prominent, especially below.

Nestlings. Are at first covered with a grayish down, showing traces of red. This gradually becomes reddish-brown above, when it is barred with dusky; and it is also barred below with dusky which shows traces of red. There are none of the characteristic markings of the adult about the face, where the feathers are barred and mixed with reddish-white and dusky. The first growth of wing and tail feathers are retained for a year.

GRAY STAGE.

COLOR. *Adult.* Above, mottled, spotted, and mixed with pale-yellowish, white, and dark-brown but the feathers are centrally striped with the latter color. Wings and tail, of mixed colors like the back. White markings above as in the red stage. Face, white, mixed with dusky. Ear tufts marked like the back and edged with lighter. Beneath, white, mottled, spotted, and barred, excepting on abdomen, with dark-brown and yellowish-rufous, every feather having a central stripe of the latter color. Tail, tibia, and tarsus, white, mottled with yellowish. Other markings below and on the head as in the red stage.

Young. Similar to the adult but are not as decidedly gray being somewhat reddish, especially above and the markings are broader.

Nestlings. At first are covered with a whitish down which shows no traces of red but which becomes barred with dusky. The first quills of wings and tail are decidedly gray. Iris, yellow, cere, greenish, bill and claws, greenish-yellow, in all stages.

OBSERVATIONS.

I have described the extremes of the two plumages assumed by these Owls, which are the ones most frequently found but I have seen every gradation between the two. These variations appear to be governed by no particular condition of climate.

as both plumages are found equally common both North and South. Parents of the same color will produce young which are in both stages of plumage and, if one parent chanced to be gray and the other red, or *vice versa*, the young may be all red or all gray, or part of the number red and the remainder gray, or individuals among them may assume the intermediate stage; in short, there appears to be absolutely no rule by which these changes can be determined. No one, however, will mistake this well-known Owl for any other species, for the small size, compact form, and prominent ear tufts, together with the colors as described will serve to distinguish it. There is a rather small Florida form of this species but they do not differ much from more Northern Owls, excepting in being a little darker, for I have found all the stages described, as common there as they are in Massachusetts. Distributed, as a constant resident, throughout North America to the Arctic Circle.

DIMENSIONS.

Dimensions of specimens from Massachusetts and Florida. Average measurements of males. Length, 8.50; stretch 20.00; wing, 6.40; tail, 3.25; bill, .75; tarsus, 1.25. Longest specimen, 9.00; greatest extent of wing, 21.00; longest wing 7.00; tail, 3.50; bill, .80; tarsus, 1.50. Shortest specimen, 8.00; smallest extent of wing, 18.00; shortest wing, 5.95; tail 2.90; bill, .55; tarsus, 1.05.

Average measurements of female specimens. Length, 9.00; stretch, 22.50; wing, 6.25; tail, 3.00; bill, .85; tarsus, 1.40. Longest specimen, 9.50; greatest extent of wing, 23.85; longest wing, 7.30; tail, 3.55; bill, .90; tarsus, 1.50. Shortest specimen, 8.50; smallest extent of wing, 21.50; shortest wing, 5.90; tail, 2.55; bill, .80; tarsus, 1.30.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in holes of trees, not elaborately constructed, composed of grass, leaves, etc.; or the eggs are often placed on any material which chanced to be at the bottom of the hole.

Eggs, from New England, four to six in number, rather spherical in form, pure white in color, with the surface very smooth. Dimensions from 1.20 x 1.45 to 1.40 x 1.60. The number of eggs deposited in Florida is seldom, if ever, more than three. They are of a similar form to those from further North but are considerably smaller, measuring 1.10 x 1.30 to 1.15 x 1.40.

HABITS.

The Mottled Owls are among the most abundant of the order in North America, yet their habits are scarcely known to the majority of the people among which they dwell; indeed, ornithologists are, as a rule, not familiar with these birds, judging from the statements which they have made concerning them and, until quite recently, even the various stages of plumages assumed by them, were not well understood. Now I do not mean to intimate that I possess any more sagacity than my collaborators when I make the above assertions, for I have doubtless made more or less mistakes, though unwittingly, in reference to what I have said about some birds, but in regard to the species now under consideration, I feel as if I had the subject well in hand as there has scarcely been a time for the past ten or twelve years, when I did not have a Mottled Owl as a pet and, as I write, a fine male is sitting on his accustomed roost near, gazing wisely at me out of a pair of bright yellow eyes.

I have begun my article by saying that the Mottled Owls were very abundant and they are much more numerous than any one would suppose who has not searched for them. They are very retiring in habit, living in holes throughout the day almost exclusively; in fact, it is rare to find one sitting on a tree and, with all my experience with the species, I do not think that I have seen a dozen specimens in such an exposed situation. They are quite timid and Sopsie. my pet Owl, when frightened, will fly to his box and dart in to it; thus the habit of seeking protection in holes appears to be instinctive. When the Mottled Owls are surprised outside their domiciles during daylight, they will half close their eyes, raise their ear tufts, draw their feathers close to their body, appearing exactly

as if completely dazed, but really they are only badly frightened, then instead of flying, trust to their motionless attitudes for concealment and, in nine cases out of ten, this ruse is probably successful.

The fact that these Owls sit with half-closed eyes, has quite likely given rise to the idea that they cannot see in the day-time but, as I have already stated, they do see remarkably well. It was only yesterday that I saw another striking proof of this given by Scopsie; he had flown on the sash of an open window near which I was standing and the instant he alighted, he gave the peculiar croak of alarm of which I have spoken in the preceding pages. I instantly stepped to the window to see what attracted his attention but, although I readily noted the direction of his gaze, could not make out the cause of his alarm until a Crow flew from a tree so far away that it appeared very small and, had I not been looking in that exact spot, I should not have observed it. But still the Owl saw it and, when it started, croaked loudly, following it with his eyes until it went quite out of sight. I have elsewhere noted the fact that this Owl can discern insects when they are upon the floor; he is also fond of watching small birds among the foliage and will follow the flight of Swallows, both far and near; in short, Scopsie exhibits every indication of being able to see perfectly in daylight. The experiment, to which allusion is so often made by writers upon Owls, that of almost touching the eyeball with the finger or any other object in order to make the bird wink, judging, if it does not, that it is incapable of seeing, is far from being a decisive test as Hawks and other birds have the same habit.

The notes of the Mottled Owls are very interesting and they have a greater variety than one would suppose who has not kept them in confinement. The alarm note is, as related, a kind of croak but is quite melodious and is given high or low, depending upon the proximity of the object which frightens the bird. Thus, for example, let Scopsie see a cow in a distant field and he will sound his note of alarm very low but, when a cat or dog enters the room where he is, he will stand erect and give the cry very loudly; then, when frantic with terror, as he has been on one or two occasions, he will dash around the apartment, fairly screaming with fright. Another change in this note is made when, although frightened, he concludes to stand up for his rights; then he will advance slowly toward the animal which he dislikes, half spreading his wings and ruffling his feathers, until he appears nearly twice his usual size; when quite near, he will bow his head, at the same time uttering a croak that is not only loud, but considerably prolonged. This has such a peculiar intonation and is so unlike any sound which is ordinarily heard that it seems to have the required effect and I have seen a cat terrified beyond description upon hearing it.

Another of Scopsie's notes, or rather a series of them, indicates anger or dislike, for when a stranger approaches his box, especially if he be sitting outside of it, he will raise his ear tufts, wink his eyes slowly, at the same time uttering a rattling, guttural sound. This is merely indicative of antipathy, for when handled by any one whom he does not fancy, he will give the same sound, much louder and in a higher key, frequently ending in a kind of scream. These demonstrations of hostility are accompanied by a violent snapping of the bill, especially when he is attacking another Owl, for I am sorry to say that Scopsie is not of a very friendly disposition regarding his own species, and will not hesitate

to assail any living Mottled Owl that is brought into the room, evidently looking upon it as an invader.

The sounds, given by my Owl, which I have mentioned, are only uttered when he is frightened or irritated; now I will describe some other notes which he produces when in far more agreeable moods. Like all Owls, he has a call which consists of a series of rather low notes, uttered rapidly and quite melodiously. This is given as an answer when he is called, when he alights on my hand, or when approached so suddenly as to be slightly startled; then, after a quick glance informs him that it is a friend who is near, he gives the sound quite low as a sign of reassurance or recognition. This same sound is made quite loud as a challenge to some other Owl or as a preliminary to an attack. It is also, when given very clearly, the love song to the mate but is then followed by a kind of squeal, emitted with the wings partly expanded. But this brings me to what we may consider the acme of Scopsie's vocal performances,—what I look upon as the true song. This is always given when he is in his box which is quite dark, having only small orifices which serve as windows, and an open door. The bird is seldom confined but usually prefers to sit in his house or on top of it. At one time, he would scarcely enter his abode without singing. The performance would commence with a series of singular, chucking notes, given quite slowly, then becoming more rapid; when suddenly the time would change, then the pitch would be raised or lowered, or two or three notes would be thrown together, or a series of lower, steadily given sounds would be followed by others which were high and uttered very rapidly; in short, although there was but a chucking sound, it was so varied that it became quite harmonious. Scopsie's song was often continued for many minutes, especially if the room were quiet and strict attention were paid to him; in fact, when he was encouraged by an imitation of the note, he would continue to sing for half an hour. Scopsie is the only Owl that I ever heard give these continuous notes and even he seldom indulges in it now, excepting occasionally, when he first sees me in the morning, then a few chucks, only, are given as a greeting. Scopsie often answers when spoken to with a chuckle, often given so very low as to be nearly inaudible, especially if he chances to feel drowsy, besides this, he has a loud call consisting of a series of rapidly given notes, which is uttered when he is alone. Nor are these varied sounds all that Scopsie is capable of emitting; in addition, he has a prolonged, whining note, when begging for food or water, and also the loud, shivering cry of his species, so often heard in the woods on still nights and which is so familiar to nearly every one.

There appears to be very little difference in the time of breeding in Mottled Owls found in Florida and those in New England, as I have taken the fresh eggs from Woodpeckers' holes in the piney woods and from palmettos in the hummocks or along their borders, the first week in April, while they breed in the apple orchards and woods of the north about the same time.

The food of the Mottled Owls consists largely of insects but they also eat quantities of birds and mice, occasionally varying this diet by taking frogs or even fish. Nor are they content with this kind of food but will frequently enter pigeon coops to kill the occupants and, on one or two occasions, I have even known of them eating their own species.

The Mottled Owls are not migratory, for their thick plumage forms an ample protection against the severe cold of even the Northern winters and, unlike the other Owls, they do not wander much, each pair spending their lives in a particular locality.

GENUS II. NYCTALE. THE SMALL OWLS.

GEN. CH. *The sternum is only slightly arched, with a warily straight keel which does not equal in height one half the width of the sternum. Outer marginal indentations, narrower than the inner. Coracoids, not very long, being quite equal in length to the top of the keel, but are not set on at a wide angle. Furcula, not well developed, for it is not ossified its entire length. Ear tufts, present but not well developed. Tail, short, but little longer than one half the length of the wings which are considerably elongated.*

Members of this genus are quite small but the plumage is long and downy. The eyes are not large and are yellow in color. The sterno-trachealis is thin, and there is a slender bronchialis, but no other laryngeal muscles. As in other Owls, the tympaniform membrane is present and although there is a thin os trans-versale it does not support a semilunar membrane. The oesophagus is nearly straight, being a little wider in the middle, and opens into a quite large proventriculus with simple, oval glands arranged in a wide zonular band which measures .50, in *Acadica*, from which this and the following dimensions are taken. The stomach is of medium size, somewhat cuboid in form, with thin, but soft, walls. The fold of the duodenum is long, inclosing a wide pancreas which, however, only extends half its length. The caeca are not very long, 1.28 in length, small near the intestine, measuring .05 in diameter, with the blind ends dilated into balloon-shaped sacs, .15 in diameter. The spleen is an elliptical body lying directly on the proventriculus. The left lobe of the liver is a little larger than the right. There are two species within our limits.

NYCTALE ACADICA.

Acadian Owl.

Nyctale Acadica Gm., Syst. Nat., I: 1788, 296.

Nyctale albifrons Swaws, Nat. Misc. V.: 1794.

DESCRIPTION.

Sp. CH. Form, short and compact. Size, small. Sternum, not stout. The marginal indentations are quite deep. Tongue, rather thick and fleshy, horny at the tip which is rounded and slightly bifid. Ear tufts, very short. Bill and claws, not long, the former is stout but the latter are slender.

Color. *Adult.* Above, including upper wing and tail coverts, uniform reddish-brown with a narrow central line of yellowish-white on the feathers of the top of the head and on sides of face. One half of the outer feathers of the scapularies, forming lines, spots on wing coverts and basal portion of feathers back of neck, white. Wings, reddish-brown, spotted on the outer and inner webs of primaries and on the outer webs of secondaries with white. Tail, reddish-brown with each feather narrowly tipped with white and marked on both webs with three pairs of white spots. Face, dusky, yellowish and white, mixed, the former color predominating around the eye and the latter on the sides of the bill and in a line to the ear tufts, which are reddish-brown streaked with yellowish. Beneath, white, with each feather, excepting on the chin and abdomen, centrally lined with pale, reddish-brown, but much more widely on the breast. Under wing coverts, pale, reddish-brown. Under tail coverts, white, with central stripes of reddish-brown. Tibia and tarsus, pale reddish-brown, unspotted.

Young. With the face, forehead and disk, very nearly white and color above much redder, otherwise similar to the adult.

Young of the year. Above of the same color as the young, but with no traces of white, excepting that the scapularies show the peculiar markings which are, however of a pale yellowish. Forehead, throat, neck, and breast, colored like the back. Remainder of under parts, including under tail coverts, pale reddish-brown. Under wing coverts, pale rose color. Wings, tail, tibia, and tarsus, as in the adult.

Nestlings. Are, at first, covered with a reddish down, but gradually assume the young plumage. Iris and soles of feet, yellow, claws, dark-brown, cere, greenish, in all stages. Sexes, similar in color.

OBSERVATIONS.

Specimens of the same age and sex are quite uniform in coloration. The plumage of the young of the year is quite singular and is the *albifrons* of authors, but it can readily be distinguished by the color of the wing and tail which are always similar to those of the adult. Readily known, in the adult stage, from the succeeding species by the reddish-brown color, and in all stages, by the three bars of spots on the tail, and from all others, by the small size, absence of any prominent ear tufts, together with the color as described. Distributed, as a constant resident, throughout North America to the Arctic Circle.

DIMENSIONS.

Dimensions of specimens from Massachusetts and Maine. Average measurements of males. Length, 7.25; stretch, 19.50; wing, 5.25; tail, 2.35; bill, .50; tarsus, .95. Longest specimen, 7.50; greatest extent of wing, 20.00; longest wing, 5.50; tail, 2.50; bill, .55; tarsus, 1.00. Shortest specimen, 7.00; smallest extent of wing, 19.00; shortest wing, 5.00; tail, 2.25; bill, .45; tarsus .90.

Average measurements of female specimens. Length, 8.25; stretch, 20.25; wing 5.50; tail, 2.50; bill, .55; tarsus, 1.05. Longest specimen, 8.50; greatest extent of wing, 20.50; longest wing, 5.75; tail, 2.75; bill, .60; tarsus, 1.10. Shortest specimen, 8.00; smallest extent of wing, 20.00; shortest wing, 5.25; tail, 2.35; bill, .50; tarsus, 1.00.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in holes of trees, not elaborately constructed, composed of grass, leaves, etc.; or the eggs are often placed on any material which chanced to be at the bottom of the hole.

Eggs, three or four in number, rather spherical in form, pure white in color, with the surface very smooth. Dimensions from 1.00 x 1.20 to 1.05 x 1.25.

HABITS.

I have said that the Mottled Owls were of retiring habits, on account of which they were very seldom seen, and the same is true, but to a greater extent, of the little Acadian Owls, for although there can be but little doubt that they occur quite commonly throughout the country, yet they are not often seen; their peculiar, rasping notes are, however, not unfrequently heard in the woods. These birds appear to be the least shy of all the Owls, allowing one to approach very near them when surprised outside their holes; in fact, I have known of their being killed with a stick or even taken alive in the hand. When captured, they readily become tame, behaving, while in captivity, in a similar manner to the Mottled Owl. As both of these species enter holes quite readily, they may be easily taken by fastening small boxes, provided with a suitable orifice, on limbs of trees in the woods and this artifice is successfully practiced by a friend who takes both species in this way during winter. He puts up his traps, as he calls them, then visits them regularly, securing a considerable number of specimens during the season, for the Owls enter them as readily as they do cavities in trees.

I have somewhere seen it stated that Owls do not drink, but all that I ever had, were very fond of water and would not only drink it but would frequently bathe. Scopsie is especially noticeable in this respect, as are all the Mottled Owls and they may often be seen in the water during twilight or early in the morning. I once surprised a Barred Owl on the margin of a river in Florida and a short time ago, an Acadian Owl was brought in which was killed by a gentleman while Woodcock shooting, he having found the bird in a small stream.

The Acadian Owls breed about the same time as the Mottled Owls, usually choosing a hole in a tree on the margin of a wood or in it but they will sometimes select an old apple tree in an orchard for this purpose. The notes, during the nesting season, are described as being peculiar but I never heard them utter any, excepting the rasping sound which is evidently given as a kind of call and from which the name of Saw-whet Owls, occasionally applied to them, is derived. These little Owls are not migratory but they do wander somewhat during winter, at least, they are much more commonly found then than during the summer.

NYCTALE RICHARDSONI.

Richardson's Owl.

Nyctale Richardsoni Bon., Comp. List.; 1838, 7

DESCRIPTION.

Sp. Ch. Form, short and compact. Size, large. Sternum, not stout. The marginal indentations are quite deep. Tongue, rather thick and fleshy, horny at the tip which is rounded and slightly bifid. Ear tufts, very short. Bill and claws, not long, the former is stout but the latter are slender.

Color. *Adult.* Above, including upper wing and tail coverts, uniform greenish-brown with a narrow central line of white on the feathers of the top of the head and on sides of face. Spots on head, scapularies, and wing coverts, and basal portion of feathers back of neck, white. Wings, greenish-brown, spotted on the outer and inner webs of primaries and on the outer webs of secondaries with white. Tail, also greenish-brown with each feather marked on both webs with five pairs of white spots. Face, white and dusky, mixed, the former color predominating around the eye, excepting in front of it, and the latter on the sides of the bill and in a line to the ear tufts, which are greenish-brown streaked with white. Beneath, white, with each feather, excepting on the chin and abdomen, centrally lined with pale, reddish-brown, but much more widely on the breast. Under wing coverts, white. Under tail coverts, white, with central stripes of reddish-brown. Tibia and tarsus, reddish-white, spotted with brownish. Iris and soles of feet, yellow, claws, dark-brown, cere and bill, greenish, in all stages. Sexes, similar in color.

OBSERVATIONS.

Specimens are quite uniform in coloration. Readily known, in the adult stage, from the preceding species by the greenish-brown color; in all stages, by the five bars of spots on the tail, and from all others, by the small size, absence of any prominent ear tufts, together with the color as described. Distributed, as a constant resident, throughout North America to the Arctic Circle. Rare in New England during winter.

DIMENSIONS.

Average measurements of male specimens from New England. Length, 9'00; stretch, 20'00; wing, 6'00; tail, 3'02; bill, '62; tarsus, '93. Longest specimen, 10'00; greatest extent of wing, 21'00; longest wing, 6'50; tail, 3'52; bill, '72; tarsus, 1'03. Shortest specimen, 8'22; smallest extent of wing, 19'00; shortest wing, 5'50; tail, 2'52; bill, '52; tarsus, '83.

Average measurements of female specimens from New England. Length, 10'00; stretch, 21'00; wing, 6'75; tail, 3'52; bill, '74; tarsus, 1'02. Longest specimen, 11'00; greatest extent of wing, 22'00; longest wing, 7'00; tail, 4'00; bill, '84; tarsus, 1'12. Shortest specimen, 9'00; smallest extent of wing, 20'00; shortest wing, 6'00; tail, 2'98; bill, 61; tarsus, '92.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in holes of trees, composed of grass, leaves, etc., or the eggs are placed on any loose material that chances to be at the bottom of the hole.

Eggs, four or five in number, rather spherical in form, pure white in color, with the surface very smooth. Dimensions from 1'06 x 1'28 to 1'10 x 1'32.

HABITS.

Richardson's Owl, although very common in the woods of Canada and northward, is, beyond doubt, one of the rarest of the order in the United States, only visiting the extreme northern portions during winter. They are not very uncommon in Maine and Northern New Hampshire at this season but are very rare in Massachusetts, where only a few specimens have ever been taken. A male was, however, obtained in Newton on the twenty-sixth of February of the present year, 1879, by the Bangs Brothers who saw it hanging, dead, to a bush by the road side, near a house, as they were passing. Upon inquiry, they found that it had been shot some time previous by the owner of the place, who supposed it to be a Hawk and said that it had been killing his hens. South of us, this bird may be regarded as a rare straggler but has been taken once in Connecticut.

I have never been so fortunate as to meet with this species living, but writers describe its habits as being similar to those of the Acadian Owl and say that it has a peculiar note.

uttered at intervals. Mr. Will Perham discovered a nest of this species while collecting on the Magdalen Islands, on the thirteenth of June, 1878. It was placed in a hole of a dead birch tree not far from the ground and contained four young and one addled egg. As the young were well grown at this time, it is probable that the eggs were deposited about the same time as those of the Acadian Owls, very late in April or early in May. Richardson's Owl is not strictly migratory, a few individuals, only, wandering southward in winter.

GENUS III. SURNIA. THE LONG-TAILED OWLS.

GEN. CH. *The sternum is considerably arched, with a nearly straight keel which does not quite equal in height one half the width of the sternum. Outer marginal indentations, wider than the inner. Coracoids short, not being equal in length to the top of the keel, but are not set on at a wide angle. Furcula, not well developed, for it is not ossified its entire length. Ear tufts, not present. Tail, graduated, and nearly equal in length to the wings which are considerably elongated. Tarsus and toes, well feathered.*

Members of this genus are quite large and the plumage is short and compact but not strikingly downy. The eyes are not large and are yellow in color. The sterno-trachealis is thin, and there is a slender bronchialis, but no other laryngeal muscles. As in other Owls, the tympaniform membrane is present and although there is a thin os transversale, it does not support a semilunar membrane. The œsophagus is nearly straight, being a little wider in the middle, and opens into a quite large proventriculus with simple, oval glands arranged in a wide, zonular band which measures 1.08 in *ulula*, from which this and the following dimensions are taken. The stomach is of medium size, somewhat globular in form, with thin but soft walls. The fold of the duodenum is long, inclosing a wide pancreas which, however, only extends half its length. The cœca are not very long, 2.25 in length, small near the intestine, measuring .08 in diameter, with the blind ends dilated into balloon-shaped sacs, .25 in diameter. The spleen is an elliptical body lying directly on the proventriculus. The left lobe of the liver is larger than the right. There is but one species within our limits.

SURNIA ULULA.

Hawk Owl.

Strix ulula LINN, Syst. Nat., I; 1766, 133.

DESCRIPTION.

Sp. CH. Form, long and slender. Size, large. Sternum, quite stout. The marginal indentations are quite deep. Tongue, rather thick and fleshy, horny at the tip which is rounded and slightly bifid. Bill and claws, not long, the former is stout but the latter are slender.

COLOR. *Adult.* Above, including upper wing coverts, uniform dark greenish-brown, with a narrow central line of white on the feathers of the top of the head and on sides of face. Spots on scapularies, where they are large and partly concealed, and on wing coverts, and basal portion of feathers back of neck, white. Wings, dark greenish-brown, spotted on the outer and inner webs of primaries and secondaries with white. Tail, also greenish-brown, narrowly tipped with white and each feather is marked on both webs with about eight pairs of white bars. Upper tail coverts, reddish-brown, barred with white. The face, is white and dusky, mixed, the former color predominating around the eye, excepting in front of it, and the latter on the sides of the bill and in a line to the top of head. Beneath, white, with large spots of black on the sides of neck; remainder of under parts, including under wing coverts, transversely barred, excepting on the chin and abdomen, with pale reddish-brown. Under tail coverts, white, barred with reddish-brown. Tibia and tarsus, reddish-white, barred with brownish.

Young. Quite similar to the adult but there is a dark band across the breast, and the feathers below show traces of rufous, especially on the flanks.

Nestlings. Are at first covered with a reddish down and, in time, gradually assume the plumage last described. Iris and soles of feet, yellow, bill, also yellow, darker at base and on lower mandible, cere greenish, and claws, dark-brown, in all stages. Sexes, similar in color.

OBSERVATIONS.

Specimens are quite uniform in coloration. Readily known, in the adult stage, from the preceding species by the very dark greenish-brown color in all stages, by the bars on the long tail, as well as on the lower parts; and from all others, by

the peculiar form, together with the color as described. Distributed, as a constant resident, throughout Northern North America to the Arctic Circle. Rare in New England during winter.

DIMENSIONS.

Dimensions of specimens from Massachusetts and Maine. Average measurements of males. Length, 15.25; stretch, 21.00; wing, 7.50; tail, 6.75; bill, .95; tarsus, .95. Longest specimen, 15.75; greatest extent of wing, 32.00; longest wing, 8.00; tail, 7.00; bill, 1.00; tarsus, 1.00. Shortest specimen, 14.75; smallest extent of wing, 30.00; shortest wing, 7.00; tail, 6.50; bill, .85; tarsus .90.

Average measurements of female specimens. Length, 17.00; stretch, 32.00; wing, 8.00; tail, 7.00; bill, 1.00; tarsus, 1.05. Longest specimen, 17.50; greatest extent of wing, 33.00; longest wing, 8.50; tail, 7.25; bill, 1.10; tarsus, 1.15. Shortest specimen, 16.75; smallest extent of wing, 31.00; shortest wing, 7.50; tail, 6.50; bill, .90; tarsus, .95.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed either in holes of trees or on the branches, composed of sticks, twigs, etc., lined with grass, leaves, and feathers.

Eggs, six or seven in number, rather spherical in form, pure white in color, with the surface very smooth. Dimensions from 1.20 x 1.50 to 1.30 x 1.62.

HABITS.

The Hawk Owl is common in Canada and northward but is very rare south of this point, consequently, is very seldom seen even in Massachusetts, where I have met with it but twice; once I secured a male in beautiful plumage in the Boston Market, some years ago, which had been killed in the vicinity, and a short time after this, I saw a fine adult cross the road just in advance of me. This specimen was flying in broad daylight, about noon, but it was one of those dark, lowering days in December which precedes a long winter storm. The bird moved as steadily as a Hawk but had the unmistakable motions of the wings so characteristic of the Owls. Although the Hawk Owl has been likened to the Falcons, yet the structure of the scapular arch, especially of the furcula, would prevent its making any sudden aerial evolution; therefore, it cannot capture its prey when upon the wing but must drop upon it in a similar manner to that practiced by all the members of the order.

The Hawk Owls breed in the vicinity of Calais, Maine, for Mr. George Boardman has secured one or two nests there, but this may be considered as their southern range during summer and, as they are not strictly migratory, only a few irregular stragglers are ever found below this, even in winter. The time of depositing the eggs does not vary from that of the other small Owls, judging from a young female, now before me, which was taken by the Bangs Brothers at Port Le Preaux, New Brunswick, on the tenth of August, for it has almost wholly assumed the first plumage, being as far advanced as a young Long-eared Owl, killed by the same enthusiastic collectors only a day or two ago, about the twelfth of August, in Wayland, Massachusetts.

FAMILY VI. ATHENIDÆ. THE GROUND OWLS.

Sternum, with four marginal indentations. *Tarsus*, very long. *Feet*, rather small. *Eyes*, comparatively small. *Facial disk*, very imperfect. *Ear tufts*, wanting. *Tail*, quite short.

This family of Owls which is characterised by the long, nearly naked tarsus and short tail, is evidently closely allied to the preceding group; just how closely, I cannot determine in a manner quite satisfactory to myself as I have never made a dissection of one. Nor have I seen any of the bones; I have, however, ventured to give the number of marginal indentations as four as it does not appear probable that these birds are related to the Disked Owls which have only two. In preparing these articles on the Owls, I am indebted to Messrs. J. W. Knowlton and F. H. Braeclott and the Bangs Brothers for the privilege of using specimens from their collections.

GENUS 1. SPEOTYTO. THE LONG-LEGGED OWLS.

Gen. Ch. Tail, short, not being equal in length to one half the wings which are considerably elongated. Tarsus and tibia, very long. Head, small.

Members of this genus are quite small and the plumage is short and compact but not downy. The eyes are comparatively small and are yellow in color. The legs are strikingly long enabling the birds to walk with ease upon the ground. There is but one species within our limits.

SPEOTYTO CUNICULARIA.

Burrowing Owl.

Strix cunicularia MOLINA, Sagg. Stor. Nat. Chili; 1782.

DESCRIPTION.

Sp. Ch. Form, slender. Size, not large. Bill and claws, not long, the former is stout but the latter are slender and are not very sharp.

Color. *Adult.* Above, including wings, tail, upper wing and tail coverts, uniform yellowish-brown, barred and spotted everywhere with yellowish-white. The face, is white and dusky, mixed. Beneath, including under wing and tail coverts, yellowish-white, transversely barred, on a band across the throat and on the breast, sides, and flanks with light reddish-brown.

Young. Quite similar to the adult but are generally darker. Tibia, reddish-white, barred with brownish and the feathers below show traces of rufous.

Nestlings. Are at first covered with a reddish down, and in time, gradually assume the plumage last described. Iris and soles of feet, yellow, bill, also yellow, darker at base and on lower mandible, cere, greenish, and claws, dark-brown, in all stages. Sexes, similar in color.

OBSERVATIONS.

There appears to be considerable variation in skins, some being darker than others but this may be due to age. Some specimens also have the tarsus feathered more than others, which character, together with variation in size, has been considered, by some authors, of sufficient importance to entitle their possessors to specific rank, or at least to a varietal name. Known from all other species by the long tarsus and short tail, together with the colors as described. Distributed as a constant resident, throughout Western United States, Mexico, South America, and in a restricted area in Western Florida. Accidental in Eastern Massachusetts.

DIMENSIONS.

Average measurements of male specimens from Western United States. Length, 11.00; stretch, 22.50; wing, 7.00; tail, 4.50; bill, .55; tarsus, 1.75. Longest specimen, 11.00; greatest extent of wing, 23.00; longest wing, 7.55; tail, 4.00; bill, .60; tarsus, 1.75. Shortest specimen, 9.00; smallest extent of wing, 22.00; shortest wing, 6.50; tail, 3.00; bill, .55; tarsus, 1.65.

Average measurements of female specimens. Length, 10.00; stretch, 22.50; wing, 7.00; tail, 4.00; bill, .60; tarsus, 1.75. Longest specimen, 10.50; greatest extent of wing, 23.50; longest wing, 8.00; tail, 4.50; bill, .65; tarsus, 1.80. Shortest specimen, 9.50; smallest extent of wing, 23.00; shortest wing, 7.00; tail, 3.50; bill, .55; tarsus, 1.75.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in holes in the ground which are, however, not excavated by the Owls. The eggs are placed on any loose material that chances to be at the bottom of the hole.

Eggs, four to seven in number, rather spherical in form, pure white in color, with the surface very smooth. Dimensions from 1.00 x 1.22 to 1.10 x 1.25.

HABITS.

It may appear strange to many of my readers, to find birds so long supposed to be exclusively confined to the western prairies as the Burrowing Owls, given among the birds of Eastern North America and, a few years ago, no ornithologist, even, would have dreamed of adding them to our fauna; yet, as in the affairs of humanity, so it is in bird-life, for a change has come and, behold, we have the Burrowing Owls on our list. They are apparently firmly established there, for, by some chance, to mortals unknown, and at some date in the past which no one has recorded, a colony of these Owls came to Western Florida. Here they evidently found dwarf palmettos as congenial to their tastes for shade as prairie grass, and the holes made by the reptilian gophers appear to have suited their wants, as breeding places, as well as those excavated by mammalian gophers, while the apparent paradox caused by the local confusion of names, did not puzzle their brains half as much as it has some naturalists, although they had gophers of quite different habits from those to which they had been accustomed, dwelling among them, that had received the decidedly batrachian name of salamander. Truly, names among animals in Florida, have been badly mixed but, as before mentioned, this made but little difference to the Owls and they settled in the Land of Flowers, quite near the spot where the valiant De Soto landed, so long ago, on the Bahia Esjiritu Santo now known by the less pompous appellation of Tampa Bay.

I have never seen the Burrowing Owls in Florida but others have been more fortunate, and Mr. Ridgway told the story of their discovery there by Mr. Moor some years ago. He has also decided that the colony which squatted there, claiming the land by preemption, perhaps, unless some Spanish *hidalgo* presents a prior claim, are entitled to a varietal rank; and this may be true, for such matters depend entirely upon just how one may regard species and varieties, for although ornithologists are quite apt to agree in the main, they will differ about some points, and I, for one, have never considered it advisable to adopt the trinomial system for reasons which I have given in the preceding pages.

The Burrowing Owls also claim a place among our Northern birds, for my friend, Mr. Rathven Deane, states that a specimen was taken on the marshes at Newburyport, Massachusetts, in the spring of 1875; but this was an undoubted straggler, none ever having been seen here before or since.

As remarked, I have never seen a living specimen of the Burrowing Owl but Mr. Ridgway who has met with them in abundance, informs me that they always breed in deserted holes made by the prairie dog, or gopher, and that the statements made by travelers, that the Owls, gophers, and rattlensakes dwell together in harmony, has no foundation in fact. The Owls choose abandoned burrows which the rattlesnakes only enter, if they do at all, as unwelcome intruders, perhaps allured there by the prospect of a good meal of young Owls.

ORDER VIII. PSITTACI. PARROTS.

Sternum, with two inclosed marginal indentations. Keel, very high. Outer anterior toe, projected backward.

Members of this large Order are familiar to nearly every one; so familiar, in fact, as scarcely to need more than a passing notice, at least as regards external characters. The marginal indentations of the sternum are two in number, as stated, and are inclosed on the posterior border in the adult but may be open in the young. The feet are admirably fitted for climbing, there being two toes in front and two behind. The bill is of varying form but is always strong and has the upper mandible well curved.

FAMILY I. PSITTACIDÆ. THE LONG-TAILED PARROTS.

Posterior border of sternum, rounded. Scapular bones, pointed. Tail, long. Cheeks, feathered.

The tail is long and pointed. Although the cheeks are feathered, yet there is occasionally a naked ring around the eye. The cere is feathered to the bill. This Family is largely represented in Tropical America but we have only one species and one genus within our limits

GENUS I. CONURUS. THE AMERICAN PAROKEETS.

GEN. CH. *Bill, short and very strong, with the upper mandible notched. Tail, very long. Stomach, muscular. Height of keel, nearly equal to the width of the sternum.*

Members of this genus are prominently marked with green. There is, as stated, but one species within our limits, although several occur as far north as Mexico.

CONURUS CAROLINENSIS.

Carolina Parokeet.

Conurus Carolinensis Kuhl, Nova Acta, K. L. C.; 1830.

DESCRIPTION.

Sp. CH. Form, robust. Size, large. Sternum, stout, with the keel high and well rounded at the tip. Manubrium, small. Furcula, very short, slender and without any terminal expansion; it is, however, moderately well arched. Costal process very short, pointed, and curved backward. Tongue, short, thick, and terminating in a rounded knob. It is black in color. The bill is strongly curved, notched, and the upper mandible is pointed. There is a naked space around the eye. The tarsi are short and the feet, large. Tail, long and pointed.

COLOR. *Adult.* Head and neck all around, bright yellow, with the forehead above eye and sides of head, yellowish-red. Body, green generally, lighter beneath. Outer webs of primaries, bluish-green, yellow at the base. Wing coverts, bluish-green, yellow at base. Edge of wing, yellow tinged with red. Two middle tail feathers, and outer webs of remainder, green, but the inner webs are reddish. Tibia, yellow. Bill, white. Iris, dark-brown. Naked ring around eye, white. Feet, pinkish-white.

Young. Quite similar to the adult in general appearance but with the yellow on the head spotted with more or less green.

Young of the year. Head and neck, wholly green, and the tail is short. The red and yellow of the head are not acquired until after the second moult and the full dress is not assumed until the third year.

Nestlings. One of my collectors, who found the young in the nest, informs me that they are covered with a grayish down. Sexes, similar in all stages.

OBSERVATIONS.

Readily known from other species, by the colors as described. Distributed, as a constant resident, throughout Middle Florida and rarely, at intervals, along the Mississippi River to Southern Illinois.

DIMENSIONS.

Average measurements of specimens from Florida. Length, 13.25; stretch, 22.30; wing, 7.25; tail, 6.30; bill, 1.00; tarsus, .70. Longest specimen, 11.00; greatest extent of wing, 22.50; longest wing, 7.75; tail, 6.50; bill, 1.10; tarsus, .75. Shortest specimen, 12.50; smallest extent of wing, 21.00; shortest wing, 6.50; tail, 5.90; bill, .90; tarsus, .65.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in holes of trees, generally some natural cavity of a large size. A number of pairs breed together in the same hole.

Eggs, are, as I have been informed by those who have seen them, greenish-white in color and of about the same size as those of the Turtle Dove. There are, I believe, no authentic specimens in collections.

HABITS.

There were no birds for which I looked with greater interest than the Parakeets but, although I searched diligently for them throughout the winter of my first visit to Florida, I did not meet with them in the state of nature until April, 1869. I was walking across some fields on a plantation near the Mantanzas River, some twenty-five miles south of St. Augustine, when I observed a large flock of Parakeets moving along the ground. I approached within a few yards of the birds and watched them for some time but they did not appear to pay the slightest attention to me; thus I had an excellent opportunity of noting their actions. At first, I could not make out what they were doing but soon found that they were busily engaged in eating cockspurs, the seeds of a species of grass which grows very abundantly in old fields. They walked quite well for birds having such short legs and, in pressing forward, moved side by side in a long rank, looking exactly like miniature soldiers. After a few moments, something started them and they rose, wheeled about, darting rapidly up and down, precisely like pigeons, at the same time, uttering loud cries; then settled quietly down again and resumed their meal, as composedly as if nothing had occurred to interrupt.

This is the only time that I ever chanced to see the Parakeets feeding on the ground but I have been informed by the inhabitants of Florida, that they are very fond of the cockspurs and will frequently alight in the fields in order to eat them. Early in winter, they visit the swamps, where they feed upon the cypress balls. Then it is very difficult to find them as they often remain for weeks in the impenetrable fastnesses of the vast wooded tracks which, at this season, are submerged in water. Later, about the first of Febru-

ary, the Parakeets emerge from the swamps in small flocks and enter the open woods to search for the seeds of the pine cones which are then ripe. At this time, they may be met with quite frequently but the best opportunity to procure specimens occurs about the middle of February, when they may be found in large companies, feeding upon the green seeds of the maples and elms which grow along the rivers.

Thus it will be seen that these birds are somewhat migratory in habit, the time of their visiting certain localities being governed by the supply of food; add to this the fact that they are quite local in their distribution and it may readily be perceived how one may travel for an entire season in Florida without seeing a single living Parakeet. In winter, they are restricted to a belt of country, about fifty miles in width, which stretches across the entire state of Florida, from Cedar Keys to New Smyrna. In this tract, they are most abundant in the large cypress swamp which lies to the westward of the St. John's River, near Blue Springs. I was encamped at the latter place for some time and, although I could frequently hear the birds as they flew about in the swamp opposite, they only occasionally showed themselves and did not emerge from their retreat until the ripening seeds of the pine induced them to come out, as mentioned.

I have remarked that the Parakeets scream very loudly when flying; so loudly, in fact, that their shrill cries can be heard for miles. They come dashing along, moving in a most eccentric manner; now near the ground, then high over the tree tops, seeming about to alight a dozen times but still without settling, each in the company endeavoring to excel the other in producing the most discordant yells, when they will all pitch, at once, into some tree and a sudden silence ensues. So great had been the din but a second before that the comparative stillness is quite bewildering, then too, the large flock of highly colored birds, lately so conspicuous, have disappeared completely. I well remember my first experience of this nature; I stood, gun in hand, watching the evolutions of a large company as it wheeled about, awaiting an opportunity to shoot, when, of a sudden, they all alighted in a huge live-oak which stood a few rods away. I cautiously approached the tree, ready to slaughter half the flock at a single discharge, if possible, when, what was my surprise upon going within a suitable distance, not to perceive a bird. Neither could I see so much as a feather of the desired game although I walked around the tree several times and even went beneath its branches to peer up between them. After spending some time in these fruitless efforts, my patience became quite exhausted and I threw a large oyster shell up into the tree. This certainly produced an effect, not just what I intended, however, for, in an instant, out darted the entire body of screaming birds but on the opposite side of the thick tree; thus I could only stand and watch them as they disappeared in the neighboring swamp.

It seems incredible that such large birds as Parakeets can conceal themselves so effectually but, although I have had considerable experience in detecting birds among foliage, I have often been foiled by this sagacious species. When flying, they are conspicuous enough but, among the thick green leaves, especially of a live-oak, they are completely invisible. Even when they are screaming, it is very difficult to find them but it is not usual, however, for them to utter any loud sounds when sitting, yet occasionally one will

stray from a flock and will then call from a tree top until it obtains an answer, when it will at once join its friends.

While feeding, the Parakeets are not absolutely noisy but will keep up a low, continuous chattering among themselves, as if conversing in a social manner. These notes are continued while the birds are assuming all kinds of positions, now clinging to the under side of a limb while they search for the seeds of a pine cone, now reaching for some tempting morsel while they hang head downward, or climbing with great agility from twig to twig. All of these feats are done without interrupting the flow of gossip and are performed with the greatest ease, for the Parakeets are accomplished acrobats; not only using their feet with great address but also, like most Parrots, cling readily to a branch with their bill alone.

As may be readily inferred by the foregoing remarks, the Carolina Parakeets are of a most social disposition. This is not a mere liking for company, as they are actually fond of one another, for, if one out of a flock be wounded, the survivors attracted by its screams, will return to hover over it and, even if constantly shot at, will not leave as long as their distressed friend calls for assistance; in fact, I have seen every individual in a flock killed one after the other, and the last bird betrayed as much anxiety for the fate of its prostrate friends which were strewed upon the ground, as it did when the first fell. Although not naturally wary birds, continual persecution has caused them to be shy; thus, now they are far from being unsuspecting, yet, in spite of this acquired propensity, they appear to lose all timidity when they see a companion in distress. I once brought several wounded specimens into camp and they soon became quite tame but would call when they heard the cries of any of their species in the adjacent woods. If their friends chanced to hear them they would circle around, dart close to the ground, without paying the slightest attention to us and, on one occasion, when the captive birds were perched on the outside of a tent, the wild ones alighted with them, while a few endeavored to settle on the head of one of the party on whose shoulder a tame Parakeet was sitting.

In captivity, the Parakeets soon become accustomed to human beings but they must be treated well or they will acquire an ill natured disposition. Some, however, will never be good natured, even should they receive the best attention; for example, I had five or six at the time of which I have been speaking, and among them were birds of all sorts of temperaments; some were cross, not allowing any one to touch them, some were indifferent to my caresses, while one or two displayed considerable affection for me. Age appears to have nothing whatever to do with these traits but it seems to be purely a matter of individual variation, just such as we see exhibited by many of the higher animals—man, for instance.

In spite of this variability of temper, it is difficult to find more peaceful birds as far as absolutely quarreling with their own kind or with other species is concerned. When kept in confinement in any numbers, they spend the greater part of their time in clinging closely together on the side of the cage and, if one crowds the others too much, they will merely remonstrate by scolding slightly but will not, very often, attempt to bite. When kept singly, they appear to miss their companions sadly and one that I had recently, would try

to fraternize with a pet Owl which did not at all fancy the noisy Parokeet and, whenever it approached, would fly to another part of the room, followed by his pretentious friend which thus moved when he did, keeping so persistently by the side of the poor Owl as to cause him considerable annoyance. This same Parokeet, before I owned it, contracted a strong friendship for a large White Cockatoo. These birds were kept in the same cage and, as the liking, in this case, was mutual, they would sit as closely together as possible, the bright green Parokeet being half buried among the snowy feathers of its huge companion. My Parokeet exhibited an attachment for all kinds of birds, even taking a fancy to a Red-winged Blackbird which often proved a source of trouble to it, however, for it would enter the Parokeet's cage, the door of which frequently stood open, in order to eat the seeds which were scattered on the bottom. When Polly remonstrated at thus having her food stolen, the Blackbird would fly at her fiercely and drive her out of her cage which he would then occupy as long as he chose, much to the discomfiture of the Parokeet.

After witnessing such a strong predilection for companionship as is exhibited by the Parokeets, the ornithologist will not be surprised to find that these birds breed in communities but it is certainly somewhat unexpected to learn that a number of pairs nest in one hole, for this habit is without precedent, at least among our native species. Audubon made the statement, that a number of females built in the same hole, many years ago but I do not think that this fact has, up to the present time, ever been confirmed. While in Florida, I frequently asked hunters and others about the breeding habits of the Parokeets but got nothing more definite than that they nested in the cypress swamps. At length, however, one of my guides told me that he knew of a cedar hunter who had seen them during June, in the depths of a certain swamp, entering a hole in a huge cypress where they were evidently breeding. As it was impossible for me to remain in Florida as late in the season as the time designated, I offered him a good sum for each egg which he should get. Accompanied by the cedar hunter, he entered the cypress swamp about the middle of June carefully following the old blazes (notches cut on the trees to mark the way) made by the hunter some seasons before and, after traveling for a day and a half through the gloomy forests, came to the tree which contained the nest. My informant states that there were a large number of Parokeets about the tree and therefore they were certain of a good prize but, judge of their disappointment, upon opening the hole, to find that it contained nothing but young—not an egg was to be discovered; thus they were obliged to retrace their steps, bootless, after having been three days in the swamp. I trust, however, that the next time this journey is attempted, I may form one of the participants.

The Carolina Parokeets once had a wide distribution, being found as far north in the West as Lake Erie and in the East, as Pennsylvania. Even in Audubon's time, their range was much restricted, for he states that their numbers were much diminished within his recollection and they have been steadily decreasing in numbers ever since, occupying less and less territory year after year, until now, they are to be found in an exceedingly limited area. Thus, within the last century, birds which could be counted by millions and which roamed over vast sections of country, may now be numbered by thousands and occupy but

a few square miles in two or three isolated localities. The ranks of the few survivors are being rapidly thinned, for, in Florida, their enemies are legion; bird catchers trap them by hundreds for the northern market, sportsmen shoot them for food, planters kill them because they eat their fruit, and tourists slaughter them simply because they present a favorable mark. Thus a species, the history of which is still incomplete, for we know nothing definite of the breeding habits of the Parokeet or of its younger stages, is being surely exterminated, yet ornithologists and others who would prevent this calamity, can but look upon the work of destruction, powerless, under the present state of affairs, to stay the ruthless hand of the destroyer.

ORDER V. TROCHILI. HUMMING BIRDS.

Sternum, with no marginal indentations but with the posterior border much rounded. Keel, very high. Bill, very long, with a wide and deep gape, but there are no bristles at the base. The plumage is compact.

One of the most remarkable characters in this group is the exceedingly long tongue which is thin, bifid and the edges are curved so as to form a tube, while the hyoid bones curve back of the skull as in the Woodpeckers. The bill is awl-shaped, sometimes straight, at others, curved or even recurved; it also varies greatly in length and is rarely shorter than the head but is often elongated. All the members of this family are small, yet there is much variation in this respect, some of the species being so minute that they are exceeded by many insects in size. In variety of plumage, they are not excelled by any other class of birds, while in hue, they also rival all others, being the gems among the feathered tribe. They are restricted in distribution to the Continent of America and adjacent islands but although several occur west of the Central Plain, only one species comes into the range of which I write. It will be observed that I have placed these birds in a separate order from the Swifts which they resemble somewhat but it appears to me that, as they differ in many respects, they should consistently take rank as an Order.

FAMILY I. TROCHILIDÆ. THE FORK-TAILED HUMMING BIRDS.

Tip of mandibles, without any distinct serrations. Throat, with iridescent, scale-like feathers.

The form of the tail is different in the female and young male from that of the adult male, being rounded in the two former, and the throat is not as brilliant.

GENUS I. TROCHILUS. THE GREEN-BACKED HUMMERS.

GEN. CH. *Sternum, very narrow anteriorly, with exceedingly short coracoids. The heart is remarkably large, being equal to one half the length of the sternum.*

The colors are green above and white below and the male has a gorget of metallic-like feathers on the throat. Both the heart and liver are remarkably large, the latter extending over the whole abdomen, completely covering the intestines. The trachea is peculiar as the inferior larynx is placed high, consequently the bronchial tubes are very long. The only laryngeal muscle that I ever detected is a large one that completely encloses the larynx. There is no tympaniform membrane. The stomach is not muscular. The wing bones are as given in the Swifts and the pectoral muscles are exceedingly well developed, and as in that group, the legs are placed high.

TROCHILUS COLUBRIS.

Ruby-throated Humming Bird.

Trochilus colubris LINN., Syst. Nat., I: 1766, 191.

DESCRIPTION.

SP. CH. Form, rather robust. Size, medium. Sternum, stout. Tongue, bifid for its terminal third, and very thin at the tip but there is no cilia. Bill, a little longer than the head.

COLOR. *Adult male.* Uniform metallic-like green above. Beneath, white, with the throat ruby-red with a metallic luster; the sides and flanks are greenish. The wings are brown glossed with violet. The tail is greenish at the base, excepting outer feathers, the remainder is like the wings. There is an indistinct white spot back of the eye.

Adult female. Lacks the red throat of the male. The tail is tipped with white and is rounded. The sides are not as greenish and show traces of rufous, otherwise similar.

Young male. Quite bronzy above, with the feathers of the throat showing darker centers and occasionally a ruby feather with the metallic luster. The sides show some greenish but this is underlined and overwashed with rufous. The tail feathers are tipped with white as in the female but they are narrower, yet the tail is not forked as in the adult.

Young female. Similar to the young male but the feathers of the throat show grayish centers; the white is not as clear, especially on the breast where it is quite grayish, and the sides are also grayish overwashed with rufous. The feathers of the top of the head are overwashed with rufous.

Nestlings. Are born naked and pass directly into the next plumage without a moult or any intermediate downy stage. Bill and feet, black in all stages.

OBSERVATIONS.

There is but little variation in plumage in specimens of the same age and sex yet the bill varies considerably in length and breadth. The males of the first year undergo a partial moult in the spring and gradually assume the forked tail and ruby gorget of the mature stage; thus those that I obtained at Key West exhibit all the transitional stages between the two plumages. Distributed during summer throughout Eastern North America, south to Florida. Winters at Key West and in South America.

DIMENSIONS.

Average measurements of nineteen specimens from New England and Florida. Length, 3.50; stretch, 4.37; wing, 4.75; tail, 4.00; bill, .76; tarsus, .47. Longest specimen, 3.95; greatest extent of wing, 4.75; longest wing, 4.90; tail, 4.09; bill, .83; tarsus, .29. Shortest specimen, 3.07; smallest extent of wing, 4.09; shortest wing, 4.50; tail, .90; bill, .59; tarsus, .45.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in trees or bushes, composed of the moss from ferns neatly and smoothly covered with lichens which are kept in position by cobwebs. Dimensions, external diameter, 1.50, internal, 1.00. External depth, 1.25, internal, .75.

Eggs, two in number, elliptical in form, pure white in color, unpolished and unspotted. Dimensions from .45 x .35 to .50 x .35.

HABITS.

I do not think that there are any birds which have received so much attention from authors as the Ruby-throated Hummers, for they were among the first of the family to be brought into notice and were observed by every one who was in the least inclined to regard natural objects. This is not surprising for no one can well avoid admiring these graceful, little birds, and the matter which has been written upon their habits, both by scientific and popular authors, would fill volumes. I shall, therefore, be spared the trouble of saying much which has not only already been said, but which has been reiterated until it is perfectly familiar to every one; thus I shall only present the salient points of their history as I have observed them.

Just as soon as the cherry trees of New England begin to show their snowy blossoms, the buzz of the Humming Birds may be heard and the gleam of their ruby throats may be seen glancing through the foliage. At first, only the more brilliant males appear but they are soon followed by their duller colored but no less lively mates, and then we hear the low twittering which, though given in different keys, is the only note which these pygmies can utter. I say that the key can be varied, by this I mean that when the Ruby-throats are enraged, and this is easily accomplished for it will be difficult to find more irascible birds, they will emit their squeak louder, more rapidly, and in a sharper tone. This is especially noticeable when a rival male presents himself and endeavors to feed on a tree that is occupied by another. The instant they catch sight of each other, without any preliminary skirmishing, they dash together and a furious conflict ensues, not only of blows

but of voices, each scolding the other loudly, while the fray only ends in one being driven from the field. In spite of this propensity to quarrel, these Humming Birds become remarkably tame and gentle when kept in confinement. I once obtained a few alive and holding them in my hand, dipped their beaks into a cup of sweetened water when they began to drink eagerly. Then they forgot all fear, would perch on my head, shoulder, or hand, and would always come to me at once when I appeared with the cup in my hand. This sweetened water did not appear to satisfy them entirely for those which I liberated instantly began to catch insects. But one that I kept for several weeks readily ate small bits of meat. It appeared perfectly healthy and doubtlessly would have lived for a long time in captivity had not its career been brought to a close by a young Least Bittern which was kept in the same room with it, and which managed to kill it, afterward devouring the body. I think that honey or the sweet juices of flowers is taken only as a kind of side dish, insects forming the greater portion of their diet, for the stomachs of those which I have opened contained nothing but minute insects. The tongue, however, as seen in the figure and as described, is fitted for taking liquid food and the birds are evidently very fond of it. My friend, Mr. W. B. Dowse, has given me some very interesting notes on this subject which are, I think, quite new and certainly novel. I hereby give the account as he has kindly written it for me.

“I was collecting in Somerset County, Maine, during the first two weeks in August of the year 1878 and while there, the Ruby-throated Humming Birds were gathering, preparatory to their southern migration. There is a small island in Pleasant Ridge Pond the trees upon which, with the exception of perhaps a dozen, were blown down during some storm and subsequently burnt; among the fallen timber, the fire weed was growing most luxuriantly and in full bloom. This made the place a favorite feeding ground for the Ruby-throats and for three days there were too many on the island to be safely calculated, but by the tenth, they were all gone. They seemed to be females and young birds for I saw only one mature male. Of course the surrounding woods had its quota of these little, restless beings and I was much interested in watching their actions when they discovered the Yellow-bellied Woodpeckers which were exceedingly common, at work. The hammering of these latter named birds would be but commenced when a Ruby-throat, sometimes two, would put in an appearance and dart, with great scolding, at the worker who would immediately dodge to one side, when the valiant robber would insert his bill into the newly made hole. This was, I think, in order to obtain the sap for, when I held up several which I had shot and which had been so engaged, two or three clear drops of liquid ran from the bill of each and upon dissecting, I found nothing but minute spiders and more liquid. These little scenes almost invariably occurred in a live tree, for though the Woodpeckers often worked upon dead limbs, they were then seldom molested by the Humming Birds.”

I found the Ruby-throats very abundant at Key West during winter and they frequented the oleanders which grow so luxuriantly in that mild climate that they attain a considerable height; in fact, they become small trees and bloom through the month of December. I occasionally observed these birds feeding about other flowering shrubs but the oleanders

were the favorites. They arrive at Miami about the second week in June and occur at Jacksonville in March. They appear in Pennsylvania the first of May but do not arrive in New England until the middle of that month and they begin to build in the latter named section about the first of June, the eggs being deposited a few days later. The situation selected for the nest is variable, a willow by the brook side often being a chosen resort but I have seen the nest on the limb of an apple tree and they sometimes build in the woodbine which climbs over the cottage door. I have also taken the nest from the lofty branch of a maple which stood in the depth of a forest. When the domicile is placed on a limb of a tree, it so nearly resembles one of those mossy excrescences that are so common, that it is not easy to detect the difference and it is only by watching the birds, that the nest can be discovered. They have the habit of hovering around their home, and of suspending themselves in air near it and they are also very solicitous when the locality in which their domicile is placed, is invaded. The male is especially watchful and when an intruder approaches his place of abode, he will dart downward at him and pause with rapidly vibrating wings within a few feet of his head as if surveying him, then giving an angry twitter, he will disappear only to return again from some new quarter and will not rest until the disturber of his peace has departed. The young leave the nest in July but do not seem to accompany their parents long as they soon learn to forage for themselves and they may be seen singly, feeding upon flowers. There is a general migration about the last of August or first of September but some linger as late as October.

ORDER VI. CUCULI. CUCKOOS.

Sternum, with four marginal indentations. Keel, moderately high. Furcula, quite long. Manubrium, present. Joints of toes, normal in number but the outer anterior is projected backward.

This is a clearly defined order as given above. The outer toe is turned backward so that in grasping there are two toes in front and two behind. The tail is lengthened and the wings are usually quite long. The bill is of varying form. The sternum somewhat resembles that of the Passerine birds but there are four marginal indentations and the width is greater. Although some species occur in the temperate zone, the majority of the families inhabit the tropics.

FAMILY I. COCCYRIDÆ. THE WHITE-BREASTED CUCKOOS.

Upper mandible, not high at base, longer than the head. Keel, higher than one half the width of the sternum.

The sternum is very wide near the posterior border and the four marginal indentations are very narrow. The manubrium is quite well developed and the costal processes are long and straight on their anterior border. The coracoids are about equal in length to the bottom of the keel but the top of the keel is produced into a point over the terminal expansion of the furcula which is quite broad and approximates very closely to the keel.

The bill is curved while the gape is wide and deep. The stomach is not muscular and there are moderately long cœca. The tail is quite long but not greatly exceeding the wings in length. The tail is considerably graduated.

GENUS I. COCCYGUS. THE AMERICAN CUCKOOS.

GEN. CH. *General colors are brown above and white below. No bands or conspicuous spots anywhere on the body. Tail, more or less broadly tipped with white.*

The sternum is as given under Family characters, as is also the bill. The larynx is provided with a rather stout sternotrachealis and a bronchotrachealis posterior both of which have their tracheal origin at the same height; the lower extremity of the latter is attached to the bony half rings of the larynx. The tympaniform membrane is present and the os transversale supports a slight semilunar membrane. The œsophagus is without dilatation and opens into a large, rather globular, proventriculus which has quite thick walls composed of long oval glands which are arranged in a zonular band and measure in *erythroptalmus* .10 in length. The stomach is a rather spherical sack with very thin walls and is lined with a serfibrinous membrane which is, at least in our two northern species, covered with hairs that, under the microscope, resemble those from caterpillars. The duodenum is very short and incloses a compact pancreas which, although short, is quite wide at the upper extremity. The cœca are long with the blind ends somewhat dilated. The spleen is an oval body situated nearly over the cardiac opening of the stomach and is quite granular in structure. The tibiae are covered with long feathers but the tarsi are only slightly feathered on the extreme upper anterior surface.

COCCYGUS ERYTHROPTALMUS.

Black-billed Cuckoo.

Coccygus erythroptalmus Bon., Obs. Wils.; 1825, 48.

DESCRIPTION.

SE. CH. Form, not very robust. Size, medium. Sternum, not very stout. Tongue, long, thin, wide at the base, and quite horny, especially near the tip which is bifid, and about one third of the terminal portion of the sides is provided with coarse cilia. Space around eye, naked.

COLOR. *Adult.* Above, including wings and tail, reddish-brown with a decidedly greenish gloss everywhere excepting on top of the head where there is an under tint of plumbeous. Beneath, white, with the throat, upper breast, abdomen, and under wing and tail coverts, overwashed with yellowish-rufous. Two thirds of the basal portion of the inner webs of the wing feathers are also yellowish-rufous. Central pair of tail feathers slightly, and all the others more broadly, tipped with white which on all, but the two former, is preceded by a band of dusky. Sides of head, plumbeous. Naked space around eye, including eyelid, scarlet. Bill, black, blue on basal two thirds of lower mandible. Feet, bluish.

Young. Very similar to the above but the tail is only slightly tipped with white and the dusky subterminal band is not as clear. There is less yellowish-rufous below, while the lower mandible is not as blue.

Nestlings. Are not unlike the above, but their appearance is changed considerably by the feathers of the upper parts being narrowly edged with white. The colors are purer, there being only a trace of the yellowish overwashing, but all the feathers show dusky centers. Bill, as in the young stage of plumage but the feet are brown. Sexes, similar in all stages.

OBSERVATIONS.

Specimens vary greatly in size but, although some are much larger than others, yet the increase is well proportioned. The nestlings are able to fly some time before they assume the full length of tail or attain the size of the adult. One now before me and which had left the nest, presents a singular feature for it yet retains the egg tooth on the tip of the upper mandible that almost all birds lose in a few days after birth. Readily known from the two remaining species of this genus which occur within our limits by the narrow white tipping to the tail and also by the bluish tint on the under mandible. Distributed during summer throughout Eastern United States from the latitude of Georgia to that of the White Mountains. Winters in South America.

DIMENSIONS.

Average measurements of thirteen specimens from New England. Length, 11.85; stretch, 16.25; wing, 5.70; tail, 5.55; bill, .90; tarsus, .92. Longest specimen, 12.70; greatest extent of wing, 17.00; longest wing, 6.00; tail, 6.61; bill, .95; tarsus, 1.00. Shortest specimen, 11.00; smallest extent of wing, 4.50; shortest wing, 5.40; tail, 4.50; bill, .85; tarsus, .85.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in trees or bushes, flat in form and loosely constructed, composed of sticks among which are placed leaves, pine needles, and weeds, lined with leaves, catkins of the willow, etc. Dimensions, external diameter, 8.00, internal, 4.50. External depth, 2.00, internal, .75.

Eggs, four in number, rather elliptical in form, quite dark bluish-green in color, occasionally spotted with a darker shade of the same. Dimensions from 1.00 x .70 to 1.25 x .75.

HABITS.

During the last days of May, when the trees and shrubs of New England have so far assumed their delicate green foliage as to form shadowy retreats for those birds that are fond of concealment, an abruptly given note may be heard coming from some dense thicket. Perhaps I ought not to call the note abrupt for, although it begins without any preliminary warning, it is so rich in tone and is uttered so smoothly, with a constantly falling cadence, that one quite forgets that the musician neglected to give an opening prelude and listens eagerly for a repetition of the lay. But the hidden vocalist is fickle, often refusing to repeat its song and, as it persistently remains invisible, the listener, especially if he be not well skilled in bird lore, is inclined to look upon the author of the peculiar, though pleasing, melody as a mysterious being, a kind of dryad, who takes this method of informing the powers of the air that they have quite overlooked the fact that the shrubbery in its favorite copes is suffering for want of rain.

There are few birds which are so large and withal so common which are so little known among those who are not ornithologists, as the Black-billed Cuckoos. I have had many of the uninitiated ask me the name of the author of the mystical notes and almost all were surprised when I told them that it was a Cuckoo, for there is nothing in the *cow-cow-cow* of this species that would suggest the name. As I have intimated, these notes are oftener given just before a fall of rain than at any other time for this Cuckoo appears to be exceedingly sensitive to any atmospheric change, and I have even heard them utter their notes during the darkness of summer nights when wet weather was impending.

The Black-billed Cuckoos begin to breed about the first of June, choosing some retired spot in a tangled thicket in which to place the nest. The eggs are deposited at long intervals so that it is not unfrequent to find both young and eggs in the same nest. This habit is, doubtlessly, the result of an occasional quickening of an ancestral trait, usually latent, for we find that other species of Cuckoos, noticeably the common European, are parasitical in their breeding habits and, consequently, more or less irregular in time of depositing their eggs. Nor does this peculiarity end here in our species for two or three instances have come under my notice where either the Black-billed has deposited its eggs in the nest of the Yellow-billed Cuckoo or *vice versa*, and furthermore, although I have never seen an instance, I have been informed by such good authority that I see no reason for doubting the statement, that occasionally the eggs of the Black-billed are to be found in the nests of other birds and were once taken from that of a Chipping Sparrow. It is, of course, possible that this habit, instead of being only an occasional outbreaking of one that is nearly always latent, is progressive or, again, that under favorable circumstances, it may become more general; in fact, as fully established as that of the Cow Bunting, but this is a matter for ornithologists of future generations to prove.

These birds are extremely solicitous for the safety of their young and care for them long after they have left the nests. It is difficult to tell exactly when the Cuckoos take their departure as in autumn they are much more retiring in habit than in spring and as the note is seldom given then, they must be seen in order to ascertain their presence. I have found them as late as the last of September in Pennsylvania and the Bangs Brothers obtained one in Waltham, Massachusetts, as late as the middle of October but this is exceptional for it is probable that the majority depart in early September.

COCYBUS AMERICANUS.

Yellow-billed Cuckoo.

Coccyus Americanus Bon., Obs. Wils.; 1825, 17.

DESCRIPTION.

Sp. Ch. Form, rather robust. Size, medium. Sternum, rather stout. Tongue, long, thin, wide at the base, and quite horny, especially near the tip which is bifid, and about one third of the terminal portion of the sides is provided with coarse cilia. Space around eye, naked.

Color. *Adult.* Above, including wings and central tail, plumbeous-brown with a greenish gloss everywhere excepting on top of the head. Beneath, white, with the under wing coverts overwashed with yellowish. Three fourths of the basal portion of the inner webs of the wing feathers are dark-cinnamon which encroaches upon the outer webs. Central pair of tail feathers slightly tipped with black, remaining feathers nearly black, excepting basal portion of the more central, tipped with white which extends along the outer webs of outer feathers. Spot in front of eye, ring around it, and triangular area back of it, dusky. Naked space around eye, yellowish. Bill, black, yellow on basal three fourths of lower mandible and on edges of corresponding portion of upper. Feet, bluish.

Young. Very similar to the above but the tail is not as dark and there is less yellow on the lower mandible and none on the edges of the upper.

Nestlings. Are not unlike the above. There is a more decided greenish gloss. The top of the head is lighter. Feathers of the upper parts, narrowly edged with white. Bill, wholly black, excepting a small spot of yellow on the center of lower mandible. Sexes, similar in all stages.

OBSERVATIONS.

Specimens vary greatly in size as in the preceding species. Judging from a nestling which yet retains a trace of the egg tooth, this organ is not shed as is usual but is worn away, (see observations on page 216). Readily known from the Black-billed Cuckoo by the yellow bill, cinnamon on the wings, and broader white tipping to the tail. Differs from the Mangrove Cuckoo as given under that head. Distributed during summer throughout Eastern United States from the latitude of Georgia to that of the White Mountains. Winters in South America.

DIMENSIONS.

Average measurements of thirteen specimens from New England. Length, 11.85; stretch, 19.25; wing, 5.75; tail, 5.50; bill, .72; tarsus, .92. Longest specimen, 12.70; greatest extent of wing, 20.00; longest wing, 6.00; tail, 6.00; bill, .80; tarsus, .95. Shortest specimen, 11.00; smallest extent of wing, 18.50; shortest wing, 5.50; tail, 4.10; bill, .75; tarsus, 1.00.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in trees and bushes, flat in form and very loosely constructed of sticks, pine needles, leaves, and weeds, lined with leaves, catkins of the willow, etc. Dimensions, external diameter, 9.00, internal, 4.50. External depth, 2.00, internal, .75.

Eggs, four in number, elliptical in form, light greenish blue in color, unspotted, but sometimes overwashed with whitish. Dimensions from 1.10 x .75 to 1.28 x .80.

HABITS.

Although the Yellow-billed Cuckoo is found regularly in Pennsylvania and is always as abundant as the Black-billed, yet it is quite irregular in this respect in New England. Some seasons it will be very common and at others it is extremely difficult to find a spec-

imen. I do not know of any reason for this peculiarity unless it be caused by the temperature of particular seasons. These Cuckoos arrive about the same time as the other species and occasionally associate with them. They have much the same habits and notes but I have fancied that I could distinguish the song of the present species as it appeared harsher. As a rule, the notes of the Yellow-billed are more broken, thus they appear to utter *cow-co-cow-co*, giving the four syllables together, as it were, and therefore, they do not glide forth as smoothly as those produced by the Black-billed. There are, however, some sounds which are made by both which are so nearly alike that I have never been able to detect any difference.

This species in company with the former are the terror of other small birds during the nesting season for they will constantly rob their nests. I have frequently seen a Cuckoo enter a thicket in which a Robin or Cat Bird had built a home and in a moment the air would resound with the shrill cries of distress given by the parents, causing all the small birds in the immediate vicinity to rush to the spot and as each joins in the outcry, the noise produced is apparently enough to frighten away a bolder bird than a Cuckoo. But in spite of all this din, the glossy thief nearly always succeeds in accomplishing his purpose and emerges from the thicket, carrying an egg impaled on his beak. He does not always escape unscathed, however, for he is pursued by a motley crowd consisting of Robins, Cat Birds, Thrushes, Warblers, etc. that follow him closely, harassing him on all sides, and some of the more courageous will even assault him with blows from their beaks so that he frequently leaves some of his feathers floating in the wind behind him. As the long and broad tail of the Cuckoo is a prominent object and as it is also a portion of the bird which its enemies can seize with comparative safety to themselves, this member often suffers in these forays, insomuch, that by the middle of summer, it is quite difficult to find a Cuckoo of either species which has a full complement of tail feathers.

In spite of this propensity to rob the nests of other birds, the Cuckoos are quite useful as they destroy quantities of insects. I have mentioned under generic characters that the lining of the stomachs of our northern species were thickly covered with hairs that resembled those from caterpillars. This internal membrane or stomach lining is soft and the hairs which under the microscope are seen to be furnished with barbs, are fastened into it just as they grow on the larvæ of insects. The hairs which I have examined appear to come from one species, viz:—the tent caterpillar. I have noticed that the Cuckoos are very fond of these destructive insects and apparently do much toward checking their ravages. During the passed summer, I had an opportunity of observing how beneficial the Cuckoos were in this respect for a pair of Black-bills which had a nest near, would visit a small apple tree on which these caterpillars had established a colony, several times every day and thus devoured so many of the destructive pests that their ravages were so completely checked that the foliage of the tree which would have been entirely eaten had the insects remained unmolested, showed but few traces of their devastation; in fact, I do not think that one out of the large number of caterpillars that were hatched in the spring, ever came to maturity. This good was accomplished, be it noticed, through the exertions of a single pair of birds which, without doubt, also ate quantities of other insects.

In breeding habits, the Yellow-billed Cuckoo does not differ essentially from the Black-billed. The eggs are deposited about the same time and the young leave the nest early and, although they have not acquired the full plumage, fly very well. I obtained some in this stage at Watsontown, Pennsylvania, during the first week in September, which were, in company with their parents, feeding in the tops of lofty trees. In the autumn, the Cuckoos grow very fat and one which I obtained at Watsontown, on the twenty-eighth of September, was so corpulent that it was scarcely able to fly but sat apparently stupefied, not attempting to move when I walked within a few feet of it. They remain in the north until about the first week in October, then all take their departure for tropical climes.

COCCYGUS MINOR.

Mangrove Cuckoo.

Coccygus minor CAB., Jour. fur Orn.; 1825, 47.

DESCRIPTION.

Sp. Ch. Form, robust. Size, not large. Sternum, stout. Tongue, long, thin, wide at the base, and quite horny, especially near the tip which is bifid, and about one third of the terminal portion of the sides is provided with coarse cilia. Space around eye, feathered.

Color. *Adult.* Above, including wings and central tail, plumbeous-brown with a slight greenish gloss everywhere excepting on top of the head. Beneath, white overwashed with a strong tinge of yellowish-rufous which is darkest on the abdomen and under tail coverts. Three fourths of the basal portion of the inner webs of the wing feathers are yellowish-rufous. Central pair of tail feathers slightly tipped with white, remaining feathers nearly black, excepting basal portion of the more central, tipped with white which extends along the outer webs of outer feathers, at first, widely, then rapidly narrowing to a mere line which extends to the base of the feathers. Spot in front of eye, ring around it, and triangular area back of it, black. Bill, black, yellow on basal three fourths of lower mandible. Feet, bluish.

Young. Very similar to the above but the tail is not as dark and there is less yellow on the lower mandible and they are not as strongly overwashed below. Sexes, similar in all stages.

OBSERVATIONS.

Readily known from the Yellow-billed Cuckoo which it closely resembles, by the yellowish-rufous overwashing below and by the absence of the cinnamon on the wings. Distributed during summer throughout the Florida Keys. Winters in South America.

DIMENSIONS.

Average measurements of specimens from Florida. Length, 12.00; stretch, 15.00; wing, 5.95; tail, 6.50; bill, .90; tarsus, .92. Longest specimen, 12.25; greatest extent of wing, 16.00; longest wing, 5.10; tail, 6.15; bill, 1.00; tarsus, 1.10. Shortest specimen, 11.75; smallest extent of wing, 15.00; shortest wing, 5.00; tail, 4.75; bill, .85; tarsus, .85.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in bushes, they are flat in form and very loosely constructed of quite small sticks, and weeds, lined with leaves. Dimensions, external diameter, 9.00, internal, 4.50. External depth, 2.00, internal, .75.

Eggs, four in number, elliptical in form, light greenish blue in color, unspotted, but sometimes overwashed with whitish. Dimensions from 1.10 x .75 to 1.30 x .85.

HABITS.

One of the most remarkable trees in North America is the mangrove which grows so abundantly along the Gulf of Mexico, extending up the east coast of Florida as far as Mosquito Inlet. It is a tree of the tropics and cannot endure the slightest frost; thus those which occur north of Cape Canaveral are of stunted growth as they are occasionally frozen for, during exceptionally cold winters, the biting influence of the Frost King is felt

even in this usually genial clime but south of the headland above mentioned, perpetual Summer holds undisputed sway and here the mangrove flourishes. But to see it growing to perfection, one must visit the Keys where this singular tree may be found in all stages of development. Although I have previously alluded to the mangrove, I think it best to describe it in detail as I shall frequently have occasion to speak of it in the forth-coming pages of this work.

The mangrove (*Rhizophora Mangle*) as implied above, invariably grows in soil which is either constantly covered with salt water or is overflowed by the tide twice a day. The peculiar constituents of sea water appear to be necessary for its support as when it grows on the banks of rivers, it is only found along their margins as far as the tide-water extends; in fact, it appears to thrive best in those shallow bays or lagoons on the extreme southern coast of Florida where, by constant evaporation, the water becomes so impregnated with salt and lime as to be fairly bitter to the taste while it is greenish-white in color. Although usually but a shrub or, at best, a small tree some fifteen feet high, under the favorable circumstances of which I have spoken, it often attains the height of fifty, or even seventy-five, feet with trunks which measure nearly a foot in diameter. The leaves are oval in form, quite thick in structure, with a polished upper surface, and of such a dark olive-green as to appear quite brown in the distance. The bell-shaped blossoms, though small, are quite numerous and are divided into four petals which are yellow in color. They bloom in winter; at Key West, as early as December but a little later further north. Then the fruit which is long and cylindrical in form, slightly curved, slowly comes to maturity, ripening in the autumn when it falls into the sea where it floats in an upright position. The water of the Gulf of Mexico and among the Keys is always of quite a high temperature, rarely, if ever, falling below seventy degrees; thus the embryo mangroves are placed under very favorable conditions for development and I have frequently seen them in the open ocean with a small tuft of leaves growing upward at one extremity while the rootlets would be starting downward at the other. Perhaps there are few plants in the world which form such important agents in land making as the mangroves for they not only exist in the earlier stages of their lives, under circumstances in which many plants would perish, being constantly submerged in the saltiest of sea water, but will take root on anything that offers them a foot-hold. Thus when the floating, cigar-shaped embryos come in contact with the top of a coral reef which has been brought within a short distance of the surface, they will almost invariably become fixed to it and as the roots grasp the rock firmly, insinuating themselves into every crack or crevice, when once attached it is almost impossible for the waves, even if they are impelled by the force of a hurricane, to tear them away for, as the huge billows come sweeping along, the willowy plant merely bows before them and they pass harmlessly over it. The young tree grows rapidly upward, and after it has attained the height of several feet, develops a wonderful character, for it now sends out root-stalks which drop downward, resembling long, slender rods as they are almost exactly the same size at the bottom as at the top. They are extremely elastic and sway with every breeze, but when they touch the earth, they drop roots, thus become fixed, then rapidly increasing in size, soon acquire the firmness of the parent stem.

The floating debris becomes entangled in this labyrinth of trunks and, decaying, forms soil which accumulating with incredible rapidity, soon becomes dry land. When the water no longer flows about them, the mangroves die, only to be replaced by other trees among the most noticeable of which are the button wood. Thus island after island is being formed along the entire extent of the Florida Reef and so quickly do they spring up that spongers who lived at Key West, pointed out to me keys of considerable size which occupy spots that when they were boys, were nothing but the water-covered tops of coral reefs.

Such, in brief, is the history of the mangrove, a tree which is so intimately connected with the name, and in fact with the lives, of the Cuckoos which we have under consideration, for it is in the foliage of these trees or in the thickets near them that they pass their existence. The first and only living specimen that I ever saw of this species was on Bamboo Key which I have described on page 176. This was during the first week in May, 1871. I was standing near a thicket when I observed a Cuckoo very near me which at first sight I thought was a Yellow-bill, but something in its appearance, what, I cannot now tell, caused me to look at it more closely when it at once flashed across my mind that it was a bird for which I had hitherto been looking in vain, and that a specimen of the Mangrove Cuckoo was before me. I had left my gun leaning against the wrecker's shanty, only a few steps away, but although I traversed that space twice in much quicker time than it takes to write these lines and stood with my thumb on the hammer of my gun in the exact spot that I had occupied a moment before, I could not find the bird nor did I ever see it again, although I searched carefully every square rod of the Key. Three years later, the members of one of my expeditions obtained one at Key West on the twenty-first of May but did not find another although they searched diligently for them. According to their description, the bird which they obtained was very wary, being shot on the wing as it darted out of a mangrove thicket and, as the one which I saw was far from being unsuspecting, I judge that these Cuckoos are quite shy, probably keeping well hidden in the dense thickets. I do not think that they are particularly common or I should have seen more of them but, without doubt, they are of regular occurrence among the Keys and I have reasons for believing that they are occasionally found along the East Coast of Florida, at least, as far north as Cape Camarveral. They breed on the Keys but migrate early as I saw none in the autumn.

Coccyzus minor maynardi.

Maynards' Cuckoo.

DESCRIPTION.

SUB SP. CII. Size, form and general coloration of the Mangrove Cuckoo, but very much paler beneath, often with a tinge only of the buff so characteristic of the Mangrove Cuckoo. Occurs on the Bahamas and on the Florida Keys.

HABITS.

Maynard's Cuckoo is found all winter on the Bahamas, throughout the islands which I have visited, from New Providence to Inagua, but not as common at this season as it is in spring. They frequent thickets near fields, and often venture into the open grounds to feed, but usually when taken by surprise in such places, quickly retreat to the thickets, into which they glide easily. Once within the cover of the shrubbery, their movements are quite deliberate, but when approached, they will jump from branch to branch, and although not appearing to hasten, will manage to elude their pursuer, and become quickly lost in the foliage.

The flight of this Cuckoo is rapid, the wings being moved quickly, much more so than in the Black or Yellow Billed Cuckoos. They generally move straight forward, without doubling, and when they wish to alight they do so suddenly without any preliminary lessening of their speed, and as soon as their feet touch the branch the tail is dropped perpendicularly. As a rule, this Cuckoo is rather shy, especially when in open fields, but I once came across one near Mathewstown, Inagua, that was feeding in an old field, that was very tame, allowing me to approach within ten feet of it, as it deliberately searched for food among the remains of partly decayed stubs of trees which stood in the clearing. When I came too near it would merely fly from stub to stub.

All through the winter Maynard's Cuckoo is rather silent, but as spring approaches they begin to utter their singular cries, and at times, more especially before rain, are quite noisy. The notes may be represented by the syllables "ou, ou, ou, ou, qua, qua, qua, coo, coo, co." The "ous" are given very rapidly, with a decided Cuckoo-like intonation. The "quas" are harsher, more like the notes of the Bahama tree frog, and are not hurriedly given. The last three notes are more Cuckoo-like than any of the others. The first four notes are often omitted, then the harshly and gravely given "quas" begin the song and on occasions these quaint sounds are not followed by any other notes, then it is sometimes difficult to distinguish the notes uttered from some of those uttered by the large Andros Island Cuckoo, *Saurothera andrea*. This varied song is uttered in the early morning with rather more energy than at any other time in the day.

I have never found a nest of this Cuckoo, but judging from the condition of the ovaries of females that I dissected should say that the eggs are deposited about the first week in May.

GENUS II. CROTOPILAGA. THE BLACK CUCKOOS.

GEN. CII. Form, long and slender. Tail, of eight feathers, larger than wing and rounded. Bill with the culman of upper mandible, elevated and compressed into a sharpened ridge, which gives the birds a parrot-like appearance. There are three species of the genus, all tropical or sub-tropical, and one only of which has been taken in our section.

CROTOPHAGA ANI.

Ani.

DESCRIPTION.

SP. CII. Size, medium. Bill either smooth or ridged transversely. Color, dull black, lustrous on the edge of the feathers, especially on the head and neck behind.

OBSERVATIONS.

Known at once from all other birds of our section by the uniform dark colors and singular bill. From the other two species of this genus, the Ani may be distinguished as follows: the Grooved-billed Ani has the upper mandible always roughened by longitudinal ridges and the bill is a little smaller than that of the Ani, although the bird is much the same size. The Grooved-billed Ani is found in Texas and southward. The Great Ani, which inhabits northern South America may be distinguished from the other two by its large size. The Ani occurs in the Bahamas, and others of the West Indies, in northern South America and accidentally in Florida and Pennsylvania.

NESTS AND EGGS.

NESTS, placed in trees, and are built by several pairs of birds, the females of which lay in the same nest. The nests are composed of sticks lined with grass. They are bulky structures twelve inches in diameter but shallow, being only about four inches deep. EGGS, elliptical in form, pale greenish blue, but this color is nearly or quite concealed by a white calcaneous deposit. Dimensions, 1.20 by 1.55 to 1.22 by 1.60.

HABITS.

Of all the birds with which I am acquainted I consider the Ani one of the most singular. Its somber colors, oddly formed beak, startling, abruptly-given cries, disagreeable odor, and unbirdlike habits render it so different from all other bird species that it stands out clearly from among its fellows with a silhouette-like distinctness, which impresses itself upon the mind of all who have ever become familiar with it. Even the Creoles of the Bahamas, one of the most unobservant peoples under the sun, know this bird. It is remarkable as being the only bird on the Bahamas which has received attention enough from these preeminently superstitious and unimaginative people to have become interwoven into their folk lore tales. Unfortunately, however, the chief characteristics of the bird, enumerated above, are not of a nature to render it a favorite with any race, and all of the Creole legends connected with it are decidedly unpleasant. The Ani is one of the principal agents of the evil spirits. It is called the Devil's Bird, and its master causes it to visit new made graves in order to catch the souls of the occupants. The gardener does not like to see it about his fields and sets the boys to stoning it whenever it appears.

On account of this harsh treatment the Ani has learned to regard man as his natural enemy, and I was always greeted, whenever I attempted to approach one, with their harsh and melancholy notes, and the birds would dash away from me to hide in the nearest thicket.

So different are the Anis from all others of the order to which they belong, that it is difficult to believe that they are Cuckoos. Neither in general form, color, note, nor in habit do they resemble Cuckoos, and the only thing about them that proclaims their relationship is the feet.

In flight they most nearly resemble a Canada or Florida Jay, alternately flopping and sailing, moving with a straight forward flight from tree to tree with great rapidity, uttering their mournful notes as they quickly disappear in the distance, vanishing so utterly, that one pauses to wonder whether they were really birds, or whether, after all, the Creoles are not right in thinking them beings endowed with supernatural powers.

Another un-Cuckoolike habit of the Anis is that they associate in flocks, and I do not think that I ever saw a single living specimen alone by itself. This gregarious habit has evidently endowed them with one virtue and that is that they are sympathetic. When one is wounded and utters cries of alarm, the remaining members of the flock gather around and exhibit their solicitation by loud cries and frantic movements.

A careful study of the Anis convinced me of the fact that a number of females are led by two or three males, and these males take great care of their charges. They utter cries of alarm when they perceive an intruder, and drive the females before them into a place of safety. I have even seen males fly against females or young birds which did not attempt to escape soon enough, and knock them off the limb on which they sat and then accompany them to a distant thicket.

I am inclined to think that the Ani is polygamous, and this habit of the males taking care of a number of females would appear to confirm this idea. It is now a well established fact that several birds unite in building a single nest in which a number of females deposit eggs. Governor Blake called my attention to a nest that was built in a tamarand tree that stood in the grounds of the Government House at Nassau. It was placed on a branch about ten feet from the ground and was quite a bulky structure. The eggs were deposited in April, and there were originally nine in all. I did not see the nest until June 4th, at which time the young had flown, leaving two addled eggs behind them. The Anis must breed somewhat irregularly, for as early as March 22d I procured newly-fledged young. They also moult irregularly; on March 8th, 1884, I found a number at Nassau which had just completed moulting, and on April 24th, of the same year, I got two specimens, at Deep Creek, Andros, which had just begun to moult.

Anis live largely on locusts, especially a large species, which is quite common on the Bahamas, and which has a peculiar, rather disagreeable odor, which is imparted to the birds. I have also found beetles in their stomachs. The local name at Nassau and on Andros is Devil's Bird and Deadman's Bird, but on Cayman Brae, where they are also common, they are called Old Annas.



FIG. 49. Head and foot of Ani, Female, Fresh Creek, Andros, April 24, 1893.

ORDER VII. PICI. WOODPECKERS.

Sternum, wide, with four marginal indentations. Keel, very low. Outer anterior toe, projected backward.

The joints of the toes are usually normal in number. The bill is strong and wedge-shaped. There are ten primaries and twelve tail feathers. This Order contains three natural groups which certainly constitute families; the *Yungidae* which are exclusively Old World, the *Picumnidae* which are found only in South America, and the *Picidae* which have a general distribution throughout Europe, Asia, Africa, and America

FAMILY I. PICIDÆ. THE TRUE WOODPECKERS.

Posterior extremity of the sternum, emarginate. Scapula bones, truncate. Tail feathers, stiffened and acuminate.

Although I have included all of our Woodpeckers under one Family, yet I am far from being satisfied with this arrangement as certain strong characters, especially internal, exhibited by many of the species, indicate that some of the genera may be grouped into natural families or sections but with the present material which I have at my command, I can do no better than to simply attempt to make what appears to me, a natural arrangement of the genera. Although the sternums are tolerably uniform in proportion, yet they exhibit some peculiarities. They all agree in having long, tolerably well arched furculas without any terminal expansion. The manubrium varies slightly in size but the main differences lie in the comparative width of the sternum and depth of the marginal indentations. The tongue varies greatly as does also the digestive apparatus, especially the form of the proventriculus and its accompanying gastric zone, all of which will be given under head of generic characters.

GENUS I. SPHYRAPICUS. THE YELLOW-BELLIED WOODPECKERS.

GEN. CH. *Sternum, narrow, not twice as wide as the height of the keel. Marginal indentations, deep, the inner being equal in depth to the height of the keel and the outer considerably exceeding it. Manubrium, quite large. Terminal hook of scapula, angled on the upper and lower sides. Tongue, without extensible sheath, and the cerato-hyals are not greatly elongated, only extending to the middle of the occiput. Proventriculus, not especially enlarged. Salivary glands, small or absent. Upper mandible, but slightly curved.*

Members of this genus are transversely banded above and marked on the head with scarlet. The tail feathers are quite annulate. The hind toe is barely half the length of the outer which is projected backward. There is but one species within our limits.

SPHYRAPICUS VARIUS.

Yellow-bellied Woodpecker.

Sphyrapicus varius BAIRD, Birds N. A.; 1858, 103.

DESCRIPTION.

SP. CH. Form, not robust. Size, medium. Sternum, not stout. Tongue, long, thin and horny throughout its entire length, provided with fine cilia which fringe the rounded tip and extend along the sides for three fourths of the terminal portion.

COLOR. *Adult male.* Above, including wings and tail, lustrous-black with the feathers of the back, rump, and scapularies, crossed by bands of white and edged with the same, especially on the rump where the inner webs of the feathers are wholly white. Tips of all the wing feathers and spots on outer and inner webs, markings on inner webs of central tail feathers, tips of four outer, and line extending along outer web of extreme outer, longitudinal patch in middle of wing formed by tipplings, and edges of wing coverts, also white. Top of head and patch on throat, scarlet. Sides of head, occiput, and breast, black, with line passing from back of eye around occiput and one extending from base of bill along sides, white. Remaining under parts, including under wing and tail coverts, white, tinged with sulphury-yellow, especially on the abdomen and middle of the lower breast. Feathers of the sides and flanks, marked with arrow-shaped spots of black. Bill, black. Feet, greenish-brown.

Adult female. Similar to the male but lacks the scarlet patch on the throat which is replaced by one of dirty white. There is also a brownish tinge to the feathers of the sides.

Young male. With the general markings of the adult but the white above is tinged with brownish-yellow and the breast has but few traces of the black patch but it is replaced by white narrowly banded with dusky. The scarlet feathers above and below are more or less mixed with brownish, and sometimes with black. Entire under parts strongly tinged with sulphury-yellow. Bill, brown. Feet, greenish.

Young female. Similar to the male in the same stage, the white of the throat being obscured by brownish but the breast is not as distinctly banded with dusky.

Nestlings. A pattern of the markings of the more mature stage is retained to a considerable extent but there is a slaty-brown washing obscuring the colors of the back, head, and lower surface where it is barred with dusky. The males occasionally show some red on the head and throat but out of a large series of females now before me, I do not find one which exhibits the slightest trace of this. Bill and feet, similar to the preceding.

OBSERVATIONS.

Specimens in the adult stage vary in amount of white markings, especially on the tail, as some have the central feathers barred with it. This is also true of the young and even of the nestlings. Occasionally a band of scarlet replaces the white on the occiput; this constitutes the variety, *nuchalis*, which was at first supposed to occur only in the West but which may be frequently found in all sections East where the species occurs. The nestlings vary considerably in amount of sulphury-yellow, usually there are but slight traces of it below but one now before me is slightly tinged with it, even on the top of the head. Readily known from all of our Woodpeckers by the markings as described. Distributed during summer throughout Eastern North America, north of latitude 41°, and along the mountain ranges, further south. Winters in Eastern United States, south of the latitude of Pennsylvania. In preparing this article, I am indebted to Messrs. F. H. Brackets and W. B. Dowse and the Bangs Brothers for the use of specimens.

DIMENSIONS.

Average measurements of eighteen specimens from Eastern North America. Length, 8.25; stretch, 11.82; wing, 4.86; tail, 3.55; bill, .80; tarsus, .85. Longest specimen, 8.75; greatest extent of wing, 15.11; longest wing, 5.00; tail, 3.40; bill, .95; tarsus, 1.00. Shortest specimen, 7.75; smallest extent of wing, 4.31; shortest wing, 4.62; tail, 2.00; bill, .85; tarsus, .70.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in gourd-shaped holes, usually excavated in dead trees. Dimensions, diameter of external orifice, 1.50; greatest internal, 5.00. Internal depth, 11.00.

Eggs, four to seven in number, elliptical in form, pure, polished pearly-white in color, unspotted. Dimensions from 60x75 to 75x85.

HABITS.

The Yellow-bellied Woodpeckers find their summer homes in those vast evergreen forests which still cover a large portion of Northern New England. It is true that these shadowy woodlands are also the chosen resort of several other species of this family but the beautiful birds of which I am speaking, outnumber them all; in fact, one can scarcely enter a patch of wood after the first of May without being greeted by their querulous cries. Although found everywhere in the shelter of trees, yet they are most abundant in the vicinity of water for they prefer to build their nests in dead trees that stand in the borders of lakes or ponds. I well remember my first experience in searching for the eggs of the Yellow-bellied Woodpeckers and although, as the sequel will show, it can scarcely be considered as a red-letter day as far as collecting was concerned, yet it was a day full of pleasant reminiscences, one of which is the little episode which I am about to relate.

I was at Upton, Maine, in the early summer of 1871 and one day during the second week of June, in company with two friends, who are both well known to the ornithological world, was floating in a small boat on the placid waters of Lake Umbagog. We were rowing along the shore among the dead stubs which were very numerous. The ground on which they stood had evidently been submerged for some time, as the whitened trunks were nearly branchless and, in many cases, were full of holes, many of which had been made for years but nearly all were occupied, the smaller by the White-bellied Swallows and the larger by the Crow Blackbirds. The bleached appearance of the wood around the en-

frances was always a certain indication of the age of the cavity and as the Woodpeckers almost invariably drill a new hole every year, we passed those which did not look fresh. Soon, however, we discovered a stub in which was a newly made orifice and we glided toward it, when our suspicions were confirmed for, at the sound of our voices, a fine male alighted on the top of the dead tree and began bowing his head, dodging around the trunk, peering at us from behind it, and at the same time uttering his discordant cry of alarm. In a moment more, we were beside the stub but, as it was badly decayed about the base and as the entrance to the nest was some thirty feet high, no one cared to risk a fall, even for the chance of procuring the eggs of the Yellow-bellied Woodpecker. We were all desirous of ascertaining what the nest contained, so finally, decided to cut down the tree, hoping that, as it must fall in some three or four feet of water, the eggs might remain uninjured. We were provided with an ax and now came the difficult task of using it while standing in a rocking boat, but one of us essayed to perform this part while the others held the little craft as firmly as possible by planting the oars in the mud. At the first blow of the ax, out darted the female and flew upon a neighboring stub. This proved quite an incentive to pursue our labor for we were now very sure that the much coveted eggs were above us, so we redoubled our efforts and soon had the satisfaction of seeing the tree sway preparatory to falling. Then it suddenly occurred to us that it might be precipitated across the boat or, even if inclined the other way as was apparent, it might strike the tops of some adjacent stubs and thus shoot backward against us. As in either case if we escaped injury, the boat would be swamped, we paused a moment to consider as to the best course to pursue. As the wind was blowing in puffs, we concluded that by making everything ready to shoot our light craft away instantly, we could give a few strokes with the ax, then retreat and allow the wind to finish the task. A few well-directed blows were accordingly struck, causing the tree to sway very perceptibly, then we glided away a few yards and watched the result. At this moment, a strong breeze came rippling along the water and, as the old stub felt the pressure, it inclined more and more until, as last overbalancing, came down with a loud splash that produced the effect of a miniature earthquake and for a moment, we were rocking upon waves which are seldom encountered in those placid waters. All this commotion lasted but a few seconds, everything being quiet again by the time we were along-side the floating stub which we rolled over to find the hole from which the Woodpecker had emerged. This was soon accomplished and with a few blows of the ax, the opening was enlarged sufficiently for us to see into the interior but, to our disappointment, not a single egg remained whole, for all were broken into minute fragments.

Like the other species of Woodpeckers, the Yellow-bellies are quite playful and may frequently be seen chasing one another about the tree trunks. At such times, they utter notes which have the peculiar intonation noticeable in all our species when so engaged. They also have other cries, all harsh, however, and will occasionally call by rattling upon a resounding limb. The note of alarm is not unlike that given by the Blue Jays, being delivered in about the same tone but is more querulous and thus may be recognized without difficulty.

The Yellow-bellied Woodpeckers reach their summer homes about the first of May, deposit their eggs, as shown above, about the second week in June, the young make their appearance in August, and accompany their parents for some time. They all leave for the south by the first of November, migrating quite leisurely. These Woodpeckers are extremely abundant in the cypress and other swamps which border the rivers of Florida but are occasionally found in the piney woods. They keep well up in the tops of the tall trees but their peculiar notes always betray their presence as they are seldom quiet, constantly calling to one another for they appear to be fond of company and it is not usual to find one unaccompanied by either some of its own species or by other members of the family; thus flocks of Woodpeckers are not uncommon in this section.

As we might naturally expect from the peculiar structure of their tongues, the food of these Woodpeckers differs considerably from that of those species, the lingual organs of which are provided with barbs. The Yellow-bellied Woodpeckers being unable to readily extract the larvæ of the boring beetles from the holes in which they lurk, eat largely of other insects and are, in fact, quite expert flycatchers, taking their food on the wing very easily. They are also fond of small fruits and I have even taken dried barberries from their stomachs. Of all the small Woodpeckers which are called Sap-suckers, these are the most deserving of the name for they will not only drink the juices of trees but will also eat the inner bark; in short, in the autumn it is exceedingly difficult to find one which has not been indulging in this practice. They drill small holes in the forest, as well as the fruit, trees in order to obtain their favorite food but as these orifices are very small, I do not see that they are especially injurious to the trees and, even if this were the case, the slight damage which these birds occasion is more than counterbalanced by the good which they do in destroying multitudes of pernicious insects and therefore, we may safely consider the Yellow-bellied Woodpeckers as useful birds.

GENUS I. CENTURUS. THE RED-BELLIED WOODPECKERS.

GEN. CH. *Sternum*, narrow, not as wide as the height of the keel. *Marginal indentations*, deep, all being equal in depth to the height of the keel. *Manubrium*, not very large. *Terminal hook of scapula*, angled on the upper and lower sides. *Tongue*, provided with extensible sheath, and the *cerato-hyals* are elongated, extending around the back of the skull as far, at least, as the orbit of the eye. *Proventriculus*, not enlarged. *Salivary glands*, quite well developed. *Upper mandible*, slightly curved.

Members of this genus are marked on the top of the head with scarlet and transversely banded above. The tail feathers are quite acuminate. The hind toe is not half the length of the outer which is projected backward. There is but one species within our limits.

CENTURUS CAROLINUS.

Red-bellied Woodpecker.

Centurus Carolinus Bon, List; 1838.

DESCRIPTION.

SP. CH. Form, robust. Size, medium. *Sternum*, not very stout. *Tongue*, long, narrow, not very thin and horny at the tip which is pointed and provided with barbs for three fourths of the terminal portion. The extensible sheath occupies about one half the length of the tongue.

COLOR. *Adult male*. Above, including the wings and tail, lustrous-black with the feathers of the back, wings, and rump crossed by bands of white, excepting terminal third of the primaries which are tipped with the same color. Upper tail

coverts, white streaked with black. Outer web of outer, tips, terminal portion of next pair, and inner webs of central pair, also barred with white and all, but the central pair, are tipped with yellowish-white. Top of head, occiput, and nape, scarlet-vermillion, lighter on the forehead, and extending down on the sides of the lower neck, while the feathers of the upper back are sometimes tinged with it. Sides of head and under parts, including under tail coverts, light-slaty overwashed with yellowish and tinged on the sides of the head, chin, along the lower breast, and on the abdomen with scarlet which is brightest on the latter named portions. The feathers of the under tail coverts have a central stripe of black. Under wing coverts, white, barred with dusky. Bill, black. Feet, greenish-brown.

Adult female. Very similar to the male, but the top of the head is slaty like the under parts, while the occiput and nape are scarlet-vermillion and the forehead is tinged with it. Usually the red tinging below is not as conspicuous and there is rather more white on the tail. The flanks are marked with arrow-shaped spots of dusky.

Young male. Similar to the adult but quite brown on the wings and lower back. There is very little, or no, white tinging below but the yellowish overwashing is quite strong and the tipping of the tail is nearly orange. The flanks are considerably spotted.

Young female. Not strikingly unlike the adult, but brown above as in the young male and shows but little tinging below, and even the yellowish overwashing is scarcely perceptible.

Nestlings. Birds in this plumage retain the pattern of the next stage, but they are quite yellow below and streaked in a band across the back with dusky. The scarlet of the top of the head is not as bright.

OBSERVATIONS.

Specimens vary considerably in amount of red below; the highest plumaged male that I have selected out of a large series, is tinged with this color over the entire under parts, excepting on the throat. The primaries are usually edged with white, especially in the younger stages. Readily known from all others by the description as given.

Besides those given, the following specific characters may be added: there are no laryngeal muscles, excepting the sternotrachealis which is stout. The tympaniform membrane is present and although there is an os transversale, yet it does not support a semilunar membrane. The oesophagus is without dilatation and opens into a small proventriculus which measures about .25 in external diameter. The gastric glands are simple and placed in a zomular band which measures .40 in width. The stomach is rather globular in form with thin walls that measure .18 in thickness, and the lining membrane is soft. The fold of the duodenum is not long and incloses a wide, though short, pancreas which has only one lobe but this is divided by several incisions which are of varying depth. The spleen is a spherical body lying partly on the proventriculus. The left lobe of the liver is only about one half as large as the right. A noticeable character may be seen in the peculiar, lateral extension of the greater pectoral muscles which protrude very much beyond the costal border of the sternum. (see plate XVII).

This species is distributed throughout the Eastern Section of the United States, from Key West to Connecticut, but is not common north of Pennsylvania. They are constantly resident in the Carolinas and south of them, but are migratory further north.

DIMENSIONS.

Average measurements of eighteen specimens from Eastern North America. Length, 9.67; stretch, 16.12; wing, 4.65; tail, 3.37; bill, 1.10; tarsus, .87. Longest specimen, 10.60; greatest extent of wing, 17.25; longest wing, 5.30; tail, 3.75; bill, 1.20; tarsus, 1.00. Shortest specimen, 8.75; smallest extent of wing, 15.00; shortest wing, 4.00; tail, 3.00; bill, 1.00; tarsus, .75.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in gourd-shaped holes, usually excavated in living trees. Dimensions, diameter of external orifice, 2.00, greatest internal, 5.00. Internal depth, 11.00.

Eggs, four or five in number, elliptical in form, pure, polished pearly-white in color, unspotted. Dimensions from 1.01 x .80 to .95 x .75.

HABITS.

The first time that I ever met with a living specimen of this fine Woodpecker, was at Jacksonville on the thirty-first of December, 1868, the same morning that I had the experience with the Bridge Pewee which I have related; in fact, the next shot that I fired after killing one of those Flycatchers, brought down a male of the birds which we have under consideration. Thus in examining the lovely plumage of the Woodpecker, I speedily forgot the slight disappointment which I had felt for, as I have intimated, it was the

first time that I had ever held a Red-bellied Woodpecker in my hand and, as I admired its brilliant coloring, I thought that it was the most beautiful bird that I had ever shot. Like most ornithologists, however, I have since changed my opinion in regard to this very often and I presume that I shall again many times behold in some *rara avis* what, for a season, will be the loveliest yet seen. I believe that all species, no matter how perfect, lose their charms to the collector after he has shot a dozen or so; this, at least, has been my experience and I do not think that I am any more fickle in this respect than others. Yet after all, I cannot help considering the Red-bellied Woodpeckers, fine birds, even if they have had their day with me and, having got beyond the inclination to kill every one that I see, am never tired of watching their movements.

I found the Red-bellied Woodpeckers quite abundant in winter in the piney woods which border the plantations on the Sea Islands of the Carolinas but as I proceeded south, their numbers increased and in Florida, they fairly swarmed, actually occurring in flocks. They accompany the Cockaded Woodpeckers in the pine woods and also associate with the Yellow-bellies in the swamps and hummocks; in fact, it is difficult to remain long in any portion of Florida where there are trees, without hearing the discordant croak of these Woodpeckers and I even found them on the Keys. At the time of my visit, Key West had been nearly denuded of woods for, although there was an abundance of shrubbery, there was not a tree over twenty feet high growing on the uncultivated section of the island. The key was nearly divided into two parts by salt ponds and north of these, the country was particularly barren as there was but a scanty allowance of soil. In fact, the underlining strata of limestone was exposed in many places, yet a slight depth of alluvium had been deposited in certain hollows and in them, a few stunted palmetto trees had managed to take root. Passing these one day, I heard a familiar note and glancing in the direction from which it came, saw a Red-bellied Woodpecker clinging to the trunk of one of the dwarfed palms and not far away, I found his mate. Curious to ascertain whether they were local inhabitants or only visitors to this desolate spot, I searched among the low trees for signs of a nest and soon discovered some holes drilled in the fibrous trunks of the palmettos one of which was evidently the nest of the pair that I had just transferred to my collecting basket. As this was in November, they were not, of course, breeding but only keeping watch over their domicile, lest it should be occupied by others.

Further north, on the heavily wooded keys, I found that these Woodpeckers occurred but were not common until I arrived at Miami. Here they inhabited the piney woods almost exclusively and built their nests about the first of April, excavating the cavities for them in living pine trees. As the breeding season approached, they were, like the Yellow bellies, quite playful, sporting about the trunks or high limbs of the pine trees, then launching outward, would pursue one another rapidly through the air, for like many other members of this family, these Woodpeckers, although they move in a heavy, undulating manner while on the wing, fly very swiftly. The notes, throughout the breeding season, are not especially different from those given during the winter. Although not unlike those uttered by the Yellow-bellies, they differ enough to be readily distinguished, being louder and perhaps harsher.

I have found the Red-bellied Woodpeckers but once in Pennsylvania, that was on the second of October, 1875, at Watsonstown. They occur in Southern New England and, as rare stragglers, in Western Massachusetts. I think those that pass the summer north of the Carolinas must arrive late in the season and depart early.

GENUS III. MELANERPES. THE RED-HEADED WOODPECKERS.

Gen. Ch. *Sternum*, twice as wide as the height of the keel. *Marginal indentations*, deep, all being equal in depth to the height of the keel. *Posterior border of sternum*, emarginate. *Mandibrium*, very small. *Terminal hook of scapula*, angled on the upper and lower sides. *Tongue*, provided with extensible sheath, and the *cerato-hyals* are elongated, extending around the back of the skull as far, at least, as the orbit of the eye. *Proventriculus*, small. *Stomach*, somewhat muscular. *Salivary glands*, quite well developed. *Upper mandible*, slightly curved.

Members of this genus are marked on the head with scarlet but are not transversely banded above or below. The tail feathers are quite acuminate. The hind toe exceeds one half the length of the outer which is projected backward. There is but one species within our limits.

MELANERPES ERYTHROCEPHALUS.

Red-headed Woodpecker.

Melanerpes erythrocephalus SWAINSON, F. Bor. Am., II, 1821, 316.

DESCRIPTION

Sr. Ch. Form, robust. Size, large. *Sternum*, not very stout. *Tongue*, long, narrow, not very thin, and lony at the tip which is pointed and provided with barbs for three fourths of the terminal portion. The extensible sheath occupies about one half the length of the tongue. The salivary gland which is a hollow cylinder, lies along the maxillary bone and tongue; it measures about .10 in diameter by .85 in length. There are no laryngeal muscles, excepting the sterno-trachealis which is stout. The tympaniform membrane is present and although there is an os transversale, yet it does not support a semilunar membrane. The œsophagus is without dilatation and opens into a very small proventriculus which measures about .20 in external diameter. The gastric glands are simple, very small and placed in a zonular band which measures about .50 in width. The stomach is rather globular in form with very muscular walls that measure .30 in thickness, and the lining membrane is rugose. The fœd of the duodenum is quite long and incloses a small, narrow pancreas. The spleen is an elliptical body lying almost entirely on the proventriculus. The left lobe of the liver is only about one half as large as the right.

Color. *Adult*. Head all around, including nape, chin, throat, and upper breast, scarlet; the latter, narrowly banded with black. Basal half of wings, whole of primaries, and tail, black, with bluish reflections. Terminal half of secondaries, rump, upper tail coverts, tips of all, but central pair of tail feathers, outer web of outer pair, and under parts, including under wing and tail coverts, white, with the abdomen tinged with yellowish. Bill, bluish, black at tip. Feet, greenish-brown.

Young. There is no scarlet on the head or breast, excepting occasionally a few stray feathers; this color being replaced by dusky, overwashed above by yellowish-rufous and grayish, and streaked below by the same. The black feathers of the back and wings, including the primaries, are edged with grayish and the white is barred with rather wide bands of black. The tail is similar to that of the adult but the white markings are not as wide. The white beneath is overwashed with yellowish-rufous, and streaked on the sides and flanks with dusky. Bill, wholly black.

Nestlings. Similar to the young, but there is more yellowish-rufous above and it even extends over the back, and the dusky stripes below are more numerous. Sexes, similar in all stages.

OBSERVATIONS.

There is little, or no, variation in plumage in the adult, but one now before me has the scarlet of the head tinged with yellow, and one, a fully adult male procured at Williamsport in spring, presents a remarkable character for the feathers directly beneath the eye are grayish in color and greatly elongated, measuring about .60 in length. The young vary considerably more than the adult, the main difference being in a greater or less amount of black above and below. Readily known from all others by the description as given. Distributed in summer throughout the Eastern Section of the United States, rare in Northern New England. Winters in the Middle and Southern Portions, some remaining as far north as Pennsylvania.

DIMENSIONS.

Average measurements of eighteen specimens from Eastern North America. Length, 8.87; stretch, 17.00; wing, 5.30; tail, 3.45; bill, 1.01; tarsus, .90. Longest specimen, 9.75; greatest extent of wing, 17.50; longest wing, 5.60; tail, 3.80; bill, 1.12; tarsus, .95. Shortest specimen, 8.00; smallest extent of wing, 16.50; shortest wing, 5.00; tail, 3.10; bill, .90; tarsus, .85.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in cylinder-shaped holes, usually excavated in dead trees. Dimensions, diameter of external orifice, 2.00, greatest internal, 5.00. Internal depth, 18.00.

Eggs, four or five in number, elliptical in form, pure, polished pearly-white in color, unspotted. Dimensions from .75 x .90 to .80 x 1.00.

HABITS.

Although I have met with the Red-headed Woodpeckers at intervals from Massachusetts to Florida, I have nowhere found them more abundant than in Pennsylvania; indeed this latter named section appears to be head-quarters for them in the more eastern portions of the section of which I write and they exceed in number any other species of Woodpeckers, not excepting even the Golden-winged. I have said that the two last species described were noisy birds but the Red-heads by far exceed them in this respect and their loud and repeatedly given cries may be heard in all directions. This is especially noticeable in the open country for these Woodpeckers frequent the orchards or small groves which border streams, in preference to the woodlands. Although not as gregarious as some other species of the family, yet they are fond of the company of their own kind and it is not unusual to see four or five sporting together. The sycamore or buttonwood grows to a large size in the fertile valleys of the creeks which empty into the Susquehanna River and as the top branches of this tree frequently die, they form convenient roosts for these Woodpeckers as the withered limbs protrude above the foliage and thus the birds have an uninterrupted view of the surrounding country. Particular birds appear to choose certain trees on which to rest and, in autumn, will spend some hours every day upon them. This habit is observable during the fine days of autumn and an entire brood, consisting of the two parents and their dull-colored progeny, may be frequently seen upon one tree.

In spring, however, the Red-headed Woodpeckers are too busy to spend much time in idleness for they soon begin the duties of nest building, usually excavating the hole in an old apple-tree or in some stub that stands in the open, seldom building in the woods. At this season, they are very unsuspecting and will construct their domiciles in any tree that strikes their fancy, no matter how near a dwelling it may stand. Thus I once knew of a pair that chose an old stub, in which to place their home, which not only stood within a dozen yards of a railroad, but was also not fifty feet from a dwelling, while a foot path that was traversed daily, passed directly beneath its withered branches. Another pair had selected a dead limb in a buttonwood that grew by the side of an elevated tram-way, only a short distance from a saw-mill and the hole in which the nest was placed could almost be reached with the hand as one stood upon the wooden railway over which workmen were constantly pushing cars laden with lumber. In both cases, the birds appeared to be perfectly accustomed to all the bustle and din attendant upon localities which were in such close proximity to the busy haunts of man. I have frequently passed within a few feet of

the birds as they sat near the nests, without their paying the slightest attention to me. In the first instance, the nest was quite low, not over ten feet from the ground but I have taken the eggs from the lofty limb of a buttonwood, sixty feet high.

The Red-headed Woodpeckers begin to drill the holes for their nests in early May but the full complement of eggs is not deposited until June. The young leave the nest about the first of August and, as related, accompany their parents for some time. At this season, they resort to the gum trees in great numbers in order to feed upon the acid berries which grow in profusion but they also eat large quantities of insects and, like the Yellowbellies, are quite expert flycatchers. Most of the Red-headed Woodpeckers leave Pennsylvania about the last of October but a few remain all winter.

GENUS IV. COLAPTES. THE SPOTTED WOODPECKERS.

GEN. CH. *Sternum, not twice as wide as the height of the keel. Marginal indentations, deep, all being equal in depth to the height of the keel. Posterior border of sternum, emarginate. Manubrium, quite large. Terminal hook of scapula, rounded on the upper and lower sides. Tongue, provided with a long, extensible sheath, and the cerato-hyals are greatly elongated and, extending around the back of the skull and over the top of it, enter the right nostril. Proventriculus, large. Stomach, muscular. Salivary glands, well developed. Both mandibles, curved.*

Members of this genus are usually marked on the occiput with scarlet and are transversely banded above and spotted below. The tail feathers are quite acuminate. The hind toe exceeds one half the length of the outer which is projected backward. There is but one species within our limits.

COLAPTES AURATUS.

Golden-winged Woodpecker.

Colaptes auratus SWAINSON, Zool. Jour., III; 1827, 353.

Colaptes Mexicanus SWAINSON, Syn. Mex. birds in Philos. Mag., I; 1827, 410.

Colaptes hybridus BAIRD, Birds N. A.; 1858, 122.

DESCRIPTION.

SP. CH. Form, robust. Size, large. Sternum, stout. Tongue, long, not very thin, and horny at the tip which is provided with barbs for one third of the terminal portion. The extensible sheath occupies about one half the length of the tongue. The salivary glands are large, flat, somewhat triangular in form, and measure about 2.40 in length by .30 in width at the base; the ducts are at the terminal extremity and open under the tongue. There are no laryngeal muscles, excepting the sterno-trachealis which is stout. The tympaniform membrane is present and although there is an os transversale, yet it does not support a semilunar membrane. The oesophagus is without dilatation and opens into a very large, globular proventriculus which measures about .70 in external diameter. The gastric glands are rather numerous, not simple, being oval in form with four small protuberances emerging at equal intervals from the central circumference. They only occupy the lower portion of the proventriculus and are packed on a surface which is triangular in form, with the base which measures about .80 in width, toward the oesophagus and the apex which is .75 from the base, toward the stomach. Thus the upper portion of the proventriculus is destitute of glands but is provided with a mucus membrane. The stomach is rather flat in form with very muscular walls that measure .30 in thickness. The lining membrane is soft, similar to that which covers the proventriculus. The fold of the duodenum is quite long and rather twisted, inclosing a pancreas which is wide and of irregular form. The spleen is an elliptical body lying partly on the proventriculus and partly over the pyloric opening of the stomach. The left lobe of the liver is more than one half as large as the right.

COLOR. *Adult male.* Head and nape, slaty-ash. Back and wings, excepting primaries, yellowish-ash, transversely barred with dark-brown. Primaries and tail, dark-brown; the former, slightly barred on the outer and inner webs, the latter on the outer webs of extreme outer, and the inner webs of central pair, with yellowish-ash. Shaft of wing feathers and upper tail coverts, under wing coverts and axillaries, under sides of wings and tail, excepting tip, bright golden-yellow. Sides of head and entire under parts, including under tail coverts, reddish-ash, lightest anteriorly. Patch on cheek, broad crescent on breast, round spots on under side of body back of breast and on under tail coverts, black. There is a band of

scarlet around occiput. Ramp and upper tail coverts, white, while the feathers of the latter are marked in lines, edgings, spots, and bars of black. Bill, brown. Feet, bluish. Iris, reddish.

Adult female. Colored almost exactly like the adult male, excepting that there is no black patch on the cheek and the colors below are perhaps a trifle lighter.

Adult in autumn. Quite similar to the spring dress but darker, especially above, while there are strong traces of ashy on the throat.

Nestling male. Retains, to a great extent, the pattern of marking seen in the adult. The black bandings above are much broader. The tail is not barred but is edged on the outer webs with yellowish-white. The under parts are lighter and the spots are not as dark nor is the crescent as long but the cheek patches are large. The top of the head is sprinkled with red and the scarlet crescent is very wide.

Nestling female. Quite similar to the above described for, strangely enough, the black cheek patches are almost always present.

OBSERVATIONS.

There is considerable variation in amount of color and especially in the size of the spots which are larger in some than in others. In regard to the highly colored Red-shafted Flicker, I am convinced that it is identical with our species for, as we proceed Westward, we find that the two forms grade insensibly into each other. Even in the East, notably in Pennsylvania, it is not unusual to find specimens showing red feathers in the black of the cheek patches. Specimens taken in Florida are not only smaller in size but are darker in color than those from New England. Distributed in summer throughout the Eastern Section of the United States. Winters in the Middle and Southern Portions, some remaining as far north as New England.

DIMENSIONS.

Average measurements of nineteen specimens from New England. Length, 12.50; stretch, 19.25; wing, 5.93; tail, 4.35; bill, 1.25; tarsus, 1.05. Longest specimen, 13.00; greatest extent of wing, 20.00; longest wing, 6.27; tail, 4.70; bill, 1.40; tarsus, 1.00. Shortest specimen, 12.00; smallest extent of wing, 18.50; shortest wing, 5.60; tail, 4.05; bill, 1.00; tarsus, 1.00.

Average measurements of twenty-four specimens from Florida. Length, 12.37; stretch, 18.75; wing, 5.30; tail, 4.40; bill, 1.25; tarsus, .97. Longest specimen, 12.75; greatest extent of wing, 19.50; longest wing, 6.00; tail, 4.85; bill, 1.45; tarsus, 1.15. Shortest specimen, 11.00; smallest extent of wing, 18.00; shortest wing, 1.60; tail, 3.95; bill, 1.05; tarsus, .80.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in cylinder-shaped holes, usually excavated in dead trees. Dimensions, diameter of external orifice, 2.50, greatest internal, 5.00. Internal depth, 18.00.

Eggs, six to eight in number, elliptical in form, pure, polished pearly-white in color, unspotted. Dimensions from .75 x .90 to .80 x 1.00. A specimen from Florida, collected by Mr. Fred A. Ober, measures .90 x 1.15. The number of eggs deposited in Florida is from four to five.

HABITS.

The Golden-winged Woodpeckers have a wide distribution and their well-known notes are to be heard among the palms which border the wide-spread savannas of the extreme southern main-land of Florida, in the trackless piney woods which occupy so much of the country along the Atlantic sea-board, in the fertile valleys of Pennsylvania, and among the pleasant hill-side farms of New England. As they are not only showy birds and consequently attract attention, but also make themselves conspicuous by their loud cries, they are noticed by nearly every one and, therefore, receive a quantity of appellations many of which are to be found in the table of local names given at the end of the present volume.

During the mild days of early spring in Massachusetts, while the snow still lingers in the shadow of woods and on northern exposures, the rapidly given call notes of this species may be heard coming from the apple orchards. A little later, when the season has become so far advanced as to preclude all possibility of a return of cold weather, these Woodpeckers may be seen together in small companies and then the cry which is probably

a substitute for a song, is given. This rude lay which consists of a series of notes uttered with increasing rapidity, terminating abruptly, is so harsh as to be somewhat disagreeable when heard near at hand but, mellowed by distance and mingled with the carol of the Song Sparrow, the warble of the Blue Bird, the piping of the hylas in the meadows, and other sounds so characteristic of the opening spring-time, it is far from unpleasant. A little later in the season, the notes, sounding like the syllables, *yu-ca*, uttered in a peculiar manner, announces that the breeding season is approaching.

Small companies may be seen, pursuing one another about the trunks of trees or among the branches, dodging about, now under, now over, the limbs, or dashing through the air, only to alight on the next tree, where they will resume their sportive antics. These evolutions are performed with ease, for the Golden-wings glide along the branches smoothly, usually without the jerking motion of the head, observable in many other members of the family; and withal, they are exceedingly agile, all their movements being performed with marvelous rapidity.

About the first of May, the Golden-winged Woodpeckers begin to excavate the holes for their nests. They almost always select a dead trunk or limb for this purpose but will occasionally choose a living tree. The labor of drilling is performed quite expeditiously, both sexes being employed. The bits of wood removed are conveyed to a distance or scattered over the ground near the base of the tree which contains the nest; but it is noticeable that when the hole is being made in wood which is quite solid, the chips are carried to a greater distance than when the task is performed upon a partly decayed tree. Thus I found a newly finished nest, only a few days ago, which was built in an old apple-tree, the wood of which was so punky that it crumbled in my hand, and the ground about the base of the trunk was fairly whitened with the chips.

It is wonderful to observe with what ease these Woodpeckers penetrate hard, dry wood. I once kept a Golden-winged Woodpecker in a cage which was only wired on one side. After remaining quietly in confinement for a day or two, the bird began, one morning, to drill in the board which formed the side of his prison and, in an incredible short space of time, had formed a hole of sufficient size to enable him to escape into the room. I closed the hole by nailing a piece of wood over it and then replaced the bird but he promptly commenced operations in the same place, quickly emerging again on the outer side. I noticed that the wood upon which he was working was saturated with moisture that was evidently saliva secreted by glands which lie along the sides of the lower mandible. I do not understand why the bird wet the wood for it must tend to toughen it, especially if it were pine or spruce; yet it might have a different effect upon the dead limbs of trees.

The bird of which I have been speaking, became quite tame, after a short time and, although I allowed him the liberty of the room, he would always go into the box to eat or roost. The door of his cage generally stood open, yet he would almost always avail himself of the hole which he had made as a place of entrance and exit. It is observable that when these birds wish to enter a barn, which they do quite frequently, especially in winter, they will always do so by a hole of their own excavating and, when surprised in their

retreat, will always dart out of this particular hole, even if the sides be full of orifices through which they might readily escape into the open air.

As remarked, barns are the favorite resorts of these Woodpeckers in some sections during winter, yet I never knew of their nesting in them but they do use ice-houses for this purpose at Hyannis, Massachusetts, depositing their eggs in cavities made in the sawdust which is used as a packing between the double walls. The eggs are laid in New England about the first week in May, a little later in Pennsylvania, but I found them in Florida early in April.

The bears of the latter named section, especially in the vicinity of Indian River, have the singular habit of ascending the palmettos and tearing out the tender last growth in order to eat it, thereby killing the trees; thus there are many of the leafless trunks along the margin of the hammocks. These form excellent breeding places for the Golden-winged Woodpeckers and they almost invariably select them for this purpose. This species is fond of insects but feeds largely on ants and many that I have dissected, both North and South, had their stomachs crammed with them. These birds are quite expert at taking insects on the wing and may frequently be seen in autumn engaged in this occupation. They are also very fond of pears and apples but will seldom attempt to eat them unless they be overripe. They are partial to corn when it is in the milk and the one which I had in confinement fed almost entirely upon meal. The Golden-winged Woodpeckers remain in New England until late in autumn but with the first snow the majority disappear, a few remaining all winter.

GENUS V. HYLATOMUS. THE BLACK WOODPECKERS.

GEN. CH. *Sternum*, nearly twice as wide as the height of the keel. *Marginal indentations*, not equal in depth to the height of the keel; *outer*, more shallow than *inner*. *Mancubrium*, moderate. *Terminal hook of scapula*, rounded on upper and lower sides. *Tongue*, provided with a long, extensible sheath, while the *cerato-hyals* are greatly elongated and extend around the back of the skull. *Proventriculus*, very large. *Stomach*, not very muscular. *Salivary glands*, quite well developed. *Both mandibles*, straight. *Head*, crested.

Members of this genus are marked on the top of the head with scarlet but the prevailing color on the body is black, relieved by markings of white. The tail feathers are quite acuminate. The hind toe exceeds one half the length of the outer which is projected backward. There is but one species within our limits.

HYLATOMUS PILEATUS.

Pileated Woodpecker.

Hylatomus pileatus BAIRD, Birds N. A. : 1858, 107.

DESCRIPTION.

SP. CH. Form, robust. Size, large. *Sternum*, stout. *Tongue*, rather thin and horny at the tip which is provided with barbs for two thirds of the terminal length. The extensible sheath occupies about one half of the length of the tongue. The salivary glands are moderate in size. There are no laryngeal muscles, excepting the sterno-trachealis which is stout. The tympaniform membrane is present and although there is an os transversale, yet it does not support a semilunar membrane. The oesophagus is without dilatation and opens into a very large, somewhat cylindrical, proventriculus which measures about 1.05 in external diameter by 1.75 in length. The gastric glands are rather numerous, simple, and occupy a wide zonular band. The stomach is rather flat in form and quite small, measuring .65 in external width. The walls are not very muscular, and the lining membrane is finely rugose. The fold of the duodenum is quite long, inclosing a wide pancreas which is of a very irregular form. The spleen is an elliptical body lying over the proventriculus. Both lobes of the liver are about equal in size.

Color. Adult male. General color throughout, sooty-black with the throat, line extending from nostril, down the sides of neck, to the side of upper breast, line back of eye, extreme tips of primaries, basal half of primaries, excepting outer webs of inner two, basal half of secondaries, and narrow tipplings to feathers of sides, white. Top of head, including occiput, eye t, and maxillary patches, scarlet.

Adult female. Similar to the male, but lacks the scarlet maxillary patch which is replaced by black, and the anterior portion of the head is sooty-brown with the feathers tipped with yellowish.

Young. Differs from the adult in having more white edgings to the feathers below while a sulphury tinge pervades the broad white markings of the head and is especially noticeable beneath the wing, but there are few, or no, white tipplings to the primaries. Iris, yellow, bill, black, bluish at base of lower mandible, and feet, greenish-brown, in all stages.

OBSERVATIONS.

This Woodpecker is readily distinguished from all others, excepting the Ivory-billed, by its superior size, and from this latter named species by the almost uniform color above as well as by the black bill. Specimens vary but little; occasionally a female will have scarlet feathers dotting the darker patch of the anterior portion of the head and the amount of white especially the tipplings of the wings, is not always the same. Specimens from Florida are much smaller than those from Maine but are only slightly darker in shade. Distributed as a constant resident, throughout North America but are found only in the heavily wooded districts.

DIMENSIONS.

Average measurements of seven specimens from the North. Length, 18.25; stretch, 28.50; wing, 9.00; tail, 6.75; bill, 2.35; tarsus, 1.30. Longest specimen, 18.75; greatest extent of wing, 29.00; longest wing, 9.50; tail, 7.00; bill, 2.50; tarsus, 1.40. Shortest specimen, 17.50; smallest extent of wing, 23.00; shortest wing, 8.50; tail, 6.50; bill, 2.25; tarsus, 1.20.

Average measurements of sixteen specimens from Florida. Length, 16.32; stretch, 26.50; wing, 8.50; tail, 6.02; bill, 1.75; tarsus, 1.30. Longest specimen, 17.50; greatest extent of wing, 23.00; longest wing, 9.00; tail, 6.75; bill, 2.10; tarsus, 1.50. Shortest specimen, 15.15; smallest extent of wing, 25.00; shortest wing, 8.00; tail, 5.30; bill, 1.19; tarsus, 1.10.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in cylinder-shaped holes, generally excavated in dead trees. Dimensions, diameter of external orifice, 3.00, greatest internal, 6.00. Internal depth, 20.00.

Eggs, four to six in number, elliptical in form, pure, polished pearly-white in color. Dimensions from .90 x 1.05 to .95 x 1.10.

HABITS.

No one who has studied the habits of birds, will hesitate to say that Woodpeckers, as well as carpenters, may be known by their chips. When we see small bits of wood lying about the base of a tree, we are sure that some of the smaller species have been at work; larger pieces indicate that the labor has been performed by the Golden-wing, but when we meet with a tree trunk denuded throughout its entire extent and the bark lying in piles at its roots, often in blocks six inches square, it becomes obvious that such a task could have been accomplished by no other than the Great Pileated Woodpecker. The sound of his hammer and chisel is also remarkable, for none among the Woodpeckers, save the Ivory-bill, can strike such resounding blows, each of which produces a marked effect. All this labor is performed for the sake of finding insects, for the Pileated is the most indefatigable of all the family in hunting this kind of prey. They are also very fond of ants and I have frequently found them, both in Pennsylvania and farther south, at work on prostrate trees which were inhabited by these insects. They will eat fruit and are partial to the berries of the palmetto, feeding, in Florida, upon little else when these are in season.

In general habits, this large Woodpecker does not differ especially from the Golden-wing. The notes are not strikingly unlike, those of the Pileated being, of course, louder and they end more abruptly. Both have the same, energetic way of throwing the head back when at work, in order to glance quickly around, and the flight of both is similar;

while, in the wilds of Florida, where neither are shot, one is as unsuspecting as the other, for I have often walked within twenty yards of the Pileated, even when there was nothing to conceal me from the bird.

The Pileated Woodpeckers inhabit the huge forests of Northern New England, never occurring in small growths of timber; hence are now seldom, if ever, found in Eastern Massachusetts although they are occasionally taken in the western portion of the state. They are not uncommon in the mountain valleys of Pennsylvania but I found them much more common as I proceeded south and in the uninhabited sections of Florida, they are very abundant.

The Pileated Woodpeckers are found in this latter named section, both in the hummocks and in the piney woods. It is probable that they breed in both kinds of woodland but the only nest that I ever saw was built in a dead stub which stood on the edge of a clearing at Miami. I had noticed a pair of these Woodpeckers, flying about the place, early in March and, although I conjectured that they were either drilling their hole or about to do so, it was not until the twenty-eighth of the month, that I chanced to discover their home.

It was placed in a fire-blackened stub which was about three feet in diameter and the opening to the nest was, at least, thirty feet from the ground. I did not attempt to ascend to it that day as I was unprovided with any instruments with which to enlarge the hole. The next day, I returned with a small ax which I had borrowed of a cracker woman who lived near, and with great difficulty, managed to scramble up the trunk. This labor was not only arduous, but decidedly unpleasant, for the surface of the wood was reduced to charcoal which crumbled into a fine, black dust beneath my grasp. At length, however, I reached a projecting limb beneath the nest and, fortunately, near enough for me to reach it conveniently. At this stage of my proceedings, the female bird darted out of the hole and, now certain of obtaining the eggs, I at once began to cut the tree. As I was obliged to hold on with one hand and wield the ax with the other, I could not make over half a dozen strokes without stopping to rest. The tree was old, having evidently been dead for years and the wood was as hard as ivory; thus, although I labored diligently, only pausing to wipe away the perspiration that streamed down my cheeks or to clear my eyes of the dust, it was two hours before I had opened a hole of sufficient size to enable me to reach the bottom of the orifice. I eagerly thrust in my hand and—found nothing but chips. I do not believe that there was a more disappointed man than myself in the whole state of Florida. I slid down the tree in no enviable state of mind and, going to the cracker's shanty to return the ax, was greeted with a look of surprise from the woman who owned the place, which quickly gave way to one of amusement followed by loud laughter. Indignant at such treatment after my ill success, I was about to turn away without a word, when she held up a small looking-glass before me and a glance showed me the cause of her merriment. The charcoal dust combined with the moisture had so completely covered my face that I was as black as the blackest ducky that ever boasted of African origin. A vigorous washing with soap and water soon set this to rights and I then took my way campward, fully determined not to trust to outward appearances again when I found a Pileated

Woodpecker's nest. Upon returning to the same tree, a short time after, I started the female from her dilapidated nest; in a day or two after this, however, I sent a negro lad up into the same tree in order to secure the eggs of a Sparrow Hawk which were placed in a natural cavity in a limb, at least sixty feet in air, and when passing the nest of the Woodpecker, he looked in but neither of the birds were present nor did I see them in the neighborhood, so concluded that they had deserted their home. I have little doubt, however, but that the birds would have deposited their eggs in that nest, had I taken more care in opening the cavity.

The Pileated Woodpeckers are not at all migratory, being constantly resident, even in Northern Maine, although it is highly probable that they wander in the North during winter. In Florida, however, when a pair become attached to any particular locality, they seldom, if ever, leave it but spend their entire lives in a limited area.

GENUS VI. CAMPEPHILUS. THE SCARLET-CRESTED WOODPECKERS.

GEN. CH. *Sternum*, not twice as wide as the height of the keel. *Marginal indentations*, equal in depth to about one half the height of the keel; outer, more shallow than inner. *Manubrium*, very small. *Terminal hook of scapula*, nearly straight on the upper, and rounded on the lower, side. *Tongue*, provided with a long, extensible sheath, while the *cerato-hyals* are greatly elongated and extend around the back of the skull. *Proventriculus*, quite large. *Stomach*, not very muscular. *Salivary glands*, quite well developed. *Both mandibles*, straight. *Head*, crested.

In members of this genus, the males are marked on the occiput with scarlet. The prevailing color on the body is black, relieved by conspicuous markings of white, especially on the wings. The tail feathers are quite acuminate. The hind toe is about one half the length of the outer which is projected backward. As in the preceding genus, the head is large and the neck long and thin. There is but one species within our limits.

CAMPEPHILUS PRINCIPALIS.

Ivory-billed Woodpecker.

Camppephilus principalis GRAY, List of Genera; 1840.

DESCRIPTION.

SP. CH. Form, robust. Size, large. *Sternum*, stout. *Tongue*, rather thin and horny at the tip which is provided with barbs for two thirds of the terminal length. The extensible sheath occupies about one half of the length of the tongue. The salivary glands are moderate in size. There are no laryngeal muscles, excepting the sterno-trachealis which is very stout. The tympaniform membrane is present and although there is an os transversale, yet it does not support a semilunar membrane.

COLOR. *Adult male*. Uniform glossy black having greenish reflections, with a line from below the ear coverts, running down the neck, broadening on the shoulders, and extending along the back, short line at base of bill, not reaching the eye, exposed portion of primaries and basal portion of two or three inner primaries, and under wing coverts, white. Occiput, and portion extending forward nearly to the eye, forming a point, and back of upper neck, scarlet.

Adult female. Similar to the male, but lacks the scarlet on the head which is replaced by black. Iris, yellow, bill, ivory-white, feet, greenish, in all stages.

OBSERVATIONS.

This species may be at once distinguished from all the others which occur within our limits, by the large size, white bill and secondaries. They are constantly resident in Florida and are found rarely in the other Gulf States as well as in the Carolinas and along the Mississippi Valley to Southern Illinois.

DIMENSIONS.

Average measurements. Length, 20.35; stretch, 31.00; wing, 9.30; tail, 6.35; bill, 2.75; tarsus, 1.80. Longest specimen, 21.00; greatest extent of wing, 32.00; longest wing, 9.60; tail, 6.50; bill, 2.80; tarsus, 2.00. Shortest specimen, 19.75; smallest extent of wing, 3.00; shortest wing, 9.00; tail, 6.25; bill, 2.65; tarsus, 1.60.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in cylinder-shaped holes, generally excavated in living trees. Dimensions, diameter of external orifice, 4.00, greatest internal, 7.00. Internal depth, 20.00.

Eggs, four to six in number, elliptical in form, pure, polished pearly-white in color. Dimensions (approximate) from .95 x 1.10 to 1.00 x 1.15.

HABITS.

The Ivory-bill, prince among Woodpeckers, once abundant throughout the Southern States, north to the Carolinas on the east and up the Mississippi Valley to Illinois on the west, is now quite rare, being restricted to very limited areas. Even in Florida, that last strong hold for many species of birds which are in danger of being exterminated, it is common in but one section. This is the Gulf Hummock, an extensive track of heavily wooded land, uninhabited, save by camps of cedar hunters, which extends from the Suwannee River, eastward, nearly to the Oclawaha. Here they are quite numerous for they are seldom, if ever, disturbed. They also occur regularly, but rarely, in a belt of country between the Gulf Hummock and the lagoons which extend along the Atlantic coast. Although they were not unfrequent in the latter named section some ten years ago, at the present time, they are quite rare for they have not only been persistently hunted by collectors, but many have met their fate at the hands of tourists who appear to consider all birds in Florida larger than a Sparrow as legitimate prey.

The Ivory-billed Woodpeckers inhabit the thick hummocks and swamps, seldom appearing in the piney woods, but one who is skilled in interpreting bird notes, will have no difficulty in detecting their presence for their loud cries which differ considerably from those uttered by the Pileated, are constantly given when the birds are feeding. When once heard, they may be approached quite readily as they are not generally very shy. I have been informed by the cedar hunters that this species always nests in living trees, generally huge live-oaks, beginning to build during the latter part of February.

These large and handsome Woodpeckers generally go in pairs throughout the year and, as they do not wander much, even in winter, certain birds may always be found in particular sections of a hummock or swamp. When flying, they are silent, moving with a heavy, rather undulating, flight, similar to that of the Pileated Woodpecker but the Ivory-bills may always be distinguished, even when at a distance, by the snowy whiteness of their secondaries. Like many species of this family, they appear to have a predilection for the vicinity of water and I have frequently observed them crossing the St. John's River in advance of the steamer on which I was proceeding up the stream.

This occurred some years ago but I doubt if, at the present time, many of these noble Woodpeckers are to be found in the vicinity of the St. John's, for it is a lamentable fact, that they are rapidly becoming exterminated in all sections of Florida which are visited by tourists.

As related, the last strong hold of the Ivory-billed Woodpecker is in the Gulf Hummock but how long they will remain unmolested in this fastness, is a problem which the settlement of that portion of the country will solve before many years have passed. Then, unless they be protected by stringent laws, they will disappear from the surface of the

globe. The probable extinction of any species of bird appears to me worthy the attention of the National Government, for such a calamity is to be deplored by the entire Scientific World. Some efforts have been made by the Florida legislature to protect birds which occur in that state from wanton destruction but I understand that these laws have been repealed. If this be a fact, such a proceeding cannot be too severely censured for, unless such attractive birds as the Herons, Spoonbills, Parakeets, Anhingas, Ivory-billed Woodpeckers, etc., etc., be protected by urgent laws, it will not be many years before Florida, once so famous for the varied hues of her feathered tribe which added so much to the picturesque beauty of her winding streams and wooded shores; Florida! the land of flowers and of birds, will have lost one of her greatest charms—the birds: and, if it were possible for the hand of vandalism to destroy them, I doubt if it would even leave her the flowers. Should not we, then, who love to contemplate the unmolested beauties of Nature, make an effort to preserve them for the enjoyment of the coming generations? I, for one, think so and let us keep in mind that, if this is to be done at all, it must be done quickly, certainly as regards such birds as the Ivory-billed Woodpecker.

GENUS VII. PICUS. THE BLACK AND WHITE WOODPECKERS.

GEN. CH. *Sternum*, not twice as wide as the height of the keel. *Marginal indentations*, nearly equal in depth to the height of the keel; *outer*, more shallow than *inner*. *Manubrium*, moderate. *Terminal hook of scapula*, variable. *Tongue*, provided with a long, extensible sheath, while the *cerato-hyals* are greatly elongated and extend around the back of the skull. *Proventriculus*, small. *Stomach*, not very muscular. *Salivary glands*, not very well developed. *Both mandibles*, straight. *Head*, not crested.

In members of this genus, the prevailing color above is black, relieved by white markings and the males are marked, to a greater or less extent, on the occiput with scarlet. The tail feathers are very acuminate. The hind toe is less than one half the length of the outer which is projected backward. The head is not strikingly large nor is the neck very thin. The bill is about equal to the head in length. There are no laryngeal muscles, excepting the sterno-trachealis which is very stout. The tympaniform membrane is present and although there is an os transversale, yet it does not support a semilunar membrane. The cesophagus is without dilatation and opens into a small proventriculus which measures about .15 in external diameter by .30 in length in *borcalis*. The gastric glands are rather numerous, simple, and occupy a zonal band. The stomach is rather globular in form and quite large, while the walls are not very thick, and the lining membrane is finely ruffled. The fold of the duodenum is not very long, inclosing a wide pancreas. The spleen is an elliptical body lying over the cardiac opening of the stomach. Both lobes of the liver are about equal in size. There are three species within our limits.

PICUS VILLOsus.

Hairy Woodpecker.

Picus villosus LINN., Syst. Nat., 4, 1766, 175.

DESCRIPTION.

SP. CH. Form, robust. Size, large. Sternum, stout. Tongue, rather thin and horny at the tip which is provided with barbs for one third of the terminal length. The extensible sheath occupies about one half of the length of the tongue. Terminal hook of scapula, angled above and below.

COLOR. *Adult male*. Glossy black above, including sides of head and line extending down on to the sides, with the bristly feathers at base of bill, line extending from just in front of eye, inclosing it, and reaching occiput, line from the base of bill, running down sides of neck, broad line along middle of back, spots on outer webs of wing feathers, all but basal portion of three outer tail feathers, and tips of next pair, white. Patches on sides of occiput, scarlet. Under portion, including under wing coverts, white, with the latter spotted with black on the center of the second row of feathers.

Adult female. Similar to the male, but lacks the scarlet on the head which is replaced by black, and the white on the tail is not as extended.

Young. There is a sulphury tinge to the white markings, and the inner white tail feather is tipped with black, in both sexes and, in the male, the scarlet patch on the occiput is more restricted; otherwise similar to the adult. Iris, reddish-brown, bill, black, bluish at base of lower mandible, and feet, bluish, in all the preceding stages.

Nestling male. Very much tinged on the white with sulphury, the forehead is spotted with white, and the top of the head is spotted with scarlet; otherwise as in the young female.

Nestling female. A specimen before me, belonging to the Bangs Brothers, taken from the nest in Lincoln, Massachusetts, on the eighteenth of June, 1877, and which was only half grown, has the forehead spotted with white and is slightly tinged with sulphury on the white; otherwise similar to the young female.

OBSERVATIONS.

Specimens from the South, although smaller in size, do not differ strikingly in color. They may, however, be a trifle darker as an average but there is considerable variation in this respect in birds from all sections; thus, a skin taken at Smithville, North Carolina, shows as much, or more, white as any from Pennsylvania or from further north. As there is a most perfect gradation in size, from the large northern variety to the small southern one, I do not see the feasibility of applying a name to either extreme as it is not possible to draw a line between them, and the same remarks might be applicable to almost any geographical race, unless it be separated from its allies by some natural division which prevents any two forms from intergrading. Distributed, as a constant resident, throughout North America.

DIMENSIONS.

Average measurements of seven specimens from New England. Length, 9.85; stretch, 14.70; wing, 4.83; tail, 3.55; bill, 1.23; tarsus, .92. Longest specimen, 10.50; greatest extent of wing, 16.50; longest wing, 5.07; tail, 1.00; bill, 1.36; tarsus, 1.00. Shortest specimen, 9.20; smallest extent of wing, 13.00; shortest wing, 1.60; tail, 3.10; bill, 1.10; tarsus, .85.

Average measurements of five specimens from Florida. Length, 8.70; stretch, 11.00; wing, 4.65; tail, 2.97; bill, 1.02; tarsus, .67. Longest specimen, 9.90; greatest extent of wing, 15.00; longest wing, 4.75; tail, 3.20; bill, 1.05; tarsus, .75. Shortest specimen, 8.50; smallest extent of wing, 13.00; shortest wing, 4.50; tail, 2.75; bill, 1.00; tarsus, .60.

DESCRIPTION OF NESTS AND EGGS.

Nests placed in cylinder-shaped holes, generally excavated in dead trees. Dimensions, diameter of external orifice, 2.00; greatest internal, 2.50. Interval depth, 15.00.

Eggs, four or five in number, elliptical in form, pure, polished pearly-white in color. Dimensions from 65x.70 to 75x.80.

HABITS.

The Hairy Woodpeckers have, like the Golden-wing, a wide distribution, being found in nearly all localities from Maine to Florida but, in some sections, they are much more common than in others. Thus, I have found them exceedingly abundant in the vast forests of Northern Maine in autumn but, in Massachusetts, they are not of very frequent occurrence, even in fall or winter, and are rare in summer. They occur in all the wooded sections of Pennsylvania as a moderately common resident, are not unusual south of this point, especially in the Carolinas, and in Florida, I have taken them quite frequently, although, when compared with many other of the smaller Woodpeckers, as regards numbers, in a section where representatives of the families are so abundant, they appear quite uncommon, for I did not find one Hairy where I found a hundred of the Cockaded or Red and Yellow-bellied.

Although these Woodpeckers are found in such a vast extent of country, their habits do not differ noticeably, neither do those which live in the piney woods of Florida, utter any different notes from those which inhabit the forests of Maine. It is observable, however, that in the South, the harsh, abruptly given cry is not repeated as frequently as in the North, neither is the rattling call produced by striking the bill on a dead limb, made as often; in fact, the Woodpeckers of Florida, of all species, appear to be affected by the enervating climate and are thus much more indolent than birds of the same species which

are hatched in more boreal climes. I do not mean to say that Florida Woodpeckers have absolutely no energy, for energy is as much one of the characteristics of a Woodpecker as is his wedge-shaped bill or acuminate tail, but only, that they do not exhibit this quality to such an extensive degree as do their northern brethren. This lack of enterprise in Southern Hairys is also shown in a peculiar way for, although all members of the family are far from being neat, regarding their plumage, yet this is not always as observable as in specimens from Florida. The piney woods, in this section, are very often burned; consequently, the tree trunks are more or less blackened and, as the Woodpeckers run up and down on them, the white feathers of the under parts become tinged with it; therefore, as the birds neglect to clean themselves, in course of time, they become nearly, or quite, as dusky below as above. Birds of this species from Pennsylvania and Massachusetts are generally quite clean but those from Maine and further north, have their tails stained by the tannic acid from the hemlock bark. Thus, aside from size, it is quite easy to tell in what section on the coast any particular specimen was taken by observing these extraneous marks. Thus I have noted that the Hairy Woodpeckers which occur in Massachusetts in winter, seldom have buff-stained tails; consequently, judge that they do not come from far north, yet the species is partly migratory for, during some extreme cold seasons, we do occasionally have a flight of northern Hairy Woodpeckers.

I have never seen the nest of Hairy Woodpeckers but judge that they breed early. I found a hole, however, containing young, during the first week in June at Williamsport, Pennsylvania. I ascended to the nest which was built in a small dead poplar at an elevation of about twenty feet. As I was unable to reach the young, I could not ascertain how old they were but, judging by the loud, continuous, hissing noise which they made, they must have been quite well advanced. The nest of this species is seldom found in Eastern Massachusetts and I know of but two instances of its having been taken here; one, as related under description, in Lincoln on the eighteenth of June, 1877, by the Bangs Brothers, which contained young about half grown, and a second, by Mr. H. A. Purdie, in Concord on the thirtieth of May last past (1879). This one contained eggs nearly ready to hatch. Thus we may judge that the eggs are deposited about the tenth of May in Massachusetts, a little later in Maine, a week or so earlier in Pennsylvania, and considerably in advance of this time as we proceed southward.

The Hairy Woodpeckers, as far as I have observed, feed entirely upon insects, largely upon the larvæ of the boring beetle. They have been accused of eating the inner bark of trees and, although this charge can scarcely be proved against our Eastern birds, it appears that the same species West is not above suspicion in this respect. This bark-eating propensity must be indulged in to a limited extent and few, if any, who have given the matter close attention, will venture to assert that the Hairy Woodpeckers are not very useful birds.

The Hairy Woodpeckers occur as far south as Middle Florida but I never saw a specimen at Miami or among the Keys although it is probable that they occur rarely in all sections of the main-land but I do not think that they breed south of Cape Canaveral on the East, yet they are found a little further south on the West.

PICUS PUBESCENS.

Downy Woodpecker.

Picus pubescens LINN., Syst. Nat., I: 1766, 15.

DESCRIPTION.

Sp. Ch. Form, not robust. Size, small. Sternum, not very stout. Tongue, rather thin and horny at the tip which is provided with barbs for one third of the terminal length. The extensible sheath occupies about one half of the length of the tongue. Terminal hook of scapula, angled above and below.

Color. *Adult male.* Glossy black above, including sides of head and the line extending down on to the sides, with the bristly feathers at base of bill, line extending from just in front of eye, inclosing it, and reaching occiput, line from the base of bill, running down sides of neck, broad line along middle of back, spots on outer webs of wing feathers, all but basal portion of three outer tail feathers, and tips of next pair, white; but the white of the tail is more or less barred with black. Crescent-shaped mark on the occiput, scarlet. Under portion, including under wing and tail coverts, yellowish-white.

Adult female. Similar to the male, but lacks the scarlet on the head which is replaced by white, and the white on the tail is not as extended.

Young. There is a decidedly sulphury tinge to the white markings, and the inner white tail feathers are almost entirely black, in both sexes and, in the male, the scarlet patch on the occiput is more restricted; otherwise similar to the adult.

Nesting male. Very much tinged on the white with sulphury, the forehead is black, occasionally spotted with white, and the top of the head is covered with scarlet, but there is a white line crossing the occiput.

Nesting female. Similar to the male, but usually has the forehead spotted with white and the top of the head is black. A specimen before me, an undoubted female of my own dissecting, has the feathers on the top of the head slightly tipped with scarlet. Iris, reddish-brown, bill, black, bluish at base of lower mandible, and feet, bluish, in all stages.

OBSERVATIONS.

As in the preceding species, specimens from the South, although smaller in size, do not differ strikingly in color, for there is considerable variation in this respect in birds from all sections. The nestling plumage is worn but a short time, especially the scarlet on the head which is soon replaced by the normal color. The Hairy and Downy Woodpeckers may be distinguished from all others which occur within our limits by the broad white line down the back. The Downy may be known from the Hairy, not only by the smaller size, but also by the banded white on the tail. Distributed, as a constant resident, throughout North America.

DIMENSIONS.

Average measurements of fourteen specimens from New England. Length, 6.90; stretch, 11.68; wing, 3.70; tail, 2.15; bill, .67; tarsus, .89. Longest specimen, 7.15; greatest extent of wing, 12.25; longest wing, 3.90; tail, 2.85; bill, .70; tarsus, .90. Shortest specimen, 6.25; smallest extent of wing, 1.92; shortest wing, 3.50; tail, 2.19; bill, .55; tarsus, .70.

Average measurements of five specimens from Florida. Length, 6.30; stretch, 11.40; wing, 3.60; tail, 2.17; bill, .67; tarsus, .65. Longest specimen, 6.50; greatest extent of wing, 11.80; longest wing, 3.80; tail, 2.30; bill, .70; tarsus, .70. Shortest specimen, 6.10; smallest extent of wing, 11.00; shortest wing, 3.40; tail, 2.05; bill, .65; tarsus, .55.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in cylinder-shaped holes, generally excavated in dead trees. Dimensions, diameter of external orifice, 1.50, greatest internal, 2.50. Internal depth, 10.00.

Eggs, four or five in number, elliptical in form, pure, polished pearly-white in color. Dimensions from .50 x .65 to .55 x .70.

HABITS.

I have said, or rather intimated, elsewhere that the Woodpeckers, as a class, were endowed with a superabundance of energy but there are none among them all which display such an amount of nervous activity as the little Downy. Always busy; now climbing spirally up the huge bole of some old elm, pausing a second to give a quick tap on the bark; then, as the peculiar sound informs them that the wood is solid, they will utter their

sharp cry, jerk back their heads in order to give a hasty blow around, and move upward. Almost as quickly as if upon the wing, they will gain an elevated limb, eight or ten or more in air; then the resounding blows fall thick and fast, for the nice ears of our little friends have informed them that an insect lurks within. This mallet and chisel applied with such persistence, causes the bits of wood to fly in all directions, and it is in vain, that the plump larvæ which has been fattening upon the sap of the tree, retreats further into its tunnel: its fate is sealed, for the next second, it is impaled upon the spear-like tongue of the Woodpecker, jerked from its hiding place, and quickly transferred to a safe receptacle.

Thus the Downy Woodpeckers labor on, hour after hour, day in and day out, throughout the year, destroying millions on millions of insects which, had they been unmolested, would have done an incalculable injury to the husbandman. Forest, road-side, and orchard, are visited in turn by these Woodpeckers, thus there are few birds which are better known than our little spotted friends. They are called Sapsuckers by many for, in common with the Hairy, they are accused of eating the inner bark of trees but I do not think that this is a general habit with them, at least in the section of which I write. It is true that they often drill holes in the outer bark of trees, a quarter of an inch, or a little more, in depth but I never saw one of these that penetrated to the fresh bark within. I do not think that this is in the least injurious to the trees or that they are drilled by the birds with the intention of eating bark but that they are simply following the promptings of what we may call inherited instinct. We find that the California Woodpeckers store acorns, for winter use, in holes drilled in the bark for this purpose but, although the Downys do not actually pack away insects in the small orifices which they make, yet they serve as kind of store-houses for the birds, as insects enter them for convenient hiding places and are thus readily found by the sagacious Woodpeckers.

The Downy Woodpeckers breed in all sections, from Maine to Southern Florida, much more commonly, even in Eastern Massachusetts, than is generally supposed. They are fond of nesting by road-sides, often drilling their holes in the dead limb of some high tree; thus it is not readily seen and, as the birds are not as conspicuous when the tree is covered with foliage as in winter, they pass almost unnoticed, even by the collector.

The eggs are deposited during the second week of May in New England but much earlier as we proceed southward, for they breed in March in Southern Florida. The young leave the nest, in the more northern section, in July, about the fifteenth of the month and are fed by their parents for some time; at this point of their lives, their bills are soft, therefore, they are incapable of procuring suitable food for themselves.

Like the Hairys, the Downys are constantly resident, seldom migrating, excepting during severe winters, but in the cold season they wander considerably, visiting the streets of the towns and villages or even venturing into the parks of the great cities. Although the Downys are everywhere in the North, yet, in Florida, they seldom, if ever, occur in the hummocks, having a decided predilection for the piney woods. They are rather solitary birds in habit, being found oftener alone or in pairs, than with other members of the family.

PICUS BOREALIS.

Cockaded Woodpecker.

Picus borealis Vieill., Oes. Am. Sept., II; 1807, 66.

DESCRIPTION.

Sp. Ch. Form, not robust. Size, small. Sternum, not very stout. Tongue, rather thin and horny at the tip which is provided with barbs for one third of the terminal length. The extensible sheath occupies about one half of the length of the tongue. Terminal hook of scapula, angled above and below.

Color. *Adult male.* Glossy black above, including sides of head, the line extending down on to the sides, and spots on sides and flanks, with the bristly feathers at base of bill, line extending from just in front of eye, inclosing it, broadening out over ear coverts and reaching occiput, transverse bars on back and wings, all but basal portion of two outer tail feathers, and tips of next pair, white; but the white of the tail is more or less barred with black. Concealed patches on the sides of occiput, scarlet. Under portion, including under tail and wing coverts, white, with the second row of the latter spotted with black.

Adult female. Similar to the male, but lacks the scarlet on the head which is replaced by black, and the white on the tail is not as extended.

OBSERVATIONS.

There is more black spotting below in some specimens than in others but they are generally quite uniform in color. Readily known from other Woodpeckers by the absence of any conspicuous red on the head, combined with the transverse bandings above. Distributed, as a constant resident, throughout the Southern Atlantic States, as far north as Pennsylvania, but are not common above the Carolinas.

DIMENSIONS.

Average measurements of fifty specimens from Florida. Length, 8.25; stretch, 11.37; wing, 4.20; tail, 2.35; bill, .82; tarsus, .80. Longest specimen, 8.75; greatest extent of wing, 15.00; longest wing, 5.00; tail, 3.75; bill, .90; tarsus, .90. Shortest specimen, 7.75; smallest extent of wing, 13.75; shortest wing, 3.40; tail, 2.90; bill, .75; tarsus, .70.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in cylinder-shaped holes, generally excavated in living trees. Dimensions, diameter of external orifice, 1.75, greatest internal, 3.00. Internal depth, 10.00.

Eggs, four or five in number, elliptical in form, pure, polished pearly-white in color. Dimensions from .55 x .70 to .65 x .75.

HABITS.

Wilson called the Cockaded Woodpeckers, *Picus querulus*, and this seems, at first glance, to be a most appropriate name, for, of all the family, these are not only the most noisy, but their notes are given in a decidedly fretful tone as if the birds were constantly in an irritable state of mind. It must have been upon the impulse of the moment, however, that the Pioneer Ornithologist gave them the name of Querulus Woodpeckers, for a close study of their habits gives a very different impression of them. They are, in fact, a most jovial class of birds, being almost constantly engaged in sporting about the tops of the tall pines or chasing one another from tree to tree, uttering their peevish sounding notes very frequently when in the best humor. The noise is more noticeable because they congregate in flocks, and it is quite rare to find even a pair without other companions. They are also fond of the company of other members of the family and will even associate with the Jays, Blue Birds, or Warblers. This gregarious instinct does not forsake them during the breeding season, for they build in detached communities. The nests are almost always placed in living pines, often thirty or forty feet from the ground; thus, as the trunks of these trees are covered with a smooth bark, it is quite difficult to climb them and, when

the nests are reached, it is not easy to cut the hard wood, especially as the straight trunks afford no foot-hold.

In flight, the Cockaded Woodpeckers resemble the Downy but when they alight, they strike the object upon which they wish to rest very hard. Like the preceding species, they are also exceedingly agile, moving spirally up the tall tree trunks with great celerity. Although they will occasionally alight near the ground, yet they spend the greater part of their time in the tops of the lofty pines; in fact, they pass a large portion of their lives there, for they are seldom, if ever, found elsewhere than in the piney woods and they inhabit this kind of woodland even to the extreme southern portion of the main-land of Florida.

These Woodpeckers must be of great benefit to the trees of the sections in which they occur, for they are indefatigable insect hunters. Out of some thirty specimens which I have dissected in order to examine the contents of their stomachs, I found that only three or four had eaten bark; all the rest being filled with either the boring beetles or their larvæ. The Cockaded Woodpeckers breed about the first week in April in Southern Florida and a little later further north.

GENUS VIII. PICOIDES. THE THREE-TOED WOODPECKERS.

GEN. CH. *Sternum*, not twice as wide as the height of the keel. *Marginal indentations*, nearly equal in depth to the height of the keel; outer, more shallow than inner. *Mandibrium*, moderate. *Terminal hook of scapula*, variable. *Tongue*, provided with a long, extensible sheath, while the *ceratohyals* are greatly elongated and extend around the back of the skull. *Proventriculus*, small. *Stomach*, rather muscular. *Salivary glands*, not very well developed. *Both mandibles*, straight. *Head*, not crested. *Toes*, three in number.

In members of this genus, the prevailing color above is black, relieved by white markings and the males are marked, to a greater or less extent, on the top of the head with yellow. The tail feathers are very acuminate. The hind toe is wanting. The head is not strikingly large nor is the neck very thin. The bill is about equal to the head in length. There are no laryngeal muscles, excepting the sterno-trachealis which is very stout. The tympaniform membrane is present and although there is an os transversale, yet it does not support a semilunar membrane. The oesophagus is without dilatation and opens into a small proventriculus. The gastric glands are rather numerous, simple, and occupy a zonular band. The stomach is rather globular in form and quite large, the walls are quite thick, and the lining membrane is finely rugose. The fold of the duodenum is not very long, inclosing a wide pancreas. The spleen is an elliptical body lying over the cardiac opening of the stomach. Both lobes of the liver are about equal in size. There are two species within our limits.

PICOIDES ARCTICUS.

Black-backed Three-toed Woodpecker.

Picoides arcticus BARRD., Birds N. A : 1858, 98.

DESCRIPTION.

SP. CH. Form, not robust. Size, large. *Sternum*, not very stout. *Tongue*, rather thin and horny at the tip which is provided with barbs for one third of the terminal length. The extensible sheath occupies about one half of the length of the tongue. *Terminal hook of scapula*, angled above and below.

Color. *Adult male*. Glossy black above, including sides of head, maxillary line and bands on the sides and flanks, with line extending from base of bill, down the sides of neck, spots on the primaries and on a few of the secondaries, all but basal portion of two outer tail feathers, and tips of next pair, white. Square patch on the top of the head, saffron-yellow. Under portion, including under tail and wing coverts, white, while the feathers of the latter are banded with black and the breast is faintly tinged with yellowish.

Adult female. Similar to the male, but lacks the yellow on the head which is replaced by black, and the white on the tail is not as extended.

Nestling male. Similar to the adult but with the yellow on the head more restricted and the black on the back is duller, while a few feathers in the interscapular region are spotted with white.

Nestling female. Similar to the adult but, singularly, the top of the head is spotted with yellow. Descriptions of the first two plumages are from specimens in the collection of Mr Brewster. Iris, brown, bill, black, bluish at base of lower mandible, and feet, bluish, in all stages.

OBSERVATIONS.

There is more black spotting below in some specimens than in others but they are generally quite uniform in color. Readily known from other Woodpeckers by the absence of any red on the head which is replaced by yellow. Known from the succeeding species, by the absence of the transverse white bandings above. Distributed, as a constant resident, throughout North America from the latitude of Maine to the Arctic Circle.

DIMENSIONS.

Average measurements of specimens from the North. Length, 9.50; stretch, 15.50; wing, 5.00; tail, 3.70; bill, 1.25; tarsus, .70. Longest specimen, 10.00; greatest extent of wing, 16.00; longest wing, 5.50; tail, 3.82; bill, 1.30; tarsus, .75. Shortest specimen, 9.00; smallest extent of wing, 15.00; shortest wing, 4.50; tail, 3.75; bill, 1.20; tarsus, .65.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in cylinder-shaped holes, generally excavated in living trees. Dimensions, diameter of external orifice, 1.50, greatest internal, 3.00. Internal depth, 15.00.

Eggs, four to six in number, rather ovate in form, pure, polished pearly-white in color. Dimensions from .60 x .75 to .65 x .80.

HABITS.

The mere mention of the Three-toed Woodpeckers recalls to my mind the snow-clad mountains and dark evergreen forests of Northern New England, for it was among them, that I first became acquainted with these singular birds. The Black-backed Three-toed Woodpeckers appear to be quite uncommon, even in winter, in these boreal climes, where the sharp cries of the Downy and Hairy are quite frequently heard and, occasionally, the louder notes of the Pileated greets the ear, but one may travel for days, over snow-covered ground, beneath the frozen branches of the pines and spruces, without hearing the discordant sounds produced by this rare Woodpecker.

These Woodpeckers, like many other members of the family, are only migratory to a limited extent; thus, during unusually severe winters, they may occasionally reach Massachusetts in their southward flight, but they are exceedingly rare and I know of but two or three instances on record of their having been taken here. These Woodpeckers agree in general habits quite closely with the members of the preceding genus; their flight is similar and in climbing, they are as expert as any of the other Woodpeckers; three toes on each foot appearing to answer as well for clinging to the bark as four. It is difficult to account for the absence of the hind toe as this apparent mutilation does not impede the movements of the birds in the least, yet it is, perhaps, singular that we do not find more species without it, for, as a rule, any superfluity in nature, not ornamental, is almost invariably discarded.

The nesting habits of this rare species of Woodpecker are not well known but they are said to build in living trees, probably about the same time as the Hairy or Downy. They are a little more northern in distribution during the breeding season than the succeeding species.

PICOIDES HIRSUTUS.

Banded Three-toed Woodpecker.

Picoides hirsutus BARRD, Birds N. A.: 1858, 98.

DESCRIPTION.

Sp. Ch. Form, not robust. Size, large. Sternum, not very stout. Tongue, rather thin and horny at the tip which is provided with barbs for one third of the terminal length. The extensible sheath occupies about one half of the length of the tongue. Terminal hook of scapula, angled above and below.

Color. *Adult male.* Glossy black above, including sides of head, maxillary line and bands on the sides and flanks, with line extending from base of bill, down the sides of neck, short, narrow line back of eye, spots on the primaries and on the secondaries, bands on back to rump, all but basal portion of two outer tail feathers, and the tips of next pair, white, Forehead, spotted with white. Square patch on the top of the head, saffron-yellow. Under portion, including under tail and under wing coverts, white, while the feathers of the latter are banded with black and the breast is faintly tinged with yellowish.

Adult female. Similar to the male, but lacks the yellow on the head which is replaced by black spotted with white, and the white on the tail is not as extended. Iris, brown, bill, black, bluish at base of lower mandible, and feet, bluish, in all stages.

OBSERVATIONS.

Like the preceding, there is more black spotting below in some specimens than in others, but they are generally quite uniform in color. Readily known from other Woodpeckers by the absence of any red on the head which is replaced by yellow. Known from the preceding species, by the presence of the transverse white bandings above. There is also a line back of the eye in *arcticus* but it is much narrower than in the present bird. Distributed, as a constant resident, throughout North America from the latitude of Maine to the Arctic Circle.

DIMENSIONS.

Average measurements of specimens from the North. Length, 9.25; stretch, 15.25; wing, 4.75; tail, 3.60; bill, 1.15; tarsus, .60. Longest specimen, 9.75; greatest extent of wing, 16.00; longest wing, 5.25; tail, 3.80; bill, 1.25; tarsus, .75. Shortest specimen, 8.50; smallest extent of wing, 14.00; shortest wing, 4.00; tail, 3.50; bill, 1.00; tarsus, .60.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in cylinder-shaped holes, generally excavated in living trees. Dimensions, diameter of external orifice, 1.50, greatest internal, 3.00. Internal depth, 15.00.

Eggs, four to six in number, rather ovate in form, pure, polished pearly-white in color. Dimensions from .65 x .90 to .70 x .95.

HABITS.

The first time that I ever met with the Banded Three-toed Woodpeckers, was at Errol, New Hampshire, some years ago, late in autumn; so late in fact, that the ground was covered with snow to the depth of several inches. I was walking along the margin of a heavily wooded tract, looking after Pine Grosbeaks which were particularly abundant there, when my attention was attracted by hearing the harsh cry of a Woodpecker which was new to me. It instantly occurred to me that it was a Three-toed and, upon going quickly in the direction of the sound, my suspicions were confirmed by seeing the bird on the trunk of a tree. The Banded Woodpecker, for such it proved to be, was quite unsuspecting as it paid no apparent attention to me; therefore, I walked as near as I chose, watched its movements for a few moments, and then shot it. But unfortunately, although killed at once, it did not fall to the ground but clung, lifeless, to a tuft of moss on the side of the tree, some forty feet above the ground. Thus I was obliged to climb the straight trunk in order to secure my prize which proved to be a fine male.

ORDER II. ALCEDINI. KINGFISHERS.

Sternum with four marginal indentations, the two outer of which are quite deep but the inner are shallow. Bill, long and stout, with a deep gape.

This order is characterised not only as described above, but by the long and pointed wings and stout form. It will be seen that I have entirely discarded the old order, *Scansores*, as the characters presented by the members usually placed in this group are so incongruous that I see no way of arranging them naturally and, in order to be perfectly consistent, have raised the groups hitherto considered as sections or families, to the rank of Orders.

FAMILY I. CERYLIDÆ. THE CRESTED KINGFISHERS.

Head, crested. The sexes differ in markings. Legs, short. Two outer toes, joined at the base.

GENUS I. CERYLE. THE BELTED KINGFISHERS.

GEN. CH. *Keel, higher than one half the width of the sternum. Coracoids, greatly exceeding one half the length of the keel. Two outer toes joined for one half the basal portion.*

The colors of this genus are dull in comparison with other members of the family but they are conspicuously banded below. The young are born naked and acquire the feathers without any transitional downy stage.

CERYLE ALCYON.

Belted Kingfisher.

Ceryle alcyon BOIE, Isis; 1828, 316.

DESCRIPTION.

SP. CH. Form, robust. Size, large. Sternum, stout. Tongue, short, broad, flat and somewhat fleshy, provided with a triangular tip, yellow in color. Feathers of the crest, long, and loosely constructed.

COLOR. *Adult male.* Upper portion of body, including upper wing and tail coverts, slaty-blue, darkest on the head. Wings, black, with the outer portion of outer webs of secondaries, slaty-blue, and two thirds of the basal portion of inner webs of all the feathers, spots and bars on the middle of the outer webs of primaries, white. This color encroaches upon the blue of the inner webs of the secondaries in bars. The extreme tips of the two rows of wing coverts are also white, forming indistinct bars. Primaries and secondaries, slightly tipped with white. Tail, black, with the two central feathers and outer portion of outer webs, blue, with both webs of all but central pair, spotted and barred with white. Beneath, including under wing and tail coverts, white, with a band across breast, sides, and flanks, slaty-blue. There is a white ring nearly around the neck, being interrupted on the nape by a bar of slaty-blue. Sides of the head, dark-slaty, with a spot in advance of the eye and a crescent-shaped mark beneath it, white.

Adult female. Similar to the male but with the central tail feathers barred similar to the others. There is a second band of chestnut across the middle of the breast, and this color extends along the sides to the exclusion of the slaty-blue, as far as the flanks which are slaty.

Young male. Similar to the adult above but with the white tippings to the secondaries more extended. There is less white on the wing coverts but the central tail feathers are barred as in the female. There is but one band below, the upper, yet that is overwashed with chestnut which also occupies the anterior portion of the sides, and the slaty of the remaining portions are overwashed with it.

Young female. With a duller bluish-slaty band on the breast, the chestnut markings are more extended and the color on the top of the head is darker, being nearly black.

Nestlings. At first the young are completely naked, then the feathers appear without any intermediate downy stage. When the young are fully fledged, both sexes are similar and quite like the young male, for the female has only an indication of the chestnut bands. There is, however, more white on the wings, where it appears in irregular spots. The feathers of the crown are black, edged with bluish. Bill and feet, black in all stages.

OBSERVATIONS.

There is little or no variation even in size between the specimens collected at Key West and in Northern Maine, aside from those described, resulting from age or sex. Distributed in summer throughout the entire continent of North America. Winters in the more southern portions, but is occasionally found as far north as Massachusetts at this season.

DIMENSIONS.

Average measurements of twelve specimens. Length, 12.31; stretch, 21.75; wing, 6.25; tail, 3.72; bill, 1.65; tarsus, .65. Longest specimen, 13.50; greatest extent of wing, 22.50; longest wing, 6.50; tail, 4.00; bill, 2.50; tarsus, .70. Shortest specimen, 11.12; smallest extent of wing, 21.00; shortest wing, 6.00; tail, 3.45; bill, 1.81; tarsus, .60.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in holes which are drilled in banks of earth. The opening is about 3.50 in diameter and the burrow extends in a horizontal direction for from four to eight feet. The cavity for the nest, at the extremity, is some 6.00 in diameter and the eggs are placed on the sand or gravel.

Eggs, four to six in number, oval in form, pure white in color, with a polished surface. Dimensions from 1.08 x 1.12 to 1.16 x 1.40.

HABITS.

There are few birds which are better known throughout the length and breadth of our northern continent than the Kingfishers, for their abruptly given rattle is heard along the rushing streams and blue lakes of the far north, by the majestic, swiftly flowing rivers of the middle districts, and on the borders of the quiet lagoons of the extreme south. Go where we will, at the proper season, we will be greeted by these quaint birds—always provided, however, that there is water enough in the immediate vicinity to sustain life in a minnow. When we hear their enlivening notes in the north, we may be sure that the halcyon days are near, for their advent proclaims that the sway of the Ice King is broken and the laughing brooks are once more free from bondage. It is true that the happy pair no longer float their nest upon the placid waters as they did in the long-past Golden Age, but the Powers of the air yet extend their favors to the progeny of the devoted Aleyone, and when we see the Kingfishers perched on the yellowing willows, we may be sure that the glorious summer is not far away.

The Kingfishers arrive in New England from the last week in March to late in April, the time of their appearance, as implied above, depending upon the mildness of the season. At first, they are only found in the immediate vicinity of water when the male may be seen playfully pursuing the female, but later, they seek sand or gravel pits, often some distance from their usual resorts. When crossing the intervening country, they will mount high in air and pursue their way in a direct course, flying with a slow but steady flight, while the body is kept at an angle, giving the bird a peculiar appearance. A pair will frequently be a long time in deciding upon some particular spot in which to make their home, visiting first one sand-bank, then another, until a thorough inspection of the locality has convinced them that it is suitable for a home, then they will begin the laborious process of drilling a hole for the nest. This is accomplished by scratching with the feet, aided by the powerful bill, but it requires a long time to construct the tunnel and both birds will frequently be employed upon it for upwards of two weeks. The mouth of the hole is usually about two feet from the top of the bank and extends in a horizontal direction for from four to eight feet, sometimes straight but often turning to the right or left,

especially if while excavating, the birds chance to encounter a stone or if they come to a root, they will go under it. The termination of the burrow is enlarged and scooped out into a nest-like cavity which is to receive the eggs that are deposited about the second week in May. I never found that any material was used in constructing a nest for I have always taken the fresh eggs from the bare sand or gravel, but later, when the young occupy the holes, they are found on a bed of fish bones and scales which are thrown up by the birds, much after the manner of Owls and Hawks. I once kept some young alive for a short time and when first captured, they threw up fish scales and bones compressed together in oval formed bodies which were surprisingly large when compared with the size of the birds.

The Kingfishers were more abundant on the Susquehanna River than I ever saw them elsewhere and I have found a dozen holes in a half hour's row along the stream all of which were occupied. I opened several nests in order to study the growth of the young and in all cases found the fish scales and bones as described. When exposed to the light, the birds would utter a hisping cry which did not, in the least, resemble the rattle of the adults. As the young do not leave the nest-like cavity for some time, the odor that arises from the mass of filth which accumulates in the extremity of the burrow is perfectly intolerable. But later in life, not long before they fly, the little Kingfishers enter the tunnel and may often be seen sitting at its entrance. When we approached the locality in which the nest was placed, the adult birds did not manifest any uneasiness because they were accustomed to seeing many persons pass daily, in fact some of the holes were made in a bank where a public road ran close to the margin of the river and some of the nests were directly beneath the wheel tracks. But when we actually began to dig out their domiciles, the Kingfishers exhibited the utmost alarm, flying excitedly about and giving their harsh notes continuously but never venturing very near us, as they evidently understood that we were enemies. Further up the river, in sections more remote from settlements, they were as shy as in Massachusetts and showed great solicitude whenever their breeding places were approached.

The Kingfishers learn very quickly where they are safe; thus they are always shy wherever they are habitually shot at, but in sections where they are protected, they are remarkably tame. I have seen them quietly perched within a few yards of pedestrians, in localities where the use of a gun was strictly forbidden, while on ponds only a short distance away, they would be exceedingly wary. They are, however, naturally shy for those which I have found in the remote sections of Florida where they were never disturbed, would not allow me to approach very near them. The young which I endeavored to rear appeared sullen, probably through fear, would not feed readily, and soon died. It is quite noticeable that these birds are not apt to start at the report of a gun which is fired at a short distance away, even if the shot strikes quite near them, and may be shot at repeatedly with a rifle at from seventy-five to a hundred yards distance without moving, provided the ball does not actually hit the object on which they are sitting. I have thought that this was due to the similarity between the sound made by the report of a gun and the shock which they must experience when plunging into the water. The birds usually ascend to the

height of from twenty to thirty feet above the surface, then poising themselves with rapidly vibrating wings for a few seconds, they will dart suddenly downward, striking the water so forcibly as to frequently become entirely submerged. If the attempt be successful, they will rise with their prey which is usually a small fish, in their beaks, shake the water from their wings, give a triumphant rattle, and fly either to some favorite perch to devour it or carry it to their nests.

I have mentioned that the Kingfishers are found throughout Florida, being as abundant on the Keys as on the St. John's River. They must breed in all those localities, and on the St. John's and other streams, bluffs having abrupt banks occasionally occur in which they can make their holes, but I cannot conjecture where they build on the Keys as I do not know of a single bank throughout their entire extent. On Indian River I found them nesting in a singular situation. There is a narrow canal which connects Indian River with Mosquito Lagoon at a point where the two bodies of water approach each other quite closely. It is nearly twelve feet deep where the ground is most elevated and, as only about four feet of this space is occupied by the water, the remainder forms perpendicular banks. There is but little soil in this portion of Florida, the underlying strata being coquina, a substance which is composed of fragments of shells cemented together by pressure. When first dug, this rock, as it is called, is soft and crumbling, but upon being exposed, becomes nearly as hard as any limestone. Thus a crust was formed over the surface which could not be penetrated without the aid of an iron instrument, yet there were a dozen holes made by Kingfishers in the banks of the canal. These must have been excavated years before when the coquina was soft, but, at least, one was occupied during my visit as I frequently saw the birds emerge from it, and they exhibited great solicitude whenever I approached. Although I could not ascertain for a certainty, as it would have required considerable labor to penetrate to the nest, I judged that they had eggs as early as the last week in March.

The Kingfishers are solitary birds, even after the young are out they do not accompany their parents long. They are fed for the first few days after leaving the nest but they soon learn to fish for themselves and then they disperse about the country. These birds remain quite late in Massachusetts, rarely one will be seen in the winter if the season chance to be mild. They are more frequently found than in Pennsylvania, and occur regularly below this point, consequently are constantly resident in the South.

ORDER III. CAPRIMULGI. GOAT-SUCKERS.

Sernum, with two wide marginal indentations. Bill, short, with a wide and deep gape, and with more or less bristles at the base. The plumage is soft.

The wings are long and pointed. The tail has ten feathers, two less than in the preceding order, and is of varying form. The feet are small with the upper face of the tarsus feathered on its basal portion. The anterior toes are webbed at the base and the number of bones are not normal, the inner having three and each of the others, four. The eyes are large as the birds are, more or less, nocturnal in habit.

FAMILY I. CAPRIMULGIDÆ. THE NIGHT-JARS.

Nail of middle toe, pectinated on inner side. Prominent white markings on either wings or tail.

The sternum is stout and short but wide, with a high, well-rounded keel. The coracoids are also short and set on at an angle, while the furcula is somewhat stout and forms a wide, well-arched curve, proclaiming that its owner is capable of performing abrupt and varied aerial evolutions. The terminal expansion is slightly developed. The marginal indentations are so wide as to resemble scollops. Costal process, varied in form as given under generic characters. There is no manubrium nor is the sternum produced forward so as to take its place.

GENUS I. CHORDEILES. THE NIGHT HAWKS.

GEN. CH. *Wings, extending beyond the tail when closed, with the first quill longest. Bristles at base of bill, very small. Tail, forked. Plumage, blended. Costal process of sternum, approximating quite near the coracoids.*

Members of this genus are only partly nocturnal, often flying about during the day but are more active at night, especially at twilight. The larynx is provided with a very large and thick sterno-trachealis which has its tracheal origin low, quite near the larynx. There is only one other muscle, the posterior division of the broncho-trachealis. The os transversale is represented by a flat bone which does not support any semilunar membrane, however, but there are short tympaniform membranes. The oesophagus is not dilated in any portion, is lined with a thin layer of mucus, and opens into a somewhat wide proventriculus which is provided with oblong glands that lie obliquely and are arranged in a zonular band. The stomach is rather cubical in form, quite muscular, and lined with a roughly rugous membrane. The short duodenum embraces the rather large pancreas for its entire length. The spleen is a spherical body, dark in color, and placed on the stomach near the cardiac opening. There are long ceca (measuring 1.30 in *popetue*) which are dilated into bottle-shaped bodies at the blind ends.

CHORDEILES POPETUE.

Night Hawk.

Chordeiles popetue VIEILL., Ois. Am.; 1807, 56.

DESCRIPTION.

SP. CH. Form, robust. Size, large. Sternum, stout, with the keel quite high, then rounds downward to meet the furcula which has a slight terminal expansion. The posterior end of the sternum, between the marginal indentations, is produced backward. Tongue, fleshy, very short, flat and broadly arrow-shaped, provided with papillæ, which cover the upper surface.

COLOR. *Adult male.* Above, including wing and tail, dark purplish-brown, with the feathers in a line back of the eye extending around the nape, having white centers. The remainder of the feathers are irregularly spotted with yellowish-white which becomes rufous on the scapularies. There is an accumulation of rufous spots in a line passing through the ear coverts around the nape. The wings have a greenish gloss and the secondaries are tipped with whitish. There is a very broad white band extending obliquely across the middle of the four primaries next the outer, encroaching upon the inner webs of the outer as far as the shaft. The tail and its upper coverts are crossed by transverse bands of irregular spots of whitish, and there is a band of white extending across all the feathers, excepting the outer, near the tips. Beneath, white, crossed by numerous transverse bands of dark brown. There is a crescent-shaped mark of white on the throat beneath which is a dark band that is spotted with triangular marks of rufous. The space above the white mark is also brown, having the same shaped spots.

Adult female. Similar to the male, but the markings above are not as clear. The band on the wings is not as extended, and that on the tail is entirely wanting, while the crescent-shaped mark is overwashed with rufous and spotted with brown; the entire under surface is also tinged with it, showing little or no white.

Young male. Slightly tinged with rufous throughout, the white bands on the wing and tail being much restricted, and the crescent is obscured with rufous.

Young female. Very strongly tinged with rufous above and below, while the white marking on the wing is often restricted to the three upper feathers.

Nestlings. The only specimen I ever saw was shown to me by Mr. Brewster, who obtained it from Mr. N. C. Brown. This was covered with downy feathers of a dark-brown color, spotted and tipped irregularly with rufous and yellowish. It is quite probable that this species undergoes several changes from birth to the time it assumes the plumage described above.

OBSERVATIONS.

Specimens vary somewhat in markings, especially above, and while those from Florida are generally darker, they show more white above; this is especially noticeable in birds which I obtained at Lake Harney late in May when they were breeding; in fact they exhibit some approach in this respect to the bleached Western form, "*Henryi*." There is, however, no appreciable difference in size between Florida birds and those taken even as far north as Maine. Distributed during the breeding season throughout the entire extent of North America. Winters in the West Indies.

DIMENSIONS.

Average measurements of twenty-four specimens from Florida and New England. Length, 9.00; stretch, 22.17; wing, 7.82; tail, 3.95; bill, .25; tarsus, .57. Longest specimen, 9.75; greatest extent of wing, 22.25; longest wing, 8.90; tail, 4.55; bill, .30; tarsus, .65. Shortest specimen, 8.25; smallest extent of wing, 21.00; shortest wing, 6.75; tail, 3.25; bill, .20; tarsus, .45.

DESCRIPTION OF NESTS AND EGGS.

Nests, simply hollows scratched in the ground, or the eggs are frequently deposited on bare rocks and, of late years, also on the flat, concrete-covered roofs of houses in cities like New York and Boston.

Eggs, two in number, elliptical in form, dirty white in color, spotted and blotched irregularly with brown, slaty and lilac. Dimensions from 1.20 x .80 to 1.26 x .85.

HABITS.

It is impossible to find a bird which is more generally known whenever it occurs than the Night Hawks. Even the Seminoles of Florida described it to me long before its arrival and when I showed Tiger a skin he exclaimed, at once, "*Ho-pil-car!*" a name by which they designate it, and once more proceeded to give me a good account of its habits, by which I judged that it bred in the vicinity. They were very abundant about the first week in April at Miami yet many of these were probably only migrants, but I found them common and nesting on Merritt's Island, Indian River, and obtained a single egg deposited on a spot destitute of vegetation. Later, about the fifteenth of the month, the same season, I found them, evidently breeding, in the piney woods but failed to find an egg. The males were sitting on the limbs of high pine trees but the females were not visible during the day, only making their appearance at twilight. I found the fresh eggs in the grain fields of Pennsylvania during the last week of May and obtained the females with eggs ready to be deposited, in Maine, on the fifth of June. When breeding, the females are not at all shy, as they will permit one to walk quite near them without starting. Indeed I have nearly placed my foot upon them as they sat crouched flat against the ground, before they would rise, then would only fly a few yards and settle again. So closely do the colors of the Night Hawks correspond with those of the soil which is destitute of vegetation, that it is almost impossible to detect the birds, especially when the surface is slightly broken or covered with stones. Like many ground nesters which are similarly colored, these birds appear to be aware that this similarity of color to that of surrounding objects is their best protection, consequently they will almost always remain quiet until the intruder approaches very near them. When forced to take wing, they rise very suddenly, flying in an eccentric or zigzag course but with a rapid motion. The females merely utter a kind of croak repeated once or twice when first on the wing, then are silent.

I have mentioned under descriptions that the Night Hawks deposited their eggs on the flat roofs of houses in cities. Several species of our native birds have taken advantage of the changes wrought by the settlement of the section in which they live; thus, instead of being driven away, when their former breeding places were encroached upon and, in many instances, destroyed, they have promptly availed themselves of the opportunities afforded by the many structures erected by man and built their nests in them. This is especially noticeable among the Swallows, for all, but one, of our Eastern species have greatly modified their habits, and the breeding range of all has become extended since the occupation of the country by the whites. The Wrens have generally abandoned holes in rocks and trees and now resort to buildings, at least in the vicinity of settlements. The Chimney Swift may be mentioned as another species whose habits have been utterly changed by the innovations of man, and the same is true of the Phœbe, though to a limited extent. But in the cases mentioned and in all others which occur, one or two species excepted, the birds which have taken up their abodes in the immediate presence of man, are small, consequently are seldom, if ever, molested, and so, from the first, they readily became familiar with the ways of civilization. With the Night Hawks, however, this is quite different, they were most emphatically a bird of the wilderness and although they resort to newly made clearings and open fields, these are almost always remote from houses, and when disturbed once or twice in any locality, the birds promptly take their departure. Thus, it is almost impossible to find the nest of one of these birds near any of the towns in the immediate vicinity of Boston yet, most unexpectedly, we find them common in the midst of the metropolis, itself.

It is true that the gravel-covered roofs do, in a measure, resemble the barren spots of land of which they are so fond, but if the birds ever chanced to mistake the extended rows of house-tops for the quiet, hill-side fields in which they were wont to nest, one would think that the sights, odors, and, above all, the constant din arising from the midst of a great city would speedily dispel all such illusions. Yet it did not, for some years ago, the first pair of Night Hawks ventured to lay their eggs on a roof in Boston and now they are common there through the summer. Both sexes are found there during the day and in the twilight, the peculiar, sharp, rapidly given cry may be heard above the noise caused by the surrounding multitude, and then they will be seen to plunge downward toward the crowded streets, but their booming note, if heard at all, comes faintly to the ear, being almost, if not quite, lost in the constant waves of louder sounds. Master Outram Bangs who has taken the eggs from roofs, informs me that the females were quite tame when approached, flying only a few feet and showing no solicitude, whatever, when their eggs were removed.

I have alluded to the notes of the male for, excepting the peculiar croak, the females are silent. The singular cry which consists of but one sharp note repeated at intervals, is usually given while the birds are on the wing, but on several occasions I have heard it when they were perched on the limbs of high trees. This rude attempt at melody is only made through the breeding season and more often in the twilight or during cloudy days, seldom in the bright sunlight. The bird mounts upward with that peculiar, eccentric

flight, so characteristic of this species, then, darting suddenly in an oblique direction for a few feet, will emit his discordant squeak; when he will fly a few yards, only to repeat this performance, the notes being given after intervals of a few seconds. Every movement carries him upward, until he has reached quite an altitude, higher in day-light than in the evening, when down he plunges with half closed wings to within a few yards of the ground and, just as he extends his wings to turn upward again, comes the peculiar boom, so aptly described by authors as similar to the sound produced by blowing into the bung-hole of an empty barrel.

Just how this sound is produced is not easily explained and has given rise to various theories. Some authors affirm that the air rushing through the loosened quills of the wings causes the noise. It is true that this explanation appears plausible but I am inclined to think that the sound is not produced mechanically, for reasons which I will now give. First, the noise is under the control of the will of the birds for they frequently dive in silence. This is one point but is not conclusive, as the quills of the wings might be made to change their position so that the sound would ensue at one time and be withheld at another, but a careful examination of the wings does not reveal any essential difference in structure from those presented by other members of the family. Under the microscope, the barbs of the quills are seen to be furnished with very long barbules which are pectinated on both sides for their basal two thirds, but this is also observable in the Whippoorwill and other allied species. The long filaments of the barbules causing the fringed wings in Owls and other birds, ensure a silent passage through the air and consequently the flight of a Night Hawk is particularly noiseless as any one who has had one pass close to him, will remember. Thus it will be seen that the facts of the case do not at all support the theory. The idea that the air rushing into the suddenly opened mouth causes the sound is too improbable to notice and therefore I will hasten to explain what I consider the true origin of the booming note of the Night Hawk. I say note, most advisably, for I am certain that this singular cry is vocal. As will be seen upon referring to the generic characters which I have given, there are but two laryngeal muscles. The broncho-trachealis posticus is not strong in the male and is scarcely developed in the female. I therefore judge that this produces the squeak, but the sterno-trachealis which acts as a relaxor to the tympaniform membrane, is very thick and strong, just as it is in the Whippoorwill and Chuck-will's Widow. In both these species, it is quite probable that the peculiar notes which are so decidedly in a minor tone, are caused by this muscle acting upon the membrane of which I have spoken above. Now I can see no reason why the note of the Night Hawk should not be produced by the action of the same muscle, for it is also in the minor tone and if any of the louder cries of the Whippoorwill or, better, of the Chuck-will's Widow were prolonged, they would not sound very unlike the boom of the species under consideration.

I scarcely think that the Night Hawks are abroad all night, but that they only fly during the dusk of evening, being more active in hunting, however, as it grows dark; in fact the males remain high in the air until long after sunset, when they will descend and fly rapidly along close to the ground. They feed upon insects which they capture during

these forrays. The Night Hawks migrate about the first of September, when hundreds may be seen, toward the close of day, flying in detached flocks. They keep at a considerable elevation until after sunset, when they descend near the ground to feed as they go. I have never seen this species in Florida during winter or even in November but found them abundant, as already described, after the first of April and they are common through the summer.

GENUS II. ANTROSTOMUS. THE WHIPPOORWILLS.

GEN. CH. *Wings, not extending beyond the tail when closed, with the second or third quill longest. Bristles at base of bill, very long. Tail, rounded. Plumage, soft and owl-like. The costal process of sternum does not approach the coracoids but sends a spur upward at right angles with them.*

Members of this genus are entirely nocturnal in habit, never, voluntarily, flying during daylight. The sterno-trachealis is very large and thick, and has its origin low, as in the preceding genus. There is a very weak broncho-trachealis posticus, and also a singular muscle which passes completely around the trachea, above the origin of the other muscles, and is fastened to the lower extremities of the furcula; other portions of larynx, similar to those given in the preceding genus. The œsophagus is larger near the mouth than elsewhere. The other characters are as described in *Chordeiles*, excepting the cœca which is proportionately longer, measuring 1.40 in *vociferus*.

ANTROSTOMUS VOCIFERUS.

Whippoorwill.

Antrostomus vociferus BON. LIST; 1838.

DESCRIPTION.

SP. CH. Form, somewhat robust. Size, not large. Sternum, not stout. Tongue, long, smooth, thin and somewhat fleshy. The hyoid bones curve upward back of the skull. The bristles of the bill are without lateral filaments.

COLOR. *Adult male.* General color above, dark-brown, but this is obscured by spots, tippings, and edgings of ashy and rufous. The top of the head is ashy-brown, streaked with dark-brown. There are drop-shaped spots of rufous on the wing covers, forming a bar. The wings are dark-brown barred on both webs with spots of bright rufous. The tail is also brown, marked with ashy and rufous which appear in small spots and form bars. The three outer pairs of feathers are broadly tipped with white which shows a yellowish tinge below. Beneath, dark-brown with the feathers tipped and spotted with yellowish-rufous which nearly covers the flanks and under tail and wing coverts. There is a band of white on the throat beneath which is an indistinct one of rufous.

Adult female. Quite similar to the male, but lacks the white markings on the outer tail feathers; the entire tail is, however, excepting the central pair of feathers, tipped with yellowish, and the white band on the throat is replaced by one of yellowish.

Young. The colors above and below are much more rufous, showing but little of the ashy of the adult. In the male, the white of the tail is as in the adult, but the dark-brown of the outer webs of the outer feathers encroaches upon it, and all the feathers are tipped with a buffy-yellow.

Nestlings. Judging from two specimens which I now have, and one that was kindly loaned to me by Mr. August Koch, which are assuming the second plumage, the nestlings are covered with a dark down tipped with yellowish, but it is quite probable that this species, like the preceding, undergoes several changes between birth and the plumage of the specimens which I have. Bill, black and feet, brown in all stages.

OBSERVATIONS.

These birds are extremely variable in markings, some being much darker than others. The spots on the wing coverts are not always present, and in many specimens the scapularies are marked with a rich dark-brown, while there is considerable difference in the markings below, yet there will be no difficulty in recognizing the species by the colors as described. It will be well to keep in mind that the Whippoorwill has no white spots on the wings and that the tail is conspicuously marked with white; just the reverse of the markings on those parts in the Night Hawk. Known from the following bird as described under the head of observations in the succeeding pages. Distributed during summer throughout the Eastern section of North America from the Carolinas to Canada. Winters in Florida and the West Indies.

DIMENSIONS.

Average measurements of eight specimens from Pennsylvania and Florida. Length, 9.75; stretch, 18.75; wing, 5.75; tail, 4.55; bill, .47; tarsus, .65. Longest specimen, 10.30; greatest extent of wing, 19.10; longest wing, 6.70; tail, 5.10; bill, .55; tarsus, .69. Shortest specimen, 9.15; smallest extent of wing, 18.00; shortest wing, 5.75; tail, 4.10; bill, .40; tarsus, .60.

DESCRIPTION OF NESTS AND EGGS.

Nests, mere hollows scratched in the ground among the leaves, no material being used. A secluded locality is always selected, usually among thickets.

Eggs, two in number, perfectly elliptical in form, very delicate creamy-white in color, spotted and blotched irregularly with lilac, pale lilac and pale brown. Dimensions from 1.20 x .75 to 1.25 x .80.

HABITS.

I have mentioned elsewhere that the steep sides of the Alleghany Mountains are covered with a thick growth of trees which, on account of the scarcity of the soil, are, even at the base of the elevations, quite low and as we ascend, we find them more dwarfed, until on the summit, they are little better than shrubs. The abrupt inclines are strewn with fragments of rocks of varying size but some of them are quite large and as they are well shaded in summer, they form admirable resting places for the Whippoorwills. In fact, I never before saw so many in any one locality, as every glen or nook appeared to be inhabited by them. The twilight comes on somewhat prematurely in those deep valleys and while the highest mountain tops are gleaming in the rays of the setting sun, the lower slopes are enshrouded with rapidly gathering darkness. The lays of the diurnal songsters have ceased and naught is heard save the occasional chirp of a belated Robin as he hastens to his roost in the alder thicket by the brook side; then all is still. After the noise and bustle with which the numerous feathered tribes always end the day, the first hush of evening seems most profound. Then it is that the opening notes of the Whippoorwills float out upon the air. The first which utters his cry strikes out boldly and renders his lay distinctly and well but the echo of his effort has not died away before it is answered by another, then another begins, and soon the entire mountain sides are ringing with their melody. So abundant are the birds that it is impossible at times to catch a single note, all being blended, for when the Whippoorwills become excited, the song which, at first, is given with sufficient deliberation to enable one to distinguish the separate utterances, is poured forth with such rapidity as to sound like an uninterrupted stream of notes, and this continues until the birds cease, apparently exhausted. As there are, at least, a dozen birds engaged in singing at one time and as each tries to outdo the others in rapidity of execution, the noise produced by them is very confusing.

All these particular outbursts are evidently caused by a feeling of rivalry, for it is only exhibited to the extent of which I speak, during the time when the males are courting their mates. The silent females are doubtlessly expected to be guided in their choice by the celerity with which the song is given; in short, in select Whippoorwillian circles, he who utters the greatest number of notes in the shortest space of time is considered the finest singer.

If any one who had never before heard the song of the Whippoorwills, should chance to hear them at such a time as I have described, he would be greatly disappointed in their

reputed fine powers of song. Yet the notes of these birds are certainly very fine when heard to advantage. I well remember when this unique song first greeted my ear. I was floating leisurely in my boat along a New England river on a clear, calm night in early June, lazily watching the play of the moonlight upon the water, not caring to break the delightful hush which reigned, by even dropping an oar, when, from the shadowing forest, came the low, plaintive song of the Whippoorwill. Distance truly lends enchantment to this lay, for when I heard it then and as I have heard it many times since, coming from the far away woodlands, it did not seem as if the peculiar cadence could be produced by a bird; it is so mournful but withal so singularly sweet that it appears more like an exhalation from the purple mist which hangs over the valleys, harmonizing as perfectly with the surroundings as does the gentle sighing of the perfumed air through the tree-tops of the forests.

When heard near at hand, however, even after the breeding season, when the notes are given quite distinctly, all these illusions vanish for then there is a harsher tone perceptible which is not very agreeable. The delivery of the song is always hurried and, although there are three notes, distinctly pronounced, yet their resemblance to the syllables *whip-poor-will* is more or less fanciful and might be equally well illustrated by other sounds. For example, Cooper, in an introduction to one of his novels, says that the birds distinctly articulate *wish-ton-wish*, but the best rendering of it that I ever heard was from the Seminoles who call it *wac-co-lar*, with the accent on the last syllable just as the birds repeat it. The females never sing and only utter a *chuck* when alarmed. This same note is also given by the males and often precedes the song.

The Whippoorwills are abundant in Florida throughout the winter and I even found them common in the thickets at Key West, but they are silent until about the middle of March, after which they soon migrate northward. They continue to sing in their summer resorts throughout the season and I once heard one utter the full song several times at Watsonstown, Pennsylvania, on the night of the thirtieth of August. These birds remain concealed in the thick woods during the day, resting on the ground or on a rock or branch near it. They are strictly nocturnal, never flying voluntarily during day-light, but when disturbed, they will rise and make their way swiftly through the tangled undergrowth, avoiding the intervening obstacles as skillfully as in the evening, settling down again in some secluded place. They are quite shy birds and will never admit of a near approach, but are tamer in the night than in the day, for they will then frequently emerge from the woods to rest upon house-tops and sound their cries. They will select particular points on which to light and will visit them repeatedly. Unlike the Night Hawks, they do not, usually hunt about the field in search of their prey, but will sit in some moderately elevated situation, like a post-top, and launch out at the passing insects, much after the manner practiced by the Flycatchers. They are very fond of dusting themselves in roads or paths and will frequently resort to them for this purpose. They will also settle on newly ploughed fields and walk in the freshly upturned earth, a habit which I have also observed in the Night Hawks.

The Whippoorwills deposit their eggs in the woods without any nest, about the last

week in May, the young are fully fledged by the last week in July, and as they are found alone in the woods at that early age, must learn soon to hunt for themselves. These birds are rather solitary in habit and, although quite a number occasionally collect in favorable localities, they are not gregarious, even while migrating. The southward passage occurs in September and as these birds are never seen flying during the day-time, it must be performed wholly at night.

ANTROSTOMUS CAROLINENSIS.

Chuck-will's Widow.

Antrostomus Carolinensis GOULD, *Icones Avium*; 1838.

DESCRIPTION.

Sp. Cn. Form, robust. Size, large. Sternum, stout. Tongue, long, narrow, thin and somewhat fleshy. The hyoid bones curve upward back of the skull. The bristles of the bill are provided with lateral filaments.

COLOR. Adult male. General color above, dark-brown, obscured by spots, tipplings, and edgings of rufous. The top of head is rufous with three longitudinal streaks of black, extending from the base of the bill to the nape and there is a yellowish-rufous line over the eye. There are drop-shaped spots of rufous on the wing coverts, forming a bar. The wings are dark-brown barred on both webs with spots of yellowish-rufous which are sprinkled with brown. The scapularies and upper wing coverts are marked with black and edged with ashy. The tail is brown, marked with ashy and rufous which appear in small spots forming bars. The three outer pairs of feathers are broadly tipped with white which becomes buffy-yellow below, and all the feathers are tipped with buff which is sprinkled with brown above. Beneath, dark-brown, with the feathers tipped and spotted with yellowish-rufous. There is a narrow band of whitish on the throat but it is not very distinct.

Adult female. Quite similar to the male, but lacks the white markings on the tail which are replaced by brownish, and the buffy tipplings of the feathers are without dots, but there is a distinct, subterminal bar of black, and there is no white band on the throat. Bill and feet, brown in all stages.

OBSERVATIONS.

Specimens vary considerably in markings, much as in the preceding species to which the general colors bear considerable resemblance; they may be known at once by the larger size and buffy color on the under side of the white of the tail. Distributed during summer throughout the Eastern section of the United States, north to the Carolinas, and in the interior into Southern Illinois. Winters in the West Indies.

DIMENSIONS.

Average measurements of six specimens from Florida. Length, 12.87; stretch, 25.00; wing, 8.55; tail, 5.95; bill, .42; tarsus, .67. Longest specimen, 13.25; greatest extent of wing, 25.50; longest wing, 8.90; tail, 6.50; bill, .45; tarsus, .75. Shortest specimen, 12.50; smallest extent of wing, 24.60; shortest wing, 8.30; tail, 5.40; bill, .30; tarsus, .60.

DESCRIPTION OF NESTS AND EGGS.

Nests, mere hollows scratched in the ground among the leaves, no material being used. A secluded locality is always selected, usually in thick hummocks.

Eggs, two in number, perfectly elliptical in form, pale-salmon in color, spotted and blotched irregularly with lilac, pale-lilac and brown. Dimensions from 1.40 x .95 to 1.55 x 1.07.

HABITS.

Shortly after the first notes of the Whippoorwill are heard in Florida, a more voluminous song comes through the still evening air; it is similar in tone to that of the above mentioned species, but louder and more prolonged, for it consists of at least one more syllable, and although the lay pronounced by the birds bears but little resemblance to their name, any one who is familiar with ornithology would at once exclaim, 'that is the Chuck-will's Widow!' The notes are so different from those of the birds last described, that even the settlers in Florida notice it and call them Spanish Whippoorwills. The song of the

Chuck-will's Widow is certainly peculiar, being, by far, the most noticeable of all the bird notes heard in the South, excepting, perhaps, those of the Great Horned and Barred Owls. As I have said, the cadence does not especially resemble the syllables of the name and in order to illustrate the song, I shall once more call my friends, the Seminoles, upon the stage for the birds appear to them to articulate *chic-co-bil-lar*, and this certainly is a very good rendering of the notes. The cry is given with startling energy when heard quite near at hand; the first syllable is pronounced very distinctly, with emphasis, then follows the second somewhat prolonged and less forcibly uttered, while the remaining two are very quickly given with a decided accent upon the last. The whole is poured forth in the hurried manner so characteristic of the Whippoorwill and in about the same tone.

When the short twilight of the South is fading into night, the Chuckwill's Widows emerge from the secluded retreat, afforded by some thick hummock, in which they have passed the day and, alighting upon some favorite perch, will begin to sing. As before remarked, this lay is given with an abruptness which is even startling, especially when the bird is but a few yards away. No preliminary sound gives notice of his presence, for he flits to his perch in utter silence; then, from out of the gloom, comes the cadence, so suddenly and so loud that, although one may have been perfectly familiar with the song for years, he will always, for a moment, be taken completely by surprise. When an ornithologist hears this peculiar lay for the first time, in such close proximity, he is very apt to grasp his gun and start in pursuit, certain of adding a Chuckwill's Widow to his collection. He approaches the spot where the bird appears to be located, carefully avoiding all the intervening obstacles which is no easy task in a Florida hummock, even in broad daylight. Guided by the song, he reaches a point where the increased volume of sound informs him that he is near enough for a shot if he could only discern the bird, when a sudden silence ensues—the bird has flown and the spirits of the would-be captor fall to zero; but instantly rise again, for the song breaks out anew a few yards away. The hunter follows only to be foiled again, for once more the wary bird has perceived him and has flitted onward, but, as before, only a short distance, so that the excited pursuer once more plunges on into the thickets now being rapidly enshrouded in darkness, but all in vain, for the Chuckwill's Widow is a perfect will-o'-the-wisp of a bird alluring the incautious follower deeper and deeper into the gloomy hummock and causing him to take so many turns that unless he be well skilled in wood-craft, he will become utterly lost and may be forced to spend the night in the forest with the wild cats for company.

My first experience with these birds was similar to that which I have described, excepting that I did manage to extricate myself from the labyrinth into which they led me, but I afterward learned that there were two ways in which to procure these wary birds. The most simple is to search a hummock in which one is certain they are concealing themselves. I have found that they rest either on the ground or near it and when aroused, will generally give one an opportunity to shoot, or if the branches prove too thick, one has only to note the direction in which they fly when, by following, they may be started again. The other method which I have employed was to listen carefully to the song from two or three points, thus getting the approximate position of the bird. Then by examining the

locality in daylight, some prominent object may be found like a stump, log, or a branch destitute of foliage upon which one may be reasonably certain the birds alight; then by hiding early in the ensuing evening in a place where the birds can be seen when they come, a shot can be obtained at them, for I have observed that when they once select any particular point as a resting place, they will return to it repeatedly to sing. This habit once proved quite annoying to me as one selected the ornamental top of my tent-pole where he would sound his loud notes continuously. He took care, however, not to settle there until we were all asleep but the sound would always awaken me, when upon my making the slightest noise, off he would go, only to return when I had once more begun to doze. He favored us more with his visits on moonlight nights than at other times, and proved a great nuisance until I finally managed to shoot him.

When mellowed by distance, the lay of the Chuck-will's Widow has a soft, dreamy cadence which has an extremely soothing effect, for then only two of the notes are audible, the third and fourth, the more emphatic and harsher *chuck* remaining unheard. Besides the notes of which I have spoken, these birds utter a croaking sound when alarmed or when in pursuit of their mates. When excited by a feeling of rivalry or by the sight of the female, the song, like that of the Whippoorwill, is given with such rapidity that it becomes a series of notes which end abruptly as the female comes sailing by, for then the male starts in pursuit of her. When aroused from the ground, the birds will frequently alight on a branch crosswise; in fact, they appear to have more grasping power in their toes than is possessed by the Whippoorwills for, although I have seen this latter named species alight as described, yet they more often rest longitudinally on the object upon which they are sitting, like the Night Hawks.

I have had quite a number of the eggs of the Chuck-will's Widow in my possession, yet I have found but one nest. I was walking through a hummock when one of those black, half-wild hogs so common in Florida, jumped up from a thicket in which he had been resting and made off among the palmettos. I looked after him mechanically when I observed a Chuck-will's Widow start from the ground directly in front of him. As this was the first of May and as I had shot a female only a day or two before which was about to lay, I at once conjectured that the bird had a nest there. Keeping my eyes carefully on the spot, I hastened forward and, guided by the tracks of the hog, soon found the eggs. There were two of them and they were lying upon the fragments of palmetto leaves without any other attempt at a nest than a slight hollow scratched in the debris. The bird must have remained on them until the nose of the intruding animal was actually over her, for she appeared to start from beneath his feet and she must have moved quickly as he was trotting quite briskly. Unfortunately, one of the animal's hoofs grazed an egg, breaking a hole in the side, disclosing the fact that they contained embryos quite far advanced which may partly account for the parent sitting so closely.

The Chuck-will's Widows make their appearance in Florida shortly after the middle of March and the eggs are deposited about the last week in April. Of the nestling and subsequent changes in plumage before acquiring the adult stage, I know nothing, as the birds had always departed in early autumn, before my arrival in Florida.

ORDER IV. CYPSELI. SWIFTS.

Sternum, with no marginal indentations. Keel, very high. Bill, short, with a wide and deep gape, but there are no bristles at the base. The plumage is not soft.

The wings are exceedingly long and pointed, while the feet are moderately large and provided with long, sharp claws admirably adapted to the purpose for which they are intended; that of clinging to perpendicular walls. The eyes are quite large and many of the species are semi-nocturnal in habit.

FAMILY I. CILETURIDÆ. THE AMERICAN SWIFTS.

Joints of toes, normal in number. Coracoids, exceedingly short and set at a rather wide angle. Furcula, short and arched.

The body is extremely short and compact, consequently the legs and wings have their origin quite near together, the knees when bent, coming on a level with the heart. The tibiæ are long but the tarsi are short. The short furcula is well arched and is provided with a very small terminal expansion. The humerus is very short, not more than one half the length of the fore-arm which is normal in length, while the carpus and metacarpus are considerably elongated; the result of this modification is a very long, saber-shaped wing. The skull is not large but the neck is quite long. The high keel supports very large and firm pectoral muscles, thus the birds are exceedingly strong on the wing, having apparently untiring powers of flight.

GENUS I. CILÆTURA. THE CHIMNEY SWIFTS.

GEN. CH. Tail, short, with the shafts stiffened and extending beyond the webs in thorn-like spines. The mouth is provided with two peculiar glands, situated beneath the tongue.

Members of this genus are noticeably characterised by the termination of the tail. The tarsi are naked and the tibiæ are only partly feathered. The peculiar glands beneath the tongue are somewhat triangular in form and, during the nesting season, secrete a viscid saliva which is exuded through a number of ducts that open along the inner edges, consequently, directly under the tongue. The larynx is provided with a strong sterno-trachealis and also with a slight broncho-trachealis. The tympaniform membrane is present and although there is an os transversale, yet it does not support a semilunar membrane. The œsophagus is without dilatation. The proventriculus is small, with simple oval glands which are arranged in a zonular band. The stomach is flat, rather round, the walls are thin and lined with a smooth membrane. The loop of the duodenum is short, encircling a rather long pancreas which extends along the intestine. The spleen is an oblong body, situated directly over the cardiac opening of the stomach. The cœca are quite large.

CHÆTURA PELASGIA.

Chimney Swift.

Chætura pelasgia STEPH., Shaw's Gen. Zool. Birds, XIII; 1825, 76.

DESCRIPTION.

SP. CH. Form, rather slender. Size, medium. Sternum, stout. Tongue, short, thin, flat and horny, especially at the tip but is not bifid nor provided with terminal cilia. When viewed laterally, this organ has a somewhat peculiar appearance, as the first bone, the glosso-hyal, is placed higher than the remaining portions, the uro-hyal being bent downward; thus the tracheal opening which approximates quite closely to the tongue, is considerably beneath its level.

COLOR. Adult. Dark sooty-brown, throughout, darkest on the head, back, and wings where there is a greenish gloss. The wings and tail are not dark and the throat is quite pale but gradually becomes darker on the breast.

Young. This stage of plumage is scarcely different from the above, the general colors are, perhaps, darker, and the primaries and scapularies are slightly edged with whitish.

Nestlings. Quite similar to the above. The rump and upper tail coverts are quite pale and the line of demarkation between the former and the back, is quite distinct, and all the feathers of these parts show lighter edgings as do those of the top of the head. Bill, dark-brown, feet, light-brown, and sexes, similar, in all stages.

OBSERVATIONS.

It is remarkable that the nestlings pass directly into the next plumage without moulting. They are, I think, born naked but quickly acquire the feathers without any intermediate downy stage. There is so little variation in plumage, even in specimens of different ages, that it requires the closest study to determine which are birds of the year after they have become fully grown. The plumage of this species is always smooth and shows but little wear, even just before moulting which goes on very gradually, especially on the wings, but two feathers, one on either side, being shed at the same time. The new plumage is considerably darker than the old. There is a single white feather in the top of the head of a specimen before me showing a slight inclination to albinism which condition of plumage is certainly very rare among these birds, the only instance that has come under my notice being a pure white specimen in the collection of Mr. Jesse Warren. It is noticeable that the keel is pierced with holes near the sternum, these being larger in the young birds. Distributed during summer throughout Eastern North America, south to the Carolinas. Winters south of the United States.

DIMENSIONS.

Average measurements of ten specimens from New England. Length, 5.32; stretch, 12.34; wing, 5.05; tail, 1.65; bill, .22; tarsus, .46. Longest specimen, 5.50; greatest extent of wing, 12.62; longest wing, 5.21; tail, 1.78; bill, .25; tarsus, .55. Shortest specimen, 5.15; smallest extent of wing, 12.10; shortest wing, 4.90; tail, 1.61; bill, .20; tarsus, .41.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in the unused flues of chimneys, composed of sticks, cemented together with the viscid saliva which is exuded from the sublingual glands. They are semicircular in form. Dimensions, longest diameter, 4.00, shortest, 2.00. External depth, 1.75, internal, .75.

Eggs, four in number, long oval in form, light-creamy in color, not highly polished, and unspotted. Dimensions from .76 x .45 to .85 x .50.

HABITS.

The first week in May or but a few days later, the Chimney Swifts suddenly make their appearance in New England. I say suddenly, for, unlike the Swallows who send out a few skirmishers in advance in order to ascertain if the great enemy of their race, Winter, has entirely withdrawn his forces, the Swifts come in a body. The day before, not a bird of this species is in sight but on the ensuing morning the air is filled with them. Their long northward flight from tropical climes is evidently performed without a pause for I have seen them crossing over Florida about the first of May in large numbers and in a few days they are in their summer homes. There are probably few, if any, birds which possess such untiring powers of flight as the Swifts and after their arrival from their southern journey, they appear very lively, darting about through the air as rapidly, and displaying as much freshness and vigor, as upon following days, just as though a continuous aerial voyage of a few thousand miles over land and sea did not weary them any more than an hour's sail over the meadows.

This Swift is popularly known as the Chimney Swallow and it is true that in being constantly on the wing it does resemble the family of birds from which it derives this name, but here the similarity ceases, for neither in form, habit, nor color does it bear any semblance to them. Even the flight is quite different, the wings being used with a quick fluttering motion and all the other movements of the birds are performed with an abruptness quite at variance with the elegant evolutions of the Swallows. I do not mean to imply that the Chimney Swifts are not graceful in some of their changing modes of flight;

for example, when sailing in a direct line or moving in large circles, they glide through the air so easily and so smoothly that no one would accuse them of awkwardness; in short, they fly so well that a certain heaviness which is only perceptible upon comparison with the light, almost ethereal, movements of the Swallows, is quite over-looked and one is never tired of watching the characteristic and unwearied flight displayed by the Chimney Swifts. When the birds are sailing, flying in a direct line, or wheeling in immense circles, the tail is closed but when a sudden turn is made, then it is expanded and is also opened when the birds wish to check their flight. Unlike the Swallows, they do not move in particular strata of atmosphere in different days but, while soaring high in air, will often come plunging downward and fly along within a few feet of the ground. They have a habit of darting close to any one and will repeatedly persist in so doing. I have known of quantities being killed by boys who stood on a bridge and struck them down with sticks as they passed. I have been informed by good authority that these birds will sometimes mount in air, then form a circle by closely following one another and continue to fly in this manner for some time.

I never saw the Chimney Swifts alight and do not think that they ever settle outside the chimneys. Even when gathering material with which to construct their nests, they do not rest on the trees but will fly through the dead branches and break off the small twigs as they pass, grasping them with their beaks. These Swifts are among the birds, the breeding habits of which have become decidedly modified by the innovations of man. They doubtlessly nested in hollow trees before the advent of the whites but now they always breed in unused flues of chimneys. As soon as they arrive, they occupy their usual quarters at night and soon begin to build. At this season, the glands of which I give a figure in plate XIII, are enlarged and secrete a viscid substance which, for convenience, we may call saliva yet it bears but little resemblance to this secretion as it is usually found. This saliva is poured forth abundantly during the time of nesting and is used to cement the twigs together. As seen by the figure of the tongue in the plate, this organ is of a somewhat peculiar shape and is doubtlessly used as a kind of trowel which it resembles in form, to spread the cement upon the twigs. This viscid substance is milky white in color when first exuded, but becomes yellowish and nearly transparent when dry. It is of the consistency of bird-lime when first applied and must harden quite rapidly. The birds evidently are obliged to exercise care while at work in order to prevent their feathers from being entangled, but this occasionally occurs and it is not unfrequent to find feathers fastened to the nest. Both sexes are provided with these glands which rapidly shrink after the breeding season and are scarcely discernible by the time the young are hatched, the space that they occupied being used as a kind of pouch in which insects are packed when they are captured. I have seen the birds when this cavity was completely filled with minute insects that were intended for the young.

I think that these glands are peculiar to the Swifts as I never observed them in any other species, not a trace of anything of the kind being found in any of our Swallows that I have examined. As the cement secreted by the glands of the Swifts is soluble in water, the nests frequently become detached during storms and fall to the bottom of the

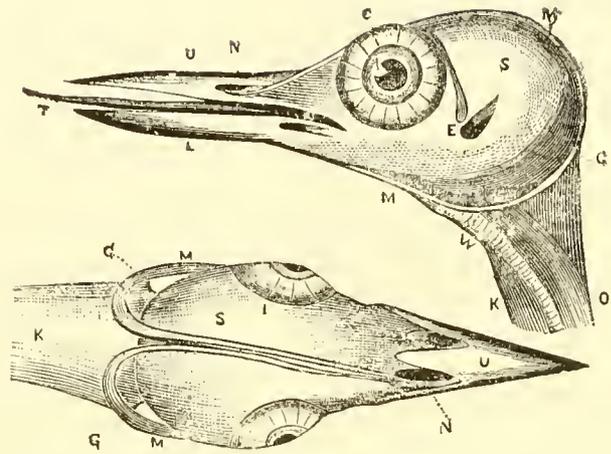
chimney. If they contain young partly grown the little fellows manage to clamber up the sides and cling to the bricks, remaining in this position until able to fly. They appear to suffer no more inconvenience than if in the nest as they are regularly cared for by the parents. When the Swifts enter a narrow flue, they proceed in a singular manner; balancing themselves for a moment over the opening and elevating their wings to the utmost, they will settle downward but a too rapid descent is avoided by oscillating the body from side to side. When ascending, the wings are vibrated rapidly, causing a noise which resembles distant thunder. They are very devoted to their offspring and I once observed a touching display of this. A house in the chimney of which a pair of these birds had a home, was on fire, the roof had fallen in, thus the flames were leaping upward with fury and the intense heat caused all in the immediate vicinity to withdraw, when I observed a Chimney Swift circling high over the burning pile; it paused above the chimney which contained its young, balanced itself for a moment, and, to my astonishment, dropped quickly with the usual rocking motion, into a flue which was surrounded by bricks that were fairly glowing with heat. This extreme devotion to its young must have caused its death as it did not appear again; in fact, it could not have lived a moment in the furnace which it entered.

Swifts are very tenacious of life and this is not only true of our species but, as I once learned to my cost, is also noticeable in at least one other. I was passing through a field near my place in Newtonville in the summer of 1877, when I observed a singular appearing bird clinging to a pole which was lying on top of a wall. It was nearly the size of a Night Hawk but its manner of clinging to the wood was so different that I saw at once that it was not this species. I approached it cautiously but when I was within twenty yards, it turned its head to look at me and then I saw that it was a huge Swift of some species. I instantly raised my gun and shot at it, knocking it off its perch but on the opposite side of the wall from that on which I was standing. Thus I lost sight of it for a moment, only to see it again mounting in air some fifty yards away, too far to get a second shot with the light charge with which my remaining barrel was loaded. It was evidently wounded badly for it flew laboriously but with the characteristic flight of the Swifts. I watched it anxiously as it continued to mount upward, expecting every moment to see it fall but was disappointed for it disappeared in the distance and I never saw it again. What it was is, of course, only a matter of pure conjecture.

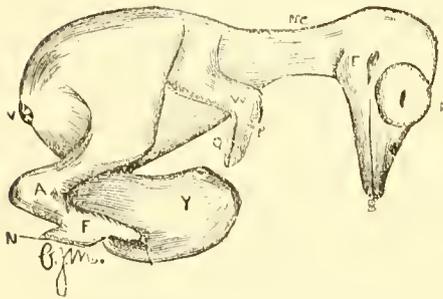
The only notes that the adult Chimney Swifts utter is a kind of rattle which is given quite slowly when the birds are moving moderately but as the speed is increased, the notes are poured forth more rapidly and end in a perfect chatter. The young make a hissing noise when the parents appear which sounds quite loud in the chimney. The eggs of the Swifts are deposited the last week in May but the young do not leave the chimneys until the last of August at which time they are nearly fledged and resemble the adults so closely in flight that it is almost impossible to detect the difference. The Swifts do not remain late in autumn but migrate, at least, by the first of October, departing as they arrive, in a body. I do not think that they linger on their autumnal migration but leave at once for the tropics.



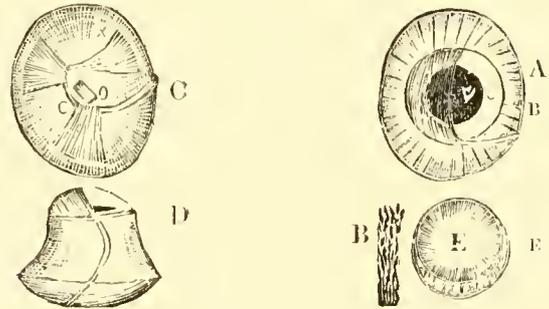
Bark in which acorns have been placed by the California Woodpecker.



Head of Golden-winged Woodpecker with the skin removed; life size. T, tongue; L, lower mandible; U, upper mandible; N, nostril; M, M, tongue muscles; c, eye; E, ear; W, windpipe; G, back of head; K, O, neck; The upper figure represents a side view, the lower, a top view; the lettering being the same in both.



Young Kingfisher, taken from the egg; life size. B, bill; I, eye, E, ear; N, C, neck; W, wing; P, thumb; Q, hand; Y, yolk sack; F, foot; N, hind toe; A, leg; V, vent.



Eye of Mottled Owl, showing nictitating membrane; life size. A, front view of eye; V, pupil; O, iris; B, muscle of nictitating membrane. E, lens, showing power of magnifying, E, inside the lens shows how much the one outside is enlarged when seen through the lens. B, section of iris magnified. C, Back of eye; X, termination of muscles on eye; O, optic nerve. c, pulleys through which the muscles run. D, side view of same.

ORDER CLAMATORES. SONGLESS PERCHERS.

Base of hind toe on a level with the three anterior toes, which are not capable of any extended lateral movement. Front scales of tarsus extending nearly around to the back, and the comparatively narrow space between the edges is protected by scales which are flattened or rounded, not projected backward into a sharp ridge. Inferior larynx provided with less than six pairs of vocal muscles. The sterno-trachealis has its origin above all of the other muscles. Primaries, ten. Tail feathers, twelve. Marginal indentations of sternum, two, and they equal in depth, at least one fourth the length of the top of the keel. Keel moderate, but exceeding in height one half the width of the sternum, but it is never as high as the sternum is broad. (See plate XIV; figs. 7, 18, and 19.)

In this edition I have concluded to elevate the group of birds, which in the old edition I considered a section of the order Insectores, to the rank, of order, as I now regard the birds contained in this group as fully and consistently entitled to this rank. Taken as a group, the birds in the order Clamatores are distinctly different from those in the following order; although some species among the Oseines approach quite nearly to some members of the present order, for example the Redstart and other flycatching warblers, also the waxwings. But as far my studies of both groups go, there is no difficulty in separating them by one well defined and constant character, the muscles of the inferior larynx.



A, Tarsus of Kingbird, B, Tarsus of Pine Grosbeak; both considerably enlarged.

These muscles are restricted to what are practically four pairs only. The sterno-trachealis is always present. (See plate XIV where at 1 I have given the figure of the inferior larynx, considerably enlarged, of a King bird. St. is the sterno-trachealis) and on account of the great abridgment of the broncho-trachealis, (the upper portions not coalescing as in members of the following order) it has its origin on the trachea far above all of the other muscles.

The very much abbreviated and probably functionless, broncho-trachealis muscles, *ib. ba.* and *ib. bp.*, nearly form a portion of the bronchialis which is not divided into three as in members of the Oseines, but which is fused into one, (See *ib. B. B.*) the function of this being to aid in tensifying the upper portion of the tympaniform membrane, which is the only vibrating vocal organ which members of this group possess, although in many genera there is a trace of a semiluna membrane, but this is, as far as I have seen, always so rudimentry as to be functionless. The absence of the sharp ridge on the back of the tarsus, found on most all members of the Oseines, is a character rarely ever found in members of this order. The extension of the scales of the front portion of the tarsus of a Gray Kingbird may be seen in the accompanying figure, A, being the tarsus of the Kingbird enlarged and B, that of a Pine Grosbeak drawn on the same scale. Also compare with other figures and remarks given under the following order.

FAMILY I. TYRANNIDAE. THE TYRANT FLYCATCHERS.

Bill, more or less triangular in form, wider than high at base, and the upper mandible is abruptly curved at the tip, which is notched. Nasal and loreal region at base of upper mandible provided with stiff bristles which also very often occur on the chin. Sternum, broad with high keel

This is a large family with dull colors, occasionally relieved by yellow below or by bright markings on the crown. The differences between the various genera are slight, although constant. I have made some changes in the arrangement of the genera, based mainly upon anatomical characters. The tympaniform membrane is always present but, although I have found the os transversale in all that I have examined, I have never seen the semiluna membrane. The coracoids are short, but are set on at an angle, causing the furcular to be well arched, and its terminal process is short.

GENUS I. MYIARCHUS. THE CRESTED FLYCATCHERS.

GEN. CH. Bill, about as long as the head, which is crested, but without a bright central patch of feathers. Outer quills, not incised. Tail, slightly rounded. Height of keel, less than one half the length of coracoids.

Upper outline of manubrium, viewed from the side, straight for one third the length then angled obliquely downward. Marginal indentations, narrow and shallow. Broncho-trachealis anticus and posticus present, also traces of bronchialis anticus.

The colors above are dull, but there is more or less yellow below. I have placed this genus nearest the Order Oscines partly on account of the similarity of the sternal characters but more particularly on account of the development of the laryngeal muscles which exceed those of any species in this order that have come under my notice.

MYIARCHUS CRINITUS.

Great Crested Flycatcher.

Myiarchus crinitus CABANIS, Jour. fur Ornith. III; 1885, 179.

DESCRIPTION.

SP. CH. Form, rather robust. Size, large. Sternum, as given above. Feathers of the crest, long but rounded at the tip.

COLOR. Adult. Above, olivaceous-green with feathers on the top of the head showing the darker centers. Upper tail coverts and tail, dull-cinnamon, tinged with greenish, with the inner webs of the feathers of the latter, except a narrow margin next the shaft, bright-cinnamon. Wings, including coverts, dark-brown, with tips of the latter, forming bars, and the edges of the scapularies and secondaries, pale-yellow, while the outer edge of the basal portions of the primaries are bright-cinnamon, and the inner webs of all the longer feathers are edged with pale cinnamon. The throat and upper breast, dark-ash. Remainder upper parts, including under wing and tail coverts, lemon-yellow. Bill, brown. Feet, black.

Young. Differ from the adult in having the bars on the wings less clearly defined, in being darker above, and in having greenish on the anterior portions of the sides. The cinnamon is also darker.

Young of the year. Color above, inclined to be reddish, the bars on the wings are clearly defined, but the whitish is replaced by pale-cinnamon and the edges show very little yellow. The outer webs of the tail feathers are lighter cinnamon, the throat is lighter, and the yellow of the breast encroaches upon dusky.

Nestlings. The top of the head is overwashed with pale-cinnamon. Beneath, very pale with the yellow encroaching upon the breast considerably. Sexes, similar in all stages.

OBSERVATIONS.

Occasionally there will be indications of narrow cinnamon edgings to the feathers of the crest, this being especially observable in Florida specimens. Birds from the latter named section are also darker than the more northern, skins otherwise they are quite similar in coloration, but the bill is almost always longer and the curved point of the upper mandible is more elongated; they do not differ in size, however. Distributed in summer through Eastern North America, from Middle Maine to Southern Florida, wintering on the Keys and in the West Indies.

DIMENSIONS.

Average measurements of thirteen specimens. Length, 8.85; stretch, 13.30; wing, 4.15; tail, 3.75; bill, .80; tarsus, .81. Longest specimen, 9.20; greatest extent of wing, 13.60; longest wing, 4.35; tail, 4.00; bill, .92; tarsus, .90. Shortest specimen, 8.50; smallest extent of wing, 13.00; shortest wing, 4.00; tail, 3.50; bill, .70; tarsus, .77.

DESCRIPTION OF NESTS AND EGGS.

Nests placed in holes of trees, composed of grass and fine weeds with the occasional cast-off skin of a snake. Dimensions, external diameter, 4.00; internal, 2.50. External depth, 2.00; internal, 1.00.

Eggs, four or five in number, rather elliptical in form, buff in color, streaked and lined with brown and lilac. The markings are usually placed longitudinally and give the eggs a peculiar appearance rendering them at once distinguishable. Dimensions from .80x.65 to .85x.70.

HABITS.

There are few birds, even among the most melodious of the Oscines, that render themselves more conspicuous by their voices than the Great Crested Flycatchers. It is true

that all the notes which they utter are given in about the same tone, yet their cries are loud, consisting of a series of somewhat shrill whistles often followed by a harsh chatter. There is considerable individual variation in the notes of these birds, yet there is a similarity of intonation by which they can at once be recognized. Besides the regular lay, I have heard them give a peculiar note which so nearly resembles the call of the Quail that it is impossible to decide which of the species is producing the sound. The first place that I ever heard this cry was in a thick hummock at Miami, when I was so completely deceived that I advanced carefully through some yards of tangled thicket, expecting every moment to start a Quail, and did not discover my mistake until I had approached so near a Great Crested Flycatcher which was perched on a low bush, as to be enabled to perceive the motion of its throat as it gave utterance to the imitative strain. The locality in which I found this particular bird was exceptional for these Flycatchers do not often occur in the hummocks of Florida but prefer the more open country, being usually found in the piny woods. These latter named sections are usually vast plains with slight depressions which are filled with water and grown up to cypress trees. These swamps, generally circular in form and which vary from fifty to several hundred yards in diameter, are the chosen resort of the Great Crested Flycatchers. Indeed, it is difficult to find a swamp which is surrounded by pine woods, after the first of April that is not guarded by one or more of these birds. I say guarded, for like nearly all members of this section they seem to consider the land in their immediate vicinity as their special property and will instantly eject any avian intruder which ventures upon their domains.

The Great Crested Flycatchers spend the entire winter on the Keys but do not make their appearance on the southern portions of the main-land of Florida until March. They reach the vicinity of Jacksonville in early April, arrive in Pennsylvania about the first of May, and I have taken them in Massachusetts during the second week of the month. In Pennsylvania I found them frequenting old apple orchards and they build in holes after the manner of the Blue Bird, depositing their eggs about the middle of June. It is a well known fact that the sloughs of snakes are very frequently found in their nests, they do not always occur, yet their presence is so general as to leave no doubt but that it is a decided habit of the Flycatchers to use them. Why these singular objects are employed is of course a matter of pure conjecture, yet, as the skins are placed in a conspicuous position and as the birds must take considerable pains to secure them, it is probable that they are intended as something more than mere building material. Dried snakes' skins are hardly attractive enough to be considered as ornamental, even to birds, so we are forced to the conclusion that they must be regarded as useful by the Flycatchers. It is noticeable that many birds exhibit great fear of snakes, and Robins or other species may be kept from eating berries by simply hanging the slough of a snake on the bushes.

Therefore it is quite possible that the Flycatchers taught by a long experience, use the skins of these reptiles to frighten away such predatory species as Cuckoos and Crow Blackbirds. The Great Crested Flycatchers become attached to certain localities and will build their nests for several successive years in the same hole if not disturbed. Individu-

als also have the habit of visiting particular trees during certain hours of the day and I have seen the same bird return to perch on the top of a high black walnut regularly every day at a given hour in the afternoon. I do not think that he missed a day during the two or three weeks that I observed him. These birds guard their nests quite assiduously, especially when they have young, but do not appear to pay their offspring much attention after they have left the nest and have become somewhat accustomed to snapping up insects, in which art they soon become expert. About the middle of August, when the young are flying about, the adults become silent and retire to the woods to moult and soon after migrate.

GENUS II. TYRANNUS. THE KING BIRDS.

GEN. CH. *Head, semi-crested with a bright central patch of feathers. Outer quills, incised. Tail, square and slightly emarginate. Height of keel, about equal to one half the length of the coracoids. Upper outline of manubrium, viewed from the side, showing a rounded process with a truncated end. Marginal indentations, shallow but not very narrow. Only slight traces of either division of the broncho-trachealis but the bronchialis is well developed.*

The colors above are dark but lighter below being either white or yellow. The central patch of the crown is only present in the adult stage. This genus appears to come next *Myiarchus* in laryngeal development as well as in sternal characters.

TYRANNUS CAROLINENSIS.

King Bird.

Tyrannus Carolinensis BAIRD, Birds N. A.; 1858, 171.

DESCRIPTION.

SP. CH. Form, robust. Size, medium. Sternum, not very stout. Feathers of the crest, somewhat lance-shaped. Bill, shorter than the head. Tongue, thin, flat, and horny, bifid at tip, but not provided with cilia.

Color. *Adult.* Above, dark slaty-blue with the top of head nearly black. Upper tail coverts, dark and edged with white. Tail, black with the outer web of two thirds of the terminal portion of outer feather rather widely, and a shorter terminal portion of all the remaining feathers narrowly edged, and tips of them all, white. Wings, dark-brown with the lesser coverts slaty, and both rows tipped with white with a tinge of sulphury-yellow forming indistinct bars, while all the remaining feathers are edged with white. Central patch of feathers on the crown, bright-orange under which are some of yellow. Beneath including under tail coverts, pure-white with under wing coverts, sides, flanks, and an indistinct band across the breast, slaty. Bill and feet, black.

Young. Show traces of brown above, the head is not as dark, the orange patch is not as extended, and the white tipping to the tail is not as broad.

Young of the year in autumn. Quite similar to the preceding but browner above, especially on the head which is without the concealed central patch. The white edgings of the feathers of the rump are replaced by reddish and the other white markings above are tinged with sulphury-yellow.

Nestlings. Uniform brownish-slaty above. The white markings are much less extended than in the young and either decidedly sulphury or yellowish-rufous. Beneath, pure silky-white with but few traces of slaty anywhere. Inside of mouth, yellow. Bill, black. Feet, plumbeous. Sexes, similar in all stages.

OBSERVATIONS.

There is but little individual variation in plumage even in specimens from Florida, but the bills of the more southern birds are larger and have the curved tip longer. Nestlings from the same brood vary somewhat in amount of white on the wings and tail, also in shade of color above and amount of slaty below. Distributed in summer throughout Eastern United States from Florida, at least as far north as Canada.

DIMENSIONS.

Average measurements of seven specimens from New England. Length, 8.37; stretch, 14.55; wing, 4.21; tail, 3.31; bill, .72; tarsus, .65. Longest specimen, 8.55; greatest extent of wing, 15.27; longest wing, 5.05; tail, 4.42; bill, .70; tarsus, .60. Shortest specimen, 8.20; smallest extent of wing, 13.77; shortest wing, 4.37; tail, 3.10; bill, .75; tarsus, .70.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in trees, rather bulky structures, composed of grass, weeds, of which the common everlasting usually form the greater part, and roots, lined with fine grass and rootlets. Dimensions, external diameter, 4.50, internal, 2.50. External depth, 2.50, internal, 1.50.

Eggs, four to five in number, oval in form, pale-buff in color, spotted and blotched irregularly with umber and lilac. Dimensions, from 1.00x.75 to .85x.65.

HABITS.

About the second week in May, when the advancing vegetation has given assurance that the cold season has fairly passed, the peculiar, shrill, continuous cries of the King Birds are heard in the open fields and orchards of New England. The males arrive first and with a characteristic promptness which this species ever displays, each individual selects some particular spot as a home and guards it with great assiduity. A few days later the females arrive and both soon begin the duties of nest building. The King Bird in certain districts appear to prefer particular kinds of trees in which to place their domiciles. Thus in some sections it is quite difficult to find a nest which is not built in a buttonwood. In other localities the birds select apple trees, while in some places they show a predilection for bushes which overhang the water. They never build in close assemblies for in no case will one pair allow another to settle very near them, but they sometimes exhibit a decided inclination to sociability by building in detached communities. When family affairs are fairly under way, and the female is sitting, the male redoubles his watchfulness but when the young appear both parents guard the vicinity of the nest with the most jealous care. Then, all such enemies to small birds as Crows and Hawks are obliged to exercise care when passing near a King Bird's nest, for upon the appearance of one of these birds he is instantly attacked with a fury that cannot be resisted, for the King Bird is both powerful and agile. I have seen an unfortunate Crow which was merely flying over an orchard in which a pair of these irascible birds had a home, assailed and not only driven from the spot but pursued for half a mile.

The boldness of the King Birds is noticeable and their attacks even to species much larger than themselves is no trilling matter, for they do not, like many other birds under similar circumstances, merely dash at the object of their dislike and pass it without touching it, but they strike so hard with their sharp beaks as to frequently make the feathers fly. At any rate I never saw a Crow or Hawk but what would retreat as hastily as possible, their usual plan being to rise very high in the air, thus escaping the persecutions of the persistent little tyrants. Even cats are ignominiously driven from the field by the brave King Birds. Cats are very cowardly when they are obliged to encounter any danger which they do not understand and I once saw one badly frightened by a Chipping Sparrow. This particular animal was notably brave and would seldom retreat before a dog, but in the ease in hand the Sparrow alighted directly upon her head as she was about to spring upon its young, chirping loudly, at the same time picking her ears fiercely. The Cat was completely mystified by this strange proceeding and instantly ran away, shaking her head as she ran, thus dismounting the bird. The downward swoops of the Flycatchers which are always accompanied by loud screams judiciously delivered by the birds at the

moment they strike, generally prove too much for feline courage, and I never saw a cat that would await a second attack.

The King Birds also appear to prefer certain plants for building materials, for example in the interior they very frequently use the common everlasting, while on the sea shore they choose the bleached eel-grass. The eggs are deposited early in June and the young leave the nest by the middle of July. This is a time full of anxiety for the parents as they are extremely solicitous for the safety of their offspring. They manage to keep them together never permitting one to stray far from the others, then when danger appears they will fly around them and by their cries induce them to move away.

I once saw a family of four nestlings sitting together and, as I came near, the adult birds tried to persuade them to fly by uttering loud cries, going a short distance in the direction they wished them to take and returning. Their offspring were quite young and did not appear to comprehend, for they did not move. As I drew nearer, the adults became quite excited and darted frantically about, then finding that the objects of their care did not understand what they wanted, one, evidently the female, flew swiftly against two that were sitting together, causing them to take wing, when the remainder followed and all moved away to a distant tree.

Just after sunset, during the bright evenings of summer, the King Birds have a singular habit of taking a rapid flight upward. After going some yards silently, they will suddenly dart obliquely a few feet uttering a shrill twittering, then will mount higher, only to repeat this eccentric movement again and again. Then having attained to a considerable altitude, they will quietly descend into the gathering darkness. I never remember observing this excepting during twilight and think that the same bird performs but once during the evening. As the males only exhibit this peculiarity, it may be regarded as an attempt at a song and, although not very melodious, is not unpleasant. There are probably few birds which are so useful as the King Birds for they are almost, if not wholly, insectivorous and, aside from their habit of eating a few honey-bees, never do any harm. They may be seen perched on a convenient fence-post or mullen-stalk, occasionally launching out at some passing insect and, with a decisive snap of their strong beaks, terminating its career. The King Birds remain in New England until about the middle of September, then depart southward. I think that they must migrate very rapidly, passing quite out of the United States to winter in the West Indies. They enter Florida on their return about the first of May, a few remaining to breed.

TYRANNUS DOMINICENSIS.

Gray King Bird.

Tyrannus Dominicensis RICH. List; 1837.

DESCRIPTION.

Sp. Ch. Form, very robust. Size, large. Sternum, stout. Feathers of the crest, somewhat lance-shaped. Bill, stout, longer than the head. Tail, somewhat forked.

Color. *Adult.* Above, light-slaty inclined to brownish, with the top of the head darker. Wings and tail dark-brown with all the feathers edged with sulphury-yellow. These edges are wider on the secondaries and tertiaries and both

rows of coverts are tipped with the same color, forming indistinct bars. Concealed coronal patch, orange and yellow with white at the base. There is a broad, dusky line commencing at the lores and extending over the ear coverts. Beneath, including under tail coverts, yellowish-white, with the sides, flanks, and indistinct bar across the breast, slaty. Under wing coverts, sulphury-yellow. Bill and feet, black.

Young. Similar to the adult, but browner above, and with much less white on the wings which is often replaced by brownish. Sexes, similar in all stages.

OBSERVATIONS.

There is some variation in the size and form of the bill but there is a great similarity of coloration. Readily known from the preceding species by the larger size, stouter and longer bill, absence of white on the tip of the tail, and general paler colors above. Distributed in summer throughout the Keys and along both coasts of Florida, north on the Atlantic side to Charleston, South Carolina; accidental in Massachusetts. Winters in the West Indies.

DIMENSIONS.

Average measurements of twenty-two specimens from Florida. Length, 9.52; stretch, 15.32; wing, 4.43; tail, 3.82; bill, 1.24; tarsus, .77. Longest specimen, 9.80; greatest extent of wing, 16.10; longest wing, 5.06; tail, 4.25; bill, 1.45; tarsus, .80. Shortest specimen, 9.25; smallest extent of wing, 14.55; shortest wing, 3.80; tail, 3.40; bill, 1.01; tarsus, .74.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in bushes, composed of grass and weeds, lined with fine grass and rootlets. Dimensions, external diameter, 4.75, internal, 2.75. External depth, 2.75, internal, 1.75

Eggs, Four in number, deep-salmon in color, spotted and blotched irregularly with umber and lilae. Dimensions from 1.10 x .80 to .90 x .70.

HABITS.

The first time that I ever saw the Gray King Bird was on the seventh of April, 1871. I was in company with my friend, Mr. H. W. Henshaw, and we were just returning from a trip into the Everglades. As we were pulling slowly along the sluggish stream which is the beginning of the Miami River, we were saluted by a loud whoop and, turning in the direction of the sound, saw the tall form of the young Seminole chief, Tiger-tail, looming up over the tops of the grass which is not very high at this point. He had observed us and, wishing to cross the river, had hailed us. After setting him on the other side, we passed onwards but it was owing to the slight delay which this incident occasioned that we saw the Flycatcher now under consideration for, just as we neared the rapids which occur in the river as it emerges from the Everglades, a bird flew silently across and alighted on a tall cypress which stood near the margin. I at once recognized it as being the Gray King Bird and pointed it out to my companion, who landed and secured the specimen.

This bird was evidently a straggler for I did not see any more at Miami, nor did I meet with the species again until the last week in April, when I found them very abundant among the Keys. There is a similarity in the flight of the Gray King Bird and that of the common King Bird but, the former may be at once recognized by their heavier movements, and they are much less agile. The northern species are noisy birds but in this respect they are excelled by the Gray King Birds which are constantly chattering. They not only utter their cries while flying, but will also give their shrill notes while sitting, raising their wings while so doing, very much after the manner of the Red-winged Blackbirds.

The Gray King Birds appear to prefer the outer, or higher, keys and visit them in great numbers, especially during the spring migration. In order to give some idea of the homes of these birds, I will describe Bamboo Key where I found them particularly common. This little island which contains nearly two acres of land, lies about midway between Key West and Cape Florida. It is one of a line of outer keys which have an old coral reef for a foundation and, as the present reef which extends parallel with the keys but which lies five miles at sea, is clearly visible, this is used as a wrecking station and has a lookout erected upon it. There were two families living there but, with the characteristic improvidence of the poorer class in Florida, they did not attempt to cultivate the soil, choosing rather to depend upon a precarious livelihood gained by wrecking. Thus the vegetation of the place was, in a great degree, in a primitive condition. Nearly the whole key was surrounded by a belt of mangroves but these grew on very low ground over which the tide rose every day; higher, on the dry land, were bushes among which two or three species of cacti grew in profusion and, as the whole was overgrown by a tangled mass of vines, it formed an impenetrable thicket. The wreckers had formed a small clearing in the midst of this jungle and erected two or three wretched houses.

I landed on the first of May and remained there several days during which time I saw hundreds of Gray King Birds. They appeared to be migrating, for numbers were constantly arriving from sea-ward, yet, unlike many other species, they invariably came in pairs and were evidently mated as they were constantly pursuing each other through the air in a playful manner, at the same time vociferating loudly. They exhibit a decided preference for mangroves and later, by the middle of the month, build their nests in them, usually selecting bushes which overhang the water. These birds inhabit all of the higher keys from Key West to Cape Florida. They also occur on the West Coast in suitable localities but I do not think that they are as abundant on the East side of the peninsula. They must migrate early, as I never found them in autumn.

GENUS III. CONTOPUS. THE PEWEES.

GEN. CH. *Bill, shorter than the head which is crested but without the central coronal patch. Outer quills, slightly incised. Tail, square and emarginate. Upper outline of manubrium, viewed from the side, rounded gradually downward. Height of keel, a little less than one half the length of the coracoids. Broncho-trachealis, slightly developed. Bronchials, quite large.*

The colors are dull, relieved only by restricted white markings below. There is a silky patch of elongated, white feathers growing from the sides of the upper rump. The under mandible of the adult is yellow, veined with red in life.

CONTOPUS BOREALIS.

Olive-sided Flycatcher.

Contopus Borealis BAIRD, Birds N. A.; 1858, 188.

DESCRIPTION.

SP. CH. *Form, robust. Size, large. Sternum, stout. Tongue, triangular in form, thin, horny, bifid, provided with coarse cilia which extend along the sides. Stomach, somewhat muscular. Wings, long and pointed. Feathers of semi-crest, rounded.*

Color. Adult. Above, including wings, tail, and upper tail coverts, dark sooty-brown overwashed with plumbeous on all portions excepting top of the head. Edges of secondaries, tertiaries, and tips of two rows of wing coverts, forming indistinct bars, white. Beneath, including under tail coverts, yellowish-white. Narrow band across breast, sides, flanks, and

under wing coverts, thickly streaked with olivaceous-slaty. Upper mandible, dark-brown, under, yellow, darker at tip. Feet, black.

Young of the year in autumn. Similar to the adult but more strongly tinged with yellow below, the wing bars show a tinging of rufous and the under mandible is dark-brown.

Nestlings. Are more olivaceous above. The white of the wings is replaced by rufous. Under portions, inclined to buff. Bill, dark-brown, yellow at base of lower mandible. Sexes, similar in all stages.

OBSERVATIONS.

There is but little variation in plumage in specimens of the same age. Readily known from all allied species by the large size and olivaceous markings below as well as by the greater proportionate length of wing. The descriptions of the younger stages are from specimens in the cabinet of Mr. Wm. Brewster. Distributed in summer from Massachusetts, northward. Winters south of the United States.

DIMENSIONS.

Average measurements of seven specimens from New England. Length, 7.62; stretch, 12.92; wing, 4.00; tail, 2.82; bill, .60; tarsus, .61. Longest specimen, 7.74; greatest extent of wing, 13.50; longest wing, 4.20; tail, 2.99; bill, .71; tarsus, .68. Shortest specimen, 7.50; smallest extent of wing, 12.45; shortest wing, 3.80; tail, 2.74; bill, .65; tarsus, .60.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in trees, composed of sticks and weeds, lined with fine roots. Dimensions, external diameter, 4.00, internal, 2.00. External depth, 2.00, internal, 1.00.

Eggs, three to four in number, oval in form, salmon colored, spotted and blotched with yellowish-brown, amber and lilac. Dimensions from .75 x .60 to .85 x .65.

HABITS.

The last Flycatcher described was a member of the avi-fauna of the extreme southern portion of the United States and now we will turn to one which inhabits the more northern section of the Union. In many parts of Maine and New Hampshire, clearings are made in the primitive woods by cutting away the smaller growth of timber, but the larger trees are merely girdled. A belt of bark of greater or less width is removed completely around the trunk, after which the trees soon die but are left standing until they decay. These gigantic spruces and hemlocks which have required centuries to come to maturity, do not quickly succumb to the destroying elements but the bark soon falls away and the exposed wood becomes whitened by the sun and air. They will last for years and portions of forests thus treated are called deadnings, a suggestive name, for these leafless giants stretching their withered and whitened limbs over the despoiled soil, strongly remind one of tombstones in a cemetery. The Olive-sided Flycatchers, however, do not appear to regard them in such a melancholy light, but look upon them as convenient roosting places and whenever one of these clearings occur on the side of a mountain or other rising ground, the loud whistling notes of these birds may be heard. If the deadnings be large, there may be two pairs but usually there is only one, for, like the other members of this family, the Olive-sided Flycatchers are very quarrelsome and will not permit any birds, much less one of the same species, to settle very near them.

The notes of these birds are very loud, fully equalling those of the Great Crested Flycatchers, if not exceeding them. The ordinary call slightly resembles the plaintive *pe-wee* of the Wood Pewee, but is so much harsher and is given with so much emphasis that the similarity is scarcely perceived upon hearing the cry, but comes as an after-thought. Besides this comparatively gentle strain, the Olive-sided Flycatchers utter some loud whistles when alarmed that may be heard at a great distance.

In Massachusetts, these Flycatchers appear to prefer old fields grown up to cedars, but place the nest on the outermost limb of some deciduous tree, either an apple or an oak. They become attached to certain localities and will return year after year to breed in the same place, for Mr. H. A. Purdie has found the nest several successive seasons in one field. They are extremely solicitous for the safety of their eggs and sound their loud alarm notes so frequently that, as Mr. Purdie remarks, they always betray their nesting place.

They arrive in New England about the middle of May, nest the first week in June, the young leave their homes by the middle of July, and all migrate by the last of August. I saw a single specimen on a slope of the Alleghany Mountains near Williamsport, Pennsylvania, as late as the first week of June, thus it is possible that they breed in the more elevated portions of that section, more especially as the growth of timber there corresponds quite nearly to that of Northern New Hampshire.

CONTOPUS VIRENS.

Wood Pewee.

Contopus virens CABANIS, Jour. für Ornith., III: 1855, 179.

DESCRIPTION.

Sp. Chr. Form, slender. Size, small. Sternum, not stout. Tongue, rather long, thin and horny, bifid, but without the terminal cilia. Stomach, not very muscular.

Color. *Adult.* Above, including upper tail coverts, olivaceous-brown, darkest on the head. Wings and tail, brown, with the secondaries and tertiaries edged with yellowish-white. Tips of two rows of wing coverts, forming bars, also white. Beneath, yellowish-white, with the sides, flanks, tibia, and indistinct band across breast, olivaceous-brown. Under tail coverts, yellowish-white, streaked with olivaceous. Upper mandible, dark-brown, lower, yellow. Feet, black.

Adult in autumn. Darker above and much yellower below than in spring. The under mandible is also dark-brown, but pale-yellow at the base. The wing markings show a strong tinging of yellow.

Young of the year. Quite brown above with an overwashing of yellowish-rufous on the nape, rump, and upper tail coverts. The wing bars are broader, but the white is replaced by yellowish-rufous. Under portions, similar to the adult, but the dark markings are greenish. Bill, very dark-brown, yellow at base of lower mandible.

Nestlings. Similar above to the plumage last described, but browner and showing more yellowish-rufous. Beneath, olivaceous-brown, with the abdomen and under tail coverts, yellowish-white. Bill, usually black, with dull-orange at the base of the upper mandible, but a specimen not quite fully grown, kindly procured for me by the Bangs Brothers, has the under mandible entirely yellow as in the adult.

OBSERVATIONS.

Specimens of the same age vary but little, excepting in form of bill. In the younger stages this member is broader and has a shorter curved tip, especially in nestlings. It is somewhat difficult to obtain a specimen which is entirely in the first plumage as they acquire the second dress before they are fully grown and, on the other hand, the adults delay so long in assuming the autumnal dress that it is rare to take one in this stage in New England; the one which I have described being taken on the autumnal migration in Pennsylvania. Known from *borealis* by the smaller size, more slender form, and the uniformity of the darker markings, they being in streaks in the larger species. Distributed in summer throughout Eastern North America from Canada south, at least, to Georgia. Winters in Mexico and Central America.

DIMENSIONS.

Average measurements of fourteen specimens. Length, 6.45; stretch, 10.20; wing, 3.37; tail, 2.41; bill, .57; tarsus, .50. Longest specimen, 6.80; greatest extent of wing, 10.85; longest wing, 3.60; tail, 2.75; bill, .65; tarsus, .55. Shortest specimen, 6.10; smallest extent of wing, 9.65; shortest wing, 3.15; tail, 2.21; bill, .50; tarsus, .45.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in trees, composed, inwardly, of grass and pine leaves. The outside is smoothly covered with lichens secured by cobwebs. Lined with fine grass. The whole structure somewhat resembles that of the Humming Bird. Dimension, external diameter, 2.50, internal, 2.00. External depth, 1.50, internal, 1.00.

Eggs, three in number, oval in form, creamy-buff in color, spotted and blotched around the larger end with brown, amber, and lilac, there being few or no markings on the smaller end. Dimensions from .71 x .50 to .75 x .55.

HABITS.

Among the numerous birds which visit New England in summer, there are none that come with less display than the Wood Pewees. Almost all of our returning migrants announce their arrival more or less ostentatiously; the flocking Blackbirds chatter loudly as soon as they enter the meadows, the Bobolink greets his old home with his most cheerful song, the notes of the Oriole seem the clearest when he sings among the blossoming cherry trees, and even the little Chipping Sparrow does not allow an hour to pass after he enters the garden without informing his old friends of his advent by uttering his peculiar notes. In fact, field, meadow, and woodland are ringing with the melody of newly arrived songsters and amid this joyous outbreak, the gently given *pe-wee* of our somber-colored little friends passes almost unheeded. But later, in June, when the oaks and maples are covered with delicately tinted foliage, when the ferns have fully unrolled their beautiful pinnate fronds, when Nature has clothed all vegetable life with her loveliest greens and the air in the groves is redolent with that spicy odor only to be observed in early summer, then the plaintive lay of the Wood Pewee is heard to perfection. It is more noticeable near the middle of the day when many birds are taking their noon-time siesta and naught is to be heard excepting the long-drawn notes of this Flycatcher which are given very low as if the bird was not desirous of breaking the stillness. They sing throughout the day all summer long, constantly reiterating their lay even during the most sultry days of August.

As might be inferred from the plaintive melody uttered by the Wood Pewees, they are rather indolent in habit when compared with the other Flycatchers. Neither are they quarrelsome and I cannot recall an instance when I saw one make an attack upon another species. This indolence, however, is more seeming than real, it being the habit of the birds to go quietly about their vocations without bluster. They will perch on some high limb in the woods, in an upright attitude with drooping wings, but it can be seen that they are watching keenly all the while, for the head is turned quickly from side to side and the bright eyes are surveying every object far or near with microscopic exactness. Suddenly it catches sight of a passing insect which is desirable, for the Wood Pewees are epicures to a certain extent as they will not eat all species of insects, then it launches out with an almost inconceivable swiftness, checks its rapid flight by spreading its tail to the utmost, and the loud snap of its beak announces that its victim has met its fate. Their prey is usually taken on the wing, but I have occasionally seen them picking insects from the branches.

They are generally silent when feeding, the notes of which I have spoken being given more frequently when the birds are at leisure. Besides this call, the Wood Pewees indulge in a kind of song. They will alight on a limb, usually flying upward before so doing, and, giving a little flutter of the wings, will utter a few murmuring notes which are so low that they can be heard but a few yards. This peculiar lay is only given, as far as I have observed, in the breeding season and, as it is evidently an attempt to sing, proves that the birds would indulge in as melodious a carol as any of the members of the Section Cœcines, were they not debarred by physical impossibilities. Thus in the Wood Pewee we

find a clear illustration of the use of the vocal muscles, they being imperfectly developed the bird is incapable of uttering any thing approaching the songs of its better endowed neighbors. Rarely, these birds give a harsh cry not unlike some of the sounds produced by the Olive-sided Flycatchers.

I have described the Wood Pewees as inhabiting the deep woods and, although this is their frequent custom, they occasionally inhabit orchards, but it is quite rare to find a nest on other than a forest tree. The neat domicile of this Flycatcher is one of the prettiest among those of our native birds and its covering of lichens renders it quite inconspicuous when placed on a limb. The birds are usually wise enough to select a large branch where the nest resembles one of the peculiar knobby excrescences so often seen on oaks. There are a few species of birds which use this peculiar kind of covering for their structures. Notably among these are the Vireos, Gnatcatchers, the present species, and the Humming-Birds, and it is observable that all birds which make use of it seldom employ any other material, even if they build in widely different sections. Thus the nests of the Wood Pewees that I have examined which were taken in Georgia were not essentially different from those taken in Maine. There is also a singular uniformity in the eggs of this species which are among the most beautiful of any I ever saw, occasionally one is found that is not spotted as thickly as usual, but the form of the egg, the shade of ground color, with the position of the markings are so peculiar and constant that the species is always recognizable at sight.

The Wood Pewees arrive late, about the first week in May, shortly after which they begin to build but, as some time is required to construct their elaborate domiciles, the eggs are not deposited until June. The birds guard their nests very carefully and in spite of their usual gentle disposition, will not hesitate to dart into the face of any one who attempts to scale the tree in which their home is placed. The young appear about the first of July and leave the nest the latter part of that month. They follow their parents for a long time and are fed by them, as their bills are quite soft and are long in assuming the hooked form peculiar to the adults and which may be necessary in order to catch insects successfully. At this time the young have a continuous twittering cry, quite unlike anything that their parents ever utter, and they always keep well together, seldom scattering about woods. They remain in Massachusetts until the middle of August, when they all disappear. I found them more abundant in Watertown, Pennsylvania, the first week in September, than I ever saw them in any other given section. Their call notes could be heard on all sides for there were hundreds of them, but in a few days they had all departed for the south.

GENUS IV. SAYORNIS. THE PICEBES.

GEN. CH. *Bill, much shorter than the head which is semi-crested but without the central coronal patch. Outer quills, not incised. Tail, square and emarginate. Upper outline of manubrium, viewed from the side, angled obliquely downward. Height of keel, about equal to one half the length of the coracoids. Broncho-trachealis, very slightly developed. Branchialis, quite large.*

Colors above quite dark, usually relieved by lighter below. The bill is black on both mandibles. Although there is an elongated patch of feathers on the upper rump, yet they are not as thick as in the last genus, nor as white

SAYORNIS FUSCUS.

Phœbe. Bridge Pewee.

Sayornis fuscus BAIRD, Birds N. A.; 1858, 181.

DESCRIPTION.

SP. CH. Form, rather robust. Size, medium. Sternum, as given above. Tongue, thin and horny, bifid, but without the terminal cilia. Stomach, rather muscular.

COLOR. *Adult.* Above, including upper tail coverts, sooty-brown, darkest on the head, with a tinge of olivaceous on all portions excepting top of head. Wings and tail, dark-brown with the outer edges of all the feathers, yellowish-white. Both rows of wing coverts, narrowly tipped with white, forming indistinct bars. Beneath, including under wing and tail coverts, pale yellowish-white, with the sides, flanks, and an indistinct band across breast, sooty-brown. Bill and feet, black.

Adult in autumn. Darker above than in summer, the wing bars are clearer, the under portions are of a decided sulphury yellow, and the dark markings are not as extended.

Young of the year. More olivaceous above than in the adult stage. The whitish wing bars are replaced by yellowish-rufous, there is a deeper shade of yellow below, and the sooty-brown markings are olivaceous.

Nestlings. Much browner above than the young, being overwashed with yellowish-rufous, but the top of the head is darker. The wing bars are yellowish-rufous. Beneath, pale yellowish-white with faint indications of brownish on the sides. Upper mandible, black, under, brown. Sexes, similar in all stages.

OBSERVATIONS.

There is little or no difference in plumage, in specimens of the same age and season but there is a slight variation in form of the bill as usual in this group. Known from the Wood Pewee by the larger size, black bill which is longer even in nestlings, and general browner colors above in all stages, and from other Flycatchers by the characters as given. Distributed in summer throughout Eastern North America, from Canada at least as far south as South Carolina. Winters in the southern section from the Carolinas to Florida and on the Keys.

DIMENSIONS.

Average measurements of twenty-five specimens from New England and Florida. Length, 7.00; stretch, 11.41; wing, 2.66; tail, 2.67; bill, .55; tarsus, .70. Longest specimen, 7.50; greatest extent of wing, 12.60; longest wing, 3.82; tail, 3.75; bill, .60; tarsus, .75. Shortest specimen, 6.50; smallest extent of wing, 10.32; shortest wing 2.40; tail, 2.50; bill, .50; tarsus, .65.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed under bridges, buildings, in the shelter of ledges of rocks, upturned trees, or banks of earth. Composed of moss and roots lined with fine grass, rootlets, and hair. Dimensions, external diameter, 4.50, internal, 2.50. External depth, 2.50, internal, 1.25.

Eggs, four to six in number, oval in form, creamy-white in color, occasionally dotted with reddish-brown. Dimensions from .75 x .50 to .80 x .60.

HABITS.

On the thirty-first of December, 1868, I found myself for the first time, gun in hand, in the pine woods of Florida. As this was then, comparatively speaking, an unknown section to ornithologists, I was naturally anxious to find what birds occurred there. I had not gone far when I saw a Flycatcher perched on the lower branch of a pine, but some distance above my head; this I instantly shot, and, upon picking it up, was a little disappointed at finding that it was a Phœbe, for after traveling so far I expected to find something with which I was not quite so familiar, but later in the day I secured several fine birds that I had never seen living before and as I always consider it necessary to actually shoot every species, in order to be absolutely sure of their identification, I was contented for I had proved beyond a doubt that this Flycatcher wintered in Florida. I did not

recognize the bird when I first saw it, partly because I was looking for something quite different but more particularly because I had not been accustomed to finding this species in the woods. Since that time, however, I have found that they prefer the wooded districts in the south, but they are occasionally found on the plantations, and at Key West I observed them about the gardens of the city.

The Phœbes are among the first of our spring migrants to enter New England and their energetic, oft-repeated *phe-be* is frequently heard when the fields are white with snow. It must be quite difficult for these birds to find insects thus early in the season but they do manage to get them for all that I ever dissected, no matter how cold the weather, were filled with flies or beetles. I say all but I must make one exception; this was a specimen that I shot on the eighth of April, 1868, during a snow storm which was of a long duration. The bird was sitting in a hawthorn hedge when I procured it and, upon opening it, I found that it had been eating the dried berries of that shrub. Thus it will be seen that birds which are as strictly insectivorous as these Flycatchers will, when compelled by necessity, adopt a vegetable diet.

Almost immediately after their arrival, the Phœbes select a suitable breeding place. In Massachusetts this is usually a nook on a conveniently placed prop under a bridge or barn, or in some out-building but, as they appear to prefer the neighborhood of water, the former named structures are more frequently chosen. At Ipswich there are certain bogs where peat was dug, when this substance was used for fuel, and as the meadows belonged to farmers who often lived at a distance, they constructed small houses there in order to store the peat when it was dry. When coal became abundant and cheap, peat was abandoned and thus the little buildings became useless. They were left standing, however, much to the delight of the Phœbes who now occupy them every season. I do not think I ever entered one of these structures at the proper season but what I found a nest of one of these Flycatchers. There were never more than one to a house, however, for the Bridge Pewees never permit a second pair of the same species to build very near them.

After a pair of these Flycatchers have taken possession of any particular place it is difficult to make them leave it; no matter how persistently they are robbed they will build anew, often choosing the exact spot from which the former nest was removed. The same pair or their successors must occupy the same site for many years as I once knew of an old mill under which a pair of Phœbes built season after season, until the building was destroyed by fire, when they merely moved to an adjacent edifice. If undisturbed they will often place a second nest over the first but I do not think that the old domicile is ever used without additional material. Two broods are nearly always reared the same season and a new lining is placed over the old one on which the fresh litter of eggs are then deposited.

It is not common to find the nest of a Phœbe in other than the situations described in Massachusetts for there are many available places awaiting their choice, but in northern Maine, where out-houses, bridges, etc, are not as common, they breed in the shelter afforded by the upturned roots of trees. In buildings the nest is sometimes placed flat upon the

top of some beam, but it is oftener fastened to the side of a perpendicular wall after the method practiced by the Swallows, and then mud or clay is used to make the material adhesive. This latter named mode of constructing their domiciles is more often employed in the woods than any other.

In Pennsylvania I have found the nest of the Bridge Pewees under the shelter of overhanging rocky shelves in quarries and also beneath the projecting banks of earth along the Susquehanna River. They are remarkably abundant in the latter named section and one can scarcely go a mile along the stream where suitable places occur, without finding one of the neatly constructed homes of these Flycatchers. The birds appeared to be less pugnacious in this particular locality for they would build in close proximity to the Rough-winged Swallows that occupied the deserted holes of Kingfishers, not more than a dozen yards away and both species were on excellent terms.

The Phœbes arrive in New England, as previously remarked, very early when compared with other members of the family, stragglers often making their appearance in March, but they become common during the first week of April. They lay their first litter of eggs at least by the first of May and the young leave the nest in June. Immediately after this they lay again and the second brood may be found in August in company with their parents. It is also quite probable that a third brood is occasionally reared but this is not usual. As the Bridge Pewees are the first of all the Flycatchers to come into New England, so they are the last to take their departure, lingering as late as the last of October. At this season these birds are usually silent, having apparently forgotten the lay practiced in spring. Their notes are somewhat plaintive at times but are more frequently given with energy, especially in early spring when the birds merely reiterate the *phe-be* at intervals. As the season advances, they will often repeat this lay quite rapidly and on summer evenings they have the habit of rising in the air by short, oblique flights, when their notes are given in quick succession. This rude attempt at a vesper song resembles that made by the King Birds, but the Phœbes do not indulge in it as regularly. These Flycatchers are found throughout the Atlantic States in winter from the Carolinas, south, and I have seen them common even at Key West.

GENUS V. EMPIDONAX. THE LITTLE FLYCATCHERS.

GEN. CII. *Bill, considerably shorter than the head which is slightly crested but without the central coronal patch. Outer quills, slightly incised. Tail, somewhat rounded. Upper outline of manubrium, viewed from the side, rounded gradually downwards. Height of keel, a little exceeding one half the length of the coracoids.*

Colors above are dark-olivaceous, below, either white or yellowish. The markings of the bill are variable. The development of the laryngeal muscles is also variable and is given under specific characters. The wings are short and rounded.

EMPIDONAX MINIMUS.

Least Flycatcher.

Empidonax minimus BAIRD, Birds N. A.; 1858, 195.

DESCRIPTION.

SP. CII. Form, slender. Size, rather small. Sternum, not stout. Tongue, thin and flat but not horny, provided with a bifid tuft of cilia at tip which extend along the side for one third of the terminal length; yellow in color. Stomach, quite

muscular, walls .15 thick. Larynx provided with a thick and strong sterno-trachealis. Broncho-trachealis quite well developed, also bronchialis anticus.

Color. Adult. Above, including upper tail coverts, olivaceous-green, darkest on the head, where the feathers show dusky centers, and paler on the rump and upper tail coverts, with a plumbeous under tint on the nape. Wings and tail, dark-brown, with the outer feathers of the latter lighter. Tips, edges of the terminal two thirds of the secondaries, outer edges of the tertiaries, tips of primaries and of two rows of wing coverts, forming bars, pale yellowish-white. Beneath, white, becoming yellowish on the abdomen and under tail coverts. Sides, flanks, and an indistinct band across breast, olivaceous. Under wing coverts, yellowish-white. There is a broad white ring around the eye and the lores are white mixed with dusky. Bill, brown, yellow at base of lower mandible. Feet, brown.

Young of the year in autumn. Browner above than in the adult stage, the whitish wing bars are decidedly yellowish, and the olivaceous markings below are inclined to be yellow also, while the band on the breast is better defined. The under mandible is wholly yellow.

Nestlings. Nearly slaty above, with a greenish overwashing. Beneath, white, with a faint tinge of yellowish. The band on the breast is scarcely discernible and the other dark markings below are not nearly as extended. Sexes, similar in all stages.

OBSERVATIONS.

Specimens vary somewhat in shade of color above, some being quite dark while the same birds will frequently be very yellow below, with the band across the breast quite clearly defined. In this stage of plumage, these birds so nearly resemble Trail's Flycatcher that it is almost impossible to detect any difference in the dried skins although the same birds would be easily recognized in the flesh. The precise differences between this species and other members of the genus are given under observations in the succeeding pages. Distributed in summer throughout Eastern United States between latitudes 40° and 47°. Winters in Central America.

DIMENSIONS.

Average measurements of twenty specimens from New England. Length, 5.50; stretch, 8.10; wing, 2.40; tail, 2.17; bill, .66; tarsus, .38. Longest specimen, 3.70; greatest extent of wing, 3.50; longest wing, 2.65; tail, 2.10; bill, .70; tarsus, .42. Shortest specimen, 5.30; smallest extent of wing, 7.70; shortest wing, 2.25; tail, 2.50; bill, .62; tarsus, .35.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in trees, composed of dried grass, woody fibers, cotton, etc., all neatly woven and held in place with cobwebs. Lined with horse-hair and feathers. Dimensions, external diameter, 2.75, internal, 1.57. External depth, 2.00, internal, 1.50.

Eggs, four in number, rather elliptical in form, yellowish-white in color, usually unspotted. Dimensions from .60 x .50 to .65 x .52.

HABITS.

About the first week in May the abruptly given *che-beck* of the Least Flycatcher is to be heard in the orchards and along the hedge-rows of New England, and I will venture to assert that there are none among our native birds whose advent is so noticeable. Not only do their energetic notes announce their presence, but the disturbance which they always create among the other members of the feathered tribe, renders them conspicuous; for the Least Flycatchers are the most pugnacious species which visit us, not excepting even the King Birds. Like most of the present family, they migrate very rapidly and, as particular birds exhibit a predilection for certain spots to which they return season after season, every orchard is soon tenanted by its elf. I say elf, for truly elvish are the tricks displayed by the Least Flycatchers. Nothing in the form of a bird is allowed to remain within the bounds of their jurisdiction; a group of brightly colored Warblers will come trooping through the orchard in order to feed upon the insects which infest the growing leaves, when suddenly, down swoops the little tyrant with loud cries and, rapidly snapping his bill, like an epitomized fury he darts from left to right among the astonished visitants who unable to withstand this fierce assault, beat a hasty retreat and in a twinkling the Flycatcher is back

again to his perch on some favorite branch, quietly reiterating his *che-beck*. He has very little time to rest, however, especially during the migrating season, for he is constantly called upon to drive some intruder from his domains and no matter how large the species may be they are all forced to retreat, most ignominiously defeated, before the sudden and well directed attacks of their little foe. This extreme pugnacity, however, is only exhibited during the excitement of the breeding season; after the eggs are laid and domestic cares engage his attention, his tyrannical spirit becomes somewhat subdued and then he is gradually transformed into as sedate and peaceful a member of avian society as can be found in the orchard.

As already described, the usual notes of the Least Flycatchers are very abrupt, they are also extremely harsh and attract attention by their oddity for they form a strong contrast to the harmonious strains of many of the Oscines. These Flycatchers, however, frequently make an attempt to sing, for they will alight on a twig, flutter their wings, at the same time uttering a feeble twitter which is so low that it can be heard but a few yards yet, in comparison to their other efforts, it is somewhat melodious. This rude lay is only practiced during the breeding season for when the young appear, both sexes are busily engaged in supplying them with food.

The Least Flycatchers begin to build soon after their arrival but, as some time is required to construct their domiciles, the eggs are not generally deposited until the first week in June. The situations chosen are almost invariably forked twigs on apple trees, for these birds are fond of the open country, seldom being seen in the deep woods. Both sexes incubate and the young hatch in less than two weeks. They are very unsuspecting when they nest near houses and a pair that built in a tree near my door the past summer would permit me to examine their neatly constructed home without evincing any concern, even when it contained young. The young are out of the nest by July and accompany their parents for a short time but they soon learn to provide for themselves, when they scatter about the country, often entering the woods at this season. I do not think that the adults moult at all while in the north as I never took one that was assuming the autumnal dress, even as far south as Pennsylvania. They do not remain late in the season, generally leaving Massachusetts by the second week in September, but I have seen them as late as the twentieth of the month. They linger for a short time in Pennsylvania when they inhabit the woods, rather avoiding the open country, but before the first of October there is not one to be found in the north.

There are few birds which are of more benefit to the husbandman than the Least Flycatchers as they have few faults and the quantity of insects which they destroy is very large. These are mainly captured where they are doing the greatest amount of damage, for these Flycatchers do not wander far from the gardens and orchards in which they build. Besides snapping up numbers of dipterous insects, they feed largely upon small beetles of various species, and I have even known them to eat canker worms. Thus, although not so ornamental or melodious as many of our native species, we must cheerfully accord this quaint little Flycatcher a place in our gardens for which it will amply repay us by doing its best to check the increase of our insect enemies.

EMPIDONAX TRAILLI.

Traill's Flycatcher.

Empidonax Trailli BAIRD, Birds N. A.; 1858, 193.

DESCRIPTION.

SP. CH Form, slender. Size, medium. Sternum, not stout. Tongue, thin and flat but not horny, provided with a bifid tuft of cilia at tip which extend along the side for one third of the terminal length; yellow in color. Stomach, quite muscular. Larynx, provided with a thick and strong sterno-trachealis. Broncho-trachealis quite well developed, also bronchialis.

COLOR. *Adult.* Above, including upper tail coverts, uniform olivaceous-green, with the feathers of the head showing dusky centers. Wings and tail, dark-brown, with the outer feathers of the latter, lighter. Tips, edges of the terminal two-thirds of the secondaries, outer edges of the tertiaries, tips of primaries and of two rows of wing coverts, forming bars, yellowish-white. Beneath, yellowish-white, becoming darker on the abdomen and under tail coverts. Sides, flanks, and band across breast, olivaceous. Under wing coverts, yellowish. There is a narrow, yellowish ring around the eye but the lores are olivaceous mixed with dusky. Bill, brown, yellow on lower mandible. Feet, brown.

Nestlings. Above, very olivaceous-brown. Beneath, yellowish. The band on the breast is scarcely discernible and the other dark markings below are not nearly as extended. Sexes, similar in all stages.

OBSERVATIONS.

Specimens vary greatly, being often as light as typical Least Flycatchers, from which it is difficult to distinguish them. In life, the two species are so different that any one can decide between them, but with the dried skins this is not as easy. Although the experienced ornithologist separates them rather by intuition than by actual differences, yet I find by careful study of a large series of both species that the following characters in Traill's Flycatcher are more or less constant. The size is generally larger but not always. The bill is usually broader but this cannot be depended upon; while the yellow under mandible, which in life is veined with purple, is not a point that counts for much as the Least Flycatcher occasionally shows one that is similar. Now for the true differences. The plumage of *Trailli* is very silky, the rump is as dark as as the back, the circle around the eye is quite narrow and yellow, while the lores are decidedly olivaceous. The differences between this species and other members of the genus are given under observations in the succeeding pages. Distributed in summer throughout New England north of latitude 43°, and across the continent; ranging as far south in the west, however, as latitude 37° and north into the Far Countries; the western form (*pusillus*) now being considered identical with the eastern. Winters in Mexico and Central America.

DIMENSIONS.

Average measurements of eleven specimens from New England. Length, 5.60; stretch, 8.25; wing, 2.65; tail, 2.58; bill, .66; tarsus, .45. Longest specimen, 5.75; greatest extent of wing, 8.75; longest wing, 3.75; tail, 2.70; bill, .70; tarsus, .60. Shortest specimen, 5.20; smallest extent of wing, 7.75; shortest wing, 2.50; tail, 2.28; bill, .60; tarsus, .40.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in trees, composed of sticks and weeds lined with dried grass. Dimensions, external diameter, 3.00, internal, 1.75. External depth, 1.50, internal, 1.00.

Eggs, three to four in number, oval in form, creamy-white in color, spotted and blotched irregularly with reddish-brown. Dimensions from .75 x .50 to .78 x .55.

HABITS.

For several of the earlier years of my ornithological experience, I looked in vain for Traill's Flycatcher and the region about my home underwent a careful scrutiny. Many an innocent Least Flycatcher fell when he chanced to wander into the woods where I was looking for its rarer relative. All this close study into the habits of at least one species of the genus greatly aided me in after years and, when on the first of June, 1869, I did meet with the first specimen of Traill's Flycatcher that I had ever seen living, I recognized it, even before shooting, as being something new. It is not at all strange that I missed finding this little bird so long, as now, with all my experience with the species, I should be obliged to let many migrating seasons pass without finding one in Eastern Massachusetts.

Not but what a certain number pass us every year, but that it is quite difficult to tell just when they will pass and just where to find one for, like the other members of the genus, this Flycatcher migrates very rapidly and is withal somewhat eccentric in choice of localities in which to feed. I have found them on the upland among deciduous trees, in thick pines, and in swampy thickets. This was, however, when they were on the way to their summer homes, but when once settled in the woods of Northern New England, they almost always prefer the alder thickets which border the countless streams of that well watered region.

It would be quite difficult to detect the presence of this small Flycatcher when the leaves are on the trees, were it not for its notes which are quite peculiar, sounding like the syllables *ke-wick*, rather slowly given when compared with the *che-beck* of the Least Flycatcher and are somewhat harsher. This lay is repeated about twice a minute during the earlier portion of the day, after which the bird becomes silent. While singing it is almost always perched upon some elevation but not so high as to render it observable as it is concealed by foliage.

It is only in its chosen home in the mountain valley where the rushing sound of rapidly flowing water fills the cool air, that the peculiar notes of this Flycatcher are heard. During the migration they are silent; consequently they are, as already intimated, not easy to find. Yet as they are seldom found in other than thick woods, it is well to examine carefully any small Flycatcher seen there for it will quite likely be this species. The Least Flycatcher does occasionally venture into the wooded districts but it is by far a more nervous and active bird than Traill's which although it has a similar habit of jerking the tail, so noticeable in the common species, yet this is done less frequently. Besides this, Traill's Flycatcher is apt to perch lower, often being found in thickets only a few feet high, and I have shot them when they were sitting within a foot of the ground. As related, they are not constant to any particular kind of woodland during the spring migration, but in autumn I have nearly always found them in the wooded lowland and in the vicinity of water.

In spring, Traill's Flycatcher appears in Pennsylvania about the middle of May, reaching Massachusetts some two weeks later and arriving in its summer resort about the first week of June. They soon commence the duties of nest building, placing the domicile in an upright fork of an alder not far from the ground, according to Mr. Brewster who has obtained several. The eggs are laid about the last of June. When the young appear, the adults exhibit considerable solicitude, flying about the intruder and reiterating their cries quite rapidly. The fledgelings leave the nest in August and accompany their parents for a time, but scatter when migrating and I have obtained solitary individuals in Massachusetts as late as the eleventh of September. But the southward march is even more hurried than the spring migration and by the first of October, they have all departed, at least from the Northern and Middle sections of the United States. I do not think that this Flycatcher ever appears in Florida; in fact all of the members of the present genus are rarely found in the latter named section, as in migrating they pursue a westerly course, keeping along the Mississippi Valley, and so on through Texas, into Mexico.

EMPIDONAX ACADICUS.

Acadian Flycatcher.

Empidonax Acadicus BAIRD, Birds N. A.; 1858, 197.

DESCRIPTION.

Plate X. Adult in spring with the nest and eggs.

SP. CH. Form, rather robust. Size, large. Sternum, stout. Tongue, thin and flat but not horny, bifid at tip but not provided with terminal cilia. Bill, broad. Stomach, somewhat muscular, walls 10 thick. Larynx, provided with a thick and strong sterno-trachealis. Bronchialis, quite well developed, but there is only a small remnant of either division of the broncho-trachealis.

COLOR. *Adult.* Above, including upper tail coverts, olivaceous with a decidedly greenish tinge predominating, darkest on the head, where the feathers show dusky centers. Wings and tail, brown, with the outer edges of the feathers of the latter, greenish, and outer webs, lighter. Outer edges of primaries, also greenish. Tips, edges of the terminal two thirds of the secondaries, outer edges and tips of the tertiaries, tips of two rows of wing coverts, forming bars, yellowish-white, with the upper bar inclined to be of a deeper yellow. Beneath, white, with the sides, flanks, under wing and tail coverts, greenish-yellow. There is a greenish-yellow ring around the eye but the lores are olivaceous. Bill, brown, yellow on lower mandible. Feet, brown.

Young of the year in autumn. Somewhat darker above than in the adult stage, but the greenish markings below are more restricted and the yellow of the wings is darker or replaced by yellowish-rufous.

Nestlings. Very light beneath, showing but little of the greenish markings. More olivaceous above than in the preceding stage and having indistinct transverse bars of dusky.

OBSERVATIONS.

Specimens of the same age and season do not vary much; the wing bars are occasionally darker than the type but otherwise the plumage is similar. The bills are also singularly uniform in size and color for Flycatchers. Known from other members of the genus by the larger size, broader bill, decidedly greener color above, and lighter tints beneath, but more particularly by the proportionately shorter fourth primary which causes quite a gap in the otherwise regular graduation of the ends of the quills when seen from above. Distributed in summer throughout Eastern United States south of latitude 42°, exclusive of New England and Florida. Winters in the West Indies.

DIMENSIONS.

Average measurements of eleven specimens from Pennsylvania. Length, 5.75; stretch, 8.95; wing, 3.00; tail, 2.25; bill, .50; tarsus, .55. Longest specimen, 5.90; greatest extent of wing, 9.00; longest wing, 3.10; tail, 2.40; bill, .55; tarsus, .60. Shortest specimen, 5.60; smallest extent of wing, 8.90; shortest wing, 2.80; tail, 2.15; bill, .45; tarsus, .50.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in trees and bushes, composed of sticks, moss, and dried blossoms of beech trees, lined with moss. Dimensions, external diameter, 3.00, internal, 2.00. External depth, 1.50, internal, .75.

Eggs, three to four in number, oval in form, creamy-white in color, spotted and blotched irregularly with reddish-brown. Dimensions from .75 x .50 to .78 x .55.

HABITS.

In the spring of 1872, I went to Williamsport, Pennsylvania, in order to study the habits of some birds that I had never before had the opportunity of seeing alive and through the kindness of my friend, Mr. August Koch, whose hospitality I enjoyed for several weeks, I soon became familiar with the best collecting grounds in the vicinity, for Mr. Koch proved a most excellent guide as he had always lived in the place and had scoured the country diligently every season from childhood in search of its avian treasures. Therefore his assistance proved invaluable to me as without it I should have been long in discovering some of the most delightful spots that I ever beheld.

The country about Williamsport is very conducive to bird life as it presents features which prove quite attractive to nearly all species. The Susquehanna River flows through

the place and the shores are bordered by fertile meadows that on the west side slope gradually upward into more elevated lands which are occupied by houses that are surrounded by cultivated fields and orchards. The Alleghany mountains rise just to the eastward of the settlement and their steep sides are covered with a thick growth of timber which, on the lower acclivities, is composed of quite lofty trees, but higher they become smaller and on the flat wind-swept hill-tops they are considerably dwarfed. But it is along the base of the foot-hills that the forests are the thickest. Here the ground is swampy, being plentifully watered by numerous rills which trickle down from the declivities above. The moist soil is deep and, as it is extremely rich, produces an abundance of undergrowth which is mainly composed of the large laurel or rhododendron. These shrubs are some ten or fifteen feet in height and, as they are not only dense but also support numerous trailing vines, the whole forms a luxurious thicket which fairly swarmed with birds, being, in fact, a collector's paradise.

There was scarcely a day during my stay in this section that I did not visit these swamps and on the twenty-third of May, I heard a peculiar note which was new to me and was certain, even before I saw the bird, that the sound was produced by the Acadian Flycatcher. This was not strange, however, partly because I was expecting to find this species but more particularly as I was perfectly familiar with the notes of all the other small Flycatchers and knew instantly that the sound which I heard was not made by any one of them. I secured several Acadians there but was obliged to leave just before they commenced breeding. Later, however, during the first and second weeks in June, I found them very abundant in White Deer Valley, a point some twenty miles down the river, and obtained several nests.

This valley is narrow and lies between the timber-covered mountains which rise so abruptly on either side that, for a greater part of the day, the sun cannot reach even the top of the lofty forest which springs from the rich soil that occupies the limited area along the bottom. As the trees which make up the woodland are either evergreen and consequently dense, or deciduous and well clothed with leaves, but a small portion of sunshine ever penetrates to the ground below; thus a murmuring brook which flows among the moss-covered rocks and beneath the nodding ferns is nearly always in shadow. This spot which at some seasons might appear gloomy, was most delightfully cool during the warm days of summer, especially as I was obliged to traverse a hot and dusty road in order to reach the place.

There were but few species of birds inhabiting this valley and the Acadian Flycatchers were by far the most abundant and I had an excellent opportunity of carefully studying their habits. The Least Flycatchers, as related, prefer the open orchards and revel in the brightest light of the long summer days, but I have found that the Acadian Flycatchers love the darkest portions of the woods. Not that they are especially fond of thickets, for, although I found them in dense swamps at Williamsport, they kept well above the more tangled portions, living among the comparatively open, although shaded, tops of the laurels, and in this valley I found that they frequented the rather sparse growth of small trees and tall shrubs.

The Acadian Flycatchers are not shy birds and will permit one to come within ten or fifteen yards without evincing any uneasiness; when a nearer approach is attempted, however, they will utter a low but abrupt *pe-wit* of alarm and flit to a more distant perch. In addition to this note which is given by both sexes, though that of the females is much less distinctly rendered, the males have a loud *se-wink*, emphatically emitted, followed by an attempt at a song which consists of a series of chuckling notes like those of a Flicker when heard in the distance. When thus performing, the birds flutter their wings after the manner of the other Flycatchers, and occasionally they will make this motion without the accompanying notes. These are the only sounds that I ever heard them produce and, although quite similar to those given by the other members of the genus, are characteristic enough to render their authors recognizable at once. When I first entered the place of which I speak, I was confident that the Flycatchers were breeding for I noticed that the females, like many other birds when incubating, appeared sluggish, but to make certain of this I shot one, when a look at the denuded abdomen confirmed my suspicions. I then set about searching for the nests systematically; or perhaps I should have said, I let the birds do the searching while I watched them. Whenever I saw a Flycatcher, usually a male as most of the females were setting, I quietly sat down and observed his movements, taking care, however, not to alarm him. After uttering a few *se-winks* and making the accompanying musical attempts, he would snap up a passing insect or two, then fly leisurely along the valley, occasionally pausing a moment, thus I could keep him in sight. In this way I would follow, until he would finally stop near a witch-hazel and utter his notes quite rapidly. Then I would feel sure that the nest was in the immediate vicinity and cautiously drawing near, would almost invariably detect the low, answering twitter of his mate as she sat on the eggs. Generally their home would be concealed by the large leaves of the hazel but sometimes I could see it for some distance. The nests which I found there were among the most artistic specimens of bird architecture that I ever beheld, for they were partly constructed of living lichens the ends of which were allowed to trail downward, and the delicate colors contrasted finely with the green of the foliage. The drawing which I give was taken from a nest that I obtained at the time of which I am writing and is represented as being on a branch of the witch-hazel.

The witch-hazel appears to be a favorite with them for all but one of the fifteen nests which I discovered were placed in this shrub, the exception to the rule being built on a low limb of a hetaeck. The flat domiciles were always placed near the extremity of the limb, supported by a horizontal fork, and from five to ten feet from the ground. The hazels usually grew from the valley bottom but occasionally one would be found a few yards up the mountain side. The birds exhibited very little solicitude upon being disturbed, the female often alighted on a branch only a few yards away and quietly arranged her feathers while I was transferring her nest and eggs to my collecting basket.

The Acadian Flycatchers, as have been shown, arrive late, the last week in May, and soon after breed, nesting, as far as I could judge, about the fifth or sixth of June, for on the fifteenth of the month the eggs all contained embryos and some few were quite far advanced. Their stay in the north is limited as they migrate early, probably shortly after

the young are strong enough to fly well, for, although I have a single specimen obtained in Pennsylvania as late as the ninth of September, I was unable to find any during the last week in August and look upon the one captured as a straggler.

EMPIDONAX FLAVIVENTRIS.

Yellow-bellied Flycatcher.

DESCRIPTION.

Sp. CH. Form, rather slender. Size, small. Sternum, not stout. Tongue, thin and flat but not horny, bifid at tip but not provided with terminal cilia. Bill, short. Stomach, muscular, walls 15, thick. Larynx provided with a thick and strong sterno-trachealis. Bronchialis, quite well developed, but there are no traces of either division of the broncho-trachealis.

COLOR. Adult in spring. Above, including upper tail coverts, decidedly greenish-olivaceous, darkest on the head where the feathers show dusky centers. Wings and tail, brown, with the outer edges of all the feathers greenish. Tips, edges of the terminal two thirds of the secondaries, outer edges and tips of the tertiaries, tips of two rows of wing coverts, forming bars, yellowish-white, with the upper bars inclined to be of a deeper yellow. Beneath, including under wing and tail coverts, greenish-yellow with the sides, flanks, and an indistinct band across the breast, olivaceous. There is a greenish-yellow ring around the eye, but the lores are olivaceous. Bill brown, yellow on the lower mandible. Feet, brown.

Adult in autumn. Inclined to be darker above, more dusky below, and the yellowish markings on the wings are darker.

Young of the year in autumn. Quite dark above but decidedly greenish. The light markings of the wings are quite yellow and broader than in the adult, otherwise similar.

Nestlings. Quite slaty above, and much lighter below, being nearly white, and the darker areas are slaty. The ring around the eye and the markings on the wing are fully as bright as in the more adult stages.

OBSERVATIONS.

Specimens of the same age and season do not vary much, but the form of the bill varies slightly. This is the greenest of our Eastern Flycatchers and may be distinguished at once by the smaller size, and yellow colors below. Distributed in summer throughout Eastern United States, north of the latitude of Massachusetts and possibly along the mountain ranges into Pennsylvania. Winters in South America.

DIMENSIONS.

Average measurement of five specimens from Upton, Maine. Length, 5.35; stretch, 8.40; wing, 2.68; tail, 2.07; bill, .75; tarsus, .42. Longest specimen 5.55; greatest extent of wing, 8.70; longest wing, 2.75; tail, 2.15; bill, .82; tarsus, .45. Shortest specimen, 5.10; smallest extent of wing, 7.90; shortest wing, 2.60; tail, 2.00; bill, .66; tarsus, .40.

DESCRIPTION OF NESTS AND EGGS.

Nests. (From description kindly given me by Mr. H. A. Purdie.) placed under the shelter of roots of upturned trees or in bunches of moss, composed of moss, lined with black rootlets, pine needles, and grass. Dimensions, external diameter, 3.50, internal, 2.50. External depth, 4.25, internal, 1.50.

Eggs, five in number, rounded-oval in form, creamy-white in color, spotted with light red-lish-brown. Dimensions from .75x.50 to .78x.55.

HABITS

I have described the preceding species of Flycatchers as inhabiting deep glens and as being fond of the obscure light of the woods, but the Yellow-bellied Flycatchers are most decidedly, of all the genus, the true children of the shade, for they are seldom found elsewhere than in the thickest swamps. Even in these secluded retreats, they avoid the tops of the bushes, keeping well down in the dense foliage, often perching within a foot of the

ground. Alder swamps which are so filled with undergrowth that it is difficult to force one's way through them, are the favorite resorts of these Flycatchers. It is extremely difficult to detect the presence of these little birds in such places, not only on account of the luxurious vegetation, but principally because they are extremely quiet, the only note which they utter during the migrations being a plaintive pea given only at intervals and, so low as to be inaudible a few yards distant. I have frequently entered a swamp in which I was certain some of these Flycatchers had taken refuge and have, at first, been unable to find a single specimen, but upon remaining quiet for a moment, I would hear the low peas in all directions. Guided by the sound of the nearest, I would proceed cautiously in its direction and after a moment's search, would see the bird as he sat on some low twig, occasionally launching outward for a short distance to catch a passing insect which his keen eye had informed him was especially palatable. As long as I remained perfectly still, the Flycatcher would pursue his vocations but upon my making the slightest movement, he would observe me and, giving a quick, upward flirt of his tail, would flit silently but with marvelous celerity among the brown stems of the alders, and skillfully wending his way through the labyrinth of twigs, vines, and leaves, he would almost instantly disappear.

Although the Yellow-bellied Flycatchers are not sluggish birds, yet when compared with the allied species, they appear somewhat inactive. This is due, however to the fact that there is little need of them leading a bustling life. The orchards which are the chosen domains of the Least Flycatchers are also the resorts of hundreds of other birds and consequently the Flycatchers must keep wide-awake in order to gain a livelihood and—they do it, as I have endeavored to show. Trails have a less disputed field but still there are enough other avian inhabitants of the locality in which they find a home to make insects tolerably scarce, so these birds cannot be idle; while as I have already described, the Acadians usually live in localities where many species of the feathered tribe are abundant. With the birds under consideration, this is quite different for they occupy spots where but few others occur and where insects abound; thus they are not obliged to lead a very active life and therefore their habits have become decidedly modified by the circumstances in which they are placed.

The lives which the members of this genus lead have apparently had some effect on their physical organization. Thus we find that the Least Flycatcher is not only the best flier, but it also has the best development of laryngeal muscles, consequently has the most variety of notes, it being understood, however that this partial development does not always mean that the voice of the possessor is the most musical. Next in order follow Trails, differing but slightly from the one last described, and then comes the Acadian with weaker laryngeal muscles, for the broncho-trachealis is but slightly developed and consequently the twittering notes are given less frequently than by the two preceding; last in the list comes the Yellow-bellied Flycatcher. The low and slowly given pea and a gravely randered ke-lick, the first as a single note and the second repeated only at long intervals, are the only sounds which I ever heard them utter for they make no attempt at the twittering song. I was not surprised, however, when, upon examining the larynx, I

found that there was no trace of either division of the broncho-trachealis, as I consider this an important muscle in producing a variety of melodious sounds.

The Yellow-bellied Flycatchers spend the summer in the forests of the more northern New England States, frequenting the swamps which are thickly covered with small larch and hemlock trees. Here they are perfectly at home but are as retiring in habit as I have described them during the spring migrations and, were it not for the peculiar *ke-tick* which is occasionally heard, they would pass unnoticed. When I was at Lake Umbagog in June, 1878, I was confident that several pairs which I observed, had nests in the immediate vicinity but could not find them, and a few seasons later I searched in vain for the eggs both at Grand Menan and further north in New Brunswick. As the nests had been described by authors as being placed in trees or bushes, my search was confined to the hemlocks, larches, etc. and consequently was always unsuccessful. But my friends, Messrs. Purdie and Deane, were more fortunate and during the past summer, 1878, succeeded in procuring a nest which was placed under the shelter of the roots of an upturned tree, much after the manner employed by the Bridge Pewee. This was obtained at Houlton, Maine, and on June fifteenth, the nest contained one egg; three days later, the entire set of four was deposited. Mr Purdie informs me that the structure was very pretty, especially when he first saw it as then the bird was sitting upon the nest and she appeared to be sucken in a ball of green moss. The female was not at all shy for she was approached within two feet before she darted off. An excellent account of this episode is given by Mr. Purdie in the Bulletin of the Nuttall Ornithological Club for October, 1878, and is written with the conscientious care so characteristic of the author. I found the Yellow-bellied Flycatchers as late as the first of June in the swamps of Pennsylvania and obtained birds in the nestling plumage the last week in August, so judge that they may breed there. They migrate early, leaving New England during the latter part of August, but they linger in Pennsylvania until the first of October when they shortly after disappear.

ORDER OSCINES, SINGING PERCHERS.

Differ from the songless Perchers in having the back portion of the tarsi produced into a sharpened ridge as seen in B in the figure given on page 401. (There are some exceptions to this rule, among which are the Horned Larks. These do not have the sharpened ridge.) Also in having six distinct pairs of inferior laryngeal muscles, and the sterno-trachealis has its origin between the divisions of the broncho-trachealis anticus and posticus.

I have given a life-sized drawing of the inferior larynx of a Crow in Plate XXXIII, figs. 1 to 4, in order that students may understand the various parts. Fig. 4 shows a view from the lower side; O, is a portion of the trachea and B, the bronchial tubes which extend to the lungs. The muscles which are deeper in color, are as follows: Bt, broncho-trachealis; Bp, broncho-trachealis posticus. Fig. 3 exhibits a side view with the same figures applied to the same parts as far as explained. The broncho-trachealis is better defined and its division into the broncho-trachealis anticus, B, and posticus, Bp, is very clearly seen. The broncho-trachealis brevis is given at Bb, the bronchialis posticus at BB, which with the bronchialis anticus, BBA make up the number of vocal muscles; their counterparts being on the opposite side. It is observable that the sterno-trachealis has its tracheal origin below the division of the broncho-trachealis; the other extremity being attached to the costal process of the sternum, seen in fig. 5, Cp.

The other accessories for producing melodious sounds are the tympaniform membrane which stretches across the under side of the upper portion of the bronchial tubes, fig. 2, M, and the semilunar membrane, shown in fig. 1, which is a section of the larynx, at S. It is supported by the os transversale, T, a slender bone which crosses the interior of the trachea. The office of the laryngeal muscles is to tighten these two membranes, which then vibrate and produce sounds.

FAMILY XVI. ICTERIDÆ. THE ORIOLES AND STARLINGS.

Bill, with the upper mandible but little curved and the lower more or less swollen at the base, unnotched. Coracoids shorter than the top of the keel which is higher than one third the length of the coracoids. Marginal indentations exceeding in depth the height of the keel. Primaries, nine.

This family belongs exclusively to the New World and is well represented in the United States. Although some species approach the preceding Family quite closely, yet the sternal characters are quite different, the marginal indentations being always much deeper. In other anatomical characters the members of the family agree with the preceding, for example both are provided with small ceca, a little better developed perhaps in the present than in the former family. Both are provided with a gall, but the stomach, which in *Fringillidæ* is always muscular, varies greatly in this family, often affording good generic characters. The females are frequently smaller in size and are always duller in color than the males.

GENUS I. DOLICHONYX. THE RICE BUNTINGS.

GR. CH. *Bill, thick and conical, shorter than the head. Upper mandible, but little curved. Wings, much longer than the tail which is rounded, and with the feathers acuminate. Sternum, not stout but broader than one half the length of the coracoids. Size, small. Stomach, muscular.*

This genus closely resembles some of the members of the preceding Family in many respects, as exhibited by the thick bill, general form, and muscular stomach, yet the marginal indentations exceed in depth the height of the keel. The females are smaller than the males, and are unlike them in plumage during the breeding season, but both sexes are similar at other seasons.

DOLICHONYX ORYZIVORUS.

Bobolink. Rice Bird.

Dolichonyx oryzivora Sw., Zool., Jour., 1827, 357.

DESCRIPTION.

SP. CH. Form, rather slender. Size, medium. Tongue, rather fleshy, provided with a short tuft of terminal, hair-like fibers. Sternum, as given above.

COLOR. *Adult male in spring.* Black throughout, with a patch on the back of the neck, edge of feathers of the back and outer webs of primaries and tail, yellowish. Scapularies, rump, upper tail coverts, and patch on the sides near the shoulders, white. Lower back, gray. Secondaries and tertiaries, edged with whitish. Tips of wings and tail, brown. The flanks, tibia, and under tail coverts are narrowly margined with yellowish. Bill, black, bluish at the base of lower mandible. Feet, dark-brown.

Adult female in spring. Uniform yellowish throughout, broadly streaked above, and more narrowly on sides, flanks and tibia with dark-brown. There are two stripes of dark-brown on the head, mixed with yellowish and two spots back of the eye of the same color. Wings and tail, brown, with the outer webs of all feathers, yellowish-white. Bill, brown, much lighter on lower mandible. Feet, pale-brown.

Adult male in winter. Similar to the adult female, but larger and yellower, especially below, while the streakings below are more suffused.

Adult female in winter. Does not differ much from the spring dress, but is somewhat yellower below, and the streakings above are more suffused.

Young male in spring. Quite like the spring adult, but with the white markings overwashed with brownish. The yellow is not as clear and the sides and flanks are edged with yellowish.

Young of the year in spring. The males have all the feathers above and below edged with yellowish, while the other markings are overwashed with dusky. The bill is also lighter. The female is much yellower below where the streakings are not as prominent.

Younglings. Uniform yellow above and below, with streakings of dusky on the upper parts, and lined on the breast, sides, and flanks with the same color.

OBSERVATIONS.

This species must be a long time in arriving at maturity, as it is difficult to find a specimen as black beneath as described in the adult dress. Out of some twenty-five skins now before me, only four are in this stage, the second plumage being more common. Specimens of the same age and sex are quite uniform in coloration. Known from all others by the markings given. There is, however, a resemblance between the female of this species and that of the Black-throated Bunting, but the latter is smaller and has reddish on the wings. Found in summer east of the Rocky Mountains, between latitudes 33° and 48°. Winters in the West Indies.

DIMENSIONS

Average measurements of twenty male specimens. Length, 7.42; stretch, 12.00; wing, 3.86; tail, 2.77; bill, .55; tarsus, 1.07. Longest specimen, 7.60; greatest extent of wing, 12.60; longest wing, 4.00; tail, 2.85; bill, .60; tarsus, 1.10. Shortest specimen, 7.25; smallest extent of wing, 11.60; shortest wing, 3.72; tail, 2.48; bill, .50; tarsus, 1.05.

Average measurements of twenty female specimens. Length, 6.97; stretch, 10.42; wing, 3.40; tail, 2.45; bill, .52; tarsus, .97. Longest specimen, 7.25; greatest extent of wing, 11.35; longest wing, 3.60; tail, 2.55; bill, .58; tarsus, 1.05. Shortest specimen, 6.70; smallest extent of wing, 10.40; shortest wing, 3.20; tail, 2.25; bill, .48; tarsus, .95.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground, being composed of coarse dried grass lined with finer. Dimensions; external diameter, 4.00, internal, 3.00. External depth, 2.50, internal, 2.00.

Eggs, four or five in number, oval in form, ashy-white in color, often spotted and blotched so thickly with chocolate-brown as to nearly cover the ground. Sometimes they have lines of darker, but I have seen them when it was difficult to distinguish them from those of the Song Sparrow. Dimensions from .70 x .54 to .75 x .60.

HABITS.

I do not know of any species among our summer visitants, that arrive with such regularity as the Bobolinks. By the tenth of May, or within a day or two of this date, the lively, rattling, energetic song of the males is sure to be heard in Massachusetts, and a few days later their duller colored mates appear. They must migrate very rapidly for I heard them passing over the Gulf of Mexico late in April, but they do not stop long in Florida, neither did I ever hear them give the full song there, but they utter a few hurried snatches by way of practice as they fly northward. It is only in their summer home that they give the entire melody which has made them famous.

When the bright days of early June have come and the trees have assumed their full dress, when the waving grass in the meadows is of that delicate tint never seen at any other season, when all vegetation is showing its best and most brilliant green, the lay of the Bobolink is to be heard to perfection. Springing upwards from the dewy herbage the male begins that wondrous carol, which is continued as he flies through the air, until he arrives over the spot where his mate is sitting on her eggs; then with extended wings he circles quickly downward, alighting beside her with a peculiar *che-che-che* given with great determination. There are but few of our native birds which show so much spirit while giving their song as the Bobolink, for he enters vigorously into the performance, and the song of one seems to inspire his neighbors, for when he begins all those which are within hearing also commence until the fields resound with joyous melody. But it is only during the breeding season that the full song is heard, after this is over and the young appear in their yellow dress, the males are more silent, but they do not readily forget their carol, and I have heard them give their spring performance even while moulting. When they have fairly assumed the autumnal dress, they only utter the metallic like call note which is given while they are on the wing.

The nests of the Bobolinks are placed on the ground, usually in a thick tuft of grass which serves to conceal them. The female if approached when on the nest, will quietly creep away through the sheltering herbage and rise some distance from the spot, and thus it is difficult to find the eggs; but as the male has the habit above described of frequently alighting near his mate where she is sitting, one can judge of the approximate position of the nest by watching him.

When autumn has fairly begun and the ripening leaves of the ivy and woodbine are dyed with brilliant hues, when the sultry heat of September has given place to the cool, clear weather of October, then the *tinch-tinch-tinch* of the migrating Bobolinks may be heard coming through the still night air, for this species, like many other of the smaller birds, move almost wholly during the hours of darkness. At first they assemble in large flocks on the salt marshes near the coast, finding shelter in the coarse grass which borders all the creeks, but with the first frosts they are off to the southward. When once started they usually move continuously, so that in a few days not one is to be found where there were thousands before.

After the wheat is harvested in Pennsylvania a thick crop of a somewhat peculiar species of grass springs up and in autumn bears a large quantity of seeds. These immense fields are the resort of the Reed Birds when they have left New England, and I found them very abundant there during the latter portion of October. They grow so exceedingly fat from having such great quantities of food, which is easily obtained, that they fly with difficulty. Indeed on one or two occasions I caught specimens in my hands as they were unable to rise from the tall grass. At first I supposed they were wounded as they appeared so helpless, but a careful inspection made it very evident that their great corpulency alone was the cause of the trouble; in fact upon giving them their liberty they managed to get off flying very slowly. Thus a great change comes over our little friends when they put on their plain autumnal dress. From energetic, lively birds whose whole time is apparently given to singing or attending to the wants of their mates and offspring, they become epicures, never uttering a note nor caring for anything but a hearty meal.

GENUS II. MOLOTHRUS. THE PARASITICAL BLACKBIRDS.

GEN. CH. *Bill, rather thick and conical, not much shorter than the head. Upper mandible, a little curved. Wings, much longer than the tail which is considerably rounded, but the feathers are not acuminate. Sternum, stout, equal in breadth to one half the length of the coracoids. Size, medium. Stomach, muscular.*

Members of the present genus also resemble those of the preceding Family in having a very muscular stomach and thick bill, but are unlike any allied species in being parasitical in breeding habits, never building a nest of their own. They are also polygamous. The females are smaller than the males and duller in color at all seasons.

MOLOTHRUS PECORIS.

Cow Blackbird.

Molothrus pecoris, Sw., F. Bor. Am., II, 1831, 277.

DESCRIPTION.

SP. CH. *Form, robust. Size, medium. Tongue, rather fleshy, provided with a short tuft of terminal, hair-like fibers. Sternum, as given above.*

Color. Adult male. Head, neck, and anterior breast, chocolate-brown. Remainder of body, black throughout, with greenish reflections on all portions, excepting near the neck above, where they are violet. Tips of wings, brownish. Bill and feet, black.

Adult female. Uniform, dull, slaty-brown throughout, lightest on the throat and darkest on the wings and tail. The centers of the feathers of the back, breast, sides, and flanks, streaked with dusky. Bill, brown, lighter at base of lower mandible. Feet, dark-brown.

Young male. Has the chocolate markings much darker. The remainder of feathers are somewhat greener, and they are narrowly margined with reddish especially below.

Young female. Similar to the adult, but darker, with a more decided gloss to the feathers above. There are indications of dusky maxillary lines, and the streakings below are more prominent.

Nestlings. Similar to the young female, but streaked below with yellowish-white, the throat is overwashed with yellow. There are decided maxillary lines, and indications of whitish wing bars.

OBSERVATIONS.

There is a general uniformity of coloration among the males, but the females vary somewhat for there are occasionally maxillary lines and some are darker above than others. There are seldom any black feathers in this sex but a specimen in the collection of Masters Edward A. and Outram Bangs has a patch on one side of the breast and a few feathers on other portions tipped with black, giving it a singular appearance. This species assumes a plumage quite similar to the adult the first season and, contrary to the rule among this Order, the nestlings moult the wing and tail feathers. These are much broader in the first plumage than in the second, and the barbs of the webs are much farther apart giving the feathers a coarse appearance. Thus I find that a secondary of the first plumage has five barbs to every ten hundredths of an inch while there are only four in one of the second, both feathers being taken from the same specimen. The feathers are also broader at first, and under the microscope the barbules are seen to be wider and provided with pectinations on both sides as far as the curve which serves to interlock them with neighboring barbules. Known from all others by the plumage as described. Distributed in summer throughout the Middle and Southern sections of the United States. Winters in the Southern States as far south as Northern Florida.

DIMENSIONS.

Average measurements of ten male specimens. Length, 7.69; stretch, 13.58; wing, 4.37; tail, 2.95; bill, .67; tarsus, .95. Longest specimen, 7.75; greatest extent of wing, 13.65; longest wing, 4.45; tail, 3.15; bill, .68; tarsus, 1.00. Shortest specimen, 7.61; smallest extent of wing, 13.52; shortest wing, 4.30; tail, 2.82; bill, .65; tarsus, .90.

Average measurements of fourteen female specimens. Length, 6.82; stretch, 11.80; wing, 3.85; tail, 2.55; bill, .60; tarsus, .80. Longest specimen, 6.61; greatest extent of wing, 12.00; longest wing, 3.95; tail, 2.66; bill, .65; tarsus, .95. Shortest specimen, 7.12; smallest extent of wing, 11.61; shortest wing, 3.70; tail, 2.40; bill, .55; tarsus, .85.

DESCRIPTION OF EGGS.

Eggs, elliptical in form, ashy-white in color, spotted and blotched irregularly with yellowish-brown and lilac. Sometimes the eggs will be nearly white, there being but few spots, while occasionally the surface will be so covered that the back ground is quite obscured. They vary greatly in size also as will be seen in the following measurements. Dimensions from .60, x .72, to .93, x .80.

HABITS.

Far back in my childhood, when all nature was full of delightful mysteries, I noticed a Chipping Sparrow busily engaged in feeding a young bird that was nearly double its own size. This singular reversing of the usual order of things attracted my attention and, although I was too young to follow up the matter that season, I never forgot the incident. Then little by little the problem became solved and one of the first unaided discoveries that I ever made in Ornithology was the parasitical habits of the Cow Blackbird. I presume that there is scarcely a person in the country who is at all interested in birds, but what is aware of the singular propensity of the Cow Blackbird to deposit its eggs in the nests of other birds. They are also quite singular in almost all of their habits especially when breeding.

They arrive in New England during the latter part of March or early in April in company with other Blackbirds, being seldom seen in flocks by themselves at this season. The males arrive first, and as soon as the females make their appearance, associate in small companies. The former named sex predominate, there being at least three of them to one female. At this time the males have a singular song that consists of two notes which, although given with great energy and evidently costing the bird a great effort, are far from being musical; for it is a kind of hiss combined with a croak. The Cow Birds are capable of uttering a much better song, and one that I kept in confinement would give a series of beautiful, liquid notes and never indulged in the uncouth performance above described.

The males are very fond of strutting about in order to display their brilliant charms to the plainly dressed females, for they spread their tails widely, droop their wings, and ruffle their dark feathers, not only when singing, but whenever they approach the object of their affections.

Two or more males often pay their attentions to one female, singularly, without attempting to quarrel, when she will suddenly take wing and all will start in pursuit. The flight of a female at this time is exceedingly swift, for she will usually manage to keep ahead of her followers who ardently press on, giving a rather sharp, prolonged cry as they dart through the air. All the males within hearing join in, and it is not unusual to see a half dozen at a time after one of the other sex who will lead them a long chase, now darting upward to a considerable height, then doubling, will glide through the tangled branches of a clump of trees, emerging on the opposite side with great rapidity. This exciting race is evidently maintained merely as a matter of sport, for when the object of chase becomes weary she will quietly settle on the branch of a tree, and her admirers gather around her, calmly arranging their feathers. After resting for a time one will commence his gallantries once more, when the female darts into the air again and the males dash vehemently after her as before.

Not long after the arrival of the females they may be seen peering about in bushes or among the boughs of trees in search of the nest of some other bird in which to deposit their eggs. Their judgement, or rather instinct, must be almost unerring, for I never knew one to mistake an old nest for a fresh one, nor do they ever place their eggs with those that are partly incubated. The species which the Cow Blackbirds select as foster-parents for their young are, strangely enough, almost always smaller than themselves. The Thrushes, Warblers, some Sparrows, and occasionally the Wrens, are the prominent birds chosen. The intruding egg is, I think, laid when the owner of the nest is absent, as those birds which are most assiduous in guarding their homes, like the Flycatchers, are only occasionally troubled. It is a noteworthy fact that very few species ever notice this addition to their store of eggs, even though it be very much larger, and quite different in color. Occasionally the nest will be abandoned after the visit of the Cow Blackbird, and once in a while a new structure will be built over the intruding egg. The species which more often show this good judgement are the Yellow Warbler and Gold Finch, but it is probable that this only occurs when the parasitical egg is laid before any of their own. Sometimes two or even three Cow Blackbird's eggs are to be found in one nest, but undoubtedly this is the work of more than one female, as it is probable that the instinct of each bird teaches her never to visit the same nest a second time.

The young changeling does not appear to be looked upon as an intruder, for it is carefully reared. This may be due to the fact that, as the eggs of the Cow Birds are always hatched first, and either the eggs which belonged in the nest are removed by the parents as worthless, or when the young are hatched they are so very weak that they are crushed to death by the interloper; thus the foster-child, being the only one left, it receives all the attention which should have been bestowed upon the rightful owners of the nest. Another proof that the intrusion of this species does not trouble the birds upon which it in-

poses, is that they never pay any attention to the presence of the Cow Blackbirds. These latter named birds, when mature, never disturb any eggs or young of other species, which may account for the forbearance on the part of those deceived; thus while the predatory Cuckoos and Jays are greeted with loud cries and driven from the place, the Cow Blackbirds pass unnoticed, although they doubtlessly kill more young birds than all other species combined.

I have mentioned that eggs of the Cow Birds vary considerably, this would suggest the idea that they approximate in size and markings with those of the birds in whose nests they are deposited. This is not so according to my observations, yet I would not be surprised if, upon careful examination and comparison of a large number of specimens, that they did in a measure agree, at least in color. This species derives its common and Latin names from its habit of associating with cattle. They usually settle around cows in a pasture for the purpose of catching grasshoppers which are started by the movements of these animals, and of which the birds are very fond. Our little friends appear to be on excellent terms with their large associates, for they may often be seen perched on their backs.

During early autumn the Cow Blackbirds assemble in large flocks on the coast in order to feed on locusts, and migrate early in October, accompanied by Red-winged and Crow Blackbirds.

GENUS III. AGELEUS. THE RED-WINGED BLACKBIRDS.

GEN. CH. *Bill, pointed, broad at tip, equal in length to the head. Upper mandible, straight. Wings, longer than the tail which is considerably rounded. Sternum, stout, equal in breadth to one half the length of the coracoids. Keel, high. Size, rather large. Stomach, muscular.*

Males of the present genus are black in color with red shoulder patches. The females are smaller than the males, and duller in color at all seasons.

AGELÆUS PHENICEUS.

Red-winged Blackbird.

Agelaius phoeniceus, VIEILLOT, Anal., 1816.

DESCRIPTION.

SP. CH. *Form, robust. Size, rather large. Tongue, long, thin, and horny, provided with a bifid tuft of coarse, terminal, hair-like fibers. Sternum, as given above.*

Color. Adult male in summer. Uniform, lustrous black throughout, with the lesser wing coverts, bright-scarlet, margined on the lower side with either yellow or buff. Bill and feet, black.

Adult female in summer. Dark-brown above, with the feathers narrowly margined with yellowish-white. There is a median line extending from bill to occiput, and a superciliary line, reaching to the nape, of yellowish-rufous. Shoulders, strongly tinged with red. Beneath, white, streaked with dark-brown. Throat and sides of head, overwashed with roseaceous. Bill, brown, lighter at base of lower mandible. Feet, dark-brown.

Adult male in winter. Similar to the summer plumage, but all of the feathers are narrowly edged with reddish, which wears away, however, as spring approaches.

Adult female in winter. Much more strongly marked above with yellowish to which is added a tinge of reddish. The median line is obscured.

Young male. The black is less lustrous and the feathers above are margined with reddish. Shoulder patch is paler and streaked with black. There are indications of superciliary lines. The feathers of the breast, sides, and flanks, are edged with whitish, especially in winter when there is also much more rufous above. The bill is considerably lighter on the lower mandible.

Young female. Similar to the adult but has no rosaceous on the throat, or red on the shoulder. There is more rufous above, especially in winter.

Young male of the year in spring. With the feathers above widely margined with rufous, especially on the shoulders, where there are but few indications of scarlet. There are superciliary lines and a slight maxillary line. All the feathers below are edged with whitish. The ground color is black, however, but this is rather brownish, especially on the tips of the wings.

Young male of the year in winter. Similar in color to the female, being brown above, with the feathers margined with yellowish-white and reddish. White, beneath, streaked with dark-brown. There is a tinge of yellow on the throat. No indications whatever of red on the shoulders. Other markings similar to those of the adult female but the size is always considerably larger.

Young female of the year. Strongly tinged below with yellowish which is more noticeable in winter. Otherwise similar to the young.

Nestlings. Resembles the above, but there is much more yellow below, and there are indications of wing bars. The bill is light-brown. There is a naked space around the eye and on the throat long after all of the remainder of the body is covered with feathers.

OBSERVATIONS.

Adult males from Massachusetts have a pale-buff margin to the shoulder patches which are of an intense scarlet. This margin is made up of the lower row of lesser wing coverts and they are darker where they are covered. Florida birds have less of this edging and it is of a darker buff. In Western skins of the so-called "*gubernator*" these coverts are only buff at the base, the tips being black. The Southern females do not differ much from more Northern specimens, excepting that they are smaller, as are also the males. Females from Utah have the colors on the anterior portions more obscured, and there is but little trace of a median line. A male specimen in the collection of the Masters Bangs, taken in October, is quite similar to some taken at Key West only a month later. Distributed in summer throughout the United States. Winters in the Carolinas and southward.

DIMENSIONS.

Average measurements of fifteen male specimens from New England. Length, 9.03; stretch, 14.72; wing, 4.75; tail, 3.55; bill, .98; tarsus, 1.07. Longest specimen, 9.50; greatest extent of wing, 15.25; longest wing, 5.00; tail, 3.65; bill, 1.05; tarsus, 1.15. Shortest specimen, 8.61; smallest extent of wing, 14.20; shortest wing, 4.50; tail, 3.45; bill, .92; tarsus, 1.00.

Average measurements of fifteen female specimens from New England. Length, 7.72; stretch, 12.20; wing, 3.83; tail, 2.87; bill, .82; tarsus, .95. Longest specimen, 8.00; greatest extent of wing, 14.50; longest wing, 4.00; tail, 3.05; bill, .90; tarsus, 1.00. Shortest specimen, 7.45; smallest extent of wing, 12.00; shortest wing, 2.40; tail, 2.70; bill, .85; tarsus, .90.

Average measurements of fifteen male specimens from Florida. Length, 8.57; stretch, 14.42; wing, 4.30; tail, 2.87; bill, .85; tarsus, .97. Longest specimen, 9.25; greatest extent of wing, 14.50; longest wing, 4.66; tail, 3.62; bill, 1.00; tarsus, 1.05. Shortest specimen, 7.90; smallest extent of wing, 13.75; shortest wing, 3.95; tail, 3.00; bill, .71; tarsus, .90.

Average measurements of fourteen female specimens from Florida. Length, 7.50; stretch, 12.72; wing, 3.32; tail, 2.75; bill, .95; tarsus, 1.05. Longest specimen, 7.98; greatest extent of wing, 12.25; longest wing, 3.90; tail, 3.02; bill, .95; tarsus, 1.05. Shortest specimen, 7.10; smallest extent of wing, 11.15; shortest wing, 3.00; tail, 2.45; bill, .75; tarsus, .92.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in trees, bushes, or on tussocks. They are compact structures, composed of quite coarse grass and weeds, lined with fine grass. Dimensions; external diameter, 4.15, internal, 3.42. External depth, 5.85, internal, 1.85.

Eggs, oval in form, three to five in number, pale-blue in color, spotted, blotched, and lined irregularly with reddish-brown and amber. The above described markings are on the surface, and usually cluster around the larger end, but there are other spots which are duller and incorporated in the shell. The spots vary greatly in number, and occasionally one will be immaculate. Dimensions from .90 x .65 to 1.07 x .75.

HABITS.

There are few, if any, among our insessorial birds that are found in such immense flocks as the Red-winged Blackbirds. Large quantities associate together in New England, but as they move southward these communities join forces, and when they arrive in the rice fields of the Carolinas and Georgia, they have accumulated in such vast swarms as to fairly darken the air. Great numbers also occur throughout Florida, and I even found them abundant at Key West. During the entire winter they are gregariously inclined, but as spring approaches they break up into small flocks and the males which have only the *cluck*, used as a call note when flying, or as one of alarm when startled, begin to give

the louder and more energetically delivered song which indicates that the breeding season is drawing near.

The wide-spread marshes of the everglades of Florida are covered with a luxuriant growth of tall grass which attains to the height of five or even six feet. These vast plains form the homes of hundreds of Red-winged Blackbirds and there they also breed. As the grass is submerged in at least a foot of water in the spring, the Blackbirds are obliged to suspend their nests near the top of the stout stalks, of which they bring several together weaving the leaves in the nests and around them in order to make them secure. The everglades are seldom free from wind which often blows a gale, waving the grass back and forth furiously, so that the birds are forced to build exceedingly compact structures or they would be blown to pieces. The nests are therefore made of the leaves of the coarse saw grass which abounds, neatly and firmly woven together. The swaying motion to which their domiciles are constantly subjected, has a tendency to throw the eggs out, and would were it not that the birds who have doubtlessly been taught by the experience of former generations, build their nests very deep and, not content with this, they make them more secure by contracting the entrance so much that it is impossible for the eggs to fall out, even when the grass bends so that the tops touch the water. I discovered the first nests in that locality on the eighth of April, and they each contained three eggs which I afterwards found were all that were ever deposited. These, contrary to the rule among birds which lay a less number of eggs in the south than in the north, were proportionately smaller when compared with New England specimens.

May first of that same season found me standing on one of the small outer keys, about a hundred miles south of the point last described. This islet, like many others, contained a small lagoon in the center, around which was a belt of land that supported a number of trees, mainly the kinds known as Buttonwood and Mangrove. There were a large number of Red-winged Blackbirds breeding on this Key but I was puzzled to find the nests, for I could not see them in the trees and there were no bushes or grass. After watching them attentively for a few moments, I saw a female emerge from a small hole in a Buttonwood tree not far from the ground, and climbing up to it discovered the nest which was built like that of a Blue Bird. I afterward found several in similar places all containing eggs. For a time I could not understand why the birds had chosen these novel situations for homes, but the *ha-ha* of a passing group of Fish Crows helped to enlighten me, for I knew that the predatory habits of this latter named species renders the eggs of all birds unsafe if exposed, unless the owners are sufficiently strong to protect them, and what the Red-wings lacked in strength they made up in cunning, as they placed their treasures where it was impossible for their enemies to get at them.

By the middle of May I had reached Ipswich, where I found fresh eggs of the Red-wings. Here they construct their domiciles of the long eel grass which has been bleached white by exposure to the sun. This is often woven into long pendulous nests which are hung to trees after the manner of the Baltimore Orioles. Indeed I have found specimens built by the Red-winged Blackbirds which were fully six inches deep and so nearly like the structure of the above named bird found in the same place, that it was difficult to

distinguish one from another. These nests were all placed in slender saplings which bent with every breeze, hence their peculiar form. But what is more singular, is the fact that when the birds built in the low shrubs which were so stiff that they could not wave much, the nests were often of the same form as those taken from trees. Indeed one of the deepest that I ever obtained, I found in the midst of a barberry bush where there was no need of building such an elaborate structure. This certainly looks as if the birds labored without reasoning sufficiently, or they would not make themselves unnecessary work. It is extremely probable, however, that habits caused by surrounding circumstances are acquired slowly and when once fixed become difficult to eradicate, being even inherited by the succeeding generations.

June first I found the Red-wings building on the floating islands in Lake Umbagog, evidently sitting on their eggs which were in a somewhat advanced state of incubation. Thus it will be seen that there is but little over six weeks difference in time of nesting between the birds found in the most Southern portion of the United States and those that occur in the more Northern, which is quite short when we consider the extremes in climate, there being almost perpetual summer on the Florida Keys, while the ice and snow linger in upper New England until the first of May.

Although the Red-winged Blackbirds appear in New England in early March, when the snow is still in the valleys and on the northern slopes, they leave when the first frosts have whitened the meadows. Then young and old accumulate in vast flocks and move southward. They remain for a short time in Pennsylvania but soon migrate, seeming to prefer the salt marshes of the coast at this season of the year. As winter advances they retreat inland.

GENUS IV. XANTHOCEPHALUS. THE YELLOW-HEADED BLACKBIRDS.

GEN. CH. *Bill, pointed, broad at tip, a little shorter than the head. Upper mandible, nearly straight. Wings, longer than the tail which is a little rounded. Sternum, not stout, quite similar in form to that of Agelaius, excepting that the coracoids are somewhat shorter. Size, large. Stomach, muscular.*

Males of this genus are black in color, with yellow heads and with no white markings on the wings. The females are smaller, and duller in color, and they also lack the white markings.

XANTHOCEPHALUS ICTEROCEPHALUS.

Yellow-headed Blackbird.

Xanthocephalus icterocephalus, BAIRD, Birds N. A., 1858, 531.

DESCRIPTION.

SP. CH. Form, robust. Size, large. Feet, large and stout. Tongue, rather thin and horny. Sternum, as given above.

COLOR. *Adult male.* Greater portion of body, glossy black. Head, excepting band at base of bill, lores, and space around eye which are black, neck, upper breast coming down into a point, and ventral spot, yellow. Greater wing coverts, white, black at tips. Bill and feet, black.

Adult female. Uniform sooty brown, with the chin and breast yellow but paler than in the male. There are traces of yellow on the sides and top of the head, and superciliary lines of the same color. No white on the wings. Bill, brown. Feet, black.

Young male. Similar to the female, but has white on the wings as in the adult, and the colors are somewhat paler, especially the yellow.

Young female. Differs from the adult in having superciliary lines of whitish extending down to the nape, streaks of whitish on the breast, and indications of a median line of the same on the head. There are but few traces of yellow on the breast.

OBSERVATIONS.

This species is readily distinguished from other Blackbirds in the adult stage by the yellow head, and in other stages by the peculiar colors as described. Distributed during the breeding season throughout the region west of the Mississippi. Wintering in the more Southern sections. Accidental in Massachusetts, Pennsylvania, and Florida.

DIMENSIONS.

Average measurements of male specimens. Length, 10.50; stretch, 17.30; wing, 5.40; tail, 4.13; bill, .88; tarsus, 1.40. Longest specimen, 10.60; greatest extent of wing, 17.40; longest wing, 5.45; tail, 4.17; bill, .98; tarsus, 1.45. Shortest specimen, 10.40; smallest extent of wing, 17.20; shortest wing, 5.35; tail, 4.05; bill, .80; tarsus, 1.35.

Average measurements of female specimens. Length, 10.00; stretch, 17.00; wing, 5.25; tail, 3.70; bill, .80; tarsus, 1.30. Longest specimen, 10.10; greatest extent of wing, 17.10; longest wing, 5.30; tail, 3.75; bill, .85; tarsus, 1.25. Shortest specimen, 9.95; smallest extent of wing, 16.95; shortest wing, 5.21; tail, 3.62; bill, .76; tarsus, 1.26.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in reeds. They are bulky, though compact, structures composed of quite coarse grass and weeds, lined with fine grass. Dimensions; external diameter, 5.60, internal, 4.12. External depth, 5.85, internal, 2.65.

Eggs, oval in form, three to five in number, bluish-gray in color, spotted and blotched irregularly with yellowish-brown and occasionally lined with amber. Dimensions from .80 x .70 to 1.00 x .75.

HABITS.

Although the Yellow-headed Blackbird has been taken once in Florida and once in Massachusetts, as stated, yet I have never chanced to meet with it; but Mr. R. Ridgway of the Smithsonian Institution, has kindly written for me a description of its habits, as observed by him.

“The tules constitute in California one of the most characteristic, if not prominent, features of the landscape. The term is peculiar, so far as the United States are concerned, to the vernacular of that state, and is used to designate those vast areas of reedy marsh which occupy so great a portion of the valleys of the rivers which flow into the Bay of San Francisco. It was among the tules, near Sacramento, that we formed our acquaintance with the Yellow-headed Blackbird. There this species swarmed among the countless multitude of the feathered race. Its most intimate associates being the Red-wings which were no less numerous than the motley crowd of water-fowl composed of hovering Terns, clucking Coots, Gallinules, and various kinds of Ducks which together made an uproar quite confusing to one not used to the scene.”

“The geographical range of the Yellow-headed Blackbird is quite coëxtensive with the treeless districts of the western half of the continent, where ever suitable localities, such as that described above, occur. It is, therefore, to be met with from the prairie districts of the Mississippi valley to the Pacific, being no less numerous in parts of Illinois and Wisconsin than in the most favored parts of California, while to the North and South its regular range extends to the wild rice swamps of the Saskatchewan on the one hand, and to the prairie sloughs of Texas on the other. Within the above limits the Yellow-headed Blackbird may be said to occur regularly, although there are of course very numerous districts where it is never found, owing to unsuitableness of environment. There are, however, even records of its occurrence far beyond any localities above mentioned. It has been captured at Volusia, Florida, near Philadelphia, Pennsylvania, and in Massachusetts, while it has even strayed to Greenland and Cuba. The occurrence of this species in these last two localities, however, may be regarded as entirely exceptional.”

“The habits of the Yellow-headed Blackbird partake in their character of those of the Red-wings with which it usually associates. It is, however, more decidedly gregarious, while it is also noticeably more terrestrial, being frequently seen on the ground walking about with a stately, graceful step very much after the manner of the Cow Blackbird.”

“The Yellow-headed Blackbird usually, if not always, breeds in colonies, in which respect it corresponds in habits with Brewer’s Blackbird and other members of the family, selecting for the purpose an extensive marsh filled with tules. It attaches its nest to the reed stalks, fastening them between several upright stems. The material, and doubtless also the exact position of the nest, probably vary more or less according to the character of the locality. The males of this species loiter in the vicinity of the nests while the females are incubating and, when their homes are invaded, circle about the intruder, uttering at the same time harsh notes of distress. The song of this Blackbird is a very unmusical affair. Indeed we cannot bring to mind any other of our native birds whose notes are so discordant, and we know not with what to compare them unless it be the grating squawk of a Guinea Fowl. The male, however, makes a great parade of himself when in a musical humor, puffing out his feathers, strutting about in a very pompous manner, and then, after a great heave and strain, delivers himself of a wheezy sort of squeak which is evidently satisfactory to himself, while it also seems to please his mate.”

GENUS V. STURNELLA. THE MEADOW LARKS.

GEN. CH. *Bill, pointed, broad at tip, equal in length to the head. Upper mandible very little curved. Wings very much longer than the tail which is well rounded. Feet, large. Sternum, narrower, but little exceeding the height of the keel in width. Coracoids much shorter than the top of the keel. Marginal indentations shallow and narrow. Stomach, not very muscular. Size, large.*

Members of this genus are conspicuously marked with yellow or other bright colors below. The legs are long and the tail short, indicating terrestrial habits. The females are smaller than the males.

STURNELLA MAGNA.

Meadow Lark.

Sturnella magna Sw., Phil. Mag., I; 1828, 436.

DESCRIPTION.

SP. CH. *Form, robust. Size, large. Feet, very large and stout. Tongue, long, thin and horny, with a longitudinal central depression, and deeply bifid at tip, but without any terminal cilia. Blue in color on the basal half, remainder, white. Sternum, as given above.*

Color. Adult male in summer. Above, including wings and tail, reddish-brown, with the feathers of the back and rump having lighter edges and dark-brown centers. Wings and tail have either the central portions dark-brown with confluent, transverse bars or with both webs barred without the central line. Outer feathers of tail, white, with some portions of outer and inner webs more or less marked with brown. Top of head, dark-brown, with a median line extending from the bill to the occiput, yellowish-white. Sides of head, excepting dark-brown line back of eye, lores, sides of neck, sides, flanks, under wing coverts, and under tail coverts, ashy-white, more or less tinged with yellow, especially on the latter-named portion, and line extending from base of bill to point over eye, bright gamboge-yellow. Spots on sides, flanks, and crescent shaped mark on breast, with the horns broadening out and extending up on to the neck, black. Bill, dark-brown, bluish at base of lower mandible. Feet, brown.

Adult female in summer. Smaller in size than the males and with the dark markings more or less obscured with brownish-yellow.

Adult in winter. Differs from the summer dress in being more rufous above and in having the black markings obscured with whitish. This is much more noticeable in the female, and in both sexes just after the autumnal moult.

Young of the year. Has the markings above more suffused. There is very much less yellow in advance of the eye. The entire under parts are overwashed with whitish nearly obscuring the black crescent. There is more white on the tail.

Nestlings. Are similar to the adult above, excepting that there is no yellow on the superciliary line and the brown of the head is mixed with reddish. Beneath, uniform pale yellow, lighter in the female on the throat, with the sides, flanks, and a crescent-shaped patch on the breast, spotted and lined with dark-brown. Bill and feet, brown, the former lighter on lower mandible. But what is most singular is that in this stage there is much more white on the tail than in any other stage. The wing and tail feathers are moulted.

OBSERVATIONS.

Readily known from all other birds by the description as above. As will be seen by the measurements, Florida specimens differ in being smaller and they are also brighter in color. The so-called "*neglecta*" from the West differs in having the yellow extend up on the maxillary, which is seldom if ever seen on more eastern skins. Individuals from the same locality do not vary much either in size or color. Distributed in summer throughout the United States south of the latitude of Southern New Hampshire, usually retreating a little southward in winter.

DIMENSIONS.

Average measurements of ten male specimens from Massachusetts. Length, 10.40; stretch, 16.30; wing, 4.90; tail, 3.16; bill, 1.25; tarsus, 1.30. Longest specimen, 11.00; greatest extent of wing, 17.00; longest wing, 5.15; tail, 3.50; bill, 1.30; tarsus, 1.25. Shortest specimen, 9.95; smallest extent of wing, 15.07; shortest wing, 4.76; tail, 2.83; bill, 1.18; tarsus, 1.39.

Average measurements of nine female specimens from Massachusetts. Length, 9.55; stretch, 14.43; wing, 4.29; tail, 2.82; bill, 1.20; tarsus, 1.39. Longest specimen, 9.75; greatest extent of wing, 15.63; longest wing, 4.56; tail, 3.11; bill, 1.25; tarsus, 1.41. Shortest specimen, 8.98; smallest extent of wing, 13.50; shortest wing, 4.15; tail, 2.48; bill, 1.16; tarsus, 1.21.

Average measurements of ten male specimens from Florida. Length, 9.80; stretch, 15.70; wing, 4.45; tail, 2.85; bill, 1.20; tarsus, 1.46. Longest specimen, 10.20; greatest extent of wing, 15.75; longest wing, 4.60; tail, 3.20; bill, 1.28; tarsus, 1.45. Shortest specimen, 9.50; smallest extent of wing, 14.75; shortest wing, 4.25; tail, 2.82; bill, 1.15; tarsus, 1.35.

Average measurements of fourteen female specimens from Florida. Length, 9.55; stretch, 14.44; wing, 4.25; tail, 2.82; bill, 1.13; tarsus, 1.30. Longest specimen, 9.54; greatest extent of wing, 14.75; longest wing, 4.65; tail, 2.90; bill, 1.26; tarsus, 1.35. Shortest specimen, 8.50; smallest extent of wing, 13.00; shortest wing, 3.90; tail, 2.40; bill, 1.13; tarsus, 1.25.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground. They are composed of grass lined with finer. Dimensions: external diameter, 5.10, internal, 2.42. External depth, 5.15, internal, 2.15.

Eggs, oval in form, four to six in number, pure white in color, spotted and blotched with redish-brown and lilac, more thickly on the larger end. Dimensions from 1.05 x .70 to 1.15 x .80.

HABITS.

The famous Indian Hunting Grounds of Florida which lie south of the Everglades, are very remarkable as the topography of the country is quite different from any that I ever saw elsewhere in the state. A narrow strip of high pine land extends along the coast, but back of this is a wide reach of prairie that is bounded on the west by a strip of piney woods beyond which is another stretch of open land, thus prairies and woods alternate for many miles. The growth of grass on the margins of these plains is low, seldom exceeding six inches in height, and consequently forms the homes of countless Meadow Larks, for these birds always exhibit a decided preference for low herbage. The Hunting Grounds were a perfect wilderness at the time of my visit in 1871, for there was but one settler and he was newly located in the neighborhood. The nearest house to the eastward was thirty miles distance and to the westward and northward hundreds of miles intervened before there was the slightest vestige of civilization. Thus the birds which occurred there were seldom if ever disturbed so that I found them exceedingly tame; in fact they would start up at my feet, fly a few yards, and either settle down again in the grass or alight on a low limb of a pine, where they would quietly gaze at me, even allowing me to pass directly beneath them without attempting to move. Then as if satisfied that I intended doing them no harm, would sound a loud, strange note which was so utterly at variance with the song

of the same species in New England, that when I first heard it could scarcely believe it was a Meadow Lark. This lay even in the North has a peculiar intonation which is quite suggestive of freedom, but that given by the birds which inhabit the trackless piney woods and wide-spread plains of Florida is, although very melodious and pleasing, so wild, clear and ringing, that it is in perfect harmony with surroundings where Nature reigns supreme.

As we advance northward through Florida, more into the haunts of civilization, we find that the Meadow Larks gradually learn the lesson that all birds acquire sooner or later,— the fear of man. Thus I found them rather on the alert in the neighborhood of small settlements and near Jacksonville they were fully as shy as in Massachusetts. This is largely due to the fact that as they frequent the plantations they are often hunted as game. They are also looked upon as nuisances for they eat rye and other grains, frequenting newly sown fields in large numbers for this purpose, and specimens that I shot on a plantation were filled with rye, though they usually subsist upon insects. Probably the cultivated district affords them better facilities for obtaining food, for as we proceed further northward into Georgia and the Carolinas they almost wholly abandon the wooded districts. In Pennsylvania and Massachusetts they are seldom, if ever, found in other than open fields which have been cultivated at some recent period, excepting on the coast where they often occur on the salt marshes. They never nest there, however, but build on the uplands at some distance from the water.

The Meadow Larks breed in Florida during the last week of April but do not lay in Massachusetts until the middle of May. The nests in the latter named section are placed in the grass and although often open are sometimes domed, occasionally there being a covered passage for some distance. When the female is sitting, the male lingers near and seated on some tree pours forth his loud, clear lay which is certainly one of the most thrilling and enlivening songs given by any of our native birds.

By July the young may be seen in company with their parents who exhibit great solicitude for their safety, flying about and uttering sharp cries until their offspring are induced to take wing when all move away to some adjacent field. The family continues in company and are frequently joined by others until quite large flocks accumulate in autumn. At this season they are rather peculiar in habits, as they often crouch in grass which is high enough to conceal them until the intruder comes very near, when they will rise suddenly and fly swiftly away in a straight line, giving a few sharp notes as they go. Those in the immediate neighborhood will not always start at the report of a gun, and will only jump when approached quite closely. They appear to become very much attached to certain localities and will always return to spend the night in chosen spots, often coming in long after sunset. They repose on the ground in scattering groups and start quite readily even during the darkest nights.

The Larks of Massachusetts linger until late in autumn, moving southward when the ground becomes covered with snow, but they are apt to return occasionally during the milder weather, and I have taken them in every month of the year. Therefore I should judge that the birds which breed in any one locality seldom go far from it. South of Virginia they are not migratory at all, or at best only gather in large flocks.

GENUS VI. ICTERUS. THE ORIOLES.

GEN. CH. *Bill, much pointed, not very broad at tip, shorter than the head. Upper and lower mandibles a little curved. Wings, somewhat longer than the tail which is slightly rounded. Feet, not large. Sternum, not nearly as narrow as that of the preceding genus. Keel, rather low. Coracoids, equal in length to the top of the keel. Marginal indentations equal in depth to the height of the keel. Stomach, not muscular. Size, medium.*

Members of this genus are conspicuously marked either above or below with bright colors or with black. They are all arboreal in habits.

ICTERUS BALTIMORE.

Baltimore Oriole.

"*Icterus Baltimore* DAUDIN," AUD., Orn. Biog., I; 1831, 66.

DESCRIPTION.

Sp. Ch. Form, rather slender. Size, medium. Feet, not large. Tongue, thin and horny, with a slight central depression, bifid at tip, provided with a fringe of cilia extending along the sides for one third the terminal length. Sternum, rather stout.

COLOR. *Adult male in summer.* Head, all around neck coming down into a triangle on the breast, back, wings, and band across tail reaching to the tips of central pair, black, also bar on tips of greater wing coverts and outer edges of outer webs of all the wing feathers, white. Remaining portions, orange-yellow, brightest on the breast. Upper mandible, black, blue on lower edges. Lower mandible and feet, blue.

Adult female in summer. Beneath, uniform yellow, tinged with orange on the breast. Upper portions, including the tail, yellowish-brown, brightest on the head and rump. No black band on the tail. Wings, brown, with white markings as in the males. Bill, bluish throughout. Feet, blue.

Adult male in autumn. Much brighter beneath than in spring, the breast frequently becoming orange-carmine. The back has a faint overwashing of orange and the rump is tinged with dusky. There is much more white on the wings which is yellowish.

Adult female in autumn. Much deeper in color below, and the back is more uniformly overwashed with yellowish-brown. The wings have much more white.

Young male. Has much more white on the wings, and the rump is overwashed with yellowish-brown. There is only a slight indication of the black bar on the tail, the central feathers becoming perfect first. The color below is not nearly as bright.

Young female. Is much lighter in color below, showing none of the orange tinging on the breast. The back is not as clear black.

Young of the year in spring. The males are mottled on the back with yellowish-brown and black. The black of the lower neck only extends in spots on the breast, and the color below is pale showing only a tinge of orange. The female is very pale.

Young of the year in autumn. The males show no black whatever and both sexes are tinged with orange below. The back is pale, otherwise the plumage is similar to the female in autumn. Bill, brown, considerably lighter at base of lower mandible.

Nestlings. Very pale-yellow beneath and paler brown above. Wings and tail as in the last plumage. Bill, brown throughout. Feet, blue. The wings and tail feathers are not moulted.

OBSERVATIONS.

I have described the average brightest plumage of the adult, but I once procured a specimen that had a carmine streak down the breast. A local race of perfectly adult specimens which I procured on the islands in the Susquehanna River at Williamsport, Pennsylvania, differ in being of a nearly uniform pale-yellow beneath and in having considerable white on the wings. Readily known by the colors as described. Distributed in summer from the Carolinas north to Canada on the eastern side of the Central Plains. Wintering south of the United States.

DIMENSIONS.

Average measurements of twenty-five specimens. Length, 7.62; stretch, 11.65; wing, 3.71; tail, 2.82; bill, .72; tarsus, .85. Longest specimen, 8.00; greatest extent of wing, 12.25; longest wing, 4.00; tail, 3.10; bill, .75; tarsus, .90. Shortest specimen, 7.25; smallest extent of wing, 11.15; shortest wing, 3.42; tail, 2.65; bill, .70; tarsus, .80.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in trees, pendulous in form, composed of strips of fibrous bark, horse-hair, strings, rags, etc., neatly and firmly woven together. Dimensions; external diameter, 4.00, internal, 2.00. External depth, 6.00, internal, 5.00.

Eggs, four to six in number, oval in form, pale-blue in color, spotted, dotted, and lined with umber. Some of the markings are incorporated in the material of the shell. Dimensions from .90 x .60 to 1.20 x .72.

HABITS.

When the warm, reviving breath of the south wind has caused the cherry trees of New England to put forth their blossoms, the first notes of the Baltimore Orioles are heard. I do not think I ever knew a single season to pass when these lovely birds did not appear promptly as soon as the cherry trees were in bloom, for they are extremely fond of frequenting them in order to feed on the insects which infest them at this season. As they swing gracefully from the topmost boughs, their brilliant plumage forms a fine contrast with the snowy flowers which surround them, while at intervals the perfumed air is filled with bursts of that clear, ringing melody which is always a sure indication that summer has fairly come. Later the dark-green foliage on the lofty branches of the grand old elms which beautify so many of our streets is enlivened by their presence. Indeed of all the ornamental trees which are to be found in villages, the elm appears to be the prime favorite with the Orioles for these birds seldom occur far from dwellings when their chosen trees stand in the immediate vicinity of them. In some portions of Pennsylvania, however, where but little attention is paid to planting trees about the houses, they almost always inhabit small groves, seeming to prefer the lofty trees in the immediate neighborhood of water.

The Susquehanna River at Williamsport is some three hundred and fifty yards in width and is filled with numerous small, wooded islands upon which the Baltimore Orioles abound, in fact I never saw them more abundant in any given locality. It was here that I first obtained the specimen with the peculiar yellow plumage of which I have spoken, but these only occurred at one particular point on the River, all of the other birds being in normal dress. This was about the middle of May when they were migrating, which would partly account for the large numbers that had congregated together, but later when they were nesting, they were still numerous, proving that it was an attractive place for them. The birds which remained there were remarkable on account of having a peculiar song that consisted of several short, though sweet, notes repeated rapidly. The effect, however, was very pleasing, but I was much surprised to find that the females sang nearly as well as the males. It is a fact that no two birds even of the same species sing exactly alike although the difference is oftentimes so very slight that it is extremely difficult to detect, but I know of very few, if any, among our native birds where there is so much individual variation in the song as in that of the Baltimore Orioles. It is also noticeable that the peculiar lay of some individuals is frequently inherited by their offspring. Thus I know of several places where all the Orioles utter notes which are similar but which I never heard elsewhere. But a particular song is not always imparted by the parent to its descendants; for example, one of the finest singers that I ever heard was an Oriole that built for several years in an huge pear tree which stands back of my place in Newtonville. This bird besides having a variety of clear, liquid notes which were perfectly enchanting, frequently uttered a series of loud whistles which sounded almost exactly like those given by the Great-crested Flycatcher, yet I never heard any other Oriole attempt anything like them. The melody of the Baltimore Orioles, although so varied that it is simply indescribable, has a singular clear richness of tone which renders it unmistakable whenever heard. Their

Harmonious strains have caused them to become general favorites and, as they are seldom molested, they have acquired confidence in humanity, frequenting the gardens and shrubbery about dwellings. Thus they find protection from many enemies under the guardianship of man, but they amply repay him for his kindness by destroying multitudes of insects. They not only eat greedily of that detested pest, the canker worm, but are among the few species of birds that will eat the tent caterpillar. They will alight on the nest of this destructive insect, tear it to pieces, and devour the larvæ. Later in summer they will take a few berries and they are immoderately fond of green peas. This latter named trait is their only fault, yet we may well pardon them for this when we find that they also eat the potato beetle. An Oriole that I shot in the act of helping himself to peas had four or five of the above named insects in his stomach.

As a nest builder this Oriole excels, not only is the structure durable but it is extremely light and admirably formed to occupy the position usually chosen for it,—the extremity of a swaying bough. That this habit of suspending the nest in such inaccessible places, where no animal large enough to injure the eggs or young can reach it without the aid of wings, is an ancestral trait acquired in the Tropics, where such a precaution is much more a matter of necessity than here, can scarcely be doubted. At present, however, it is exceedingly conducive to the increase of the species that this cautionary trait was perpetuated, as practically it can make but little difference to the Orioles whether their eggs are stolen by monkeys who would eat them, or by some urchin who is ambitious to have the egg a “Golden Robin” in his collection.

The eggs of these Orioles are deposited by the first of June and the singular notes of the young may be heard early in July. As they leave the nest by the middle of the month they become fully fledged by the first of August and undergo their first moult when the adults acquire their autumnal dress. By September they are all in perfect plumage and shortly after migrate in straggling flocks. I have a specimen which was taken in Massachusetts as late as November 13, but this is extremely exceptional for they seldom remain after the middle of September. They linger for a time in Pennsylvania, but depart for the South before October.

ICTERUS SPURIUS.

Orchard Oriole.

Icterus spurius Bon., Obs. on Nom. Wils.; 1825, No. 44.

DESCRIPTION.

SP. CH. Form, slender. Size, small. Feet, not large. Tongue, as in the preceding species. Sternum, not stout. Bill, slender and considerably curved.

COLOR. *Adult male in summer.* Head, all around neck coming down into a triangle on the breast, back, and tail, black. The latter, slightly tipped with white. Wings, also black, with a bar of white and chestnut, and all the outer edges of outer webs, margined with either chestnut or greenish white. Remainder of body, including lesser and under wing coverts, chestnut. Bill, black, blue at base of lower mandible. Feet, blue.

Adult female in summer. Yellowish-green throughout, darker on the back. Wings, brown, with white markings as in the male, but with no chestnut. Bill, brown, lighter at base of lower mandible.

Young male. Similar to the adult female but there is a patch of black extending over the throat, lower neck, and lores. There are also black feathers in the back, and portions of the tail are frequently of the same color, while there are traces of chestnut on the sides and middle of the breast. Bill and feet as in the adult.

Young female.—Similar to the adult but much paler, especially on the back. The wings are lighter and have more white on them.

Nestlings.—Quite like the adult female but very pale-yellow throughout, but are a little darker above. Wings and tail are like the above for they are not moulted.

OBSERVATIONS.

There is but little variation in plumage among birds of the same age and sex from the same locality, so that they may readily be distinguished by the colors as described. Distributed in summer throughout the Eastern Section of the United States, south of Massachusetts. Winters south of the United States.

DIMENSIONS.

Average measurements of twenty specimens. Length, 6.62; stretch, 9.50; wing, 3.00; tail, 3.10; bill, .65; tarsus, .70. Longest specimen, 7.25; greatest extent of wing, 10.00; longest wing, 3.25; tail, 3.25; bill, .90; tarsus, .75. Shortest specimen, 6.00; smallest extent of wing, 9.25; shortest wing, 2.75; tail, 3.00; bill, .60; tarsus, .65.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in trees, not very pendulous in form, composed of fine, tough grass firmly woven together. Dimensions: external diameter, 1.00, internal, .90. External depth, 2.50, internal, 1.50.

Eggs, four to six in number, oval in form, pale-blue in color, spotted, dotted, and sometimes lined, with amber and lilac. Dimensions from .80 x .60 to .85 x .65.

HABITS.

The city of Wilmington, North Carolina, is pleasantly situated on a high bluff which overlooks Cape Fear River. Like many of the Southern cities, the streets are well shaded with live oaks and other trees which as a natural result attract many birds. On visiting this place, May 25, 1872, I found that the foliage was swarming with various species of the feathered tribe, but none were more prominent than the Orchard Orioles. This was partly due to their abundance but they rendered themselves noticeable by the loud, clear whistle which sounded out in all directions. This song, although similar to that of the Baltimore Oriole, is in many respects not as varied but is, notwithstanding, very fine. The Orchard Orioles were about to breed in Wilmington, and I saw the females carrying material for their nests. This is seemingly quite late to begin laying so far south; indeed I found them with eggs at Williamsport, Pennsylvania, about the same date, and have seen a nest full of eggs in Massachusetts as early as June.

This Oriole differs somewhat in habits from the Baltimore inasmuch as it nearly always places its nest on an apple or other low tree, in the fork of a limb and not suspended from it. They have the very restless movements which characterize this genus. One may be seen clinging to the lowest branches of a tree, then with the rapidity of thought will bound upwards, and swing from the topmost bough where he remains only for a moment, however, as suddenly catching sight of a passing female, he darts off in pursuit followed by one or two others, for like the Baltimore, the males are rather promiscuous in their attentions. On account of their preferring low trees as homes, they frequent the neighborhood of houses in Pennsylvania, nesting in the fruit trees, and are seldom seen on the river in company with the Baltimore Oriole. Nor did I ever see the two species associating together anywhere.

The young make their appearance in the trees about the middle of July but they migrate very soon, as I did not find them at all during the last week of August.

GENUS VII. SCOLECOPHAGUS. THE RUSTY BLACKBIRDS.

GEN. CH. *Bill, slender, pointed, not very broad at tip, a little shorter than the head. Upper and lower mandibles a little curved. Wings, longer than the tail which is slightly rounded. Feet, not large. Sternum, narrow. Keel, higher than one half the width of the sternum. Marginal indentations exceeding in depth the height of the keel. Coracoids exceeding in length the top of the keel. Stomach, not very muscular. Size, rather large.*

The adult males are black in color, but the females are duller, while the young show rusty markings. There are never any bright colors.

SCOLECOPHAGUS FERRUGINEUS.

Rusty Grackle.

Scolecophagus ferrugineus SWAINSON., F. Bor. Am., II; 1831, 286.

DESCRIPTION.

Sp. CH. Form, rather robust. Size, quite large. Feet, medium. Tongue, long, thin and horny, with a terminal tuft of hair-like fibers. Sternum, as given above.

COLOR. *Adult male in summer.* Uniform lustrous black throughout, with greenish reflections. Bill, black, lighter at base of lower mandible. Feet, brown.

Adult female in summer. Uniform dark-plumbeous throughout, lighter on the throat, becoming very dark on the wings and tail where there are greenish reflections.

Adult and young in autumn. Similar to the summer adult but having all the feathers margined with reddish-brown, while the adult females are darker.

Young of the year. The males are dull black with the entire plumage overwashed with reddish-brown. There are also superciliary lines of the same. The female is dull-plumbeous, but is so overwashed with rusty that the ground color is quite obscured.

OBSERVATIONS.

There is considerable variation in size but there is no essential difference in color in birds of the same age and sex. Readily known by the uniform black and plumbeous plumage in the adult stage, and the young may be distinguished by the rusty overwashing. Distributed in summer throughout Eastern North America, north of the White Mountain range. Winters from the Carolinas to Middle Florida.

DIMENSIONS.

Average measurements of ten specimens. Length, 9.50; stretch, 11.50; wing, 4.45; tail, 3.50; bill, .75; tarsus, 1.25. Longest specimen, 9.70; greatest extent of wing, 14.90; longest wing, 4.80; tail, 3.95; bill, .80; tarsus, 1.30. Shortest specimen, 8.65; smallest extent of wing, 13.60; shortest wing, 4.12; tail, 3.35; bill, .70; tarsus, 1.20.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in bushes, composed of twigs, weeds, and grass, the latter being mixed with mud. The whole is lined with leaves and fine grass. Dimensions; external diameter, 6.50, internal, 2.00. External depth, 4.00, internal, 2.00.

Eggs, from three to five in number, oval in form, pale-blue in color, spotted and lined with light-brown. Dimensions from 1.05 x .75 to 1.00 x .70.

HABITS.

Just south of Blue Springs, Florida, was a thick grove of Palmettoes which bordered a narrow strip of marsh that lay between it and the St. John's River. These trees, like many others which grow in rich soil, were quite high and the fronds very large, consequently the shade was so dense that the sun was quite excluded. Thus a somber light pervaded the place which was not conducive to the growth of plants so that the dark soil was covered with rapidly decaying fragments of palm fronds. This debris naturally formed a shelter for many insects and minute mollusks which were, however, far from being safe in their gloomy retreat, for large numbers of Rusty Grackles had found that they were abundant

there and entering from the marsh, visited the grove regularly. I always found them there in the morning, walking about on the ground and overturning the rubbish in search of their prey. They were not in the least shy, in fact it was difficult to make them fly at all, but when approached quite closely or when alarmed at the report of a gun, they would alight on the trees over my head, but after a moment would settle down again. They remain in Florida until after the first of March when they migrate.

The Rusty Blackbirds arrive in Massachusetts about the middle of the month and frequent the trees and shrubbery by the side of streams. They are, while here, the most unsuspecting of all the Blackbirds, allowing one to come quite near them without exhibiting the slightest alarm. In Florida they are silent or at best only utter that peculiar chirp of alarm given by all the Blackbirds, but here they make a most unmelodious attempt to sing, emitting a wheezy kind of croak. This rude lay is all the song that our dark-colored friends are capable of giving and evidently the birds consider it a most brilliant performance for they spread their tails, ruffle their feathers, and strut proudly before the silent females who are seemingly quite impressed with the superiority of their mates. These Grackles linger for a time, but in the middle of April depart northward.

There are spots on the Magdalen Islands which might rightly be termed sloughs, for they are perfectly inaccessible as the surface, although apparently solid, is in reality so thin that it will not bear the weight of a dog. This floating mass of vegetation, however, supports bushes and in some cases small trees all of which grow very thickly together. I had observed Blackbirds about them on several occasions, but as they kept well in the center of the large tracks, I could not make out at first what they were but after a time found that a large colony of Rusty Grackles were evidently building in one of the above described places. All efforts to penetrate the fastness proved unavailing and upon visiting the locality somewhat later, (about the middle of July) I concluded by the movements of the birds that the young were out, but I did not procure any. This species breeds at Lake Umbagog, Maine, and Mr. E. Harrington obtained a nest there, early in June, which contained fresh eggs.

By the last week in September the Rusty Grackles reappear in Massachusetts where they frequent the fields of ripened corn, but I do not think they eat the grain for I never found anything in their stomachs except insects and small mollusks. They remain in small flocks until the middle of October, then depart southward. I found them gathered in large numbers with the Crow Blackbirds in Pennsylvania, and migrate with them a little later in the month.

GENUS VIII. QUISCALUS. THE BOAT-TAILED BLACKBIRDS.

GEN. VII. *Bill, stout, not very pointed nor broad at tip, about as long as the head. Upper mandible, curved. Wings, a little shorter than the tail which is graduated. Feet, large. Sternum, narrow. Keel, higher than one half the width of the sternum. Marginal indentations considerably exceeding in depth the height of the keel. Coracoids, much shorter than the top of the keel. Stomach, not very muscular. Size, large.*

The adult males are black in color. The females are much duller and smaller. The tail, when spread, is boat-shaped. There are never any bright colors.

QUISCALUS VERSICOLOR.

Purple Grackle. Crow Blackbird.

Quiscalus versicolor VIEILL, Analyse; 1816.

Quiscalus agelaius BAIRD, Amer. Jour. Sci. and Arts, XII, 87; 1866.

Quiscalus ancus RIDGWAY, Proc. Phil. Acad. Nat. Sci.; 1869, 135.

DESCRIPTION.

Sp. Ch. Form, robust. Size, quite large. Feet, stout. Tongue, long, somewhat fleshy, but thin and horny for the terminal fourth, bifid, and provided with fine, terminal cilia which extends along the sides of the horny portion. Blue in color, black at tip. Sternum, not very stout.

Color. *Adult male.* Uniform lustrous black throughout with bluish and greenish reflections on the head, neck, and upper breast. The remainder of the body is bronzy with violet reflections on the wings and tail. Eyelids, dark-brown. Iris, white. Bill and feet, black.

Adult female. Uniform, dull brownish-black throughout, with greenish reflections on the head and with bluish on the wings and tail. Bill, feet, and iris as in the male.

Young of the year. Similar to the adult female but the males show some of the bright reflections, but the females are much duller.

Nestlings. Uniform dark-brown, darkest on the wings and tail, where there is a slight gloss of violet. There is a yellowish overwashing beneath, where there are indications of dusky streakings. Iris, dark slaty-blue. Bill and feet brown. The wing and tail feathers are moulted.

OBSERVATIONS.

There is a great amount of variation in skins from different localities. Birds from New England besides being quite large in size have usually, though not always, the bluish-green reflections of the head ending in a well defined line on the neck, and the wings are uniform in coloration. Birds from Florida differ from this in being beautifully variegated on the wings, back, sides, and rump, with bronze and violet reflections, while the head is of a purer blue, and specimens from the middle district rather combine the two patterns of coloration. I have, however, seen a perfect series of gradations in all respects and thus look upon the so-called species as given in the synonyms. The nestlings are at first much darker than those described, as seen by a male partly fledged which was kindly procured for me by the Bangs Brothers. Distributed in summer throughout Eastern North America from the Arctic Circle to the Gulf of Mexico. Wintering in the more southern portions.

DIMENSIONS.

Average measurements of fifteen male specimens from New England. Length, 12.62; stretch, 17.73; wing, 6.65; tail, 5.30; bill, 1.75; tarsus, 1.25. Longest specimen, 13.20; greatest extent of wing, 18.12; longest wing, 6.05; tail, 6.09; bill, 1.60; tarsus, 1.30. Shortest specimen, 12.00; smallest extent of wing, 17.10; shortest wing, 5.22; tail, 4.58; bill, 1.45; tarsus, 1.09.

Average measurements of nine female specimens from New England. Length, 11.45; stretch, 15.76; wing, 4.95; tail, 4.52; bill, 1.45; tarsus, 1.20. Longest specimen, 12.00; greatest extent of wing, 16.30; longest wing, 5.22; tail, 4.89; bill, 1.55; tarsus, 1.25. Shortest specimen, 11.00; smallest extent of wing, 15.30; shortest wing, 4.62; tail, 4.10; bill, 1.40; tarsus, 1.15.

Average measurements of twenty male specimens from Florida. Length, 12.14; stretch, 16.12; wing, 4.91; tail, 4.82; bill, 1.25; tarsus, 1.22. Longest specimen, 12.50; greatest extent of wing, 17.30; longest wing, 5.55; tail, 5.05; bill, 1.30; tarsus, 1.30. Shortest specimen, 11.00; smallest extent of wing, 15.49; shortest wing, 4.40; tail, 4.09; bill, 1.20; tarsus, 1.08.

Average measurements of twenty female specimens from Florida. Length, 11.14; stretch, 11.09; wing, 5.20; tail, 4.86; bill, .98; tarsus, 1.22. Longest specimen, 11.75; greatest extent of wing, 15.49; longest wing, 5.52; tail, 5.24; bill, .82; tarsus, 1.25. Shortest specimen, 10.00; smallest extent of wing, 13.54; shortest wing, 4.75; tail, 4.24; bill, 1.22; tarsus, .99.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in trees and bushes. They are large, compact structures composed of coarse grass and weeds mixed with mud and moulded into form, lined with fine grass. Dimensions: external diameter, 7.00, internal, 3.45. External depth, 4.50, internal, 3.50.

Eggs, from four to five in number, oval in form, pale-blue in color, spotted, blotched and lined with brown and amber. The lines are seldom well defined on the edges, and the ground color is often clouded, being sometimes completely obscured with brownish washing. Some specimens are uniformly dotted throughout. Dimensions from 1.30 x .90 to 1.09 x .86.

HABITS.

It is difficult to find a section of country north of the Florida Keys, east of the Mississippi River, where the harsh chirp of the Crow Blackbirds is not to be heard, at least throughout the summer. They are so versatile in their habits that they find nearly all localities suitable for their homes. Thus I found their nests fastened to the waving grass of the Everglades, and they build in immense numbers on the reedy margin of the upper St. John's. In Pennsylvania they select low bushes along the river bottoms, and in Massachusetts where the country is quite thickly populated, experience has taught them the necessity of choosing the highest pine trees as summer homes. I know of three rookeries similarly situated, all within the radius of a mile from my place. At Ipswich, where they are seldom disturbed, they often breed in orchards near houses or in small trees on the islands of the marshes, and the nests are sometimes placed so low that they can be reached from the ground. They also exhibit a propensity to nest inside deserted buildings and I once knew a pair that placed their domicile in the mouth of a partly covered well. On a few occasions I have taken the nests from holes in trees at Ipswich but they most always build in holes of old stubs that stand in the shallow water of Lake Umbagog. The material used and the form of the structure are also variable. Thus in the Everglades I found that the nests were firm, compact and deep with a contracted entrance. Those placed in high trees in Massachusetts are composed partly of mud and are rather flat being formed nearly like those of the Robin, while on the coast the birds generally use the bleached eel grass, therefore the nests are much lighter. Those which I have taken from holes in trees were largely composed of mud mixed with coarse grass and weeds. Although so variable in breeding habits the time of depositing the eggs does not differ much in the wind-spread section of which I have spoken, when we consider the extremes in climate. In Florida the eggs are laid about the first of May and I have found them at Ipswich a few days later, while the birds lay by the middle of the month at Lake Umbagog, and possibly but a little later much farther north.

I have mentioned that these birds built in rookeries, and I have always found them nesting in communities of fifty and upwards. In fact they are gregariously inclined at all seasons, assembling in large flocks in the autumn and winter, often in company with the Boat-tailed Grackle, for the two seemed to be on excellent terms. In matter of diet the Crow Blackbirds are perfectly omnivorous, now visiting the newly sown fields in order to feed on the grain, or pulling up the farmer's corn just as it has appeared above the ground that they may eat the swollen kernel at the root. Then in autumn vast swarms settle on the fields of ripening corn and eagerly strip the ears; thus they are constantly in mischief, but by far the worst charge that can be laid upon them is their trait of robbing the nests of other birds.

They will visit the homes of those species which build in accessible situations and deliberately remove the eggs or, what is more to be deplored, the helpless young and devour them in spite of the cries of the distracted parents who are powerless to prevent the outrage, as the aggressors are both strong and agile. So frequently were these depredations committed upon the homes of the Robins and other birds, that built about my place this season, that there was scarcely an hour in the day during early summer when I could

not hear the warning cries of the adult birds, followed by the harsh, scolding notes of the Crow Blackbird as he was vigorously attacked on all sides, but he seldom retreated without accomplishing his purpose. Such continuous slaughter must greatly thin the ranks of the birds that are thus robbed and it will be safe to say that the Purple Grackles destroy more birds than all the other predatory species combined. The sufferers quickly forget their wrongs, for it is only during the breeding season or when the young are small that they exhibit any enmity toward the Blackbirds, and I have seen the Grackles amicably eating cherries in company with a large number of smaller birds, composed of half a dozen species.

In Florida, where the Purple Grackles are very tame, they also eat a variety of food. In early Winter large flocks may be seen on the tops of the palmettoes, feeding on the fruit, and they also eat berries in their season. Later small flocks are found on the margin of streams, frequently wading into them in search of little mollusks, crabs, etc., and it is not rare to meet with one or two scattering individuals in the thick hummocks, overturning the leaves in order to find insects or small reptiles which they devour. I once saw one catch a lizard which was crawling over the fan-like frond of a palmetto, and fly with it to the ground. The reptile squirmed all the while in its frantic endeavors to escape, but the Blackbird held it firmly and, after beating it to death, removed the skin as adroitly as if accustomed to the operation, then swallowed the body.

The harsh, guttural notes of the Purple Grackle can scarcely be called a song but, like all the other Blackbirds, they make great display when uttering them. The performance is given while the birds are perched upon some elevated situation, and I have frequently heard an entire flock, composed of some hundreds of individuals, thus employed. As each evidently tried to surpass the others in emitting the rasping squeal, they succeeded admirably in producing much more noise than music. The notes of the local race found in Florida differ from those which occur in the North in being much more disagreeable, if that were possible, for they are somewhat harsher.

The young leave the nest by the last week in June and become fledged by the middle of July, when they accompany their parents and all gradually gather in flocks, so that by the first of October vast numbers have accumulated. They always select some particular spot, usually a thick swamp, as a roosting place, to which they return regularly every evening, coming in small flocks, and continuing to arrive until long after twilight. They are quite watchful even during dark nights, for if a gun be discharged in one of these resorts all of the birds will rise at once and many will fly away to neighboring woods while others will return after a time, but if disturbed very often they will abandon the place entirely. By November when the leaves are falling, they migrate, lingering for a time in Pennsylvania, where such quantities accumulate that the vast flocks fairly darken the air. They move in exceedingly compact bodies, flying so closely together that it seems impossible for them to use their wings at all, yet they fly very swiftly, and when one of these living clouds is passing overhead the sound produced by their pinions resembles that of rushing water. The Crow Blackbirds take their final departure for the South before the first of November.

QUISCALUS MAJOR.

Boat-tailed Grackle.

Quiscalus major VIEILLIOT, Nouv. Diet. XXVIII, 1819, 487.

DESCRIPTION.

Sp. Ch. Form, robust. Size, large. Feet, very stout. Tongue, long, thin and horny, deeply bifid at tip, and provided with a fringe of cilia which extends along the sides for the terminal fourth, black in color. Sternum stout.

COLOR. *Adult male.* Uniform lustrous black throughout, with purplish-blue reflections on the head, neck, and upper breast, and greenish on the remainder of the body, being duller on the wings and tail. Iris, reddish brown. Bill and feet, black.

Adult female. Dark-brown above, becoming reddish on the head, with a greenish gloss on the back, wings, and tail. Sides of head, dusky, with a supereiliary line of yellowish-brown. Beneath yellowish-brown, becoming darker on the sides, flanks, and under tail coverts. Iris, bill, and feet as in the male.

Young. The males lack the bright reflections and the feathers of the breast show whitish edgings. The female is much paler beneath.

Nestlings. Similar to the young female but much paler beneath, especially on the throat and abdomen. There is also a strong overwashing of yellowish-brown above. Bill and feet, brown.

OBSERVATIONS.

There is little or no variation in birds of the same age and sex from the same locality. Readily distinguished by the large size and colors as described. Distributed in summer from Florida to the Carolinas and throughout the Gulf States. Winters in the more southern portions.

DIMENSIONS.

Average measurements of thirty male specimens from Florida. Length, 15.95; stretch, 22.70; wing, 6.35; tail, 6.45; bill, 1.62; tarsus, 1.95. Longest specimen, 16.90; greatest extent of wing, 25.00; longest wing, 7.70; tail, 7.40; bill, 2.00; tarsus, 2.05. Shortest specimen, 15.00; smallest extent of wing, 20.50; shortest wing, 5.00; tail, 5.50; bill, 1.25; tarsus, 1.40.

Average measurements of twenty female specimens from Florida. Length, 12.74; stretch, 17.35; wing, 5.62; tail, 5.30; bill, 1.38; tarsus, 1.31. Longest specimen, 13.50; greatest extent of wing, 18.00; longest wing, 5.95; tail, 5.60; bill, 1.50; tarsus, 1.40. Shortest specimen, 12.00; smallest extent of wing, 16.70; shortest wing, 5.40; tail, 5.00; bill, 1.25; tarsus, 1.25.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in grass and bushes. They are large, compact structures composed of coarse grass and weeds, lined with fine grass. Dimensions; external diameter, 8.00, internal, 4.00. External depth, 5.00, internal, 3.00.

Eggs, from three to four in number, oval in form, pale-blue in color, clearly lined and spotted with brown and amber. The lines are well defined on the edges, but the ground color is often clouded with brownish. Dimensions from 1.35 x .90 to 1.20 x .80.

HABITS.

Among the most noticeable land birds of Florida are the Boat-tailed Grackles. This is partly due to their large size, but is mainly owing to the fact that they make themselves conspicuous by their loud notes and ostentatious display. As they are generally regarded as harmless birds they are seldom molested and thus have acquired confidence in man, becoming very tame. Indeed they are the most unsuspecting of any birds of such large size that I ever saw, and I have frequently passed within two yards of them as they sat on the low bushes on the bank of the river. But wherever the tourists go, they are prone to shoot everything that they see, and the Jackdaws, as they are called, soon become aware of this propensity, so that they are very shy about cities or towns. Being remarkable sagacious birds they do not remain long where they are persecuted, but retreat to wilder sections

where they are very abundant, and where I have had many opportunities of observing their habits.

Like the preceding species, the flight of the Boat-tailed Grackles is somewhat heavy and decidedly marked, for the long, keel-shaped tail gives the bird a peculiar appearance and looks as if it were too heavy for the remainder of the body which is often kept at an inclination, with the head highest. I do not think these birds are as agile in aerial evolutions as the other Blackbirds for they seldom wheel in circles, but fly more in a direct line; in fact this species is characterized by their dignified movements, even when walking. They spend a great portion of their time on the ground, frequenting the neighborhood of streams and other bodies of water into which they wade in search of small mollusks, crabs, etc. Throughout the winter these Blackbirds assemble in large flocks, some of which are wholly made up of males while others are composed mainly of females, but by the first of March these large assemblies break up into smaller companies and both sexes come together. Then the males begin to sing, but perhaps I am violating the rules of harmony when I call this peculiar lay a song. Yet, although the chirp is much harsher than that of the Crow Blackbird, the remainder of the performance is much different. It consists of a series of sharp, short, though clear, energetic notes uttered somewhat rapidly, and taken in connection with the primeval surroundings, produces an effect which is exceedingly pleasing.

As I have remarked before, the east side of the Indian River is mainly composed of dry prairies through which are interspersed little ponds. The space occupied by the water is small, but it is surrounded by a belt of marshy ground, of a greater or less extent, which has thickly grown to high, coarse saw grass. This rank herbage which is often six feet high, is the chosen resort of the Boat-tailed Grackles, and the nests are fastened to the large stems. Sometimes there will be willows near the water, and on a few occasions I have found the nests in them. The average height of the structures above the surface was four feet, but I took one from a branch of a tree that was placed ten feet from the ground.

This was quite exceptional, in fact it is rare to find them elsewhere than in the grass. The birds began to breed in the Everglades by the second week in March, and I found them nesting in the rushes in the islands at Salt Lake by the seventeenth of the month, but it was as late as the third of April when I visited the breeding ground mentioned above. The eggs had evidently been deposited for some time, as they nearly all contained embryos, but some were fresh. The usual number was two, indeed out of at least thirty nests only one contained three. Farther south, in the Everglades and in the Indian Hunting Grounds, I almost always found three.

This is all that I ever obtained but Mr. C. H. Nauman has taken four, three are, however, the usual number deposited. The birds were quite solicitous for the safety of their eggs, chirping loudly and alighting quite near us. The males were present and evinced considerable interest, for they elevated the feathers on their heads, fluttered their wings and joined in the general outcry. But they have a singular way of exhibiting their excitement which I never observed in any other species, for they draw the nictitating membrane

of the eye backwards and forwards very rapidly. At this time they also uttered a croak which resembled the alarm note of the Green Heron. I do not think that the males share in the duties of incubation but they certainly care for the young when they appear. I found the fully fledged nestlings flying at Lake Harney by the first week in May, and Mr. Nauman writes me that they bring out two or even three broods in one season. I have seen the Boat-tailed Grackles as far north as Pamlico Sound in North Carolina, on the twentieth of November, and at Smithville on the twenty-second, but I did not meet with them after this along the coast until we reached the St. John's River. This was during the cold season of 1876-77 when they would be much more likely to seek warmer quarters. I do not think, however, that they remain above Florida during winter, but they migrate northward in the spring as far, at least, as Virginia.

FAMILY XVII. CORVIDÆ. THE CROWS AND JAYS.

Upper mandible, more or less curved and usually notched. Lower mandible, not swollen at base. Nostrils, almost always covered with projecting bristles. Coracoids, shorter than top of keel which is moderately high, but not exceeding in height one third the length of the coracoids. Marginal indentations not exceeding in depth the height of the keel. Primaries, ten.

This Family is largely represented in the Old World as well as in the New. There is an apparent resemblance to some members of the preceding Family, but the bristly feathers of the bill, ten primaries, and the peculiar form of the sternum will serve to distinguish them. The œeca are very well developed, and the stomach is usually quite muscular. The females do not differ from the males, or at least in our native species.

GENUS I. CORVUS. THE CROWS.

GEN. CH. Bill, stout, about as long as the head. Upper mandible, curved. Wings, much longer than the tail which is rounded. Sternum, well proportioned with the expanded, termination of the furcula short. Marginal indentations, very shallow. Size, large.

The prevailing colors are black. The five pairs of laryngeal muscles of this genus are particularly distinct and will serve to illustrate this character as given under Section I, *Oscines*. (See plate VI. Nos., 1, 2, 3, and 4, of which explanations are given at the end of this section.)

CORVUS CARNIVOUS.

American Raven.

Corvus carnivous BARTRAM, Travels in E. Fla; 1793, 290.

DESCRIPTION.

SP. CH. Form, robust. Size, large. Feet, stout. Tongue, somewhat fleshy, but thin and horny at tip, which is bifid, and provided with a terminal cilium which extends along the sides, black in color. Sternum, stout. Feathers of neck and throat, lance-shaped.

COLOR. Adult male. Lustrous black throughout, with purplish reflections which are more noticeable on the back, neck, and breast. Bill and feet, black.

Young of the year. Quite similar to the adult but considerably duller. The bill is brownish and the soles of the feet, lighter.

Nestlings, Uniform dull brownish-black beneath. Head above, darker. The wings and tail are lustrous with purplish reflections, as in the above for the feathers are not moulted. Bill and feet, brown. Sexes, similar in all stages.

OBSERVATIONS.

There is little or no variation excepting in size, which depends greatly upon the locality. Winter birds are brighter in color. Readily known by the superior size, and lance-shaped feathers on the neck. Distributed as a constant resident throughout Eastern North America north of Massachusetts and everywhere west of the Mississippi River. Rare in the Alleghany Mountains and on the coast of New Jersey.

DIMENSIONS.

Average measurements of fifteen male specimens from North America. Length, 23.20; stretch, 50.50; wing, 16.50; tail, 9.90; bill, 2.50; tarsus, 2.18. Longest specimen, 25.00; greatest extent of wing, 56.00; longest wing, 17.50; tail, 10.95; bill, 2.78; tarsus, 2.66. Shortest specimen, 21.10, smallest extent of wing, 46.00; shortest wing, 15.50; tail, 9.06; bill, 2.40; tarsus, 2.35.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in trees or on cliffs. They are bulky, compact structures composed of sticks, lined with coarse grass and sea-weed. Dimensions: (approximate) external diameter, 36.00, internal, 18.00. External depth, 18.00, internal, 6.00.

Eggs, from four to five in number, dark-green in color, spotted and blotched with grayish and black. Dimensions from 1.70 x 1.35 to 1.80 x 1.45.

HABITS.

When the thick, white fog hangs like a pall over the Magdalen Islands quite obscuring the surrounding water and causing the steep, conical, grass-covered hills near at hand, to look like dim, greenish clouds suspended in mid air; when nothing is to be heard save the monotonous, never-ceasing sound of waves beating at the base of the high cliffs, and the east wind coming fresh from the ice-bergs which float in the mighty ocean not far away, is as chilly as a breath from the tomb; when all objects appear so distorted and unreal in the misty light, that one seems transported to another world; then a harsh croak is heard sounding out with such sudden distinctness as to be startling.

One who is unaccustomed to the locality gazes about in amazement for there is not a living thing in sight, and the cry was so weird and coincided so perfectly with the gloomy surroundings as to suggest that it was of supernatural origin. Again the uncouth note is repeated, but nearer, harsher and more real, and then the eye guided by the sound, sees a black shape gliding through the mist. Then another appears and still another, followed by half a dozen more, while the air is filled with dismal croakings. One can by this time discern that the mysterious sounds are produced by Ravens which are returning from a predatory excursion to some neighboring island, for these black pirates take advantage of the obscuring fog in order to rob the nests of various sea-birds which breed near.

The Ravens subsist largely by pillage, at least during summer, eating the eggs and destroying the young of other birds. They also attack small lambs, picking out their eyes, thus causing their death, and they will sometimes kill large sea-birds. Dr. E. L. Sturtevant informed me that he was at one time standing on a beach at Grand Menan, when he saw a Gannet soaring very high in air with, what appeared to be, a black spot above and below it. The bird seemed distressed and continued to mount upwards until both dark spots were seen to be above it, when suddenly it fell from that immense height, struck the ground, and was actually dashed to pieces by the force of the shock. Dr. Sturtevant approached it, when a Raven sprang from the body and flew away. These birds also eat fish or any other dead animals thrown up by the waves.

The Ravens prefer the bleak, wind-swept islands along the coast and build their nests on the rocky shelves of high cliffs. They always choose the most inaccessible situations that are available, often placing their bulky domiciles in a niche which is so small that it can hardly contain it. The newly hatched young must be very tenacious of life, or the

parents must guard them very assiduously, for their homes are often placed in localities where they are fully exposed to storms. I saw one on the naked face of a cliff at Bird Rock where every blast coming from the north-east must have blown against it. This was in July so the nest was empty, but the Light Keeper assured me that the eggs were deposited as early as the first of April and that the adult birds had succeeded in rearing a brood which had flown away some time before my visit. A week or two earlier, in June, I found a nest containing young on a high cliff at Amherst Island. We were unable to reach it without incurring great risk even with the aid of ropes, but we succeeded in gaining a point quite near it where we could observe the young. The adults exhibited considerable solicitude, as they flew distractedly about occasionally giving their harsh cries, but taking great care, however, not to approach within gunshot of us. Caution appears to be a special attribute of the Ravens for it is extremely difficult to procure a shot at one, but, as they fly badly during a high wind which sweeps them out of their course, they are frequently blown within shooting distance and my friend, Mr. G. W. Brown, succeeded in procuring one or two perfectly adult specimens in this way, but as this was in July they were moulting badly.

The movements of the Ravens are much heavier than those of the Common Crow which they resemble in many respects, and their flight is slower, but they sail more often circling about high over head. These birds are migratory, large numbers coming from the north to the Magdalen Islands and to Grand Menan during the winter. They are much tamer during the severe cold weather and, as they give considerable trouble by killing lambs as previously stated, the farmers at the latter named place are obliged to shoot them in self-defense. Thus I knew one man who managed to secure sixteen in a single day but they were unusually abundant that season. I think that they breed in the White Mountains and also at Tyngsboro', Massachusetts, for I had a nestling fully fledged which was obtained at the latter named place by Mr. Will Perham who states that he is positive they nest in the vicinity. I have seen them on one or two occasions in the Alleghany Mountains but they are very rare there, while they are occasionally found on the coast of New Jersey.

CORVUS AMERICANUS.

Common Crow.

Corvus Americanus. AUD. ORN. BIOG. II; 1834, 317.

DESCRIPTION.

SP. CH. Form, quite robust. Size, medium. Feet, stout. Tongue, somewhat fleshy, but thin and horny at the tip, bifid, and provided with terminal cilia which extends along the sides, black in color. Sternum, rather stout. Feathers of the neck, not lance-shaped. Feet, large. Middle toe and claw, shorter than the tarsus.

COLOR. *Adult.* Uniform, lustrous black throughout, with violet reflections which are brightest on the back, wings, and tail. Bill and feet, black.

Young. Are much duller throughout, and the feathers on the head and neck are slightly grayish. Bill, somewhat lighter at tip.

Nestlings. Uniform, dull brownish-black, with the wings and tail lustrous, for they are not moulted. Bill and feet brown. Sexes, similar in all stages.

OBSERVATIONS.

There is little or no variation in birds of the same age from the same locality, but Florida specimens are smaller with large bills and feet. Readily distinguished from the closely allied *ossifragus* by the large size of the feet and the shorter middle toe. Distributed in summer throughout North America, retreating into the United States in winter.

DIMENSIONS.

Average measurements of ten specimens from New England. Length, 19.50; stretch, 27.50; wing, 12.30; tail, 6.92; bill, 2.25; tarsus, 2.30. Longest specimen, 21.00; greatest extent of wing, 38.00; longest wing, 12.60; tail, 7.50; bill, 2.50; tarsus, 2.20. Shortest specimen, 18.00; smallest extent of wing, 36.00; shortest wing, 12.00; tail, 6.25; bill, 2.00; tarsus, 2.00.

Average measurements of six specimens from Florida. Length, 18.22; stretch, 35.10; wing, 21.65; tail, 7.25; bill, 2.30; tarsus, 2.29. Longest specimen, 19.15; greatest extent of wing, 37.90; longest wing, 12.50; tail, 8.00; bill, 2.60; tarsus, 2.58. Shortest specimen, 17.00; smallest extent of wing, 33.00; shortest wing, 10.80; tail, 6.50; bill, 2.00; tarsus, 2.00.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in trees. They are large structures composed of sticks, lined with grass, weeds, hair, etc. Dimensions: external diameter, 18.00; internal, 10.00. External depth, 10.00; internal, 1.00.

Eggs, from three to five in number, oval in form, varying from pale to dark-green in color, spotted and blotched with yellowish and grayish-brown. Dimensions from 1.55 x 1.10 to 2.00 x 1.30.

HABITS.

Among the first birds that I remember noticing were the Crows. I must have been very young, yet the earliest impression that I received regarding them was their extreme shyness, and the members of this species which I have met in the North have ever taken the greatest pains to confirm this idea. Sagacity is certainly one of the prime characteristics of the Crow and sagaciousness has taught them that all members of the human family, of whatever age, sex, or color, are their mortal enemies. Any one in our section who has endeavored to shoot them will bear testimony to this and, furthermore, many affirm that the birds are accurate mathematicians, being enabled to calculate to an inch the distance a gun will send shot, and thus tantalizingly keep just out of range. Although I cannot exactly confirm this statement, I do know that the birds very quickly learn where they are safe and where they must be cautious. For example, there is an estate not far from my place where no one ever shoots, as the owner has banished all guns from his land. Birds of many species build there and among them are two or three pairs of Crows. These wary birds are as unsuspecting as Robins when at home and I have frequently walked within twenty yards of them, but they are as shy as any of their comrades whenever they visit neighboring farms.

I found them very tame in Florida, where they are always abundant, excepting in the immediate vicinity of settlements, and at first it appeared quite odd to see Crows alight within a dozen yards of me without the slightest indication of fear. These birds in Massachusetts have a peculiar way of jutting the tail and of keeping the head erect as if constantly on the lookout for danger, but the southern race is much more indolent, for I never remember observing this habit. They simply gazed at me quietly and then, if I approached too near, would give a caw or two and fly to the next tree. They are mainly found in the piney woods, seldom visiting the prairies or hummocks, and they are also rare on the plantations where I never knew of their being in the least troublesome.

In Massachusetts the Crows, most unfortunately for the farmer, frequent the open country and are ready, at the slightest notice but without any special invitation, to feast on the newly sown grain or pull up the freshly sprouted corn. They are also very fond of this latter named article of diet when the ears are in the milk, that is just before ripening. All these depredations are committed in such a sly manner that the thieves elude completely the intended vengeance of the husbandman. They are in the fields at break of day or take advantage of a temporary absence of the guardian of the crops. Scarecrows, no matter how artistically constructed, lose their sham terrors after a time and other inventions for frightening them almost always fail. In short they are bound to have their fill and will not be driven away from any locality where they get good living, until one or two are slain and the bodies of the offenders are exposed on the spot where they committed their venturesome forays. Then the survivors take the hint and depart but, persistent to the last, only wing their way to some neighboring farm where they will commence their ravages with fresh vigor.

I found the Crows building in the tops of high pine trees at Miami about the first week of April. The time of breeding in Massachusetts varies somewhat with the season but the eggs are usually deposited by the first week of May. In most districts they select high pines but I have found the nests at Ipswich in apple trees not ten feet from the ground. These birds are not very shy in this latter named section as they are seldom disturbed, for they obtain the greater portion of their food about the creeks and on the marshes, seldom molesting the crops. The voice of the Crow is harsh but the caw is rather enlivening, especially in winter. This note is all that they usually utter but occasionally they emit a peculiar cry consisting of four or five notes, pitched in a high key. It appears at first thought that the cawing Crows should hardly be placed in the same section with the Mocking Bird, White-throated Sparrow, and other species that pour forth such charming melodies. Not only are the notes of the Crow capable of considerable modulation, as has been illustrated by keeping them in confinement and instructing them, but they also have a kind of song which is given during the breeding season. It may seem absurd to talk about Crows singing, but having heard their performance, I can bear testimony to its excellence, that is comparatively speaking.

I was once watching a pair of Crows that were building in a small grove in Newtonville and, as I had succeeded in gaining a place of concealment not far from the birds, without attracting their attention, had a fine opportunity of observing their movements, while they were entirely unconscious of my presence. The first thing that I noticed was a peculiar sound which somewhat resembled the cooing of a Dove, but it was far more musical. As only one of the birds was discernible from where I stood, I could not at first make out from what direction it came, but after a moment, moved slightly, when I saw at once that the author of this singular melody was no other than a Crow, evidently a male. He was seated on the limb of a tree by the side of his mate and was behaving in an odd manner for so grave a bird. He would move sideways on his perch, bow his head, spread his tail, and droop his wings, at the same time giving utterance to the cooing note. The female watched him demurely all the while but made no demonstrations whatever, and,

after performing some five minutes, both flew away. Another habit which I have observed relative to the breeding of the Crows, is that sometimes three birds will be engaged in building one nest and then all will remain about it until the eggs are hatched. I have noted this upon several occasions during different years, but of what sex the odd bird was I am unable to say, yet as I have found the usual number of eggs in the nest upon two occasions, judge that it is either a barren female or a male.

In winter the Crows come down from the north in countless numbers and frequent the seashore in small flocks. At this season they subsist on animal and other edible food thrown up by the tide, but during the severest weather, when the earth is covered with snow and the creeks, rivers, and bays are ice-bound, they undergo many hardships. I have frequently seen them with both feet frozen so stiff that they were unable to walk, and in this condition they were endeavoring to procure food from the margin of the ice where the water which dashed over them with every wave froze almost as soon as it struck, and their tails and wings became clogged with ice. It seems strange that these birds will remain in such an inhospitable region where they must suffer greatly, when a few hours' flight would carry them to much warmer quarters. It is noticeable, however, that a large quantity of the Crows do migrate just before storms, returning in milder weather. The few that remain more in the interior of the country fare better, for they have thick woods to which they can retreat and, as they are of a provident disposition, they lay up stores of corn, acorns, etc. which they hide in holes of trees or bury in the ground. It is interesting to watch a Crow when he is endeavoring to find one of these caches. He will fly across a snow-covered field where he has made his deposit and, after taking a turn or two, evidently misled at first by the changes which the weather has made, soon alights and confidently proceeds to a small mound, but a moment's scrutiny of this satisfies him. He then turns to another but with no better success, next he pauses an instant to take a better survey and to refresh his memory, when he hops briskly a few yards, gives two or three strokes with his powerful beak, and unearths his treasure. It is also observable that he is silent until he has completed the discovery and devoured his lunch, then he gives a few triumphant caws as he flies slowly away.

The Crows form a self-constituted police force, being constantly on the lookout for offenders, and when an Owl or Hawk appears within the bounds of their jurisdiction, some will give chase, some sing the peculiar notes which call others, until the unfortunate intruder is surrounded by a mob, all of whom vociferate loudly. They will not desist until the object of their alarm has taken its departure or hidden itself. Besides these gatherings, the reason for which is obvious, the Crows often assemble for no apparent object. They will occasionally gather in large numbers, generally selecting a few scattering trees which stand in an open country as a place of rendezvous, but I can give no plausible reason for these assemblies. They are, however, of not unusual occurrence in the autumn. I do not think that the Crows of Massachusetts or south of this point are migratory, but judge that the large numbers of these birds which frequent the coast all winter, come from the far north, for they are larger in size and less suspicious than the natives, as if unaccustomed to being disturbed.

CORVUS OSSIFRAGUS.

Fish Crow.

Corvus ossifragus WILSON, Am. Orn., V; 1812, 27.

DESCRIPTION.

SP. CH. Form, slender. Size, small. Feet, not stout. Tongue, somewhat fleshy, but thin and horny at tip which is bifid and provided with terminal cilia which extends along the sides, black in color. Sternum, not stout. Plumage, well blended. Middle toe and claw, longer than the tarsus.

COLOR. *Adult.* Lustrous black throughout, with purplish reflections which are more noticeable on the back, wings, and tail. Bill and feet, black.

Young of the year. Quite similar to the adult, but considerably duller, especially on the wings and tail which are inclined to be brownish.

Nestlings. Uniform, dull brownish-black beneath. The wings and tail are lustrous for the feathers are not moulted. Bill and feet, brown. Sexes, similar in all stages.

OBSERVATIONS.

As will be seen by the measurements, there is considerable variation in size in birds from the same locality, otherwise they are similar. Known from *Americanus* by the inferior size, brighter colors, blended plumage, small size of the feet, and shorter middle toe. Distributed in summer along the coast as far north as New Jersey, retreating southward in winter.

DIMENSIONS.

Average measurements of forty-six specimens from Florida. Length, 15.75; stretch, 33.75; wing, 11.25; tail, 6.25; bill, 1.65; tarsus, 1.75. Longest specimen, 21.00; greatest extent of wing, 43.75; longest wing, 14.00; tail, 7.25; bill, 2.05; tarsus, 2.05. Shortest specimen, 15.10; smallest extent of wing, 30.00; shortest wing, 9.75; tail, 5.50; bill, 1.05; tarsus, 1.50.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in trees. They are bulky, compact structures composed of sticks, lined with coarse grass and sea-weed. Dimensions; external diameter, 18.00, internal, 10.00. External depth, 10.00, internal, 4.00.

Eggs, from four to five in number, oval in form, varying from pale to dark-green in color, spotted and blotched with yellowish-brown and lilac. Dimensions from 1.10 x 1.05 to 1.50 x 1.15.

HABITS.

Just after dark on the fourth of December, 1876, the Yacht Nina was hove to, some miles at sea, off North Island, South Carolina. All day we had been sailing down the coast before a fine breeze, but now the wind was freshening and, as the dangerous Romain Shoals lay just in our course, we had decided that it was best to put into the Pedee River. The Ducks, Loons, and other sea birds had been flying towards land for the last few hours, great cumulus clouds were rolling across the darkening sky, the sea was rising fast, in fact everything indicated a coming gale. We were waiting for the moon to rise for, although the Georgetown Light sent its guiding rays to us, the passage across the bar was intricate and difficult to follow in the darkness. Soon the east brightened, and then the silvery disk came pushing upward, quickly illuminating the waves which were beginning to toss wildly under the influence of the rising wind. Giving one more look at the chart which I had been somewhat anxiously studying, I came on deck and we put our little vessel's head on her course, steering directly toward the land. For an hour or more we dashed onward, until at last we could see the low, black line of coast. As we drew nearer, we could discern the white sandy beach shining in the pale moonlight, then the sound of breakers came to our ears but still we resolutely kept on for I knew that our only safety lay in this course. Suddenly, just as we seemed to be leaping into the now foaming breakers, we swung

around and ran along the smooth beach just outside the breakers. It soon became apparent why we took this way for we could see a long line of white-capped waves breaking over a shoal that lay to the eastward. So we ran on between the land and reef until the great, luminous eye of the light-house opened upon us from behind the palmetto trees that stood on North Island, then we once more turned landward, this time sailing directly into the mouth of the river and anchored under the lee of a point. It was well for us that we did for in an hour the wind was blowing such a gale that, sheltered as we were, our yacht dragged her anchor and we were obliged to put over a second.

As we lay there two days I had a fine opportunity of collecting the birds on the neighboring islands. I never remember seeing a more lovely spot than North Island. It consisted of small hillocks with ponds interspersed at intervals, while the whole was covered with a thick growth of trees; the evergreen live oak, stately magnolias, glossy-leaved bays, beautiful palmettoes, and large holleys grew in profusion. They were covered with vines and draped with long streamers of Spanish moss, and the whole was surrounded by a ridge of white sand which formed a very appropriate setting for the most perfect gem of an island that I ever saw.

The wind was blowing hard and cold from the North-east but, as the trees formed a perfect shelter, hundreds of birds were congregated there and by far the most numerous were the Fish Crows; in fact they greatly outnumbered all the other species put together. They were evidently migrating for they came down the coast in an almost unbroken stream and continued to fly all day. I think I saw more pass the island than I ever saw before. It did not seem possible that there could have been so many of these Crows in existence for they could be counted by tens of thousands. I have always found that they accumulate in large flocks in winter and have noted immense numbers on the prairies of Southern Florida, but nothing that I had previously seen ever gave me the impression which I that day received regarding the abundance of these birds, and I was thoroughly satisfied that the Fish Crows were not in any danger of being exterminated, at least in the section of country which they inhabit north of South Carolina.

The Fish Crows are essentially maritime birds and, as will be inferred by the above remarks, gregariously inclined for the greater portion of the year. They spend their time about shores, not only of the sea but of large bodies of water, subsisting largely upon what they can pick up on the margin. They have, however, a singular habit of hovering over the surface in order to catch any floating object, and I have seen several thus engaged at one time when they so nearly resembled Gulls that, had it not been for the flight and note, they might have been taken for a black species of this latter named family. They do not, however, depend wholly upon the water to supply them with food, for they are very fond of the fruit of the palmetto and I have also found them feeding on the spicy berries of the bay.

The Fish Crows are not always, however, content with such diet but, unfortunately for the Herons, Cormorants, Terns, and other birds which breed in rookeries, are extremely fond of eggs and will always eat them whenever a favorable opportunity offers but, as they regard the parents birds, especially the sharp-beaked Herons, with the utmost re-

spect, they never visit the nests excepting in the absence of their owners. The Crows are always on the alert, however, and when a nest is left unguarded, even for a moment, they will dart into it, plunge their beaks through the shell of the eggs and carry them away. I once found a nest of a Fish Crow built in a low tree which was completely surrounded by the shells of Cormorant's eggs, each of which was emptied through a hole in the side. There was a rookery on a neighboring island and the Crows spent their time in flying about it, frequently returning with an egg. Whenever we visited a heronry or Cormorant rookery the Fish Crows had a fine time, for, evidently understanding what we were after and knowing that the parent birds would retreat before us, they came in numbers and, as they were not shy, would always manage to obtain their share of the eggs. Indeed upon one occasion they carried away all the eggs from a heronry, consisting of upwards of a hundred nests, in an hour's time.

Of the three species of this genus which occur in Eastern North America, the Raven is the least active, the gravest and the heaviest flyer; next, as an intermediate, comes the Common Crow; while the present species represents the other extreme, being full of nervous activity, flying with a quicker motion of the wings, and seldom sailing. They also stop suddenly and will wheel as readily in the air as a Red-winged Blackbird. They move in straggling flocks and as they go utter the *ha-ha* which, although not much lower than that of the Common Crow, has such a peculiar intonation as to be recognizable at once. They migrate constantly through the winter, and large numbers often pass a given point, thus I have seen them flying for several hours over the Everglades. At such a time, if I shot one and it fell where its companions could see it, they would hover over the spot, then circle about, vociferating loudly, often coming within a few yards of my head. They appear to select particular spots as roosting places, generally in swamps, to which they return before sundown and depart after sunrise. These Crows breed about the first week in April, frequently in communities but I have found single nests. The structures are very large for the size of the bird and are placed in trees. Taken all together the Fish Crows can scarcely be considered as useful birds but they are decidedly characteristic of southern maritime scenery, and many a barren reach of sea-board is enlivened by their energetic movements and quaint cries.

I have spoken of the Fish Crows as inhabitants of the sea-shore, but I have also found them on the rivers in the interior of Florida and judge that they occur on large bodies of fresh water some distance from the sea, yet think that in winter they are by far more numerous along the coast. I have seen them as far north as Norfolk, Virginia, as late as the tenth of November, but they were migrating then, yet it is possible that some remained all winter.

GENUS II. CYANURUS. THE BLUE JAYS.

GEN. CH. *Bill, stout and conical, a little shorter than the head which is crested. Wings, about equal in length to the tail which is well rounded. Sternum, well proportioned. Marginal indentations equaling in depth the height of the keel. Size, not large.*

The prevailing color, above at least, is blue which, with the crested head, renders the species in this genus conspicuous. The wings are usually barred with black.

CYANURUS CRISTATUS.

Blue Jay.

Cyanurus cristatus SWAINSON, F. BOR. AM., II, 1831.

DESCRIPTION.

Sp. CH. Form, robust. Size, medium. Bill, rather thick and conical, with the upper mandible slightly curved. Stomach, rather stout. Tongue, broad, thin and horny, bifid, and provided with coarse, terminal cilia which extend along the sides. Crest, not very long.

Color. *Adult.* Above, blue, tinged with purplish, purest on the head. Wings and tail, pure dark-blue, with the inner webs of the former dark-brown, and with the feathers of the latter, excepting central pair, as well as the secondaries, tipped with white, and all are barred with black. The greater wing coverts are also barred with black and tipped with white. Forehead, nasal feathers, ring around eye, and throat, dusky-white. Band across occiput, extending down on the sides of head and connecting with a crescent on the breast by a longitudinal bar, black. Loral spot and under wing coverts, also black. Remainder of breast, abdomen, and under tail coverts, white. Bill and feet, black.

Young. Much duller above and with less white on the wings and tail. The black markings of the head, neck, and breast are not as distinct, while there is rather more white below.

Nestlings. Uniform slaty above, black on the head where there is only a short crest. Wings and tail, as in the above. The black markings of the head, neck, and breast are present, but are rather brownish. The remainder of the lower parts are quite white. Bill and feet, brown.

OBSERVATIONS.

Occasionally the black crescent will be bordered above and below with bluish. Florida specimens, although somewhat duller in color, especially below, are not very much smaller than more northern skins. Distributed as a constant resident throughout Eastern North America.

DIMENSIONS.

Average measurements of ten specimens from New England and Florida. Length, 11.00; stretch, 16.25; wing, 5.32; tail, 5.50; bill, 1.50; tarsus, 1.70. Longest specimen, 21.00; greatest extent of wing, 17.00; longest wing, 6.25; tail, 4.78; bill, 1.15; tarsus, 1.40. Shortest specimen, 10.00, smallest extent of wing, 4.50; shortest wing, 1.40; tail, 5.00; bill, 1.00; tarsus, 1.20.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in trees, composed of sticks and roots, lined with strips of cedar bark and rootlets. Dimensions, external diameter, 6.00, internal, 4.50. External depth, 3.50, internal, 2.00.

Eggs, from four to five in number, oval in form, varying from yellowish-brown to grayish-green in color, spotted and blotched with drab, and occasionally dotted with black. Dimensions from 1.05 x .55 to 1.20 x .90.

HABITS.

I have said that the Crows were sagacious, but they certainly find rivals in this particular trait in the Blue Jay for it will be difficult to find a species which exhibits any more sagacity than the present, in many points. The Crows are very fond of hearing their own voices and in this they are also surpassed by the Jays which are certainly as garrulous and as noisy birds as any of our native species. When the first frost has opened the burs, disclosing the dark-brown chestnuts within, then the Jays are supremely happy and their loud cries resound through the still autumn air. They are extremely busy but utter their cries as they pursue their vocation, for this is their harvest time, and they may be seen flying toward the deep woods, laden with chestnuts which they deposit in some hiding place as a winter store. They usually select some hole in a tree or perhaps a cavity behind a loose strip of bark which they fill with nuts. But they do not confine all their attention to the above named article of diet but will also gather acorns and, what is more unfortunate

for the farmer, will visit the corn field in order to carry away the ripened grain. It is astonishing what an amount of corn these birds will manage to remove in a few weeks. When they have once found a field which is near enough to a wood for them to enter it unperceived, they will labor persistently until the husbandman interferes with them by shooting some of the thieves or by removing his corn to the barn. Thus the provident Jays find a store of provisions awaiting them when the ground is covered so deeply with ice and snow as to be inaccessible to them.

In flying the Jays are somewhat awkward, moving quite slowly, but among the thick branches of the dense woods they are perfectly at home and, as they are exceedingly watchful, they are very difficult to approach. If one who has had but little experience in studying the habits of these birds, enters a grove which is resounding with their loud cries in search of them, he will be surprised to find that the noise suddenly ceases. He pushes onward into a thicket from which the sound appeared to come only a moment before, but finds nothing and, after a thorough search in every portion of the woods, is obliged to give up the chase, unsuccessful, although the birds have not left the place and have doubtless often gazed at him within gunshot. They were merely practicing the art of concealing themselves and in this they are almost perfect. I use 'almost' as a qualifying word for I long ago discovered a vulnerable point in their armor; unfortunately they are very inquisitive. As long as the intruder bustles about and shows himself, they sit very quietly in their hiding places or just keep out of his sight by hopping nimbly from limb to limb, but should he merely enter the grove and conceal himself, they appear eager to find out what he looks like. They go about it very cautiously, however, but right here another unfortunate trait discloses itself, they will not keep quiet, but at first one will begin a low muttering sounding exactly as if it were conversing with its companions who will then answer. Thus I have seen many a Jay come to grief through these two faults.

Like the Crows, the Jays always mob an Owl whenever it ventures into their domains but they are usually content with simply driving it out of the woods, seldom following it into the open sections. They also dislike Hawks and will follow them with mocking cries, taking care, however, to keep well out of the way, yet will always try to annoy their large enemy by imitating his shrill cries. This they do to perfection for the Jays are fine mimics and their voices are capable of considerable modulation. Their usual notes are harsh and somewhat discordant yet to me it is not unpleasant, but I presume this is owing more to the very pleasing associations connected with them than to any harmony in the sounds themselves, for the cries of the Jays are oftener heard on those misty autumnal days, when the forests of New England are so rich in color and when the air is as soft and warm as if the departed summer had returned.

The Jays always seem to prefer the pine or evergreen trees and in winter they are seldom found far away from them, as they retreat to them for shelter during storms and severe weather. No matter how intense the cold, these birds manage to survive provided they have an abundance of food, but I have, on a few occasions, found them frozen to death. This was when a sudden cold snap succeeded a long rain storm, then doubtless the Jays were wet through and in this condition their feathers were not such perfect

non-conductors of heat and cold as when dry, therefore they perished. These are the dark days of Jay life, but usually at this season the time passes pleasantly, for they have their stores to draw upon and they may be seen perched upon a branch holding a frozen chestnut in their claws, hammering at it briskly with their strong beaks until it is broken to pieces when it is swallowed. On fine days they occasionally make excursions into the orchards in search of the eggs of insects, such as caterpillars and canker worms. Thus they prove of some benefit to the husbandman but they are too great transgressors to be favorites as they, not only steal the farmer's produce, as related, but also rob the nests of other birds, even killing the young.

In spite of their cautious disposition, Jays are stupid about some things; for example, I know of but few birds that are easier to capture in snairs than this species. I have never found any difficulty in taking them, even in box traps baited with an ear of corn. They are not remarkably interesting as pets, as they do not become tame readily, but are not especially shy in their native state when not molested and I have seen them very abundant in the live oaks which stand in the streets of Jacksonville, Florida, often alighting within a few feet of the heads of the pedestrians. They also become quite familiar on the farms in the North, especially in winter, and I know of one that was accustomed to enter a shed when the door was left open. He would hop about the floor or bask in the sun, but was always ready to dart out whenever any one approached. The Jays of New England breed the first week of May, placing the nest in low trees, often choosing a cedar or other evergreen. The birds attend very closely to the duties of incubation, and even if the female be shy at other seasons it is difficult to make her leave her eggs then. When the young appear both parents are very assiduous in guarding them. The newly fledged nestlings may be found in the woods by the first of July, and the families remain in company until the following summer. The Jays are not usually migratory, or at best, only during some of the severest seasons, when those from the North occasionally come as far south as Massachusetts.

GENUS III. CYANOCITTA. THE BUSH-JAYS

Gen. Ch. *Bill, stout and conical, shorter than the head which is not crested. Wings, shorter than the tail which is graduated. Coracoids, proportionately shorter than those of the preceding genus. Marginal indentations equaling in depth the height of the keel. Size, not large.*

The prevailing color above is blue, with an ashy patch on the back, but they are lighter below. The wings are not barred.

CYANOCITTA FLORIDANA.

Florida Jay.

Cyanocitta Floridaana Bon., List: 1838.

DESCRIPTION.

Sp. Ch. *Form, rather slender. Size, medium. Bill, rather thick and conical, with the upper mandible slightly curved. Sternum, as given above. Tongue, broad, thin and horny, bifid, and provided with coarse, terminal cilia which extend along the sides.*

Color. *Adult.* Above, including wings and tail, dark-blue, with the top of the anterior part of the head, lighter. Inner webs of wing feathers, dark-brown. Lories, space around eye, ear coverts, and under wing coverts, dusky. Beneath, yellowish-ash, with a slight collar crossing the breast, and under tail coverts, bluish. The throat and under portions of neck are streaked with dusky. Bill and feet, black.

Young. Quite similar to the adult, but duller, with less blue on the breast, and the top of the head is lighter. Sexes, similar in all stages.

OBSERVATIONS.

There is occasionally a superciliary line of whitish, while the throat is tinged with bluish, and the colors above are duller. This is especially noticeable in skins which I obtained at Cedar Keys and on the west coast of Florida. Thus it will be seen that *Floridana* approaches the western forms, for I am inclined to regard the so-called *Woodhousei* and *Californica* as only local races of this species. Distributed throughout Middle and Northern Florida, also quite likely along the Gulf of Mexico in suitable localities.

DIMENSIONS.

Average measurements of ten specimens from Florida. Length, 12.00; stretch, 11.55; wing, 1.52; tail, .507; bill, 1.05; tarsus, 1.30. Longest specimen, 12.50; greatest extent of wing, 1.500; longest wing, 1.75; tail, .540; bill, 1.10; tarsus, 1.40. Shortest specimen, 11.50; smallest extent of wing, 1.110; shortest wing, 1.30; tail, 1.25; bill, 1.00; tarsus, 1.20.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in bushes, composed of sticks and roots, lined with weeds and rootlets. Dimensions, external diameter, 6.00, internal, 4.50. External depth, 3.50, internal, 2.00.

Eggs, four in number, oval in form, olive-green in color, spotted and blotched with black. Dimensions from 1.10 x .55 to 1.25 x .90.

HABITS.

The soil of Florida is mainly sandy and, although capable of producing much more vegetation than one would suppose when cultivated, is in many sections covered with nothing larger than shrubbery which is mostly composed of dwarf and willow oaks. The usual height of these trees is about five feet, but in some localities they attain to nearly double this altitude and then the plains which they cover are called high scrub land to distinguish them from the low scrub. As related, the latter is inhabited by the White-eyed Towhee, while in the former the Florida Jays find a home, and as this peculiar growth is confined to certain sections, these birds are quite local in distribution. Thus the first place in which I found them, in going up the St. John's River, was at Blue Springs. Here they were abundant, and they occupied a belt of country some forty-five miles wide, extending from the above named part to the coast. They were also numerous on the East side of Indian River as far south, at least, as Merritt's Island, but the strong hold of these birds is in the high scrub lands of the Western Coast, where they fairly swarm. They occur as far south as Tampa Bay, and I found them in quite large flocks on the main-land opposite Cedar Keys. How much further west they extend I am unable to say, but should not be surprised to find them in suitable localities along the entire northern shore of the Gulf of Mexico.

The Florida Jays are noisy birds at times, and the first intimation which one receives of their presence is a harsh scream which is given as a note of alarm. As they usually move in flocks, this cry is taken up by others, and soon the scrub for many rods around will be resounding with these peculiar sounds. When undisturbed they feed on the ground or in bushes but, upon the approach of an intruder, will mount the highest point available, where they remain until driven away. They are not usually shy and will allow one to

approach them quite closely, but when one or two are shot the survivors instantly disappear. Then it is very difficult to catch sight of them, for they are very expert in concealing themselves, or rather they are expert in keeping a safe distance between themselves and their enemy. They will glide through the bushes with remarkable rapidity, never once showing themselves, or if they have an open space to cross dart over it, not in flocks, but singly, and, plunging into the next thicket, they will be at once lost to view. It requires considerable tact to obtain more than three or four out of one community the same day, the best way being to conceal oneself and, by imitating their cries, attract them. They are very inquisitive and, when bent upon investigating any object, will forget their usual caution and venture quite near, muttering in a low tone to their companions who will answer and they will converse in a similar manner to that practiced by the Blue Jays.

They are of quite a compassionate disposition for, when one of their companions is wounded, they will evince by their frantic movements and cries the utmost sympathy for its misfortune. At one time when I had disabled some Parakeets, several Jays evidently attracted by their cries, gathered around and uttered a singular harsh note which I had never heard before. Shortly after, as I was looking for Ducks in some small ponds near a plantation, not far from Lake Biersford, my attention was attracted by hearing this particular grating cry which was repeated several times. Looking in the direction from which the sound came I was surprised to see a Florida Jay clinging to the flanks of a cow. As this was to me a new feature in the history of these birds, I anxiously watched the pair for further developments. After a moment the Jay jumped upon a branch near but almost instantly alighted upon the side of the animal and appeared to be picking something from her skin. This was evidently agreeable to the cow, for she stretched out her head in a way peculiar to these quadrupeds when they are being caressed by their companions. The bird maintained its position by grasping the shaggy hair with its feet and in this way moved completely under its large friend. Wishing to obtain a closer view of this procedure, I approached, when the cow which was one of these half wild animals found in Florida, perceived me and started away upon the run, brushing the bird off in her rapid passage through the bushes. It alighted on a small tree when I shot it and, upon examining the contents of its stomach, found that it was filled with ticks or jiggers which infest the skin of all quadrupeds in this section of Florida. Thus the apparently strange companionship of the two animals was explained and it occurred to me that, as the Jay was probably accustomed to associate with deer for a similar purpose, the loud cry which I heard was intended as a note of warning to its friend for the bird was aware of my presence, but the cow was not sufficiently well posted to understand it as she was, in a measure, domesticated whereas the wilder animals being always exceedingly wary, would have comprehended at once that the Jay perceived an enemy. I afterwards saw some others similarly engaged, so concluded that it was a regular habit.

The Florida Jays breed in the scrub in communities, and I have seen many of their nests in the winter but was not fortunate enough to obtain one with eggs. They lay quite late in the season, about the first of May, and at that time are very assiduous in

guarding the locality which they have chosen as homes. At times the Jays become very familiar, approaching the houses on the edges of settlements in order to pick the bones which are thrown about or will even venture to eat the meat hung close to the hunters camp.

GENUS IV. PERISOREUS. THE GRAY JAYS.

Gen. Ch. *Bill, stout and conical, much shorter than the head which is semi-crested. Wings, longer than the tail which is well rounded. Size, medium.*

The principal colors are gray throughout. The feathers are of that peculiar loose structure seen in the Titmouse, giving the birds a downy appearance.

PERISOREUS CANADENSIS.

Canada Jay.

Perisoreus Canadensis Bon. List; 1838.

DESCRIPTION.

Sp. Ch. Form, robust. Size, medium. Feathers of semi-crest, very downy. Tongue, broad, thin and horny, bifid, and provided with coarse cilia which extend along the sides.

Color. *Adult.* Above, ashy-plumbeous, with the top of the head and neck, yellowish-white, crossed by a nuchal band of plumbeous. The secondaries and tail are slightly tipped with whitish. Beneath, grayish, lighter on the throat and dusky posteriorly. Under wing coverts, plumbeous. Bill and feet, black.

Young. Not nearly as light about the head as in the adult, and they are duller below, while there is a slight indication of a dusky line through the eye.

Nestlings. Very dusky throughout with little or no white on the head. There is also a well-defined dusky line through the eye. The throat is also dusky. Sexes, similar in all stages.

OBSERVATIONS.

There is a noticeable similarity in plumage in specimens of the same age and sex but some are a little lighter below than those which I have described. Distributed throughout Northern North America, coming into Northern United States, especially in winter.

DIMENSIONS.

Average measurements of five specimens from New Hampshire. Length, 12.00; stretch, 17.45; wing, 5.75; tail 5.75; bill, .80; tarsus, 1.65. Longest specimen, 12.10; greatest extent of wing, 17.50; longest wing, 5.50; tail, 6.00; bill, .85; tarsus, 1.70. Shortest specimen, 11.25; smallest extent of wing, 17.00; shortest wing, 5.60; tail, 5.70; bill, .75; tarsus, 1.52.

DESCRIPTION OF NESTS AND EGGS.

Nests, built in trees, composed of sticks, moss and grass, lined with fine roots. Dimensions, external diameter, 6.00, internal, 3.50. External depth, 1.00; internal, 2.00.

Eggs, five to six in number, oval in form, pale gray in color, spotted and blotched with brown. Dimensions from 1.05 x .55 to 1.25 x .90.

HABITS.

There is a great contrast in the country inhabited by the bird which we now have under consideration and the one last described. The home of the Florida Jay is in a land where frosts are seldom known and where snow never falls, a land of almost perpetual sunshine where the flowers bloom throughout the year. The Canada Jays inhabit the gloomy evergreen forests of the North, where the thick branches of the giant hemlocks and spruces exclude the sunlight and the short summer passes so quickly that vegetation has but little time to advance, while for a greater portion of the year the Ice King reigns supreme.

It was in the primitive forests of Northern New Hampshire, that I first met with the Canada Jay. This was on the third of November, 1868, and there had been a heavy

fall of snow during the night and the ground was covered with a white mantle. The early morning found me following an old logging road through the woods. The branches of the trees which met over my head were bending with the weight of snow that lay upon them, while the smaller undergrowth was completely enshrouded. Thus I was entirely surrounded by masses of glittering white which not only prevented my seeing the sky overhead, but also excluded any extended view on either hand. I was some miles from the nearest settlement; thus not a living thing was in sight and not a sound broke the stillness, when at once I was somewhat startled by hearing a most peculiar note. A few days before, two of us had chased a lynx through this very section and I was certain that the noise was made by one of those animals for it was a kind of mew not unlike that given by the wild cat. This sound was repeated several times, followed by a low murmuring and, as I remained perfectly quiet, the author of these peculiar notes approached nearer when I was enabled to discover that it was a Canada Jay. Then another appeared and still another until I was surrounded by quite a flock of them. They were all vociferating loudly as if surprised at seeing a human being in such a lonely spot but they were not in the least shy as they came within a few feet of my head in order to examine me critically. I have always found these birds tame in the section remote from settlements but in the more cultivated districts they soon become wild. Thus I found them very difficult to approach at Bethel, Maine, where they occur in winter and where they are frequently shot.

This latter named point is about their southern range in winter, but on one occasion I saw an individual in Newtonville. This was in early summer some four years ago and I was walking through the streets of the village accompanied by a friend, when I observed a bird flying over a vacant lot pursued by two or three Robins. It was flying very slowly as if weary and, coming directly toward us, alighted panting on the sidewalk within a few yards of our feet. I instantly went forward and recognised it as a Canada Jay. The poor bird was so completely dazed with fright, that I nearly caught it in my hands, but, as I stooped to take it up, it flew into a neighboring garden taking refuge in some ornamental evergreens where we followed and endeavored to capture it; but it always eluded our grasp then, after recovering somewhat, flew away over some house tops and was lost to our view. How this stranger came so far from its home, especially during such warm summer weather, remains an unsolved mystery, nor did I ever hear of this particular Jay again.

In comparing the flight of the three Jays of which I have spoken, I find that that of the Blue Jays is the strongest, and they frequently fly long distances; the Florida Jays are inclined to sail more, especially when moving across a short space and they seldom go far at one time; while the Canada Jays are the poorest flyers of them all usually sailing about through the trees and seldom leaving the woods in order to taking a prolonged flight. They are very agile among the trees, however, hopping from limb to limb with great rapidity and when anxious to conceal themselves will manage to accomplish it in an exceedingly short time. They are said to breed in February placing their nests in evergreen trees, thus the young appear in early spring.

FAMILY I. FRINGILLIDAE. THE FINCHES, SPARROWS, ETC.

Bill more or less cone-shaped and unnotched. Coracoid bones, shorter than the top of the keel, or equal to it in length, but never longer. Marginal indentations equalling the height of keel.

This family is represented largely in the United States, where all of the members may be recognized by the conical bill, combined with the sternal characters given above, but in other countries specimens may be found which grade into the Tanager on the one hand, and into the Icteridae on the other. The arrangements of genera as given by previous authors not being in accordance with the sternal characters, I have, after carefully studying the sterna of many of our species, attempted what appears to me a more natural grouping.

GENUS I. CYANOSPIZA. THE BLUE SPARROWS.

GEN. CH. Coracoid bones, a little shorter than the top of keel, which is considerably higher than one-half the width of the sternum. Plumage of adult males conspicuously marked with blue or other bright colors.

The bright colors and sternal characters of this genus show that it is closely allied to the succeeding family, while the habits of at least some of the species resemble those of some of the true sparrows. I have therefore placed these beautiful birds at the head of the Fringillidae.

CYANOSPIZA CIRIS.

Nonpareil.

Cyanospiza ciris Baird, Birds N. A. ; 1858, 503.

DESCRIPTION.

Sp. CH. Size, small. Form, somewhat robust. Upper mandible, considerably arched. Wings, not short. Tail, moderately long and somewhat rounded. Sternum, stoutly built. Tongue, fleshy and triangular, with the tip bifid and furnished with short, coarse cilia.

COLOR. Adult male, top and sides of head and neck, rich purplish-blue. Middle of back and greater wing coverts, bright yellowish-green. Remaining upper parts, ring around eye and entire under portions, including under tail coverts, carmine. Wings and tail, purplish with the inner webs of the former brown. Under wing coverts rosy. Adult female, dark green throughout, but with a yellowish tinge beneath. Inner webs of wing feathers, brown. Young of both sexes, similar to the adult female, but more dusky above, and yellowish beneath. Irides, bill and feet brown in all stages.

OBSERVATIONS.

Easily known in the adult stage by the bright colors as given above, while the young male and female are greener than the same sex in closely allied species, found within our limits. Although the adult females are normally as described, yet I have a specimen in my collection which is as brightly colored as any male I ever saw, and I have heard of at least one similar specimen. Distributed throughout the extreme Southern States in summer; winters in Southern Florida and Mexico.

DIMENSIONS.

Average measurements of thirteen specimens. Length, 5.20; stretch, 8.20; wing, 2.65; tail, 2.25; bill, .40; tarsus, .67. Longest specimen, 5.50; greatest extent of wings, 8.50; longest wing, 2.85; tail, 2.45; bill, .45; tarsus, .75. Shortest specimen, 5.00; smallest extent of wings, 8.00; shortest wing, 2.00; tail, 2.00; bill, .40; tarsus, .61.

DESCRIPTION OF NESTS AND EGGS.

The following descriptions were taken from specimens in the collection of the Boston Society of Natural History, for an examination of which I am indebted to Mr. Emerton.

NESTS, composed of fine grass lined with horse hairs and finer grasses. Dimensions: external diameter, 3 inches; internal, 2.50; external depth, 1.50 inches, internal, 1.00.

EGGS, four in number, rather round in form, ashy-white, spotted and blotched with brown, lilac and amber. Dimensions, from .60 x .55 to .55 x .45.

HABITS.

The songs of the beautiful Nonpareil may be heard in the neighborhood of almost any tangled thicket throughout the entire extent of Florida after the first of May; but before this they are only to be seen on the Keys or in the extreme southern portions of the mainland. We found them very abundant in the immediate vicinity of Miami early in January, but did not hear the song until late in March.

This species is always shy and retiring, seldom appearing in the open, but remaining in the dense thorny undergrowth which covers all waste places in Florida, especially if the soil has been cultivated. Whenever the birds perceive an intruder they retire into the depths of these fastnesses, and it then requires considerable beating to drive them out; when they at once dart into the nearest cover. The adult males are especially shy, and seldom show themselves. Even while singing they remain concealed, and although we were thus furnished with a clue to their whereabouts, it was with the utmost difficulty that we caught sight of the authors of the harmonious strains which nearly always greeted our ears when we were in the vicinity of their homes. During the latter part of May the males may be seen playfully chasing the females, but I do not think they breed until June.

GENUS II. EUETHEIA. THE LITTLE FINCHES.

GEN. CH. Coracoid bones a little shorter than the top of keel, which but slightly exceeds in height one-half the width of the sternum. Size, small.

Members of this genus may be distinguished by the small size, combined with the sternal characters given above.

EUETHEIA BICOLOR.

Grassquit.

PLATE XXV. Upper figure, male; lower, female. Plant, Lantana.

DESCRIPTION.

SP. CH. Size, very small, much below the average of N. A. Fringillidae. Bill, short, conical, the height at base being equal to two thirds the length; there is but little lateral constriction but the upper mandible is slightly arched from base to tip. The wings are short and rounded, the third and fourth quills being longest as a rule and the first is generally equal to the seventh or a little shorter than it. The tail is slightly rounded, the graduation amounting to about .10. Feet, quite large, the middle toe and claw being a little longer than the tarsus. The coracoids are about equal in length to the keel and are slightly longer than the furcula, the terminal expansion of which does not approach very near the keel, but is produced upward so that it comes in contact with the lower processes of the manubrium. The keel is low, but little exceeds one half the width of the sternum. The marginal indentations are equal in depth to the height of the keel. The posterior angle of the costal processes is not well defined, and the anterior angle is acutely pointed. The scapulars are about equal in length to the coracoids, the terminal portion is well curved and the upper angle is well rounded and produced into a point terminally.

COLOR. Adult male, head all around, anterior, two thirds of body beneath, dull, purplish black above

gradually intergrading with the dusky olivaceous of the upper parts, and beneath with the ashy olivaceous of the abdomen and flanks. Wings and tail, brown tinged with the color of the back but having a decided rufescent tinge on the wings. There is also a rufescent tinge on the breast. Feathers of abdomen slightly tipped with whitish. Under tail coverts, ashy, tipped with whitish. Under wing coverts, dusky olivaceous. Iris, brown. Bill, black, brown on base of lower mandible. Feet, dark brown. Adult female: the darkest plumaged female in my collection is precisely similar to the male in every way, but the average adult female is similar to the young male described below.

Young male, with the throat and breast only, black, and some of the feathers are edged with whitish, remaining lower parts being ashy olivaceous, and the top of the head shows but very little black. Young of the year, in winter, olivaceous green above, of a lighter shade than in the adult; beneath, pale ashy olivaceous, with a decidedly rufous tinging, especially on the abdomen, while there is an occasional dark feather in the throat, and specimens occur in all stages between this plumage and the one described above, and from that to the perfectly adult. Young female, plain olivaceous above with a decidedly ashy tinge; beneath, pale greyish slightly rufescent on flanks and milky white on abdomen. There is a tinging of olivaceous across breast. The next stage to this shows some dark feathers on the throat, then all stages occur between this and the adult. Young of the year, female, similar to the male of the same age, but lacks the black feathers of that and is somewhat more rufescent. Nestlings, of both sexes, dusky olivaceous above, becoming rufous posteriorly; beneath, ashy olivaceous, strongly tinged with rufescent, especially posteriorly, and on under tail coverts. There is less rufescent above in this stage than in the next, but rather more beneath. Wings and tail, similar to the more mature plumages.

DIMENSIONS.

Wing, 2.20; tail, 1.75; bill from base, .40, from nostril, .35, length, .25; width, .16; tarsus, .55.

OBSERVATIONS.

Out of seventy-three specimens examined, thirty-four had the 3d and 4th quills the longest, nineteen the 3d, twelve the 4th, four the 4th and 5th, two the 2d, 3d, 4th and 5th, one the 2d, 3d and 4th, and one the 5th. In twenty-four the 1st quill was equal to the 7th, in sixteen it was shorter than the 7th, and in six longer; in twenty the 1st was equal to the 8th, in five shorter; in one the 1st was equal to the 6th, and in one shorter. The graduation from this varies from .10 to .20. Variation in color appears to depend wholly upon age and partly upon sex, for although fully adult females are as dark as the males, yet by far the greater portion are plain grey, apparently assuming the black plumage much less readily than the males. I think, however, the males in perfectly adult plumage are at least three years old, for they breed in the mixed dress. Known from all other Bahaman birds by the small size and finch-like bill, and from other species of the same genus by the absence of any yellow on the bend of the wing.

The bird was described by Linnaeus in 10th edition of *Syst. Nat.*, 1756, 183, as *Fingella zena*, his description being based on Catesby's *Passer bicolor bahamensis*, and in his 12th edition Linnaeus changed the specific name to *bicolor*, a name which ought to stand, as being one of those conferred upon the bird by its original discoverer.

NESTS AND EGGS.

NESTS, placed on trees or bushes at height varying from one foot to twenty. Spherical in form, with the entrance in one side, composed of dead grass, wood stalks, bits of cotton, leaves, and other debris with which are interwoven a few feathers, lined with fine grasses. The form of a large number of nests, and I have seen in all perhaps a hundred, is spherical, but they are often varied from this, a favorite form being elliptical, with the entrance on one end of the long diameter. Nests found in the environs of Nassau contain feathers, not as a lining, but as a building material. One nest found near Nassau is composed almost wholly of skeletonized leaves. Dimensions of spherical nest, 5.00, external diameter, 2.00, internal diameter, 2.00; entrance, .50 in diameter; elliptical, 5.00 by 4.00 by 3.00; internal, from entrance to back, 2.50; entrance, 1.50. EGGS, one, two, or three in number, oval in form, dull white or faintly bluish, spotted

and dotted irregularly with reddish brown, purplish brown and blue, these markings usually becoming confluent on the larger end, either forming a ring or large blotch; generally there are a few small markings of umber on the larger end. These eggs almost exactly resemble those of the Field Sparrow, *Spizella pusilla*, especially those which have the faintly blue background; on the other hand, it is quite difficult to distinguish the dull ones from *Certhiola bahamensis*, but the nests of the two birds are quite different, those of the present species being smaller. Dimensions of eggs, .50 by .65 to .55 by .75.

HABITS.

This interesting little bird is one of the most abundant and widely distributed species on the Bahamas. I have found it occurring everywhere that there is sufficient foliage growing to afford it shelter. It occurs in Nassau in the grounds about the houses, and in the pine woods on New Providence, as well as in thickets remote from habitations; and on all other islands, even the most remote from settlements. For example, I found it common and nesting on a little island, known as Leaf Key, which lies off the south shore of Andros, nearly or quite fifty miles from any human habitation.

The Grassquits are lively little birds, and although I found them in the tall grass which grows along the eastern shore of Andros, they prefer thickets, among which they are perfectly at home, jumping nimbly about among the branches or darting swiftly across the open places. Early in the morning the males may be seen perched on the topmost branch of a tree singing. The song resembles somewhat that of the Yellow-winged Sparrow, or at least part of it does. It begins with two, sometimes three, liquid notes, given with a bell-like clearness, immediately followed by a lisping series of notes, sounding like "ze, ze, ze," considerably prolonged, and this is the part which recalls the song of the Yellow-winged Sparrow. I found them singing on January 22d, 1884, and they continued to sing until June 15th of that year. They were silent, however, when I visited the islands in the middle of November, 1887.

An individual variation of the song consists in prolonging the first two notes into a kind of twitter. The song of the young birds is very peculiar. The first notes, instead of being given clear and bell-like, as in the adult, are prolonged into a wheezy whistle, followed by a mere attempt to utter the lisping notes, and there are all gradations between this rude imitation of a song by very young amateurs and the finished cantata of the adult professional male songsters, these gradations being given by performers of varying ages.

The Grassquit begins to breed in March. At Nassau on the 17th of this month I found my first nest, which was built in a bunch of vines that lay on the top of a bush, about six feet from the ground. This contained two eggs at that time, and when I visited it again on the 20th the number had not been increased. On March 20th I found a nest in an orange tree, that stood in the yard of a Congo negro's house at Fox Hill. This nest was placed about fifteen feet from the ground and contained three fresh eggs. In a yard near, I found another nest built in a tamarind tree about the same distance from the ground. This contained two slightly incubated eggs. March 23d I found a nest placed in some grass, about ten inches from the ground. It contained two slightly incubated eggs. Through March I continued to find nests about Nassau, mostly built in trees, usually fruit trees which stood in yards near houses.

On April 29 I found no less than ten nests on Leaf Key, which I have mentioned as lying off the south shore of Andros; all of these were placed in bushes, sometimes not over a yard from the ground. Some of the eggs were fresh, others in an advanced state of incubation, and on this key at this time I procured young birds fully fledged and fully grown. I also found nests of this species late in April along the south shore of Andros, and on other small keys near Leaf Key. All of these nests were compactly constructed and closely resembled the nests of the Bahama Honey Creeper. I find from my notebook that, rather singularly, I did not hear a bird of this species utter a single note, not even a chirp, among these remote islands.

Upon returning to Nassau late in May, I found nests with fresh eggs, at the same time fully grown young of the species were common. These notes were made in 1884.

From November 15th until January 15th I shot nestlings in the first plumage at Nassau and on Andros. I found them common on Inagua in February, 1888, and on Highburn Key in April 1893, when they were singing but apparently not breeding.

The Grassquit is not a shy species, and will, if undisturbed, become quite familiar. One was accustomed to enter my house at Mathewstown, Inagua, every day and hop about the floor in search of crumbs. On the Bahamas, although quite a social species, occurring in scattered companies among the foliage, I never have seen them gather in flocks in the open fields and by the roadsides, as do two allied species in Jamaica and on Cayman Brae.

Although there are now but a few houses at Miami, Florida, or vicinity, yet this section has been settled many years. The inhabitants who formerly occupied this spot have left many evidences of their presence in the shape of ruinous walls, old wells, etc. Tradition points to this place as being the haunt of pirates, and we were informed upon reliable authority that one of those infamous men lived here until quite recently. Indeed, there are individuals now living who have seen him. He was a Spaniard named Yusippie, and was the leader of a band of blood-stained villains who lived upon the banks of the Miami, while the river formed a fine harbor in which to moor their vessels, that they might not be seen from the open ocean.

Among the traces which these Spaniards have left behind them are evidences of cultivation of the soil. The ground has been cleared for some distance back of the old fort, but is now mainly grown up to bushes and trees; there are, however, frequent glades in the midst of these thickets which are entirely void of shrubs, being only covered with grass and low herbage. These spaces vary from a few yards to several rods in diameter, and are closely surrounded by foliage. The trees and bushes are so thickly covered with vines and creeping plants that their forms are entirely concealed and they resemble rolling clouds of living green rising in huge billows one above the other. This deciduous mass is thickly starred with the large white flowers of the *Iponoea bona-nox* and the purple blossoms of the wild *Colvolvulus*, while the orange and yellow *Lantana* fills the air with a peculiar fragrance. As can readily be imagined these dense thickets were filled with birds, and therefore we frequently visited the lovely spots for the purpose of taking the various kinds found there.

Mr. H. W. Henshaw was collecting here with me on the 19th of January, 1871, when his quick eye detected a small bird among the thick bushes, and he instantly shot it. After making his way into the thicket, and searching for a time he returned bearing his prize, but with a puzzled expression on his face that instantly communicated itself to mine when I saw the little gray bird which he held in his hand, for it was a species which I had never beheld. It proved to be the Grassquit, the first and, up to this date, the only specimen ever taken in the United States. As Mr. Henshaw brushed through the lantanas to secure the bird, the spicy odor of the crushed leaves filled the air and floated around us as we were examining the specimen; therefore the *Euethia bicolor* is ever associated in my mind with the shrub upon which it is figured, and thanks to the care of my artist and engraver, both the bird and plant are placed before the reader in a highly creditable manner.

EUETHEIA CANORA.

Melodious Grassquit.

Loxia canora Linnaeus, Syst. Nat. I, p. 858. (1758).

DESCRIPTION.

SP. CH. Smaller in size than the Grassquit and rather more slender in form.

COLOR. Adult male. Throat and sides of head, black. On the lower throat, there is a broad band of bright yellow which extends on to the sides of the neck and passes into a narrow line, reaching to the eye. Top of head slaty; remainder of upper surface, bright olive green. Breast, dark brown, shading into pale gray on the abdomen and under tail coverts.

Female, similar to the male, but with throat dark chestnut brown becoming grayish on the cheeks. The yellow collar is much paler and the under parts are more ashy.

OBSERVATIONS.

Distinguished from all other of the small finches by the peculiar form and yellow collar.

DIMENSIONS.

Length, 3.75; wing, 2.00; tail, 2.05; bill, .30; tarsus, .62.

HABITS.

The Melodious Grassquit is a Cuban species, a single straggler of which has been taken on Sombrero Key, Florida, and recorded by Merriam in the *Auk*, July, 1888, page 322. Of the members of the Genus *Euethia* there are three well defined species in the West Indies: the Grassquit, *E. bicolor*, which occurs on the Bahamas and Antilles, the Melodious Grassquit, which is confined to Cuba, and the Olivaceous Grassquit, which occurs in Jamaica, the Cayman Islands, San Domingo and Porto Rico. The first two species mentioned have been taken in Florida as stragglers. I know nothing of the habits of the Melodious Grassquit as I never have seen it living, but with its nearest ally, the Olivaceous Grassquit, which is also a small species with yellow markings about the head, I am quite familiar, having met with it in Jamaica and also on the Cayman Islands, where it was the only representation of the large family of sparrows and finches.

The song of the Olivaceous Grassquit is a series of lisping notes not unlike those of the Grassquit, but accompanied by another series of ascending notes.

GENUS III. CHRY SOMITRIS. THE GOLDFINCHES.

GEN. CH. *Bill, small and pointed. Wings, long. Tail, forked. Coracoids, shorter than the top of keel, which is but little higher than one half the width of sternum. Size, small.*

All the species within our limits are more or less conspicuously colored with yellow, excepting *pinus* which has also pale-yellow markings on the wings and tail.

CHRY SOMITRIS TRISTIS.

Common American Goldfinch.

Chrysonitris tristis Bon., List, 1838.

DESCRIPTION.

Sr. CH. Form, rather robust. Tongue, quite thick, tipped with hair-like, horny fibers. Sternum as given above.

Color. *Adult male in spring.* Bright lemon-yellow. Top of head, wings and tail, black. Lesser wing coverts, tips of greater, forming bars, outer edges of secondaries, tips of primaries, elongated spots on inner webs of terminal portion of tail feathers, upper and under tail coverts and under wing coverts, white.

Adult female in spring. Greenish-brown, above and yellowish-green, beneath. The wings and tail are brown, marked with white, which is more restricted than in the male, and is frequently of a smoky tinge.

Adult male in winter. Similar to the Spring female above but smoky-white beneath, with the front and sides of the head, shoulders, and rump, more or less tinged with yellow. The white markings are broader and more extended.

Adult female in winter. Similar to the male but grayer above and inclined to be reddish-brown on the rump and lower back, while the yellowish is scarcely perceptible.

Young. Summer males of the preceding year exhibit a grayish patch, of a greater or less extent, on the upper back. There are frequently a few greenish feathers in the black of the head. The females of the same age are more reddish above.

Young of the year. Both sexes are highly tinged, above and below, with reddish-brown; while the white markings of the wings and tail are replaced by this rusty color.

Nestlings. Do not differ from the above, excepting that the throat is destitute of feathers long after the other portions of the body are covered. Contrary to the rule, even in this Family, nestlings do not moult the first autumn.

OBSERVATIONS.

There is no difficulty in recognizing this species in the adult stage, and the young may always be distinguished by the wing and tail markings as given. There is no species which has come under my observation where there is absolutely so little variation as in the present. In a series of some eighty summer skins, now before me, the yellow varies slightly in shade, but this is partly due to age. The black of the head is also more restricted in some than in others, aside from these slight modifications, however, there is a singular uniformity of coloration; while in winter there is but little more variation. A very large specimen from Utah, in the bright plumage of early summer, has the black of the head less extended than usual, which together with its uncommon size gives it a peculiar appearance. Late in summer the wear of the white edges causes them to appear blacker than earlier in the season. The adults undergo an entire change of plumage in the autumn, but in spring the feathers of the wings and tail are retained while the remainder of the body acquires a new dress. It is noteworthy that this is the only species among Fringilline birds, which I have examined, that is not streaked beneath in some stage of plumage, but I cannot find any indication of those markings even in the nestlings where they usually appear in species which are unmarked when adult.

Distributed in summer throughout northern and middle North America; winters in the middle and southern portions. The northern range, during winter, varies somewhat in different seasons, being governed by the supply of food, which is largely regulated by the depth of snow.

DIMENSIONS.

Average measurements of twenty-four specimens. Length, 5.60; stretch, 9.05; wing, 2.85; tail, 1.85; bill, .18; tarsus .45. Longest specimen, 6.00; greatest extent of wing, 9.50; longest wing, 3.00; tail, 2.07; bill, .50; tarsus, .57. Shortest specimen, 4.75; smallest extent of wing, 8.75; shortest wing, 2.60; tail, 1.60; bill, .15; tarsus, .40.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in trees. They are compact structures composed outwardly of fibrous bark, leaves, weeds, and thistle down. They are oftener smoothly lined with silvery-white thistle down than with any other material, when they present a very pretty appearance, but specimens before me vary in being lined with fine roots, horse hair, or fern cotton. Three are partly composed of common cotton, while one has rags and string neatly woven into the external portion. Dimensions; external diameter, 3.00, internal, 2.00. External depth, 2.25 internal, 1.25.

Eggs, four in number oval in form, pale bluish-green in color unspotted, in all that I have examined. Dimensions from .65 x .50 to .70 x .53.

HABITS.

It will be difficult to find, even among those preeminently gregarious birds the Sparrows, a species more inclined to associate in flocks, at all seasons, than the Goldfinches. In winter, when all the earth is covered deep with new-fallen snow, and naught is to be seen but the billowy drifts excepting the partly shrouded trees or an occasional patch of weed-tops, appearing above the silvery sheet, where the whistling wind, rushing over some unprotected knoll, has swept a portion of the snow away. This scanty outcropping of dead herbage would be inconspicuous enough when the ground was brown and bare, but is now quite noticeable when seen on the immaculate surface. But other eyes are looking at what to us seems but a blemish in so fair a landscape, looking eagerly too, for, coming from afar, borne through the frosty atmosphere, may be heard a faint sound, now nearer and louder until the air is full of pleasant, lively, bird notes, then suddenly, as if born out of the blue sky above, a hundred Goldfinches come dropping down in a small cloud upon what to them is an oasis in a desert. Each weed stalk is immediately occupied by a cluster of little brown-backed birds which are silent enough now, being busily engaged in abstracting what few seeds old Boreas has left on the branches. They are hungry and exactly like all animals in this condition, not excepting man, attend exclusively to the business of feeding until at least partly full. One can approach quite near them at such times, for they will be very little inclined to leave their breakfast, only occasionally pausing to answer the call of some passing straggler who is endeavoring to find the flock, but later in the day they are more prone to be startled. Then the slightest sound will cause one or more to jump on wing with the sharp note of alarm, when at once, without further warning, the whole flock is in air. After circling a few times about the spot, going higher and higher, they at length take their departure, moving quite rapidly, sounding their notes as they rise and fall in the undulating flight which is characteristic of this species. It is extremely probable that the same flock will not visit that locality again for days or even months, for Goldfinches are exceedingly nomadic in winter.

As spring advances, and the Goldfinches which have migrated southward are returning, the entire country is full of them. The birds linger for a time, while in the brown plumage, in immense flocks, then, as the weather becomes warmer, break up into smaller companies, and with the brightening summer put on their gala dress, assuming it seemingly at once, for so rapidly does the moult take place that the new plumage is acquired in less than a week.

I have said that they appear in gala attire, and this is true in a stricter sense than can be applied to most birds, for with the Goldfinches the long, bright days of June, when almost all other birds are occupied with domestic cares, are passed as one joyous festival. Thus they wander about in small flocks until July when the duties of incubation begin. In the more settled districts the nests are usually placed in ornamental or shade trees by road-sides. I recently counted five nests, all in trees which stood along some four-hundred yards of walk. The neat domiciles are built in the terminal fork of some high limb, and the eggs are deposited from the first week in July to the first of August.

The young appear late enough for the parents to furnish them with newly-ripened seeds which then abound upon various plants. I have always found this species feeding

exclusively upon seeds, and as they cannot find sufficient of this food earlier in the season breed late. The young accompany the adults early in September, when they flock to old fields which are grown up to thistles. Even during the breeding season the males show an inclination to flock, and as they are then full of melody, each singing with a continuous, warbling, song, of many minutes' duration, the effect produced by a concert of voices is very fine. The males also have a singular habit of flying about the neighborhood of the nests, in huge circles, emitting a peculiar note which is louder and clearer than that given at other seasons. Both sexes are remarkably fond of bathing in summer, yet they cannot be considered as cleanly for their feathers are frequently bedaubed with a gummy substance, from seeds.

The southward migration begins shortly after the autumnal moult, which occurs about the first of September. As before remarked the winter range is regulated largely by the snow-fall, for, when deep, it renders the seeds inaccessible upon which the birds depend for a sustenance. During such seasons Goldfinches may be found as far south as Florida. I even saw them at Miami, in large numbers, in the winter of 1870-71. While in the above mentioned State they feed largely on the new seeds of maples which appear early in January. They leave for the North in March.

I should have stated that the eggs are from four to six in number; five being found nearly as often as four, but six are more rare.

CHRYSOMITRIS PINUS.

Pine Goldfinch.

Chrysomitris pinus Bon., *Consp.*, 1850, 515.

DESCRIPTION.

St. Cir. Form, quite robust. Tongue, not very thick, horny, but having only a very slight indication of the hair-like terminal filers. Sternum similar to that of *tristis* but proportionately a little broader and with the keel a trifle higher. Bill, quite acuminate.

Color. *Adult in summer.* Grayish-white above and below, streaked with dusky, but lighter beneath. Basal portion of wings and tail, excepting outer webs of first three primaries, and narrow edges of outer webs of primaries, sulphur-yellow. Under wing coverts, edges and tips of greater wing coverts and of tertiaries, white.

Adult in winter. Similar to the summer plumage, but exhibiting a rufous tinge above and below.

Young and Nestlings. Differ from the winter adult in being more strongly tinged with rufous. Sexes similar in all stages of plumage.

OBSERVATIONS.

Readily known by the ever present sulphur-yellow markings of the wings and tail. Some specimens show a tinge of yellow on the abdomen. Breeds from Northern New England to the Arctic Circle; winters from Maine to Florida. The specimen from Miami is somewhat smaller in size and darker in color than more northern skins.

DIMENSIONS.

Average measurements. Length, 5.25; stretch, 8.80; wing, 2.85; tail, 1.60; bill, .42; tarsus, .55. Longest specimen, 5.35; greatest extent of wing, 9.10; longest wing, 3.00; tail, 1.65; bill, .45; tarsus, .60. Smallest specimen, (from Miami,) length, 4.50; stretch, 8.40; wing, 2.90; tail, 1.70; bill, .35; tarsus, .50.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in trees. The following description is taken from a specimen, now in the Smithsonian Institute, which was found at Parley's Park, Wahsatch Mountains, Utah, by Mr. Ridgway, who has kindly written it for me. "The very bulky structure is composed of fine strips of bark, mostly gathered from coniferous and aspen trees; the lining being of the same material but mixed with a little willow down. Dimensions; external diameter, 2.50, internal, 2.00. External depth, 2.60, internal, 1.00."

Eggs, four in number, bluish-white in color, sparsely dotted and lined with black. Dimensions, from .65 x .45 to .71 x .50.

HABITS.

Near the banks of the Miami River, not far from Fort Dallas was a small spring. It was overarched by guava trees, which had grown wild from lack of cultivation, while a convolvulus had hung its verdant, flower-starred festoons from the branches. Giant ferns with broadly pinnated fronds, five feet in length, grew on the margin and rank grasses waved beside them. Thus the sparkling waters were surrounded by a luxuriant vegetation, never seen in the North, yet there was room beneath for the birds to find a convenient bathing place. The Goldfinches soon found it, even though it did present a very different aspect from the willow-margined brooks, to which they had been accustomed in a more boreal clime, and, when the sun was high, visited the shady nook in flocks. I had long been familiar with this species in Florida, but I was surprised to hear the call note of the Pine Finch so far from its usual range. There were but a few, however, and they did not remain very long.

The Pine Goldfinch, like the preceding species, is very irregular in its migrations, and the instance related above is the only one which has come under my observation of its occurrence anywhere in Florida. Even in Massachusetts it is not found regularly in any numbers; for example, during the winter of 1859-60 it was abundant but was not common again until 1868, when it remained until the following June. When in New England it feeds largely on birch and fir seeds, thus is not dependent upon weeds which are often covered with snow. Its migrations are therefore regulated solely by the food supply, and when the seed crop, of the trees mentioned, fails it moves southward in search of other means of sustenance.

As spring advances the Pine Finch retreats to the evergreen forests of the mountainous districts where it is much more at home than in the cultivated sections. They breed in these wild, elevated, regions; Mr. Ridgway's nest, already described, was found in the Wahsatch Mountains at an altitude of 9000 feet. It was placed on the horizontal limb of a fir, twenty feet from the ground. This was taken June 23, but as Mr. Brewster found it breeding at the White Mountains, New Hampshire, in August, it is extremely probable that this species, like the Goldfinch, is obliged to await the ripening of certain seeds before attempting to rear its young, which will account for local variation in the time of nesting.

The call notes and song of the Pine Finch are quite similar to those of the preceding species, but have such a peculiar, husky, intonation that they may be readily distinguished at all times.

GENUS IV. JUNCO. THE SNOW BIRDS.

GEN. CH. *Bill, pointed. Wings, quite long. Tail, slightly forked, but with the outer feathers a little shorter than the others. Coracoids, shorter than the top of keel, which is somewhat higher than one half the width of sternum. Size, not very small.*

All the species are dull in color, unstreaked, above or below, in the adult stage of plumage. The outer tail feathers are always white.

There is scarcely a genus, throughout the entire Family, where the species so completely intergrade, in some stages of plumage, as the present; indeed it is extremely difficult to decide whether some should be considered as species or only as local races.

JUNCO HYEMALIS.

Black Snowbird.

Junco hyemalis SCLATER, PRO. Zool. Soc., 1857, 7.

DESCRIPTION.

SP. CH. Form, quite robust. Tongue, fleshy, not very horny at tip, which is provided with short, terminal, hair-like fibers. Sternum, as given under generic characters. Bill, quite sharp.

COLOR. *Adult male in summer.* Upper portion of body, including wings and tail, neck, breast and sides, slaty-black, darkest anteriorly. Belly, abdomen, flanks, under tail coverts, under wing coverts and extreme outer edges of primaries, white. Four outer tail feathers are always white and two others are more or less so colored. Bill pinkish, darker at tip and base of upper mandible. Feet, brown.

Female in spring. Similar to the spring male but having the slaty-black overwashed with rufous. Only two outer tail feathers are wholly white.

Adult in winter and Young. Adult males in winter show more or less rufous, while the females are more highly tinged with it than in the spring. The young are well washed with rufous for the first year and the white of the tail is much less extended.

Nestlings. Are thickly streaked, above and below, with dusky, when they present a peculiar appearance

OBSERVATIONS.

Specimens, of the same age and sex, vary considerably in amount of rufous, especially above. The extension of the white on the tail is also variable, but I never saw more than four feathers wholly white; a specimen, however, now before me, has the next pair nearly immaculate, there being only a basal spot on the inner webs and a very small terminal one on the outer. This specimen is also remarkable as being the only one which I ever examined from the East that had any indication of wing bars; in this case there are two which are quite distinct. This bird is very dark in color and altogether somewhat resembles "*Aikenii*."

The present species may be distinguished by the dark sides and absence of any decidedly red dorsal patch, such as is to be seen in *Oregonus* and allied species. Distributed, in summer, throughout Northern New England, Canada, and along the highlands and mountain ranges of Eastern United States, at least as far south as Virginia. Winters from the Atlantic to the Rocky Mountains between the latitudes of Florida and Massachusetts.

DIMENSIONS.

Average measurements of twenty eight specimens. Length, 6.25; stretch, 9.80; wing, 3.00; tail, 2.60; bill, .42; tarsus, .75. Largest specimen, 7.00; greatest extent of wing, 10.00; longest wing, 3.15; tail, 2.75; bill, .50; tarsus, .80. Smallest specimen, 6.00; stretch, 9.50; wing, 2.80; tail, 2.50; bill, .40; tarsus, .70.

DESCRIPTION OF NESTS AND EGGS.

Nests. placed on the ground. Composed of fine grasses and lined with the same material. Dimensions; external diameter, 4.00, internal, 3.00. External depth, 2.00, internal, 1.00.

Eggs, four or five in number, oval in form, varying from white to bluish-white in color, spotted with reddish-brown and lilac. Dimensions, from .70 x .55 to .75 x .60.

HABITS.

On December 31, 1876, I was standing on the deck of the yacht *Nina*, sailing down Calibogue Sound, before a fine breeze. We moved swiftly past a point of land, which shut out a view to the eastward, then the open ocean came into sight, and, in the distance, just to the southward, I recognized Tybee Light at the mouth of the Savannah River. Nearer, to the right of where the Sound opens into the sea, lay Daufuskie Island. It was covered with an exuberant growth of trees, mainly palmettos and live oaks, which formed a wall of verdure, against which the white tower of the range beacon stood out in strong relief; while the keeper's dwelling peeped out from among the green foliage. The whole was fronted by a clean sandy beach, which rose abruptly from the sparkling water, forming a neat foreground for one of the prettiest pictures that I had ever seen. Sweeping

onward, almost to the light, we turned suddenly to the right and entered a creek, which leads back of the island, along which we glided, for a mile or so, then cast anchor near a large plantation. Going ashore we landed in a fine grove of live oaks which were heavily draped with long streamers of Spanish moss. These were hung so thickly that, together with the dense foliage, they rendered the light quite obscure, and it was not until I had gone some distance that I observed that I had entered one of those small cemeteries, so common in the South. Emerging from those gloomy shades I entered an adjacent cotton field, from which a large flock of Sparrows started. Among them were several Snowbirds, which, true to their instinct, instantly made for the trees and concealed themselves in the long moss. This is the farthest point south that I have ever found them, but Mr. Boardman records them as common in Florida during some seasons.

As above intimated, the Snowbirds intuitively seek protection by concealment, when disturbed. They always exhibit this trait, and, in sections where there are no heavily foliaged trees, of which they can avail themselves, will take shelter under brush heaps or in thickets. This habit is acquired while they are among the spruces and hemlocks of their northern homes.

In the South, and during the autumnal migration, the males have no other notes than the sharp cry of alarm, which is often repeated several times in rapid succession until it becomes almost a twitter, but during the northern journey they indulge in a very melodious warble. This lay is only heard on those still, April mornings, when all the earth is steeped in sunshine; when the bursting buds are disclosing the delicately tinted leaves; when the grass on the southern slopes is showing its most brilliant green, and the balmy breath of the coming spring is quietly awakening all vegetation to a renewed life; then the Snowbirds, as if influenced by the surrounding tranquillity, gently pour forth their low melody. Then we hear them at their best, for strangely enough when the summer has fairly come, and all other birds are full of harmony, our little white-breasted friends forget the pleasant strains that they practiced earlier in the season, and only trill a series of harsh chipping notes, which, when compared with their former efforts, is to say the least, very inharmonious.

This species usually breeds on the ground, but Mr. H. B. Bailey found a nest at Upton, Maine, placed on the limb of a spruce, four feet from the ground. The eggs are deposited about the first week in June, but a second litter is sometimes laid in July. The young accompany their parents when they associate with the White-throated and other Sparrows, migrating with them in September, and remaining with them, often in flocks, all winter.

GENUS V. SPIZELLA. THE TRUE SPARROWS.

GEN. CH. *Bill, pointed. Wings, long. Tail, slightly forked. Coracoids, shorter than the top of keel, which is longer than one half the width of sternum. Size, medium, never very small.*

All the species are dull in color, streaked above, but not below, in the adult stage of plumage. There are never any conspicuous white markings on the tail.

There are quite a large number of species in this genus but they are quite easily distinguished, as the specific characters are very distinct.

SPIZELLA SOCIALIS.

Chipping Sparrow.

Spizella socialis Bonap. List, 1838.

DESCRIPTION.

St. Cr. Form, rather slender. Size, medium. Tongue, horny, provided with the terminal, hair-like fibers. Upper mandible, slightly curved. Sternum, as given under generic characters.

Color. *Adult in summer.* Top of head, back, outer edges of upper wing coverts, and other wing feathers, chestnut, brightest on the head, but with the occiput slightly, and the back broadly, streaked with black. Neck above, forming a collar, through which the black extends, rump, upper tail coverts, outer edges of tail feathers, ear coverts, sides of neck, and sides, ashy. Wings and tail, brownish-black. Forehead, line from bill, passing through eye, and bill, black. Median line, through black of forehead, superciliary line, throat, under wing coverts, under tail coverts, tips of upper wing coverts, forming bars, white. Remainder of under parts, ashy-white, darkest across the breast. Feet light-brown.

Adult in winter. Differs from the above in having the crown overcast with blackish, and the chestnut of the crown is extended down on the neck, almost obscuring the collar. The lines of black above are not as clearly defined, but there is less ashy below. The bill is reddish, especially on the under mandible.

Young. In this stage the top of the head, and usually the rump, are more or less streaked with black. The marking of the forehead is not as prominent.

Young of the year in autumn. Show but little chestnut on the crown, but are more rufous on the wings, the white bars being replaced by reddish.

Nestlings. Are similar to the above, but are streaked below, on all portions, excepting the abdomen, even the throat and sides of head, including superciliary stripe, are so marked. The throat is yellowish, and the sides are reddish. The sexes are similar in all stages.

OBSERVATIONS.

Specimens vary greatly in amount of chestnut on the back, where the black usually predominates, but I have seen a bird which had the back almost wholly chestnut. The black of the forehead also varies in width. It is always present, but in some specimens the white median line becomes much extended, reaching over a greater portion of the anterior crown. There is sometimes a slight trace of chestnut on the ear coverts.

Readily known in the adult and young stages by the chestnut crown, black forehead and white median line. The nestlings always show an indication of the reddish crown. This species may be distinguished from *pusilla* in having less red above. The ever present black line through the eye is a characteristic marking. Distributed, while breeding, across the Continent from the latitude of South Carolina, north, at least to that of Canada. Winters from the Carolinas southward to Cuba, but is not common below Middle Florida.

DIMENSIONS.

Average measurements of fifteen specimens. Length, 5.45; stretch, 8.50; wing, 2.65; tail, 2.35; bill, .38; tarsus, .63. Longest specimen, 5.60; greatest extent of wing, 8.75; longest wing, 2.75; tail, 2.60; bill, .42; tarsus, .73. Shortest specimen, 5.10; smallest extent of wing, 8.15; shortest wing, 2.12; tail, 2.20; bill, .35; tarsus, .55.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in trees. They are compact structures, composed outwardly of fine roots, lined with horse hair. Dimensions: external diameter, 3.25, internal, 2.00. External depth, 1.75, internal, 1.00.

Eggs, four or five in number, oval in form, blue in color, spotted, dotted and lined with black and lilac. Specimens vary from the above in being marked with reddish-brown, but it is usual to find some spots or dots of black. I once had a set that was unspotted. Dimensions, from .75 x .50 to .80 x .55.

HABITS.

One can scarcely enter a field of a plantation, in Northern Florida, which is overgrown with weeds, without starting large flocks of birds. Usually a large proportion of them will be Chipping Sparrows. They remain all winter enjoying the bright sunshine of this magnificent climate, spending their time in comparative idleness; for seeds are abundant, and it requires but a slight effort to obtain them. It is quite noticeable that the birds of this

species found as far south as Blue Spring, Florida, are mostly young, but further north, in the Carolinas, where these birds are exceedingly abundant, the adults predominate. I have mentioned, on page 29 of this work, that the adults of many birds wandered more than the immature, but this species appears to reverse that rule. The adults remain behind, in the colder climate, but the young push onward toward the warmer section of the country.

While in their winter quarters, the Chipping Sparrows have no characteristic habits, other than those exhibited by many of the Fringilline birds; neither do they have any note, save the ordinary chirp of alarm. Then, to recognize them, one must observe quite closely. By the middle of April, when they arrive in Massachusetts, they forget the life of inactivity which they led in the enervating climate where they passed the winter, and display much energy. At first the lively chipping song of the males is only to be heard at intervals along the hedge-rows which form a favorite perch for the birds, but a few days later every garden and lawn, throughout the State, will have its attendant fay in the form of a Chipping Sparrow.

They watch their domains very closely, seldom leaving the immediate vicinity of the dwellings. As a natural result, from associating so much with human beings, these little Sparrows become exceedingly tame, being, in fact, half domesticated. They will hop familiarly about the porch in search of crumbs and other bits of food, occasionally displaying enough confidence in their friends to even venture across the threshold of the open door.

About the middle of May the females can be seen gathering material for their prettily constructed nests, which are often placed on some tree in close proximity to the house. The eggs are deposited about June 1, the young making their appearance by the 15. At this time the Chipping Sparrows are nearly insectivorous, feeding largely on such destructive insect larvæ as the canker and currant worms. Although thus conferring a benefit upon mankind, they are not always as useful, for they are accused, and I fear justly, of killing honey-bees for food. I have frequently seen several of them thus employed at one time. They would alight on the top of the hives or on some over-hanging limb, and dart down at the returning or departing bees, like Flycatchers, then, having secured their prey, would alight on the ground in order to beat it in pieces before swallowing it. I have observed that the Chipping Sparrows assemble in the neighborhood of apiaries, in considerable numbers. I have found twenty or more nests, in a single season, all built in an orchard, near which stood several hives.

In spite of the above-mentioned mischievous propensity, our lively little friends are general favorites, usually finding a hearty welcome, and will amply reward the husbandman, for the protection which he affords them, by destroying large quantities of exceedingly noxious insects.

By September, the young and adults flock to the cultivated fields in order to feed on the newly-ripened seeds of weeds, which once more form their principal diet. They then associate with large numbers of other birds, such as the Field and Savannah Sparrows, Grass Finch, and many other members of this family, departing with them when they migrate southward.

SPIZELLA PUSILLA.

Field Sparrow.

Spizella pusilla Bon., List, 1838.

DESCRIPTION.

Sp. Ch. Form, rather slender. Size, medium. Tongue, horny, provided with the terminal, hair-like fibers. Keel, lower than that of *socialis*, but the coracoids are longer. Upper mandible, slightly curved.

Color. *Adult in summer.* Upper portion of body, including outer edges of wing feathers, and spot on the sides of the head, reddish-brown, palest on the rump. There is an indication of an ashy collar. The wings and tail are brown with the outer edges of the feathers of the latter, ashy. Tips of wing coverts, forming bars, white. Under portions, dirty-white, with the maxillaries, breast, sides and flanks tinged with rufous. Ear coverts, ashy. Bill, red. Feet, pale-brown.

Adult in winter. The reddish-brown above is over-washed with dusky. There is more rufous below, where the white is purer, but the white bars of the wings are inclined to be reddish.

Young. In this stage the crown shows traces of ashy, and the feathers of the back are edged with it. The bill is dusky, especially on the upper mandible.

Young of the year in autumn. Are very dusky above, but with the outer edges of the wing feathers broadly margined with reddish; even the ashy edgings of the tail are replaced by it. The entire under portions, including under tail coverts, are tinged with rufous, brightest on the sides, throat and breast.

Nestings. Are similar to the above, but are streaked below, on all portions, excepting the abdomen. The sexes are similar in all stages.

OBSERVATIONS.

Specimens vary a very little in the shade of reddish-brown. The ashy collar is sometimes quite prominent, extending across the neck, and there is an indication of a median line, of the same color, extending from the bill to the occiput.

Readily known, when adult, by the rufous color above, and by the general suffusion of rufous in the younger stages. Distributed, while breeding, from the Atlantic Ocean to the Mississippi River, between the latitudes of the White Mountains and South Carolina. Winters from the Carolinas to Middle Florida.

DIMENSIONS.

Average measurements of fifteen specimens. Length, 5.60; stretch, 8.15; wing, 2.55; tail, 2.45; bill, .38; tarsus, .73. Longest specimen, 5.95; greatest extent of wing, 8.50; longest wing, 2.75; tail, 2.60; bill, .40; tarsus, .73. Shortest specimen, 5.25; smallest extent of wing, 7.75; shortest wing, 2.12; tail, 2.20; bill, .35; tarsus, .65.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in low bushes or on the ground. They are loosely constructed, being composed of fine grasses and weeds, lined with grass and horse hair. Dimensions; external diameter, 3.50, internal, 2.50. External depth, 1.75, internal, 1.00.

Eggs, four or five in number, oval in form, bluish-white in color, spotted, and blotched with reddish-brown and lilac. Dimensions, from .61 x .50 to .70 x .55.

HABITS.

By the middle of April, when spring has fairly opened, when the warm, south wind comes in gentle puffs that scarcely move the autumnal leaves which are still clinging to the oaks, the peculiar song of the Field Sparrow may be heard coming from the low cedars which grow along steep, gravelly hill-sides or on barren tracts of land. This lay is one of the sweetest that I ever heard. It consists of eight or ten notes which commence low, gradually growing louder, then become softer, when a series of more distinct chirps are given, and the performance ends abruptly. The first part of the song is exceedingly fine, but the latter portion is not as pleasing and the sudden termination is somewhat disappointing. The bird while singing is perched on some elevated situation, and seems to enter into the business in hand with all his might.

These melodious strains are so striking that they produce a favorable impression even

upon those who do not usually notice birds. But to the lover of Nature, this song becomes so associated with the peculiar location in which it is heard, where the warm summer air is redolent with the spicy odor of the cedar and savin, that it is as much a portion of the characteristic New England scenery as the tree-covered hills themselves. Individuals vary slightly in notes, even in Massachusetts, but I was surprised to hear these Sparrows giving an entirely different song at Watsonstown, Pennsylvania, in August.

I have found the nests in a low bush but they are sometimes placed on the ground; the eggs are laid during the latter part of May and a second litter is deposited later. The birds are quite shy even when breeding. The males will cease singing when disturbed and dart into the nearest thicket from which it is difficult to start them. When forced to take wing they will instantly shoot into another place of concealment. By September the birds leave the wooded section and assemble with other Sparrows in the cultivated fields. They migrate a little later in the season, but rarely go as far south as Middle Florida.

GENUS VI. ZONOTRACHIA. THE ZONE-THROATED SPARROWS.

GEN. CH. *Bill, rather pointed. Wings, about equal in length to the tail which is slightly forked, but with the outer feathers shortened. Sternum, similar to that of Spizella, but a little broader, proportionately. Size, large.*

The throats or crowns of all the species are conspicuously marked with white, black, or yellow, often with a combination of all three colors. No prominent white markings on the tail.

ZONOTRACHIA ALBICOLLIS.

White-throated Sparrow.

Zonotrichia albicollis BON., *Consp.*, 1850, 478.

DESCRIPTION.

SP. CH. *Form, robust. Size, large. Tongue, thick and fleshy, but furnished with a terminal, bifid fringe of fine cilia. Sternum, as given under generic characters.*

Color. Adult. Upper portion of body, including outer edges of wing and tail feathers and upper wing coverts, chestnut, palest on the rump, with the back streaked with rufous and black. Wings and tail dark-brown. Tips of wing coverts, white, forming bars. Top of head, black, with a median line extending from bill to occiput, and one on either side, starting from over the middle of eye and extending to occiput, throat, under wing coverts, abdomen and under tail coverts, white, with the latter tinged with yellow and streaked with dusky. Remaining under portions, lores, sides of head below line of eye, ashy, darkest anteriorly, with the sides and flanks tinged with chestnut. Line from bill to over middle of eye and edge of wing, near shoulder, bright yellow. Bill, bluish. Feet pale-brown.

Young. The yellow line of the sides of head is less extended. The black and white of the crown show traces of chestnut. The white throat is somewhat obscured with dusky, and the breast is crossed with faint, wavy lines of the same color. There is less chestnut on the sides, and the wing bars are narrower.

Young of the year. Differs in having the crown dusky and chestnut, with the white lines replaced by pale-rufous tinged with dusky. The wing bars are also rufous. The white throat is more or less obscured with rufous. There are black maxillary lines and the breast is streaked with dusky. The yellow lines of the head are somewhat restricted and obscured with dusky.

Nestlings. Differ from the above in being finely streaked below, on all parts, excepting the abdomen, with dusky, and the white overwashed with yellowish. Sexes similar in all stages.

OBSERVATIONS.

Individuals vary but little in color, the ashy of the breast is occasionally lighter and there is sometimes an indication of a dusky spot on the middle of the breast. Readily known in the more adult stages by the black, white and yellow markings of the top of the head. Nestlings are much more difficult to determine and as I have none of the allied species in this stage at hand, cannot speak with certainty of the differences, but should judge that *albicollis* is more rufous above. The females are apt to be duller.

Distributed, while breeding, from Northern Massachusetts, to the far North, through the Eastern and Middle districts Winters from the latitude of North Carolina to Central Florida, between the Atlantic Ocean and the Mississippi River.

DIMENSIONS.

Average measurements of fifteen specimens. Length, 6.35; stretch, 9.55; wing, 3.05; tail, 2.85; bill, .48; tarsus, .90. Longest specimen, 7.35; greatest extent of wing, 9.80; longest wing, 3.40; tail, 3.00; bill, .65; tarsus, .95. Shortest specimen, 6.30; smallest extent of wing, 8.80; shortest wing, 2.82; tail, 2.60; bill, .50; tarsus, .81.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground. They are rather compact structures, composed of dried grasses and fine roots, lined with horse hair and grass. Dimensions; external diameter, 4.00, internal, 2.75. External depth, 2.50, internal, 1.75.

Eggs, four or five in number, oval in form, bluish-white in color, spotted, blotched, and dotted with reddish-brown and lilac. Dimensions, from .80 x .60 to .90 x .65.

HABITS.

The hammock edges in Florida are almost always occupied by birds of several species. Prominent among them are the White-throated Sparrows but they are confined to the Middle and Northern sections of the state. I did not find very many of them at Blue Springs, and none south of this point. But they were abundant along the borders of the extensive cotton plantations on the Sea Islands of the Carolinas and Georgia. While there, however, they have no special habits by which they can readily be distinguished from many other of the more arboreal, Fringilline birds; yet they never lose some peculiarities by which the close observer can always identify them. The sharp chirp of alarm that is given while the birds are in concealment, or while they peer cautiously out to watch the intruder, is one of the chief characteristics which the White-throated Sparrows retain at all seasons.

While passing through the Middle and New England States, when on their northward migration, they do not always frequent the wooded portions, but move in straggling flocks along the hedges and fence rows of the more cultivated sections. The mild but invigorating weather of early May apparently awakens a desire in the birds to sing, and then they begin to practice the first notes of their fine melody. But it is not until later, when they arrive in the evergreen forests which form their summer resorts, that the song is heard at full length.

Then in the early mornings of June when the purple mist hangs over the mountains, where the delicate ferns which wave by the ever murmuring brooks are sparkling with dew drops, when the freshly grown leaves of the overhanging foliage are showing their loveliest green, the melodious strains of the White-throated Sparrows may be heard to perfection. This lay consists of several sweet, prolonged whistles, and is somewhat plaintive, but very pleasing. Not only do our little musicians perform through the cooler hours of the morning, but the sultry noon-time also finds them singing. They are more silent when the sun declines toward the West, but begin again in the cool of evening. Thus they are almost untiring in their efforts through the day, and, as if not satisfied, will frequently burst into full song during the night. But when the rocky mountain tops are gleaming in the brilliant moon-light, and the silvery beams are finding their way through the openings in the shadowy forests, illuminating the little glades which form the homes of the Sparrows, they are especially musical. Then when all else is silent, save the occasional melancholy notes of the Whip-poor-will or the distant hoot of some Owl, the effect produced by this incomparable song is surpassingly beautiful.

The nests are placed on the ground, usually in some open spot and frequently by the way-side. The eggs are laid by the first week in June, but a second litter is deposited later. The singularly marked young in their first plumage, accompany their parents in August, but these small communities assemble in flocks by the first of September, then commence their southward migration. Even as late in the season as that the males cannot resist the temptation of singing, and on very fine autumnal days one or two of the sweet notes of their summer performance can occasionally be heard, but the complete song is never given at that time.

GENUS VII. PASSERCULUS. THE GRASS SPARROWS.

GEN. CH. *Bill, rather pointed. Wings, longer than the tail which is slightly forked, but with the outer feathers shortened. Tertiaries, longer than secondaries. Sternum, narrower than that of Zonotrichia, but with the keel a little higher, and the coracoids shorter, proportionately. Size, medium.*

There is usually a yellow superciliary line. All the species are streaked above and below. No prominent white markings on the tail.

PASSERCULUS SAVANNA.

Savannah Sparrow.

Passerculus savanna Bon., List, 1838.

DESCRIPTION.

SP. CH. Form, rather slender. Size, medium. Tongue, horny, provided with the terminal, hair-like fibers. Sternum as given under generic characters.

COLOR. *Adult in summer.* Upper portion of body, including wings and tail, dark-brown, with the edges of all the feathers, excepting anterior crown, whitish or pale-rufous. There are indications of whitish wing bars. A median line of yellowish-white extends from bill to occiput, where it is mixed with dark-brown. Superciliary line and ring around eye, yellow. Lores and ear coverts, dusky, with the feathers back of the latter whitish, mixed with dark-brown. Under portions, including under wing coverts, white, streaked with dark-brown on all portions, excepting abdomen and under tail coverts. Edge of wing, white. Bill, brown, lower mandible, lighter. Feet, pale-brown.

Adult in winter. Differs from the above in being overwashed with yellowish-rufous below and on the sides of the head. The yellow superciliary line is not as extended.

Young. The yellow over the eye is much restricted. The dark-brown above is lighter and the streakings below are edged with rufous. The ear coverts are also overwashed with rufous.

Young of the year. Show but little of the yellow line. There is strong overwashing of rufous above and below. The occiput is frequently tinged with yellow.

Nestlings. Are more finely streaked below where there is a strong tinge of yellowish. There is no indication whatever of the yellow superciliary line. Sexes similar in all stages.

OBSERVATIONS.

Specimens vary considerably in shade of color, and also in size. Sometimes the markings above are very pale, and there are comparatively few streaks below, but others will be extremely dark above and more heavily streaked below, when there is often a central spot on the breast. The throat is sometimes white, then the streakings unite and form maxillary lines.

Distinguished from *princeps* by the smaller size and darker color; from *rostratus* by the smaller bill. Known from other Sparrows by the yellow superciliary line, combined with the white edge of the wing and streakings below. Distributed, in summer, throughout the Continent, from the latitude of Pennsylvania to the far North. Winters from the latitude of Washington, south to Florida and Mexico.

DIMENSIONS.

Average measurements of forty specimens from Florida and New England. Length, 5.75; stretch, 9.45; wing, 2.75; tail, 1.90; bill, .45; tarsus, .82. Longest specimen, 6.27; greatest extent of wing, 9.60; longest wing, 3.00; tail, 2.25; bill, .49; tarsus, .87. Shortest specimen, 5.25; smallest extent of wing, 7.95; shortest wing, 2.50; tail, 1.81; bill, .45; tarsus, .70.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground, composed of grass loosely arranged and lined with finer. Dimensions, external diameter, 3.50, internal, 2.25. External depth, 2.00, internal, 1.25.

Eggs, four or five in number, oval in form, bluish-white in color, thickly blotched, and some portions nearly covered, with reddish-brown. Some eggs, however, are marked with very distinct spots of umber and I have occasionally seen them lined with the same color. Dimensions from 77 x .60 to 87 x .65.

HABITS.

The savannahs of Florida are wide spread plains, either fresh or salt. The former are covered with a luxuriant growth of grass often six feet high, while on the latter the herbage is shorter, and consists of several species of plants among which is the peculiar sea purslane, (*Sesuvium portulacastrum*.) This creeping herb quite covers the ground in many localities and the red, succulent leaves yield a peculiar spicy scent when crushed beneath the feet. This aromatic odor always reminds me of the marshes of Indian River, for it was there that I first saw the plant growing to perfection. These salt plains are the resorts of many birds, but none are more abundant there than the little Sparrows which I have under consideration, and which derive their common and specific names from their habit of frequenting savannahs. Many other species of the family are arboreal, but none among them are so fond of open, grassy sections as the Savannah Sparrows. In Florida they are abundant in the marshy country along the sea board or rivers of the interior, and are common on the plantations of Georgia and the Carolinas. In Pennsylvania they are found in the rich interval lands, in Massachusetts and Maine they swarm along the sand hills and marshes of the coast, and I have even found them on the grassy hill sides of the Magdalen Islands, Gulf of St. Lawrence. They are retiring in habit, often running a long distance before flying. The males, however, are fond of perching on a low limb of a tree or fence top to give their peculiar lay, which consists of a few lispings notes terminating in a faint warble; the whole performance being rather an unsatisfactory apology for a song.

The nests are built on the ground in open fields, along the edges of the sand hills, or on the marshes. There is very little attempt at concealment, but as the females sit closely it is exceedingly difficult to flush them, and when forced to leave they will frequently run some distance before rising, often feigning lameness in order to attract attention from the nests. The eggs are deposited about the first of June and a second litter in July. They breed a little later on the Magdalen Islands where I should judge that they only rear one brood. They leave Florida early in May, arriving in New England about the middle of April, and remain until the first of November.

PASSERCULUS PRINCEPS.

Pallid Sparrow.

Passerculus princeps MAYNARD, American Naturalists, Vol., VI, 1872, 637.

DESCRIPTION.

Plate III. Adult in spring.

SP. CH. Form, rather robust. Size, large. Tongue, somewhat fleshy, horny at tip which is provided with a terminal fringe of cilia. Sternum, with the keel a little higher and the coracoids a trifle longer, than those of *savanna*.

Color. *Adult in summer.* Upper portion of body yellowish-white, with the centers of the feathers dark-brown, encircled by rufous. Top of head, yellowish-rufous, streaked with dark-brown, but a median line of yellowish-white extends from the bill to occiput. Wings and tail, brown, with the outer edges of all the feathers whitish. There is only a faint indication of a wing bar. Pure-white beneath with the maxillaries, breast, sides, and flanks, streaked with brown which is edged with rufous. Tarsus and leg, and superciliary line, yellow. Edge of wing, white, tinged with pale-yellow.

Young. Quite rufous above, where the colors are more suffused. There is also no yellow superciliary line, and the bend of the wing is white. Sexes similar in all stages.

OBSERVATIONS.

There is usually a clustering of streakings on the breast forming a central spot, otherwise there is a uniformity of color. Known from all other allied species by its pale color and large size. It might be confounded with *rostratus*, however, were it not for the large bill of the latter. Found in the winter along the coast of Massachusetts, south to Long Island. Doubtless breeds on some of the islands off the coast of Arctic America. Although *princeps* is not a bird of Florida, I have ventured to insert this description with the plate, considering the species of sufficient importance to justify this course.

DIMENSIONS.

Average measurements. Length, 6.25; stretch, 11.00; wing, 3.28; tail, 2.50; bill, .46; tarsus, .95. Longest specimen, 6.30; greatest extent of wing, 11.20; longest wing, 3.30; tail, 2.60; bill, .52; tarsus, 1.00. Shortest specimen, 6.20; smallest extent of wing, 10.90; shortest wing, 3.10; tail, 2.40; bill, .40; tarsus, .90.

HABITS.

On December 4, 1868, I was walking over the Ipswich sand hills in search of Lapland Buntings, when a little bird rose wildly from the beach grass in front of me, I took a snap shot and killed the first specimen of *Passerculus princeps* ever brought to notice. For two years this was the only specimen in existence. I took two more, October 14 and 15, 1871, also on the Ipswich sand hills, then two were taken on Long Island and were sent to me by Mr. H. Herriek for identification. After this several were obtained at Ipswich but it was not until April 4, 1874, that I saw the bird in its full spring plumage. This specimen (a male) of which I give a plate, I shot on a tree at Ipswich, about a mile from the beach. Mr. Wm. Brewster has since obtained a fine female at Point Lepreaux, N. B. on April 11, 1876. A third which was obtained at Cape Elizabeth, March 15, 1875, is in the collection of Mr. N. C. Brown of Portland. Mr. Jesse Warren found them quite common at Brant Rock in the autumn some two years ago. Mr. C. H. Merriam obtained one at New Haven, November 4, 1875, and Mr. H. B. Bailey records it from Gravesend, L. I.

Thus it will be seen that the Pallid Sparrow may be found all along the coast from New Brunswick to Long Island, and probably south of that point. Mr. Brown also saw it at Lake Umbagog, N. H., but I think its occurrence so far inland is quite exceptional, as it is without doubt a maritime species breeding on islands and sandy beaches of the far North. I was disappointed at not finding it on the Magdalen Islands, Gulf of St. Lawrence, where I obtained nothing but typical *savanna*. Thus its nesting habits are entirely unknown. Neither did I ever hear it utter a note except the chirp of alarm which does not differ from that of the Savannah. In habits *princeps* also resembles the latter named species somewhat but is quite timid, rising at long gun shot it will dart quickly over the tops of the sand hills and alight in some thick patch of beach grass through which it runs nimbly. I have sometimes seen it on the salt marshes associating with the Savannahs and occasionally in apple orchards a short distance from the ocean, but it chooses those wind-swept, sandy wastes which occupy so much of the sea coast of New England and adjacent sections. I know of but few of the Sparrows that can be more readily distinguished than this species, which is due to its pale tints and large size.

GENUS VIII. POECETES. THE BAY-WINGED SPARROWS.

GEN. CH. *Bill, quite thick but pointed. Wings, longer than the tail, which is considerably forked, but with the outer feathers slightly shortened. Tertiaries, about equal in length to the secundaries. Sternum, proportionately narrower than that of Passerculus, with the keel higher, and the coracoids shorter. Size, medium.*

The shoulders are prominently marked with chestnut, and the outer tail feathers are white. There is no yellow superciliary line. All the species are streaked above and below.

POECETES GRAMINEUS.

Bay-winged Sparrow.

Poocetes gramineus BAIRD, Birds N. A.; 1858, 447.

DESCRIPTION.

SP. CH. Form, robust. Size, large. Tongue, very thin and horny, bifid at the extremity but without the terminal cilia. Sternum, as given above.

COLOR. *Adult in summer.* Yellowish-rufous above, streaked everywhere but more broadly on the back, with dark-brown. Wings and tail, dark-brown, with the outer edges of all the feathers yellowish-rufous. Shoulders, chestnut. There are two whitish wing bars. Beneath, including under wing coverts, yellowish-white, streaked on the throat, breast sides, and flanks, with dark-brown. Outer webs of two outer tail feathers, terminal portion of inner webs, and a small spot on next pair, pure white. Bill, brown, lighter on lower mandible. Feet, brown.

Adult in winter. Quite similar to the above, but there is a tinge of yellowish-rufous across the breast and on the sides and flanks. The streakings above are broader.

Young. In this stage there is a general suffusion of yellowish-rufous above and below, while the white of the tail is restricted to the outer feathers. The chestnut of the shoulders is streaked with dusky.

Nestlings. Are finely streaked on all portions excepting abdomen and under tail coverts with dusky. The shoulders show but little chestnut and there is but a slight indication of wing bars which are rufous.

OBSERVATIONS.

There is a general uniformity of color but occasionally there will be fewer streaks below when they will be narrower. The throat is sometimes white, when the streakings form maxillary lines. Known from all other sparrows by the white of the tail combined with the streakings above and below. Distributed in summer across the Continent, from the latitude of Pennsylvania, north at least to that of Canada. Winters from the latitude of Virginia, south to Middle Florida.

DIMENSIONS.

Average measurements of twenty specimens. Length, 6.29; stretch, 10.64; wing, 3.22; tail, 2.42; bill, .85; tarsus, .55. Longest specimen, 6.67; greatest extent of wing, 11.15; longest wing, 3.43; tail, 2.70; bill, .88; tarsus, .60. Shortest specimen, 5.50; smallest extent of wing, 10.25; shortest wing, 3.00; tail, 2.30; bill, .80; tarsus, .50.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground. They are slight structures, composed of dried grass. Dimensions; external diameter, 3.00, internal, 2.50. External depth, 2.00, internal, 1.80.

Eggs, oval in form, ashy-white in color, spotted, blotched, and lined, with black, brown, and amber. The lines are irregular in shape and are usually darker than the other markings. Dimensions, from .70 x .55 to .76 x .60.

HABITS.

By the middle of March, when the icy covering which has enshrouded the earth all winter is commencing to yield before the solvent rays of a genial sun, and the glittering surface is checkered with ever widening spots and patches, the song of the Bay-winged Sparrow can be heard. At first there are but one or two, but they soon increase in number and make the air of the early spring morning vocal with their fine melodies. This lay is not unlike that of the Song Sparrow, or at least the first few notes are quite similar, but the termination is entirely different, being a kind of disconnected warble, yet the effect is wonderfully pleasing.

This species like the Savannah is extremely fond of the grassy sections but does not

occur as commonly on the sea shore, in fact I never found it breeding on the salt marshes. It frequently chooses rye or other grain fields in which to build its nests that are placed on the ground, usually in some slight depression of the soil, but without any attempt at concealment. Indeed the birds appear to avoid spots that are thickly covered with herbage, and when they select greensward will place their domicile on the most barren portion where there is a sparse growth of grass. The eggs are laid about the first of May, the Bay-wing being one of the earliest among the Sparrows to breed, and then another litter is deposited later.

The brown-backed female sits closely and is extremely difficult to distinguish when on the nest, so that one may pass quite near the spot without noticing her. When started she will run away, seldom attempting to fly until she has gone some distance. Both sexes exhibit great solicitude upon being disturbed and the females will feign lameness like the Savannah. The Bay-wings migrate with the other Sparrows and go as far south as Middle Florida, but are never found off the plantations where they spend their time running about beneath the cotton-plants or through the sugar-cane in search of fallen seeds, occasionally catching insects, and to all appearance feeling as much at home as when in the corn fields of New England.

GENUS IX. CHONDESTES. THE PRAIRIE SPARROWS.

GEN. CH. *Bill, rather pointed. Wings, longer than the tail which is well rounded. Tertiaries, shorter than secondaries. Sternum, similar to that of Poocetes, but is a little wider proportionately. Size, large.*

Nearly all the tail feathers are prominently marked with white. Superciliary line, white. No streakings below in the adult stages but there is a central spot on the breast.

CHONDESTES GRAMMACA.

Lark Finch.

Chondestes grammaca Bon., List, 1838.

SP. CH. Form, rather slender. Size, large. Tongue, thin and horny but with no terminal fringe. Sternum, as given under generic characters.

COLOR. *Adult.* Upper portion of body, yellowish-rufous, streaked on the back and nape with dark-brown. Wings, and two central tail feathers, brown, with the outer edges of all the feathers yellowish-rufous, remainder of tail, black, with the outer webs of outer feathers and terminal portion of all but central pair, white. Top of head and ear coverts, chestnut. Median line from bill to occiput, superciliary line, crescent below eye, yellowish-white. Beneath, white, tinged on the breast, sides, and flanks, with yellowish. Forehead, line through eye, spot under white crescent, maxillary, and spot on center of breast, black. Edge of wing, white. Bill, brown, lighter at base of lower mandible. Feet, pale-brown.

Young. The white on the tail is less extended. The black is not as distinct and the under portions are overwashed with yellowish.

Nestlings. Are streaked on the breast. There is no indication of bars on the wing and the colors above are more suffused. Sexes quite similar in all stages.

OBSERVATIONS.

Known by the white of the tail taken in connection with the chestnut, black, and white markings of the head. The tongue, like that of *Poocetes gramineus* is much slenderer than those of other members of this family which I have examined and is also remarkable in having no terminal cilia or hair-like fibers; there is a general uniformity of coloration, but the chestnut of the head varies slightly in individuals. Distributed through the United States west of the Ohio, wintering in the more southern portions. It has, however, been seen at Washington by Mr. Ridgway in August, 1877. One was taken at Gloucester in the autumn, some thirty years ago, and I had one brought in that was taken near my place on November 22, 1877. Prof. Baird wrote me some three years since that a specimen was obtained in the autumn by Mr. W. B. Moore near Sarasota Bay, Florida. This species appears to be spreading eastward.

DIMENSIONS.

Average measurements of twenty four specimens. Length, 6.50; stretch, 10.95; wing, 2.65; tail, 2.85; bill, .53; tarsus, .75. Longest specimen, 6.75; greatest extent of wing, 11.00; longest wing, 3.75; tail, 2.65; bill, .55; tarsus, .72. Shortest specimen, 5.75; smallest extent of wing, 9.75; shortest wing, 2.75; tail, 2.78; bill, .50; tarsus, .70.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground or in trees, composed of grasses and weeds lined with fine grass, fibrous roots and horse-hair. Dimensions; external diameter, 4.00, internal, 2.75. External depth, 2.00, internal, 1.00.

Eggs, four to six in number, rather round in form, white in color, marked with faint spots of lilac, lined and blotched with brown and amber. These lines are irregular in width and are deposited in a similar manner to those of the Orioles and Blackbirds to which they bear a much closer resemblance than to those of other Sparrows or Finches. Dimensions from .75 x .65, to .85 x .70.

HABITS.

As I have never been fortunate enough to meet with the Lark Finch while living I herewith give an account of its habits kindly written for me by Mr. Henshaw who has had considerable experience with the species in the West.

“The Lark Finch, one of the finest of our Sparrows, with its trim shape and tastefully arranged colors, is in certain sections of the West one of the most abundant of birds. In the East all our Sparrows are, without regard to season, to a very considerable extent arboreal in their habits, even the species which are most terrestrial having an evident love for the hedge-rows and thickets, far from which they do not venture, and into which they always scud with chirp and flutter when danger threatens. The Lark Finch lives in the more open country and is therefore less dependent upon such shelter, often indeed preferring the prairie itself or the bare plain for an abode. In this very taste is probably to be found the reason why the bird has thus far chosen to absent itself from the East which it has hitherto found too thickly wooded for its notions.

“Not that it entirely disdains the advantages to be found in the wooded tracts, for indeed at times, as in the late spring, it quite abandons prairies and open fields and betakes itself to the copses, especially those fringing the streams. And if we seek it in its favorite home it will be found to combine in something like equal proportions the advantages of either kind of locality.

“It is certain to attract attention wherever we may chance to meet it, more particularly should it be the vernal season, which with our Finch is about the fifteenth of May at which time the males are in the full rivalry which the love season inspires. They are then in small companies which consist of both sexes with, however, a preponderance of males each of whom strives to bring his superior claims to the notice of the females. As a result each little thicket is witness to many a scene of jealous contest, sometimes of song, at other times of open battle, for the males are at this time extremely pugnacious. It is now that our Finch is to be heard at its best, and in its power of song it certainly need fear no rival in its own family. The song consists of a succession of clear liquid notes, freely interspersed with trills, the whole flowing forth to make a full chant which is as beautiful as it is indescribable. Nor, as is the case with some, I had almost said with most, of our prominent singers, is the Lark Finch at all chary of its melody. The songs of some of the very best performers are often marred by their broken and disjointed character, even while

they may be unsurpassed for sweetness and tender expression, but the end comes and finds us only half satisfied, as if the songster had withheld something which were ours by right and which he could give us if he would. Not so the Lark Finch, for not only does he sing early and late, long and often, but he seems to put his whole soul into the effort, or perhaps better, to send forth his lay without effort and to never tire. During the pairing time I have seen several males in pursuit of a female who with affected coyness led them a rapid chase through the tangled maze of brush and foliage, and as they pressed ardently on each gave voice to a hurried strain of melody which bleat into a whole, and marked their track as it were by a continuous stream of music.

“By the last of July or early August the young are all well on the wing and the birds then assemble in flocks irrespective of age or sex and so continue until the ensuing spring. In Florida, New England, and the states bordering on the coast, it has hitherto been looked upon as a mere straggler. But so many instances of its capture are now coming to light in the latter named sections that it would almost appear as if the species were actually from some cause moving eastward, and it may eventually take its place in the Eastern fauna as a regular inhabitant.”

GENUS X. PASSERELLA. THE RUFOUS SPARROWS.

GEN. CH. *Bill, rather pointed. Wings, longer than the tail which is slightly rounded. Tertiaries, much shorter than secondaries. Sternum, proportionately stouter than that of Chondestes, with the coracoids shorter and the keel higher, it is not, however, equal in height to one half the length of the coracoids. Size, large.*

All the species are prominently marked on the rump and tail with bright rufous. They are also streaked below. No prominent lines over the eye or white markings on the tail.

PASSERELLA ILIACA.

Fox-colored Sparrow.

Passerella iliaca Sw., Birds, II, 1837, 288.

DESCRIPTION.

SP. CH. Form, very robust. Size, large. Tongue, somewhat fleshy, bifid at the extremity but without the terminal cilia. Sternum, as given under generic characters.

COLOR. *Adult.* Top of head slaty, streaked and tinged with dark-rufous. Remainder of upper portion, including the wings and tail, bright-rufous, clearest on the rump, with the edges of the feathers of the back yellowish-slate. There are two whitish wing bars. Beneath, white, streaked and spotted on the throat, breast, sides, and flanks, with bright-rufous. Abdomen, marked with triangular spots of dark-brown. Under tail coverts, tinged with yellowish. Ear coverts, rufous. Bill, brown, yellow on lower mandible. Feet, brown.

Young. Quite similar to the above, but the slaty is nearly concealed by the rufous which is more extended on the back. The rufous below is lighter and there are few or no dark-brown markings on the abdomen. Sexes usually similar in all stages, but the females are sometimes duller.

OBSERVATIONS.

There is a general uniformity of coloration above but the shade varies somewhat. Below, however, there is more variation. Frequently there are white maxillary lines, below which is one of rufous, when the throat is white or only sparsely spotted. There is sometimes a clustering of rufous spots on the central breast, but occasionally these will be dusky. Rarely the centers of the feathers of the sides and flanks will be dusky. The above changes from the type are purely individual variation not dependent upon age or sex.

Known from the allied species by the bright rufous markings above and below, which will also distinguish them from all other Sparrows. Distributed during summer throughout the Eastern section of North America, above latitude 47°. Winters from New Jersey to Georgia. Rare in Florida.

DIMENSIONS.

Average measurements of twenty specimens. Length, 7.10; stretch, 11.25; wing, 2.95; tail, 3.25; bill, .50; tarsus, .70. Longest specimen, 7.50; greatest extent of wing, 11.75; longest wing, 3.80; tail, 3.10; bill, .55; tarsus, .75. Shortest specimen, 6.80; smallest extent of wing, 10.55; shortest wing, 2.30; tail, 3.17; bill, .45; tarsus, .67.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground, composed of dried grass and moss, lined with feathers. They are large for the size of the bird. Dimensions; external diameter, 5.00, internal, 4.00. External depth, 3.00, internal, 2.50.

Eggs, oval in form, four or five in number, pale-green in color, spotted, blotched, and dotted, irregularly with reddish-brown, with an under tint of lilac markings. Dimensions from .85 x .62 to .86 x .65.

HABITS.

The Magdalen Islands lie in the midst of the cold, wind-swept waters of the Gulf of St. Lawrence. They are mainly of volcanic origin and the surface is hilly, but the soil is rather poor, producing, as a natural growth of timber, nothing better than small spruces and hemlocks. Although these trees are low, seldom exceeding twenty feet in height, they grow quite thickly together. The branches are gnarled and cover the trees from top to bottom, the limbs of one tree mingling with those of others standing about it, and thus the whole forms a tangled maze through which it is impossible to penetrate without the aid of an axe. This dwarfing of the trees on these northern islands is not due to the sterility of the soil as much as it is to the climate, for these isolated spots of land are surrounded by water which is at a very low temperature, indeed it is filled with floating ice for at least eight months of the year. Upon my visit to the Gulf I found that ice-floes were still there, although it was as late as the last week in June. These frigid surroundings quite intensify the climate which is not much warmer than that of Southern Greenland. Thus I found snow in the woods during the first week of July, and after remaining through the exceedingly short summer which the inhabitants of this bleak region enjoy, I was not surprised at the peculiar character of the trees and scant vegetation, for there were but few days when an overcoat was not comfortable.

The tangled thickets did not cover the entire surface, for the inhabitants had cleared away some portions, often forming little glades which were protected from the cold winds by the surrounding trees and into which the sun shone with genial rays. These secluded spots were the chosen resorts of the Fox-colored Sparrows and there they built their nests, placing them on the ground beneath some low drooping limb by which they were usually concealed. The parents were solicitous for the safety of their eggs and greeted our appearance with shrill chirps of alarm. But when we approached cautiously we could hear the magnificent song of the male filling the clear, still air with melody. I had often heard these birds sing in New England, but learned for the first time what the full song was when I saw them on the Magdalen Islands, their efforts while migrating being only a prelude to their more finished attainments. These fine strains consist at first of three, clear, rather rapid notes given with increasing emphasis, then a short pause ensues and the remainder of the lay is poured forth more deliberately, terminating with a well rounded note giving a finish to a song which, for sweetness and clearness of tone, is seldom surpassed even by our best performers.

The Fox-colored Sparrows deposit their eggs about the last week in June, and the young accompany the adults in August, migrating with them in large, straggling flocks later in the season. This species has been found in Florida but twice to my knowledge, both times by Mr. Boardman. They are quite common in the Carolinas, however, where they remain until about the first of March, when they return northward in company with other Sparrows.

GENUS XI. CARDINALIS. THE CARDINAL GROSEBEAKS.

GEN. CH. *Bill, thick, upper mandible slightly curved. Wings, a little shorter than the tail, which is considerably rounded. Sternum, stout, with the coracoids much shorter than the top of the keel which is almost as high as one half the length of the coracoids. Head, crested. Size, large.*

The males of all the species are bright in color, but the females are duller. They are not streaked below. No prominent lines over the eye or white markings on the tail.

CARDINALIS VIRGINIANUS.

Cardinal Grosbeak.

Cardinalis Virginianus Bon., List, 1838.

DESCRIPTION.

SP. CH. Form, very robust. Size, large. Tongue, very fleshy, triangular in form but provided with the terminal hair-like fibers. Crest, pointed.

COLOR. *Adult male.* Bright vermilion-red, duller on the back, wings, and tail. Inner webs of wing feathers, dark-brown. Lores, line at base of bill, chin, and throat, black. Bill, coral-red. Feet, brown.

Adult female. Wings and tail similar to those of the males, remaining upper portions are yellowish-brown. Beneath, yellowish-rufous, lighter on the abdomen. There are traces of vermilion on the throat and upper breast. Under wing coverts, vermilion and the crest is tinged with it. Bill and feet as in the male. The black markings of the head and throat are considerably paler.

Young. Are duller. The males are overwashed on the back with olivaceous and the females show no traces of vermilion on the lower parts.

OBSERVATIONS.

This well marked species may be recognized at once by the description as given. There is a general uniformity of coloration but specimens from Virginia are much paler than those from Florida. Distributed throughout the Eastern section of the United States from the latitude of Virginia southward. Not migratory.

DIMENSIONS.

Average measurements of thirty-seven specimens from Florida. Length, 8.39; stretch, 10.95; wing, 3.55; tail, 4.40; bill, .87; tarsus, .90. Longest specimen, 9.00; greatest extent of wing, 11.75; longest wing, 3.85; tail, 4.30; bill, .95; tarsus, .72. Shortest specimen, 8.75; smallest extent of wing, 10.25; shortest wing, 3.30; tail, 3.50; bill, .80; tarsus, .75.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in trees. They are rather compact structures, composed of weeds, leaves, and Spanish moss, lined with fine grass. Dimensions; external diameter, 4.60, internal, 2.75. External depth, 2.00, internal, 1.00.

Eggs, three or four in number, elliptical in form, ashy-white in color, spotted, blotched, and dotted, irregularly with reddish-brown and lilac. Dimensions from 1.00 x .80 to 1.05 x .78.

HABITS.

The plantations of Florida are usually bordered with quite low shrubbery but it grows very luxuriantly and is often filled with briars or other climbing plants, the whole forming dense thickets which are exceedingly difficult to penetrate. As a natural result, all of these tangled copses form fastnesses for many of the birds which feed in the adjacent grounds. The first time I entered a field in the South a cloud of Sparrows of several species arose

from the weeds and sought shelter in these bushes. I went in pursuit of them in order to ascertain what they were, when my attention was attracted by a chirp not unlike that of the Fox-colored Sparrow, yet it seemed sharper. I could not imagine what the author of this cry could be, so advanced cautiously, at the same time peering into the undergrowth, when suddenly a brightly colored bird dashed across a small opening, looking like a flash of red light. I then recognized the Cardinal Grosbeak but was quite surprised to find that they frequented low bushes. This, however, has been their habit wherever I have chanced to meet them. On the Sea Islands they are common along the borders of the cotton fields and were very abundant, late in October, in low bushes on the banks of the famous Deep Cut of the Delaware and Chesapeake Canal. An apparent inclination to sociability causes them to flock even during winter, on the approach of spring this feeling increases and large numbers assemble in order to feed upon the newly ripened seeds of maple which are nearly ready to fall early in February. I have seen upwards of twenty feeding on one small tree and, as it was destitute of leaves, the brightly plumaged birds gave it a singular appearance. When eating they are silent but never quiet, and while jumping from limb to limb, clinging to the under side of a branch, or swinging from some topmost bough in order to reach a tempting cluster of seeds, they assume various graceful positions. A little later in the season they may be seen searching for seeds and insects on the ground, for which purpose they frequently scratch among the fallen leaves after the manner of the Towhee Bunting.

All through the winter they are comparatively silent, but when the jasimine begins to show its yellow flowers and the air is fragrant with its perfume, the full, clear notes of the Cardinal may be heard from morning until evening. Their exceedingly fine song and brilliant plumage attracts universal attention and consequently the Red Birds, as they are always called in the South, are general favorites. Confident of not being disturbed they build their nests near dwellings, in fact, like the Mocking Birds, they appear to seek the presence of man as a protection from natural enemies, and thus are rarely found in uninhabited sections.

In Florida the nests are frequently placed in orange trees about five feet from the ground. The eggs are deposited about the middle of April when the orange blossoms are filling the air with their delightful odor. The females sit very closely and I have nearly placed my hand on them before they would fly. There were never over three eggs in the nests which I found in Florida but further north they lay four as a regular number. This circumstance would, at first thought, seem to indicate that the Cardinals of Florida possess less vigor, but I think it is rather due to the fact that they breed oftener than those further north. The eggs are also larger. Both sexes exhibit great solicitude on being disturbed when breeding, uttering their sharp cry of alarm which causes all the birds of the same species in the immediate vicinity to assemble. Then in a few moments one will be surrounded by quite a quantity of the red-plumaged Cardinals. There are always numbers within call as they breed in communities, and I have found at least a dozen nests in one small grove. The assembled Cardinals will hop restlessly about, with crests elevated, showing the utmost sympathy for the pair that are in trouble. This fellow feeling is not only evinced during the breeding season but this bird is one of the most compassionate that

I ever saw. Not only will they endeavor to defend one of their own number when it is injured but will even heed the cry of distress of other species. I once saw this trait exhibited in a very striking manner. I was collecting at Miami and had shot a Maryland Yellow-throat which fell to the ground badly wounded, but chirping loudly. This sound attracted the attention of a female Cardinal that was in the same thicket. She instantly came to the spot and alighted over the Warbler which was then lying panting on the ground. After examining it anxiously for a moment she dropped down, hopped up to it, and, gently taking it by one wing, endeavored to raise it. The little sufferer was by this time nearly dead and consequently unable to stand, readily comprehending that her efforts were quite useless and perceiving my approach the Cardinal slowly retreated manifesting by every movement as well as note the deepest pity for the unfortunate bird. Nor are the Red Birds lacking in courage, for they will defend themselves even when badly wounded, biting very fiercely with their strong beaks. As their virtues are many and their vices very few, the Cardinals well merit the approbation which is tendered them everywhere.

GENUS XII. CARPODACUS. THE PURPLE FINCHES.

GEN. CH. *Bill, thick, somewhat swollen at base. Upper mandible, curved. Wings, much longer than the tail which is decidedly forked. Sternum, stout, with the coracoids considerably shorter than the top of the keel which is equal in height to one half the length of the coracoids. Head, sub-crested. Size, medium.*

The males are brightly colored but the females are duller. The adult males are streaked above, the females and young above and below. No prominent white markings on the tail.

CARPODACUS PURPUREUS.

Purple Finch.

Carpodacus purpureus, GRAY'S Genera; 1848-49.

Carpodacus Californicus, BAIRD, Birds N. A.; 1858, 413.

Carpodacus Cassini, BAIRD, Birds N. A.; 1858, 414.

DESCRIPTION.

SP. CH. *Form, robust. Size, not large. Tongue, very short and fleshy, triangular in form, rounded at the extremity which is fringed with fine cilia. Sternum as given above. There is a rounded sub-crest of pointed feathers.*

Color. Adult male. Dull crimson-lake, brightest on the head, palest on the rump, streaked on the back, sides, and flanks with dusky. Abdomen and under tail coverts, white, with the latter tinged with crimson-lake. Wings and tail, brown, with the outer edges of all the feathers pale-crimson. There are two wing bars of the same color. Loes and ring around eye, gray. Under wing coverts, white, tinged with crimson. Bill, brown. Feet, dark brown.

Adult female. Olivaceous-brown above, streaked with dusky. The wing bars are whitish. There are indications of a whitish superciliary line. Beneath, white, streaked and spotted everywhere, excepting on the abdomen and under tail coverts, with olivaceous-brown. Other portions similar to those of the male.

Young. Similar to the adult female, but with a greenish overwashing above and with yellowish-rufous edgings to the markings below. The superciliary line is clearer and the bill is darker.

Nestlings. Are overwashed with yellowish-rufous above and below, even the under tail coverts are tinged with it. The streakings are finer and the colors are more suffused. There are no indications of the white superciliary line. The feet and bill are of a darker brown.

OBSERVATIONS.

Specimens vary greatly in shade of color. Spring birds are somewhat brighter than winter specimens, but this is mainly due to the wearing away of the paler edges of the feathers. The white of the abdomen is also more extended on some than on others. When kept in confinement this species assumes a cage plumage of a dull yellow, but Mr. Brewster shot a specimen, colored in this manner, which was in company with several that were in normal plumage, and two skins of males, now before me, which are in full spring dress, have scattering feathers of a yellow color on the throat. A skin which I took at Williamsport, Pennsylvania, is quite yellow on the back.

Known from the closely allied *frontalis* by the duller colors, which are comparatively uniform above, and the more

deeply forked tail. The females and young of *frontalis* are more finely streaked above and below. I cannot consistently consider the so called "*Californicus*" and "*Cassinii*" as species, so give them as synonyms. Distributed during summer across the Continent north of latitude 40°. Winters between latitudes 42° and 30°. Rare in Northern Florida.

DIMENSIONS.

Average measurements of twenty-seven specimens. Length, 5.95; stretch, 8.95; wing, 4.35; tail, 2.20; bill, .57; tarsus, .45. Longest specimen, 6.35; greatest extent of wing, 10.10; longest wing, 3.47; tail, 2.10; bill, .70; tarsus, .50. Shortest specimen, 5.50; smallest extent of wing, 9.47; shortest wing, 3.12; tail, 2.00; bill, .42; tarsus, .45.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in trees, composed of small twigs and fine roots, lined with horse-hair and strips of fibrous bark, usually from cedar trees. Dimensions; external diameter, 4.50, internal, 2.75. External depth, 2.50, internal, 1.50.

Eggs, four or five in number, oval in form, light-blue in color, spotted and dotted, irregularly, with black, lilac, and amber. The black markings occasionally form lines. Dimensions from .85 x .55 to .86 x .60.

HABITS.

When the stately elm trees of New England are putting forth their blossoms, which always appear when the trees are destitute of leaves, troops of Purple Finches may be seen perched on the high branches, eagerly devouring the bursting buds. Later, when the apple trees are covered with pink and white flowers, these birds visit them in order to feed on the petals. Finches which I have dissected at this time were literally crammed with such food. This practice must be detrimental to the fruit as many stamens are also detached by the Finches when they are removing the petals. As these birds eat but few insects, subsisting the greater portion of the year upon seeds and berries of the cedar, they never recompense the husbandman for the injury which they do him. In spite of this, however, the Red Linnets, as they are commonly called, are great favorites with almost everybody, which is mainly due to the fact that their song is exceedingly fine being a continuous, rippling melody, but their musical qualities are frequently a cause of misfortune to them as many are captured and caged. They thrive well in confinement, amply rewarding the care which is bestowed upon them by frequently pouring forth their charming carol. Contrary to the rule, the females sing although not as loudly as the males, but the song is nearly as fine. This species is at least three years in acquiring the fall dress, but the young breed while in the gray plumage. The nests are usually placed in low cedars and I have known of several pairs to occupy adjacent trees. They are not very solicitous for the safety of their eggs, merely uttering a few alarm notes if disturbed. When frightened they will dart into the nearest evergreen tree and remain perfectly quiet. One can then pass directly under the birds without causing them to move, and, although there may be several, it is extremely difficult to discern them. Then suddenly one who is evidently the leader, will utter a peculiar, chucking note when instantly they will all spring into the air, rising and falling in their undulating flight until they disappear in the distance. The males have the somewhat similar habit of rising to a considerable height then descending slowly with wings held upwards, at the same time singing loudly. This is practiced only during the breeding season and usually in the immediate vicinity of the nests.

The Purple Finches remain in Massachusetts in small flocks all winter, frequenting some thick grove, but they are much more common at this season in the pine woods of Pennsylvania. They also occur on the plantations of the Carolinas and I have seen them, on one or two occasions, near Jacksonville. They appear to prefer the open country while

in the south for I never met with them in the piney woods. While migrating and at other times these birds do not accompany members of the same family but move by themselves. They also differ from most Fringilline birds in not associating in large numbers, for I never saw over twenty in one flock.

GENUS XIII. PIPILLO. THE GROUND BUNTINGS.

GEN. CH. *Bill, thick, somewhat swollen at base of lower mandible. Upper mandible, curved. Wings, a little shorter than the tail. Feet, large. Sternum, stout. Coracoids, shorter than top of keel which is considerably lower than one half the length of the coracoids. Size, large.*

Prevailing colors above, dark, lighter, below. The tail is usually, though not always, prominently marked with white. Iris, usually highly colored.

PIPILO ERYTHROPHthalmus.

Red-eyed Towhee.

Pipilo erythrophthalmus Vieill., Gal. Ois. I, 1824, 109.

DESCRIPTION.

SP. CH. Form, robust. Size, large. Tarsus, long, not very fleshy, provided with a bifid tuft of coarse, terminal, hair-like fibers. Sternum as given above. The feathers of the head are elongated.

Color. *Adult male.* Upper portion of body, including wings and tail, throat, sides of head and neck, and upper breast, black. Edge of wing, outer webs of basal portion of all the primaries, and elongated spot on the outer four, forming an oblique bar, spots on outer webs of secondaries, entire outer webs of outer tail feathers and terminal portion of all but the central pair, middle of breast, and abdomen, white. Sides and flanks bright chestnut, with the lower side of the anterior portion narrowly edged with black. Under wing coverts, under tail coverts, and crissum, pale-chestnut. Feet, brown. Bill, blue-black. Iris, red.

Adult female. With the black replaced by reddish-brown. White as in the males. The chestnut is much paler and the feathers of the back show darker centers.

Young male. In this stage the white of the tail is less extended. The white markings of the secondaries are obscured with rufous and the feathers of the rump and upper tail coverts are edged with it. There is no black margin to the chestnut of the sides.

Young female. Strongly overwashed with rufous above, the white markings being obscured by it. The white below is tinged with yellowish and there are indications of rufous wing bars.

Nestlings. Similar to the young female but streaked above and below with dusky. There are strong indications of wing bars. The males in this stage may be known from the females by the general darker colors above, the wings and tail being black as their feathers are not molted until the following autumn. Iris bluish-white.

OBSERVATIONS.

There is occasionally a concealed spot of white on the throat. Florida specimens do not differ essentially from more northern skins excepting that the chestnut is richer in shade, but almost all the birds that I obtained on the Alleghany Mountains in Pennsylvania show traces of white streakings on the scapularies, thus approaching the western forms of the genus. A spring specimen from Peotons, Illinois, shows an inclination to albinism but otherwise does not differ from skins taken in Massachusetts. Known from the closely allied species from the West by the smaller amount of white on the wings and from other species by the description as given. For comparison with the new Florida species see observations on page 111.

Distributed in summer throughout the Eastern section of the United States between the latitudes of South Carolina and the White Mountains. Winters from the Carolinas to Middle Florida.

DIMENSIONS.

Average measurements of fifteen specimens. Length, 8.65; stretch, 11.23; wing, 3.50; tail, 3.76; bill, .60; tarsus, 1.02. Longest specimen, 8.50; greatest extent of wing, 12.25; longest wing, 3.70; tail, 4.00; bill, .67; tarsus, 1.10. Shortest specimen, 7.60; smallest extent of wing, 10.40; shortest wing, 3.30; tail, 3.32; bill, .60; tarsus, .95.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground. They are loosely constructed, being composed of grass, leaves, and strips of bark, lined with fine grass. Dimensions: external diameter, 3.50, internal, 2.00. External depth, 2.50, internal 1.00.

Eggs, four or five in number, elliptical in form, ashy-white in color, spotted, dotted, and blotched, with reddish-brown and lilac. Dimensions from .90 x .70 to .95 x .75.

HABITS.

When one is wandering along the hummock edges of Florida, he will frequently be greeted by a sudden, explosive chirp which is given so loudly as to be almost startling. The author of this sound is concealed by the dense thicket and the most that can be seen of it is the quick flirt of a white-tipped tail as the bird beats a hasty retreat deeper into the bushes. If the spectator remain quiet for a few moments, however, he will see a pair of bright red eyes watching him from among the foliage and will be saluted by an inquiring *tow-hee*, for the Red-eyed Bunting is exceedingly inquisitive, but upon perceiving the slightest motion it is off, loudly and petulantly repeating its *tow-hee, tow-hee*. This is the only note I ever heard from this species in Florida, neither did I ever find them elsewhere than along the margins of the thick woods, but when in the north their habits are quite different.

The rocky sides of the Alleghany mountains are covered with small trees while the intervals between them are occupied by low bushes. This shrubbery forms a favorite resort for the Towhees, and the males may be seen any morning in May perched on the topmost boughs of the highest trees, busily engaged in pouring forth their somewhat disconnected song. This lay is not fine but yet enlivening for it rings out loud and clear and, as it echoes along the steep sides of the valleys, produces an effect which is quite pleasing. In Massachusetts the Towhees are found in open fields grown up to bushes, or along fence rows. Here they are quite familiar, following the pedestrian about when he invades their domains, occasionally uttering their peculiar cry.

They breed in the localities which I have described, about the middle of May, almost always building on the ground but on one occasion I found the nest on a small limb about a foot above the surface. The females, when setting, are quite tame and I have frequently nearly placed my hand on them before they would fly.

In August the newly fledged young are found in pastures feeding upon berries, in company with their parents. In this stage of plumage the streaked breast and whitish eyes give them a singular appearance quite at variance from the adults. They do not keep this dress long, however, but gradually assume one more like that of the mature birds. The Towhees spend the greater portion of their time on the ground, frequently scratching among the fallen leaves after insects. This habit is especially noticeable in autumn when the birds gather in straggling flocks on their southward migration.

PIPILO LEUCOPIS.

White-eyed Towhee.

DESCRIPTION.

Plate IV. Adult male and female in spring.

SP. CH. Form, robust. Size, medium. Tongue, not very fleshy, provided with a bifid tuft of coarse, terminal, hair-like fibers. Sternum, similar to that of *erythrophthalmus*, but not as stout. The feathers of the head are elongated.

COLOR. *Adult male.* Upper portion of body, including wings and tail, throat, sides of head and neck, and upper breast, black. Edge of wing, outer webs of basal portion of all the primaries, and elongated spot on the outer four, forming an oblique bar, spots on outer webs of secondaries, narrow line on outer webs of outer tail feathers, spots on terminal portion of three pairs, not, however, extending to the shaft, middle of breast, and abdomen, white. Sides and flanks, chestnut

with the lower side of the anterior portion narrowly edged with black. Under wing coverts, under tail coverts, and rissum, pale-chestnut. Feet, brown. Bill, blue-black. Iris, white.

Adult female. With the black replaced by reddish-brown which has a slaty under tint. White as in the males. The chestnut is much paler being fully as light as that on the under tail coverts. The feathers of the back and top of head show darker centers.

Young male. In this stage the white of the tail only extends over two pairs of feathers. The white markings of the secondaries are scarcely perceptible. There is no black margin to the chestnut of the sides. The feathers of the wings and rump are narrowly edged with rufous.

Young female. Strongly overwashed with yellowish-rufous above, the white markings being more or less obscured by it. The white below is tinged with yellow.

Nestlings. Similar to the young female but streaked above and below with dusky. The iris in this stage is light-brown, quite different from that of the adult.

OBSERVATIONS.

There is a concealed spot of slaty-white on the throat, indeed all of the under tint is slaty. This species differs from *erythrophthalmus*, its nearest ally, in being smaller and in having less white on the tail. This never extends over more than three pairs of the tail feathers and does not occupy the entire width of the outer web, but has a narrow line of black next the shaft. The white of the wings is also less extended. The chestnut is much paler but the most noticeable difference in the living specimen is the white eye. The females may be distinguished at once by the slaty tint of the portions which are black in the males. This is quite different from that of any other species which I have ever examined. Constant resident in the scrub lands of Florida, Georgia, and the Carolinas.

DIMENSIONS.

Average measurements of twenty-seven specimens. Length, 7.70; stretch, 10.24; wing, 3.01; tail, 3.40; bill, .56; tarsus, .95. Longest specimen, 8.25; greatest extent of wing, 10.50; longest wing, 2.80; tail, 3.70; bill, .50; tarsus, 1.00. Shortest specimen, 7.50; smallest extent of wing, 9.47; shortest wing, 3.25; tail, 3.05; bill, .65; tarsus, .90.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground. I have never seen a specimen but, judging from the description given to me by Mr. J. L. Burton who found one, think that it closely resembles that of the preceding species.

Eggs, four in number, elliptical in form, creamy-white in color, spotted and dotted with reddish-brown, a little more thickly on the larger end. Dimensions from .95 x .70 to 1.00 x .75.

HABITS.

On February 4, 1868, I launched my boat for the first time on the Indian River which runs along the coast of Florida for some hundred and fifty miles, parallel to the sea and but a short distance from it. We were bound for the canal which connects the body of water, spoken of above, with Mosquito Lagoon. After many adventures and delays we at last succeeded in finding the place and camped on the north side of Haulover Canal. Our tents stood in a little grove and a series of hummocks extended up and down the river, but the remainder of the country was covered with scrub composed of dwarf oaks, gall berries, and other bushes. These grew so thickly together that it was exceedingly difficult to make our way through it, but a narrow path extended from our camp to the orange grove of Capt. Dummett who lived about a mile and a half south of us. I was walking along this path one day when my attention was attracted by seeing what appeared, at first, to be a common Towhee gazing at me from the foliage; but on examination I saw that it had white eyes. This was my first acquaintance with the White-eyed Towhee but since then I have found them very abundant in every favorable locality from Southern Florida to the Carolinas.

This species frequents the scrub, never being found elsewhere. Like the Red-eye they spend the greater portion of their time on the ground, and on still mornings may be heard scratching among the leaves in all directions, for they are very numerous wherever

they occur. These birds are exceedingly inquisitive and will follow one for a long distance through the bushes. The White-eyed Towhees are also sympathetic for they will gather in large numbers around a wounded comrade when they hear its cries, evincing the utmost compassion for its misfortune. Although they possess similar habits to those of the more northern species yet they are not as restless, neither is the ordinary call given as loudly or with as much energy. This note also has a different sound, like the syllables *jo-ree* with a very decided accent on the latter, the first being frequently given so quickly and so low that it is not very noticeable. I have often heard the two species together and could always distinguish them by this utterance alone.

Throughout the winter the White-eyed Towhees do not sing, but by the first of March the males may be seen on the highest boughs of the small live oaks, pouring forth their song which is lower and sweeter than that of the Red-eye. This outburst of song is the prelude to the breeding season, and soon the birds are basily engaged in constructing their domiciles. Although I have searched long and carefully for the nest yet, on account of the thickness of the bushes among which they build, never found one. It is quite probable that the females sit closely, as they are very tame, which would also render the nests difficult to find. The first week in April, however, I was fortunate enough to capture a newly fledged young in the bushes, near our camp on Indian River. There were quite a number of the little *Jo-rees*, as the boys call them, about and their parents were extremely annoyed at my presence, scolding me vehemently while they hopped briskly about, jerking their tails over their backs, thus evincing as much anger as is possible for a bird to exhibit. The White-eyed Towhees are often captured and caged by boys who offer them for sale in the cities, but I do not think they sing when in confinement or thrive well. They are oftener taken in the winter than at other seasons for they are constantly resident wherever they occur.

GENUS XIV. MELOSPIZA. THE SONG SPARROWS

Gen. Ch. Bill, thick, somewhat swollen at base. Upper mandible, but little curved. Wings, a little shorter than the tail which is slightly rounded. Sternum, broad, with the coracoids not quite equal in length to the top of the keel which is much shorter than one half the length of the coracoids. Size, medium.

The species are all dull in color and are streaked above. They are lighter below where they are usually spotted or finely streaked.

MELOSPIZA MELODIA.

Song Sparrow.

Melospiza melodia BAIRD, Birds N. A.: 1858, 477.

DESCRIPTION.

St. Ch. Form, rather robust. Size, medium. Tongue, not very fleshy, provided with a terminal tuft of hair-like fibers. Sternum, as given above. The feathers of the head are elongated.

Color. *Adult.* Upper portion of body, including wings and tail, reddish-brown, with the centers of the feathers of top of head and middle of back, tips of secondaries, and inner webs of wings and tail, dark-brown. Edges of the feathers of sides of neck and back, ashy. Median and superciliary lines, ear coverts, eyes, and tips of wing coverts, faintly indistinct bars, also ashy. Under parts, white, with maxillary lines and triangular spots on the sides, flanks, under tail coverts, and breast, where they usually cluster, dark-brown, margined with reddish-brown. Bill, black, yellow at base of lower mandible. Feet, brown.

Young. Similar to the above, but with the ashy markings overwashed with dusky. The other markings above are more suffused and there is a tinge of yellowish-rufous on the entire under parts, excepting the abdomen.

Nestlings. Show no traces whatever of the ashy, which is replaced by yellowish-rufous, and the under parts are very strongly tinged with the latter named color. The streakings below occupy the same position, but are not as wide, and do not form a cluster on the breast. The bill and feet are lighter. Sexes similar in all stages.

OBSERVATIONS.

There are few birds which are more easily recognized than the Song Sparrow, yet it is difficult to find a species where there is so much individual variation in respect to the markings below. In a large series before me, from many sections east of the Mississippi River, I find that there is every gradation, from a breast so slightly spotted as to almost leave the central cluster alone, to one so heavily marked as to nearly obscure the cluster, and even the throat, usually immaculate, is spotted. Rarely there is no clustering of spots on the breast in the adult; this character is, however, usually absent in the nestlings. Specimens from Utah are less spotted than the average of more Eastern skins and are paler above. Known in the adult stage by the streakings above and spots below, taken in connection with the ashy markings of the head. The nestlings may be recognized by the reddish-brown wings and tail. Distributed during the breeding season from the latitude of South Carolina to the far North. Winters from Massachusetts to Northern Florida.

DIMENSIONS.

Average measurements of twenty-eight specimens. Length, 6.38; stretch, 8.75; wing, 2.55; tail, 2.77; bill, .48; tarsus, .75. Longest specimen, 6.75; greatest extent of wing, 8.50; longest wing, 2.80; tail, 2.90; bill, .50; tarsus, .76. Shortest specimen, 6.00; smallest extent of wing, 9.00; shortest wing, 2.35; tail, 2.65; bill, .55; tarsus, .70.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground or in bushes. They are compact structures of grass, lined with finer. Dimensions; external diameter, 4.60, internal, 2.50. External depth, 2.75, internal, 1.75.

Eggs, four or five in number, oval in form, bluish in color, spotted and dotted with reddish-brown and lilac. Dimensions from .65 x .70 to .85 x .65.

HABITS.

Winter has scarcely begun to relax his icy grasp from the water and to lift his snowy mantle from off the land, when those harbingers of the coming spring, the Song Sparrows, begin to chant their enlivening lay about the homesteads of New England. Loud and cheerily do they sing on the bright mornings in early March, and when they have once begun nothing seems to daunt their ardor. No matter how very stormy the weather, daylight always finds them singing. I have heard their song when the wind was blowing a gale, and the little performers were obliged to seek shelter beneath the hedges, and have seen one start to fly when the force of the blast was so great that it fairly swept him into a thicket but he clung tenaciously to the boughs and, as if to bid defiance to the raging elements, poured forth his liveliest carol. Rightly has this species been named *melodia*, for none among our native birds sings so long or so often as the Song Sparrow. As we have seen, they begin their musical efforts amid the snow and sleet of the lingering winter, continuing them through the spring and summer; nor does the sultry heat of August cause them to cease, for even then they sing during the cool of morning and evening. Through the autumn their melodies may still be heard, and when the brown earth is covered with fallen leaves our little, plainly colored friends occasionally indulge in the same clearly given lay that they practiced earlier in the season.

The Song Sparrows are among the first to breed of the smaller birds, nesting often by the middle of April. The nests are sometimes placed in low bushes but oftener on the ground. Shortly after the first brood have been reared a second litter of eggs is deposited and often a third brood is brought out the same season. During the summer and autumn these Sparrows are very fond of the neighborhood of streams and other bodies of fresh water,

indeed they appear to be partly aquatic, for if one be wounded it will instantly jump into the water and strike out boldly. I have also frequently seen them dive beneath the surface when I was about to capture them, or creep into holes with the body submerged, behaving much as I have seen young ducks under similar circumstances.

These sparrows, like the greater portion of the family, are seldom found in the woods but prefer hedge rows along open fields. On the Magdalen Islands they find shelter in the short shrubbery on the edges of the little clearings, they are abundant on the margins of the rich interval lands of Maine, and thousands may be found in the thickets along fences which intersect the farms of Massachusetts. They also swarm in countless myriads in the rank growth of vegetation along the river bottoms of Pennsylvania. On the borders of the cotton plantations of the Sea Islands, they were very numerous and I even met them in the orange groves of Northern Florida; in fact it is difficult to find a single locality where one will not be greeted by the chirp or melodious carol of the Song Sparrow, for they are one of the most abundant of birds in the section of which I write.

GENUS XV. HELOSPIZA. THE SWAMP SPARROWS.

GEN. CH. *Bill, somewhat slender, not thick nor swollen at base. Upper mandible, but little curved. Wings, longer than the tail which is slightly rounded. Sternum, not stout, with the coracoids equal in length to the top of the keel which is very low, not exceeding in height one third the length of the coracoids. Size, rather small.*

I have been induced to follow Prof. Baird's suggestion as given in *Birds of N. A.* 1858, p. 477, and remove the species herewith given from the genus *Melospiza*, not only on account of the differences in external structure, but also on account of the peculiar form of the sternum which has as low a keel and as long coracoids as any genus in the Family, not excepting *Ammodramus*, to which *Helospiza* is closely allied both in structure and in habit.

HELOSPIZA PALUSTRIS.

Swamp Sparrow.

Helospiza palustris BAIRD, *Birds N. A.*; 1858, 477.

DESCRIPTION.

SP. CH. Form, rather robust. Size, small. Tongue, rather thin and horny, provided with a bifid, terminal tuft of hair-like fibers. Sternum, as given above.

COLOR. *Adult in spring.* Ear coverts, sides, flanks, upper portion of body, yellowish-rufous, with the latter broadly streaked with dark-brown. Top of head, chestnut. Forehead, maxillary and superciliary lines, lores, back of neck, and band across breast, ashy. Outer webs of wings and tail, bright reddish-brown, dullest on the latter; inner webs, brown. Spots on scapularies and wing coverts, dark-brown. Throat, belly, abdomen, and under tail coverts, white, with the latter tinged with yellowish. Bill and feet, brown.

Adult in winter. Similar to the above, but with the chestnut of the top of head obscured with black markings, and a median line of ashy extends from bill to occiput.

Young. Have the sides and flanks streaked with dusky, while the top of the head is streaked with black, and the sides of the head are tinged with yellowish.

Young of the year. Colors above, more suffused, and there are but slight indications of maxillary lines. There is a tinge of yellowish over the throat, sides, flanks, and breast, and the latter is streaked with dusky.

Nestlings. The ashy markings are obscured with yellowish-rufous, and the entire under parts are tinged with it. The lower neck and breast are streaked more or less with dark-brown. Bill, lighter. Sexes similar in all stages.

OBSERVATIONS.

Specimens vary considerably in shade of color on the back, some having it nearly as bright as the crown. The streakings are also broader on some than on others. Readily distinguished in the adult stages by the clear chestnut crown and black forehead, taken in connection with the ashy band across the breast. The younger stages may always be distinguished by the bright reddish-brown wings which are very noticeable even in the nestlings. Distributed, during the breeding season, throughout Eastern United States, from the latitude of Pennsylvania north to that of Canada. Winters from the Carolinas to Southern Florida.

DIMENSIONS.

Average measurement of fifteen specimens. Length, 5.70; stretch, 7.76; wing, 2.85; tail, 2.23; bill, .45; tarsus, .82. Largest specimen, 6.00; greatest extent of wing, 8.12; longest wing, 2.60; tail, 2.35; bill, .50; tarsus, .90. Shortest specimen, 5.40; smallest extent of wing, 7.40; shortest wing, 2.20; tail, 2.12; bill, .41; tarsus, .75.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground, composed of dried grass and weeds, lined with finer grass. Dimensions; external diameter, 1.00, internal, 2.50. External depth, 2.75, internal, 1.75.

Eggs, four or five in number, oval in form, pale-blue in color, spotted and dotted quite finely with reddish-brown and black. Dimensions from .56 x .75 to .60 x .80.

HABITS.

I know of but few if any localities north of Florida where the vegetation grows more luxuriantly than on the margins of the little creeks which empty into the Susquehanna River, Pennsylvania. The soil is exceedingly fertile, for it is composed of the washings of the rich lands on the slopes, and produces a fine growth of timber. Here the sturdy sycamore grows to perfection, often rearing its lofty leaf-crowned head to the height of a hundred feet. Black walnuts also attain to a large size, while beneath them grow a host of butternuts, wild plum, hawthorns, and other small trees which so completely shade the surface, that it seems impossible for any thing to obtain light enough to thrive at all, but in spite of the dense overhanging foliage, the ground is thickly covered with rank nettles and other weeds. But wherever an opening occurs admitting the sunshine the herbage becomes exceedingly high; this is especially noticeable along the margins of the streams where giant grasses often six feet in height overhang the water. Upon the whole it would be difficult to find a place more conducive to bird life, and many species were very abundant there. The branches above were filled with the more arboreal birds while swarms of the terrestrial found a home in the herbage below, and the more open sections were occupied by the Swamp Sparrows. Here they remained throughout the summer, sheltered from the sultry noon time heat by the cool green foliage above, and they linger late in autumn, long after the butternuts have fallen and the ground is strewn with leaves, when the naked stalks and withered rustling grass affords them but slight protection.

I have ever found that the Swamp Sparrows seek grassy thickets and are common in them along the streams of Florida, even as far south as Miami. I have never heard them make any attempt at a song in the South, but in Massachusetts they trill forth a sprightly lay that consists of a series of rapidly given notes which, although somewhat resembling those uttered by the Chipping Sparrow, are more lisping and not as loud. This performance is given only during the breeding season, but in the autumn they have a very pretty warbling song which, although low, is exceedingly sweet.

The Swamp Sparrows breed about the last week in May, usually placing the nest on a tussock or on the ground, but I once found one that was fastened half way up the thickly growing stalks of some coarse grass, the bent tops of which formed an arch over it and nearly concealed it. The young may be seen accompanying their parents in August, and migrate with them in November, when they all usually move along the low lands, but on their return in spring they often follow other Sparrows across the uplands.

GENUS XVI. AMMODROMUS. THE SHORE FINCHES.

GEN. CH. *Bill, quite slender, not thick nor swollen at base. Upper mandible, somewhat curved. Wings, longer than the tail which is considerably rounded, and with the feathers acuminate. Sternum, not stout, with the coracoids equal in length to the top of the keel, or a little shorter. Keel, low, either not exceeding in height one third the length of the coracoids or but little higher. Size, small.*

The sternums of this genus vary considerably, in fact more so than is usual in species which are so closely allied. In other anatomical structures, however, there is but little difference and the more important external characters are also quite similar. The edge of the wing is yellow.

AMMODROMUS MELANOLEUCUS.

Black and White Shore Finch.

Ammodromus melanoleucus MAYNARD, *Rod and Gun*, Jan. 16, 1875.

DESCRIPTION.

Plate V. Adult in spring.

SP. CH. Form, slender. Size, small. Tongue, long, thin and horny, provided with a bifid, terminal tuft of hair-like fibers. Sternum, not stout, with the keel very low, not exceeding in height one third of the length of the coracoids which equal in length the top of the keel.

COLOR. *Adult.* Above, black, with the feathers narrowly edged with ashy. Wings, and tail very dark-brown with the outer webs margined with greenish. Beneath, white, broadly streaked everywhere, excepting on the abdomen, with black. Line extending from upper mandible to point over the eye, and edge of wing, bright-yellow. Bill, black, bluish at base of lower mandible. Feet, brown.

Young. Similar, but tinged with yellowish-rufous on the breast, sides of head, and flanks. The outer edges of the wing feathers are also brownish. Sexes, similar in all stages.

OBSERVATIONS.

There is a general uniformity of coloration in specimens of the same age, but the streakings are broader on some than on others, when there is frequently a central clustering of spots on the breast, and sometimes there are white maxillary lines. Readily distinguished from all others by the preponderance of black below. The distribution of this species is very limited as thus far observed, and none have been taken, to my knowledge, since 1872 when I found them on the saline savannas about Salt Lake and on the marshes east of Indian River, but south of the Haulover Canal. They are migratory but I do not know where they spend the winter. The nests and eggs are unknown.

DIMENSIONS.

Average measurements of eight specimens. Length, 6.95; stretch, 7.87; wing, 2.32; tail, 2.01; bill, .50; tarsus, .78. Longest specimen, 6.25; greatest extent of wing, 8.25; longest wing, 2.50; tail, 2.25; bill, .60; tarsus, .80. Shortest specimen, 5.75; smallest extent of wing, 7.50; shortest wing, 2.15; tail, 2.25; bill, .40; tarsus, .77.

HABITS.

Near the sources of the St. Johns River in Florida is a little body of water, only about two miles in circumference, called Salt Lake and, as its name implies, is quite brackish. This phenomenon is due, not to its present proximity to the sea which is only six miles distant, for a ridge of high pine lands intervenes, but to the peculiar character of the soil which contains a large quantity of salt. There is but little doubt that this entire section was overflowed by the tides of the ocean not long since. In fact the vegetation which covers these wide-spread plains is almost exactly like that which grows on the marshes of the Indian River. It is composed mainly of coarse grass and a species of rush, both of which grow to the height of four or five feet, and so thickly together that one can scarcely make his way through them. The margin of the lake is, however, destitute of vegetation as are the beds of numerous small creeks which in the spring and summer are dry, and thus form convenient roads.

I was making my way along one of these novel paths on the seventeenth of March, 1872, keeping a sharp lookout for birds, at the same time carefully watching the ground at my feet in order to detect the presence of the venomous water moccasins which were more numerous here than I had ever seen them elsewhere, when my attention was attracted by a little black bird which rose from the high grass about twenty yards from me, hovered a moment, uttering a feeble sputtering song, then dropped down and disappeared. I saw it but a moment, yet I was convinced that it was something that I had never seen before. I laboriously made my way to the spot, but was unable to start it even after the most vigorous efforts. This was my first sight of the new *Anmodromus*, for I was certain that it belonged to this genus and in a day or two my suspicions were confirmed, for an assistant brought in a specimen which he had taken in the place I had first seen it. We did not find any more near Salt Lake nor did I see a single specimen, but shortly after I found them quite common on the marshes of Indian River. Yet I only took seven specimens there, for the birds are exceedingly difficult to obtain as they are not only very shy, but after once starting will seldom rise a second time, remaining concealed in the thick grass. In flight as well as habit this species resembles the Sharp-tailed Finch much more nearly than it does the Gray Shore Finch. The song, or rather the crude attempt at a song, for the low sputtering notes scarcely deserve the title, is given while the bird hovers in air suspended over the same spot, after which it drops quickly into the grass. These are the only notes that I ever heard them utter, except a sharp chirp of alarm which is given when they are disturbed. Then one will appear for a moment on the top of a waving spear of grass, but only for a moment; the next instant it is gone.

The Black and White Finches inhabit the dry marshes where the grass grows in patches surrounded by a peculiar species which is very much lower and which becomes tangled. The birds live in the former, but build their nests in the latter, or I have every reason to believe that they do, as during the latter part of April I started them many times from the herbage, and they exhibited the utmost solicitude whenever I approached certain spots, but I failed completely to find the nest although I searched for it many times. This species was quite common on the marshes of Indian River, just below Dummett's Grove, but I never saw a specimen north of Haulover Canal. They were very abundant on the upper end of Merritt's Island where I obtained a few.

These birds are migratory as they are not to be found in Florida during winter, but where they go during this season I am unable to state, but judge that they may be found on the Bahama Islands, and it is also probable that those I found were merely a colony from that place, where they will doubtless be found to occur in large numbers. They are not, however, to be met with on the Florida Keys, but the character of the vegetation is not conducive to their habits as there are no grassy savannahs.

In comparing this species with the Gray Shore Finch we find that it has entirely different habits; first, the song is quite unlike that of *maritimus*, second, it breeds nearly two months later, and thirdly, it is migratory while the other species is a constant resident in Florida.

COTURNICULUS AUSTRALIS.
Southern Yellow-winged Sparrow.

Ammodramus australis Maynard, Am. Exchange and Mart. Jan 15th, 1887.

PLATE XXXVII.

DESCRIPTION. -

SP. CH. Size, form and general coloration of the Yellow-winged Sparrow, but darker above with less buffy edging to the feathers of the back. Beneath there is a band of decidedly ochraceous crossing the buff of the breast, and this band is streaked with reddish of much the same color as reddish markings of the back.

OBSERVATIONS.

In thus naming the Southern form of the Yellow-winged Sparrow I am merely following my convictions that there is, both in the Bahamas and in Southern Florida, a resident form of Yellow-winged sparrow which is permanently streaked across the breast, not transiently so, as in some autumnal specimens of *C. passerinus*. Above, this species is colored most like the West Indian *C. savannarum*, but this form is not permanently streaked: in fact, an autumnal bird of this species taken at Barbican, St. Andrews, Jamaica, November 11th, 1881, shows no trace of streakings, but the breast is rather ochraceous.

HABITS.

The first specimens which I ever saw of this species I obtained on a sand mound, which was thrown up in constructing a partly completed fort that stands about midway of the eastern shore of Key West, the first week in December, 1870. This mound was covered with grass and in this shelter the sparrows were quite common. I also obtained specimens on the west coast of Florida in April, 1874, and in 1884 obtained two or three more on Key West in the second week in January.

January 26, 1884, I secured a pair on an old plantation to the westward of Nassau, Bahamas. On February 21, I got another not far from the same place, and on March 14th shot two more and saw another. As late as April 12th I obtained a specimen to the eastward of Nassau. All of the birds mentioned from Florida and the Bahamas were typical Southern Yellow-wings.

The Southern Yellow-winged Sparrow is more difficult to start from concealment than is the northern species and when on the wing its movements are more rapid and its flight more eccentric. It never takes long flights and when down runs nimbly through the grass. I have never heard a song from this species, but the alarm note is a short, sharp chirp not unlike that of Henslow's Sparrow. In fact, in general habit this species appears to be intermediate between the Northern Yellow-wing and Henslows.

COTURNICULUS HENSLOWI.
Henslow's Sparrow.

Coturniculus henslowi, Bon., List, 1838.

DESCRIPTION.

SP. CH. Size, small; form, slender. Bill, about as stout as in the Yellow-winged Sparrow, but shorter, and the tail feathers are more acuminate.

COLOR, adult. Top and sides of head and back of neck, greenish buff, with center of feathers of top of

head, forming two broad lines, and some lines on back, black. Line back of eye, and broken maxillary line, also black. Back, including upper wing coverts, dark brown, with the feathers edged with chestnut, which is in turn edged with whitish. Wings and tail, brown edged with greenish. Beneath, buffy white, tinted across breast and on sides with greenish buff, and these parts are streaked with black. Bend of wing, yellowish. Bill, pale yellow, darker on the upper mandible. Feet, pale brown. In autumn, the lower parts are much more generally suffused with buffy, and the feathers above are more broadly whitish margined. Nestlings are generally similar, but are pale buff behind, and singularly are without streakings. Sexes, similar in all stages.

OBSERVATIONS.

This species may be at once distinguished from the two species of Yellow-winged Sparrows by the greenish buff head, absence of yellow over eye, and by the dark-brown, nearly black, streakings below. From Leconte's Sparrow it may be distinguished by the absence of yellowish buff on the sides and the top of head and by the yellowish bend of the wing, which in Leconte's is white.

NESTS AND EGGS.

Nests, placed on the ground composed of grass, etc. Eggs, four in number, white in color, spotted and blotched with reddish brown and umber. Dimensions, 74 by .49 to .75 by .50.

DIMENSIONS.

Length, 5.25; stretch, 7.12; wing, 2.17; tail, 2.15; bill, .48; tarsus, .70.



FIG. 50. Head and terminal portion of tail feather of Henslow's Sparrow.

HABITS.

In Massachusetts Henslow's Sparrow is not generally common. Many years ago I shot two in a marshy place on my place here in Newtonville. This was in June and my attention was attracted to the bird by its singular song. This was like the syllables "see-wick," the first being dwelt upon, the second given quickly, and both are uttered in a shrill, grasshopper-like tone. Some years after this, when in company with my friends, E. A. and Outram Bangs, I found the species quite common at Tyngsboro, Mass., in high, dry fields, and evidently breeding. This was in June and the males were in full song.

Later still, and somewhat unexpectedly, I found Henslow's Sparrow common in old dry fields, grown up to grass, about Rosewood, in Western Florida. This was early in November, 1881. In 1883 I also found them in the same place early in November. They were common, but were confined to the high grass in old fields. Later in the month they began to grow less common and during December became quite rare, insomuch so that after the 25th of that month, at which time I shot a single female, not one was to be found. From the 20th of the month the weather was unusually cold and stormy and this change of temperature might have accounted for their disappearance.

When in Florida, Henslow's Sparrow does not sing, but has a single sharp note of alarm. When disturbed they ran rapidly through the tall grass, but when forced to take wing by my dog, they rose reluctantly, and moving with an eccentric flight a few yards, dropped into the grass again, or if too hard pressed would occasionally take refuge in bushes, but would soon drop again into the grass. I noticed that they appeared to rather

prefer those portions of old fields in the vicinity of buluses, rather than the wider, grassy places.

COTURNICULUS LECONTEI.

Leconte's Sparrow.

PLATE XXXVI, Young, male, in winter.

DESCRIPTION.

Sp. Ch. Size, small; form, slender. Tail feathers very narrow and acuminate. Bill, slender.

Color. Adult in spring. Throat, sides and flanks, sides of head and brow, line over eye, buff, the latter rather ochraceous. Top of head, brown, with a central stripe of pale or ashy buff. Back of neck, chestnut, with the feathers edged with ashy buff. Feathers of back, primaries and tertiaries, dark brown centrally, this is margined with chestnut which is edged with a buff that often becomes lighter on the outer edges. Wings, pale brown, edged with pale buff. Tail, with center of feathers brown, with faint indications of pale bandings, edged on both webs, more broadly on inner, with reddish buff which becomes lighter on the extreme edges. Below the sides and flanks are decidedly streaked with brown that is sometimes edged with chestnut. Other parts below, not yet mentioned, white, faintly tinged with buff, especially on the under wing coverts. Bend of wing, white. In winter the colors, above and below, are more suffused with buff. Young, rather more buffy than the adult, and in addition to the streakings on the sides there are narrower lines extending across the breast. Iris and bill, brown. Feet, very pale brown.

OBSERVATIONS.

Readily known from the closely-allied Henslow's Sparrow by the buff, not white, throat, white, not yellow bend of wing, and from all other of our sparrows by the buffy colors and exceedingly narrow, acuminate tail feathers. Habitat, during the breeding season, from the Great Plains north to Manitoba, in winter, migrating southward from southern Kansas to Texas and from South Carolina to Western Florida.

DIMENSIONS.

Length, 4.85 to 5.00; stretch, 6.50 to 7.00; wing, 1.95 to 2.00; tail, 2.00 to 2.10; bill, .38 to .40; tarsus, .68 to .70.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground in marshy places, composed of grass, etc. Eggs, four or five in number, oval in form, white in color, spotted and dotted on the large end with brown, black, and sometimes with bluish. Dimensions, .74 by .49 to .75 by .50.

HABITS.

Although Leconte's Sparrow had been previously discovered by Mr. N. C. Brown, in Alabama, I was quite surprised to find it common about Rosewood, Florida, in the autumn of 1881, and again at the same season in 1883. They made their appearance in the latter-named year about the fifteenth of November, during a cold spell which was accompanied by high northerly winds. I first observed them in the pine woods, but later I found them in old fields that had been grown up to high grass. Here they associated with both Henslow's and the Yellow-winged Sparrow, but were rather tamer than either of these species. During damp, foggy mornings I found that they flushed quite readily, flying with a rather weaker flight than either the Yellow-winged or Henslow's Sparrow, usually in a straight line for a few yards, when they would drop into the grass again.

Occasionally they would alight on a bush, when they would remain quiet, much like a quail, without even a motion of the head. When started out of a bush they would drop at once to the ground and instantly disappear in the tall grass. Later in the day, after the grass becomes dry, Leconte's Sparrows are more difficult to start, and at this time they would lie before the dog much like a quail. When wounded, they ran through the grass with surprising rapidity.

The note of this little Sparrow in winter is a kind of double chirp. First comes a sharp note, very decidedly given, followed by one that is still sharper, but with a hissing intonation.

Although Leconte's Sparrows occur in the same fields with other sparrows, they do not associate with them, nor do they gather at all in flocks with each other. I always found them very scattering, perhaps a dozen individuals to an acre of grass land. I found them common all through the latter part of November and through the whole of December until January 1st, when I left Rosewood. During this time there appeared to be several migrations, at all events, the birds appeared to be much more common and widely distributed at certain times than at others.

GENUS XIX. SPIZA. THE SILK BUNTINGS.

GEN. CH. Bill, rather thick, but not especially finch-like. Wings, very long and pointed. Tail, short and not forked, but slightly emarginate. Feet, moderately large. We have a single species only within our limits.

SPIZA AMERICANA, Black-throated Bunting.

DESCRIPTION.

SP. CH. Size, medium. Form, slender. COLOR. Adult male, above, yellowish ash, tinged with greenish, and streaked with dusky, becoming chestnut on the upper part of the wings, then brown on the remainder and tail. White beneath, with superciliary and maxillary lines, middle of breast, under wing coverts, and edge of wing, yellow, with a triangular spot on throat and a small one on breast, black.

Adult female, similar, but everywhere duller, and with the black of throat not as extended. Young male, similar to the female.

OBSERVATIONS.

Readily known in all stages by the yellow beneath, with the black, or, in case of the young, dusky, breast and throat marks. Occurs in the eastern sections of the middle United States and extends west to Kansas, Nebraska and Colorado, south to the Carolinas, north to New Jersey, and, rarely, as far as Massachusetts.

DIMENSIONS.

Length, 6.50 to 7.00; stretch, 10.50 to 11.00; wing, 3.25 to 3.50; tail, 2.50 to 2.75; bill, .53 to .58; tarsus, .20 to .25.

DESCRIPTION OF NESTS AND EGGS.

NESTS, placed in trees or bushes, composed of fine grass, weeds, and rootlets, rather loosely put together. EGGS, three to five in number, oval in form, pale bluish-green in color, usually unspotted. Dimensions, .60 by .75 to .65 by .85.

HABITS.

This is one of the common birds of our Eastern section with which I am not familiar, having seen but a single living specimen. This was at Westertown, Pennsylvania, many years ago. The bird was perched on the top of a huge black walnut tree that stood in the yard of the house in which I was living. It lisped out its singular apology for a song a few times, then flew away. The Black-throated Bunting has been taken a few times in Massachusetts, twice at least, during the breeding season, a female taken in Watertown by Mr. L. L. Thaxter, a number of years ago in summer and a pair taken at West Newbury in June, 1872, by Mr. Gilman Brown.

GENUS XX. CALAMOSPIZA. THE LARK BUNTINGS.

GEN. CH. Bill, large, and short at base, with culman a little curved. Wings, long and pointed. Secondaries, enlarged, one of them reaching the point of the closed wing. Tail, shorter than the wing. Feet, stout. Hind claw, about as long as the toe. The wing is characteristic and somewhat resembles that of the Tit Lark (*Anthus*). We have a single species.

CALAMOSPIZA BICOLOR.

Lark Bunting.

DESCRIPTION.

SP. CH. Size, rather large. Form, stout.

COLOR. Adult male in summer, black, with a large patch of white on the middle of the wing. Female, above, grayish brown, streaked with dusky brown. White, beneath, tinged with grayish brown on the sides, thickly streaked everywhere, excepting on the head and abdomen, with dark brown. There is a poorly defined superciliary stripe. Wing, much as in the male, but the white is not as extended. Male in winter and the young are like the female.

OBSERVATIONS.

Known from all other North American Birds of a similar size by the conspicuous white patch on the wing. Occurs on the prairies of the Central plains, but is accidental as far east as Massachusetts.

DIMENSIONS.

Length, 6.90 to 7.20; stretch, 11.00 to 11.50; wing, 3.30 to 3.50; tail, 2.90 to 3.10; bill, .92 to .95; tarsus, .53 to .56.

DESCRIPTION OF NESTS AND EGGS.

NESTS, placed on the ground composed of grasses and weeds, lined with fine grass, hairs, etc. Eggs, four or five in number, oval in form, pale blue in color, unspotted. Dimensions, .68 by .88 to .70 by .90.

HABITS.

I have never met with this singular Lark Bunting living. They are said to have a sweet song which is given when the bird is hovering in the air, much after the manner of a Yellow-breasted Chat.

GENUS XXII. GUIRACA. THE BLUE GROSBEAKS.

GEN. CH. Bill, rather stout, upper mandible, slightly curved. Wings, long and pointed, folding about the middle of the tail. Tail, shorter than the wings and slightly rounded. Feet, rather small, middle toe a little longer than the tarsus.

GUIRACA CAERULEA.**Blue Grosbeak.**

DESCRIPTION.

SP. CH. Size, medium. Form, slender. COLOR Male. Brilliant blue, throughout, darkest on the back. Wings, black, crossed by two reddish yellow bands. Tail, black. Iris, feet, bill, brown, the latter lighter on lower mandible. Adult, female, yellowish brown, above, with sometimes a trace of blue, lighter below especially on throat and abdomen. Wings, browner than in the male, but banded the same. Tail, also brown. Young male, similar to the female at first but gradually assumes the blue dress, appearing in all gradations of mottlings, with sometimes the blue predominating and sometimes the brown.

OBSERVATIONS.

The only species with which this is to be confused is the Indigo Bird, but this is much smaller, and never has any band on the wings. Occurs in the United States east of the Rocky Mountains, north to Central Pennsylvania.



FIG. 51. Head of adult male, Blue Grosbeak.

DIMENSIONS.

Length, 6.50 to 7.25; stretch, 10.50 to 11.50; wing, 3.30 to 3.60; tail, 2.75 to 3.00; bill, .58 to .65, tarsus, .85 to .95.

HABITS.

I have never chanced to see a specimen of this fine Grosbeak living, and although its range is somewhat extended it appears to be somewhat local in distribution. It has been taken as a straggler as far north as Maine, and Mr. Gordon Plummer obtained a specimen near his residence in Brookline, Mass., in the summer of 1880.

GENUS XXI. HABIA. THE SONG GROSBEAKS.

GEN. CH. Bill, very large and heavy, proportionately more so than in the last genus. Tail, shorter than wing and slightly rounded only. Folded wing, not reaching to the centre of tail. Sexes, dissimilar. We have two fine species within our limits.

HABIA LUDOVICIANA.**Rose-breasted Grosbeak.**

DESCRIPTION.

SP. CH. Size, large. Form, robust. COLOR. Adult male. Head and neck all around and most of the upper parts, black. Rump and upper tail coverts, tips of middle and greater wing coverts, spots on tertiaries, patch on inner webs of outer tail feathers, and beneath, white. Triangular patch on breast, sometimes extending from middle of body to throat, under wing coverts and axillaries, rosy red.

Adult female. Brown above, streaked with yellowish buff. Central and superciliary stripe on head, white. Wing markings as in the male. White beneath, tinged with buff, narrowly streaked on sides and flanks and more broadly on sides of breast and neck with brown, under wing coverts and axillaries, salmon yellow. Young female, more heavily streaked below, and these markings extend across the breast, while the

buff tinting is considerably deeper. Young male, similar, but with the under wing lining rosy as in the adult male.

OBSERVATIONS.

Distinguished at once in both sexes by the colored wing lining and thick bill. Occurs during the breeding season throughout middle Eastern North America, from the Middle States north to Labrador, west to the Saskatchewan and to the Red River Valley and Missouri Plains.

DIMENSIONS.

Length, 7.75 to 8.50; stretch, 12.00 to 13.00; wing, 3.00 to 4.25; tail, 3.10 to 3.25; bill, .65 to .68; tarsus, .75 to .80.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in trees or bushes, composed of slender twigs rather loosely arranged, lined with fine rootlets and grass. Eggs, three or four in number, oval in form, bluish green in color, spotted and blotched with brown and lilac. Dimensions, from .68 by .92 to .75 by 1.00.

HABITS.

The Rose-breasted Grosbeaks make their appearance on the second or third week in May, depending somewhat upon the season. They frequent the open woodlands upon their first arrival, but soon scatter about the orchards and gardens. They are, however, fond of the vicinity of streams if these water courses are bordered with bushes. This habit of frequenting gardens and orchards has been quite recently acquired by this fine Grosbeak. Possibly the fact that their numbers are increasing may have something to do with this change of habit. In Audubon's time, as is well known, this species was quite rare, but it has gradually grown more and more abundant, until at the present time it has become one of our most common species.

The Rose-breasted Grosbeaks begin to build their nests early in June. The site chosen as a nesting place is frequently a clump of bushes by the side of a favorite stream, or the fragile-looking stick-built structure is often constructed on the overhanging limb of a tree directly over the water. These Grosbeaks are never shy, but when the female is setting she appears to lose nearly all fear of man. I have frequently seen them so tame that they would almost allow me to place my hand on them. I once tipped a nest on which a female was sitting completely upside down in my efforts to reach it, as it hung on the extremity of a long, swinging bough, and upon righting it again, found the bird still clinging to it with the four unbroken eggs beneath her.

The song of the Rose-breast is among the finest of our bird cantatas, ringing out loud, clear and melodiously in the still mornings of June. Some of the notes remind one of those of the Robin, especially those given in the first part of the song; others which



FIG. 52. Head of Adult female, Rose-breasted Grosbeak.

follow are not unlike those of the Scarlet Tanager, but lack the husky intonation of that species. The alarm note is a short, metallic-like chirp, but unlike that of any other North American bird. Often when uttering it the bird sits perfectly quiet without apparent motion of any kind.

In the summer of 1883 a pair of Grosbeaks built a nest in an apple-tree back of my house in Newtonville. After the young were nearly fully grown, but before they left the nest, both parents were caught by a cat. I had the three young birds removed from the nest and brought into the house. Two died after a few days, but the third bird, a male, lived until late in the winter, acquiring the full song of the male, and quite to my surprise, nearly the full plumage. It was very tame, being, in fact, perfectly fearless of mankind.

The Rose-breast is one of the first birds to depart in autumn, leaving Massachusetts early in September. I found them common at Watsonstown, Pennsylvania, as late as the 14th of the month.

GENUS XXIII. PLECTROPHENAX. THE SNOW BUNTINGS.

GEN. CH. Bill, slender, longer than high at base. Upper mandible, slightly curved. Wings, long and pointed, when folded reaching beyond the center of tail, which is much shorter than the wings, and is slightly rounded and slightly emarginate. Hind toe nail somewhat longer than its toe, but is considerably curved. Colors in summer, black and white. We have a single species within our limits.

PLECTROPHENAX NIVALIS.

Snow Bunting.

DESCRIPTION.

SP. CH. Size, medium. Form, rather slender. COLOR. Adult male in summer. White, with back, tertiaries, primaries, central tail feathers and spots on outer webs of outer two or three, black. Female, similar but smaller, with white more or less suffused with rusty yellow. In winter, both sexes have the white much suffused with rusty yellow. Iris, brown. Bill, deep yellow, brown at tip. Feet, black, in all stages.

OBSERVATIONS.

Readily known by the black and white colors as described, with the peculiar reddish yellow suffusion to the white in winter. Occurs in the Arctic regions in summer, migrating by thousands into the United States in winter, occasionally going as far south as Kansas, Southern Illinois and Georgia.

DIMENSIONS.

Length, 6.50 to 7.00; stretch, 12.00 to 13.00; wing, 4.00 to 4.25; tail, 2.50 to 2.75; bill, .40 to .45; tarsus, .75 to .80.

DESCRIPTION OF NESTS AND EGGS.

NESTS, placed on the ground, composed of grass and lined with feathers. EGGS, four or five in number, oval in form, ashy white in color, spotted and blotched with yellowish rufous, usually more thickly on the larger end. This suffused blotching is characteristic. Dimensions, .60 by .90 to .65 by .95.

HABITS.

With the coming of the winter winds and snow the Snow Buntings appear in huge flocks. With us, here in Eastern Massachusetts, they frequent the sea board rather than

the interior, in fact, it requires a series of protracted easterly storms to force them to leave the sea shore.

The habits of the Snow Buntings are all characteristic of the species, from the restless, whirling flight to the nervous, active manner in which they run on the surface of the snow, pausing a moment to gather some seeds from a nearly submerged weed or to gaze about them, then darting quickly away for a few yards will again pause abruptly. Suddenly, some one among them, either startled at fancied or real danger, will give the clear chirp of alarm, and instantly the whole flock is in air. Once on the wing, it appears difficult for them to make up their minds to alight again, and generally after wheeling about the place from which they rose for a few times, they will quickly disappear in the distance. Even when about to alight on a field, they will pass and repass a desirable spot several times, flying lower and lower, until at length thoroughly satisfied that there are no enemies concealed among the weed tops, or awaiting them amid the snow, they abruptly alight, but are off again upon the slightest alarm. Surely such habits of extreme caution must have been acquired among the arctic foxes and white ermines of their northern home, whose colors render them inconspicuous alike in summer and winter, even to such sharp eyes as are possessed by the Snow Buntings.



FIG. 53. Head of Adult Male Snow Bunting, in Winter.

I have often wondered where the Snow Buntings pass the night, especially during those severe storms when the thermometer registers far below zero, or, worse still, when the rain and sleet freezes as it falls. With us here in Newtonville the Snow Buntings always depart at nightfall, flying eastward towards the coast, often flying into the very teeth of a severe easterly gale. These little birds must possess an Esquimaux-like faculty of existing when buried beneath the snow, during the night, otherwise some of the severe blizzards which they have to encounter would sweep them about like dry leaves.

The Snow Buntings remain in New England until the melting of the snow in the spring, and with its disappearance, they, too, leave us for their far away arctic home.

GENUS XXIV. CALCARIUS. THE LONGSPURS.

GEN. CH. Bill, about as in the Snow Buntings, possibly a little stouter. Wings, proportionately shorter, not reaching beyond the middle of the tail when folded. Hind toe nail longer than its toe. COLOR. Black, brown, white and buff. We have three species within our limits.

CALCARIUS LAPPONICUS.

Lapland Longspur.

DESCRIPTION.

SP. CH. Form, slender. Size, medium. COLOR. Adult male in summer. Head, throat and breast, black, with a stripe over eye, extending from bill to neck, buff. There is a broad chestnut collar on back of

neck. Center of feathers of back, very dark brown, this is edged with chestnut and this in turn is bordered with buff. Beneath, white tinged with buff, with sides and flanks streaked with dark brown, bordered with chestnut and buff. Wings, dark brown, with the feathers edged with chestnut and buff. Tail, also dark brown, edged with buff, and there are longitudinal spots of white on the two outer feathers, that on the outermost extends along the outer web for more than half its length. Adult female, similar, but duller, with the black much obscured. In winter, both sexes have the black, especially on top of the head, much concealed by whitish or reddish tippings to the feathers and all the upper portion is much more broadly streaked with chestnut and buff. Bill, reddish brown. Iris, brown. Feet, black.

OBSERVATIONS.

Although the black markings are often obscured with lighter colors, especially in the female, they are always distinguishable enough to render the species recognizable. For differences between this and allied species of the same genus see observations under each species. Circumpolar regions, in summer; southward, in winter, in North America, occasionally as far as Washington, South Carolina and Northern Texas.

DIMENSIONS.

Extreme measurements of thirty-two specimens. Length, 6.10 to 7.00; stretch, 10.50 to 11.75; wing, 3.30 to 4.00; tail, 2.30 to 2.75; bill, .40 to .50; tarsus, .65 to .95.

DESCRIPTION OF NESTS AND EGGS.

NESTS, placed on the ground, composed of coarse grass, lined with fine grass and feathers. EGGS, four or five in number, oval in form, greenish in color, spotted and blotched coarsely and often so thickly as nearly or quite to obscure the ground color, with reddish brown, sometimes with dark chocolate, and occasionally some specimens will be marked with zigzag lines of umber and dark brown. The thick, coarse, markings are characteristic. Dimensions, from .60 by .80 to .65 by .98.

HABITS.

Most unquestionably, as a rule, the Lapland Longspur is a late autumnal migrant in New England. They make their appearance about the first of November, generally with the Shore Larks, and they accompany these birds, there usually being a dozen or so Longspurs in every flock of fifty or more Shore Larks. But unlike the latter-named species the Longspurs do not remain much later than the first of December. The explanation of this movement would appear to be that northern birds from Greenland and other adjacent shores of the continent, in migrating southward, keep along the coast until they reach the New England States, when they push across to the interior where they remain all winter. A straggler occasionally finds its way to the coast in spring, and I once shot a male that had nearly acquired the summer dress at Ipswich, Mass., in April. Even then it was in company with the Shore Larks, in fact, I have never been able to see the Longspurs separated from these birds, so that I could note any individual habits. They appear to run rapidly along the ground and when alarmed will squat and hide, much as do the Shore Larks, and will rise when the flock rises flying swiftly away with a long, undulating movement.

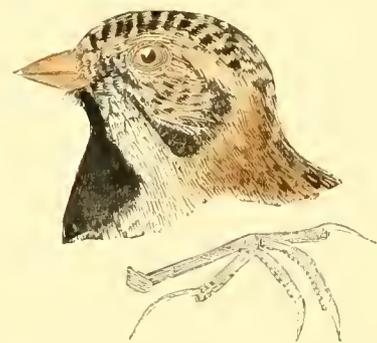


FIG. 54. Head and foot of Adult Male Lapland Longspur in winter.

CALCARIUS PICTUS**Smith's Longspur.**

DESCRIPTION.

SP. CH. Size, rather large. Form slender. COLOR. Adult male in summer. Top and sides of head, black. Line from bill over eye, lores, ear coverts, and a small patch on back of neck, white. Entire under parts, extending around neck to nape, buff. Inside of wings, white. Feathers of upper parts, black, edged with yellowish gray. Shoulder, greater and lesser wing coverts, black. Middle coverts, white, forming a conspicuous patch. Wings, brown, edged with white. Tail, brown, with whole of outer, most of second, feathers, white. Bill, brown, lighter on lower mandible. Iris, brown. Feet, very pale brown. Female, similar, but with the colors much obscured with light tintings.

OBSERVATIONS.

Distinguished from the Lapland Longspur by the buff, unstreaked underparts. Occurs in summer in the Middle Arctic regions, migrating southward in winter to the prairies of Illinois and Texas.

DIMENSIONS.

Length, 6.20 to 6.50; stretch, 10.90 to 11.30; wing, 3.50 to 3.65; tail, 2.50 to 2.60; bill, .42 to .45; tarsus, .75 to .82.

DESCRIPTION OF NESTS AND EGGS.

NESTS, placed on the ground, composed of grass, lined with finer grass and feathers. EGGS, four or five in number, oval in form, light gray in color, spotted, blotched and dotted with dark, purplish brown and lavender. Dimensions, from .63 by .78 to .65 by .80.

HABITS.

This species appears to inhabit the prairies of the west, and comes into our limits only in Southern Illinois, never having been taken very far east.

CALCARIUS ORNATUS.**Chestnut-collared Longspur.**

DESCRIPTION.

SP. CH. Size, rather small. Form, slender. COLOR. Adult male in summer. Collar on back of neck, bright chestnut. Top of head, stripe behind eye, spot on lower part of ear coverts, lesser wing coverts, and lower parts (excepting chin, throat, sides and flanks, under wing and tail coverts, which are white), black. This black beneath is frequently overwashed or marked with chestnut. Above, dark brown, with most of the feathers edged with grayish. Tail, brown, with two or three outer feathers white.

Adult female. Above, similar to male, but with the chestnut collar obscured, and with the crown like the back. Beneath, dull brown, whitish on the abdomen.

In winter, both sexes have the dark colors obscured by whitish tippings to the feathers. The young have the plumage even more obscured by light tintings.

OBSERVATIONS.

Known from the preceding species by the greater amount of white on the tail, two or three outer feathers being entirely white. Occurs in summer in the plains of the Saskatchewan, migrating south as far as the tablelands of Mexico. Casual in New England.

DIMENSIONS.

Length, 5.40 to 6.00; stretch, 10.10 to 10.75; wing, 3.00 to 3.35; tail, 2.00 to 2.30; bill, .40 to .42; tarsus, .75 to .80.

DESCRIPTION OF NESTS AND EGGS.

NESTS, placed on the ground, composed of grass. Eggs, four or five in number, oval in form, grayish white in color, spotted and blotched with dark brown. There are shell blotchings of purplish. Dimensions, from .53 by .70 to .60 by .80.

HABITS.

This is also a distinctively prairie species, but a specimen was taken at Magnolia, Mass., July 28, 1876.

GENUS XXV. RHYNCHOPHANES. THE THICK-BILLED LONGSPURS.

GEN. CH. Similar to the Longspurs, but with the bill proportionately much larger and thicker. Hind claw no longer than its toe. We have a single species within our limits.

RHYNCHOPHANES MCCOWNII.

McCown's Longspur.

DESCRIPTION.

SP. CH. Size, rather small. Form, robust. COLOR. Adult male in summer. Top of head and broad crescent on breast, black. Middle wing covert, chestnut, remaining upper parts, brown, with the feathers edged with yellowish, which becomes ashy on the back of neck and rump. Beneath, white tinged with rufous. Tail, excepting central feathers, white nearly to base, each feather, excepting outer pair, broadly tipped with brown. Sides of head, ashy, with a poorly-defined maxillary stripe. Bill, reddish brown, black-tipped. Iris and feet, brown. Adult female, lacks the black crown and maxillary stripe, and the crescent on breast is only faintly indicated. The white tail patch is more restricted.



FIG. 55. Head of Adult Male, McCown's Longspur in Winter.

OBSERVATIONS.

Distinguished at once from all of the other Longspurs by the thick bill, short, stout form, and white area of the tail. Occurs in summer on the Great Plains north to the Saskatchewan region, migrating southward in winter quite to Mexico. Accidental in Massachusetts.

DIMENSIONS.

Length, 5.80 to 6.00; stretch, 10.50 to 11.00; wing, 2.20 to 2.60; tail, 2.20 to 2.40; bill, .42 to .44; tarsus, .67 to .75.

DESCRIPTION OF NESTS AND EGGS.

NESTS, placed on the ground in open places, loosely constructed of dry grasses, lined with finer grasses, hair and feathers. Eggs, four to six in number, oval in form, dull greenish in color, spotted and dotted with reddish brown, of varying shades, and black.

HABITS.

Like most of its nearest allies McCown's Longspur is a bird of the wide spread prairie lands west of the Mississippi. Its only claim to a place in our fauna is through a single specimen taken by Mr. Edw. A. Bangs, at Ipswich, Mass., Jan. 7th, 1877.

GENUS XXVI. ACANTHIS. THE RED-POLLS.

GEN. CH. Bill, very short, acutely pointed, outline of upper mandible, curved, straight or even convex. Nostrils, concealed by nasal tufts. Wings long, folding beyond the middle of tail. Tail, considerably forked. Feet, rather small. Plumage, quite thick. We have five species within our limits.

The whole matter concerning the species and sub-species of Red-polls has until recently been in a sad state of confusion, and even now does not appear to be quite settled. That we have five distinct forms appears to be the almost universal opinion, and with this I agree, but I do not exactly coincide with the expressed opinions regarding the exact rank of some of these species.

The following account of the Red-polls is based upon my observations made on a large series of specimens and represents my conclusions upon the same.



FIG. 56. Head of Adult Male Red-poll in winter. A, bill of Hoary Red-poll. B, bill of Greater Red-poll.

ACANTHIS LINARIA.

Red-poll.

DESCRIPTION.

SP. CH. Size, medium. Form, rather robust. Outline of upper mandible, straight. COLOR. Adult male in winter. Top of head, crimson. Above, including wings and tail, dark brown, with the feathers broadly edged with yellowish, which becomes ashy on nape, and white, tinged with rosy on rump and upper tail coverts. Beneath, white, strongly tinged with rosy, excepting on abdomen and under tail coverts, and streaked on sides and flanks with dark brown. Chin, dark brown. Sides of head, ashy tinted with rosy. Forehead and superciliary stripe, ashy. Both rows of wing coverts are tipped with yellowish white, forming bars. The female is similar but lacks the rosy beneath and the chin patch is more extended. Young male, similar to the female. Adults in summer. Through the wearing away of the light tippings of the feathers the dark of the back becomes much more extended, and the red beneath is diffused. Iris, brown. Feet, black. Bill, yellow, black at tip.

Nestlings are streaked throughout above and below, and lack in midsummer the red of the crown.

OBSERVATIONS.

This is the most common species of Red-poll that visits the Northern United States in winter and it appears to range farthest south of any, occasionally reaching Washington, Kentucky and middle Missouri. It also breeds farthest south of any of the species, nesting at least as far south as the Magdalen Islands, Gulf of St. Lawrence, from which point I have received the young in the nestling plumage. The points of difference between this and the allied forms and species are given under each separate heading.

DIMENSIONS.

Length, 5.00 to 5.40; stretch, 8.55 to 8.75; wing, 2.75 to 2.80; tail, 2.30 to 2.40; bill, .30 to .35; tarsus, .50 to .55.

DESCRIPTION OF NESTS AND EGGS.

NESTS, placed in bushes, tufts of grass, or in cavities in trees or rocks, composed of twigs, grass, etc., lined with fine grasses, cottony material from willows and feathers. EGGS, four to six in number, oval in form, pale bluish green in color, spotted usually about the larger end with yellowish brown. Dimensions, .52 by .65 to .48 by .62.

Although I presume that there is never a winter passes without some Red-polls visiting us here in Massachusetts, it is also true that the numbers of these visitants vary greatly. During some seasons the country is inundated by thousands of specimens, and flocks containing hundreds of individuals may be seen daily. In other winters a few stragglers only are seen. Probably, partly, the varying depth of the snow further north has something to do with this variation of migration, for this must in a measure govern the food supply, as a heavy snowfall must cover the weeds, grasses, etc., the seeds of which form the food of this little bird, to a greater extent than a lighter fall.

With us in Massachusetts the Red-polls begin to arrive late in November and often remain until late in spring. I have on one occasion seen them as late as the 25th of April. When with us they associate in flocks, but are a restless species, moving rapidly from place to place uttering a somewhat husky chirp as they fly with an undulating movement. In the spring the males have a pleasing warbling song. One of my collectors obtained the young fully grown on the Magdalen Islands in July, so that the Red-polls must breed early, probably nesting in May. The habits of all the Red-polls appear similar and the nests and eggs as far as known are indistinguishable.

Acanthis linaria holboellii.

Holboell's Red-poll.

DESCRIPTION.

Sub. Sp. Cui. Outline of bill straight as in the Red-poll, and the colors are about the same, but the size is considerably larger, the length being 6.00 or more, and the wing not less than 3.00. These differences in so small a bird are quite discernable and this form appears noticeably large.

This sub-species is more northern in distribution than the Red-poll, breeding far north and rarely reaching the United States in its southern range, and is very rare as far south as Massachusetts.

ACANTHIS ROSTRATA.

Greater Red-poll.

DESCRIPTION.

Sp. Cui. Outlines of upper mandible, decidedly curved. (See Fig. 56, B.) The size is large, averaging larger than the least length of males, over 6.00. The streakings, both above and below, are broad and heavy. These, with the large bill with its curved upper mandible, which is about the size and form of that of a Tree Sparrow, will serve to distinguish it. This is usually regarded as a sub-species, but I have never seen a specimen that could not be distinguished at sight. The Greater Red-poll does not have such a high northern breeding range as does Holboell's, and migrates into the United States in large numbers, often in flocks by itself. I had a lot sent me from Clayton, Minnesota, in the winter of 1885, and they were common that winter throughout eastern Massachusetts, especially on the coast in the neighborhood of Boston.

Acanthis hornemannii.

Greenland Red-poll.

DESCRIPTION.

Sp. Cui. Bill, proportionately short, with the outline of the upper mandible decidedly convex. Size, about that of the Greater Red-poll, averaging possibly larger, at least 6.00 long, but the color is much lighter, the dusky markings being narrower, and the rump is wholly white or rosy without any streakings whatever. Occurs in Greenland and Northern Europe, possibly never occurring on the mainland of North America.

ACANTHIS EXILIPES,**Hoary Red-poll.**

DESCRIPTION.

Sp. Ch. Bill very short, with the outlines of upper mandible convex. (See Fig. 56, A.) Size, small, at least no larger than the Red-poll, length not exceeding 5.50. Colors, similar to those of the Greenland Red-poll. Thus this species differs from the Red-poll in having the colors much lighter, with the rump either plain white, or rosy, unstreaked.

The Hoary Red-poll has been given in recent lists and ornithological works as a sub-species, but why I do not understand. A sub-species is, as I regard it, an incipient species, in other words, a form which has not acquired sufficient or strong enough characteristics to render it wholly distinct from the parent stock, and thus along the border-line where the two forms come together constant intergrades occur. But when one form inhabits an island or another continent, with no opportunity for actual intergradation there surely can be none. Reversions toward the parent stock may occur for many generations on one side and strong individual traits on the other, which I have called presagement characters, and which indicate the direction of the evolution of a new species. Thus two species may appear to approach one another quite closely through individual variation, by reversion and presaged characters, when there is no real integration that marks an incipient or sub-species.

I do not suppose that there is an intelligent ornithologist living today who does not believe in the truths of evolution, for he cannot give the matter close consideration without seeing most clearly that one species is derived from another, and that among all animals reversions toward remote ancestors occur. Also that before a new species becomes evolved certain individuals of the stock, from which it is about to spring, will show some characteristics that will be possessed by the coming species. These are presagement characters, and long after the new species has become fixed, through being placed under different environment, these characters will continue to appear in individuals in the parent stock, while on the other hand reversions will occur in the evolved species for many generations. As before remarked, individuals thus characterized on either hand are not in any sense of the word intergrades and cannot rightly be so considered. If we believe in evolution why not apply the facts which it teaches practically?

Although the Greenland Red-poll as a species in its journey north, following up the retreating ice during the closing centuries of the Glacial Period, probably left behind it some individuals that, through changed environment, produced a smaller and weaker race, after it crossed to Greenland, or after Greenland became separated from the mainland of North America, it could not intergrade with the forms left behind. Thus I do not see any reason why both the Greenland and Hoary Red-polls should not be considered species. The rule here applied may also be applied in many other cases too numerous to mention at this time.

GENUS XXVII. LOXIA. THE CROSSBILLS.

GEN. CH. Bill, stout, both mandibles much curved, with the tips elongated and crossed. Wings, long and pointed, folding beyond the middle of the tail which is deeply forked and which has both upper and under coverts elongated, extending beyond its middle. A singular and unique genus of finches of which we have two species within our limits.

LOXIA MINOR,**American Crossbill.**

DESCRIPTION.

Sp. Ch. Size, medium. Form, robust. COLOR. Adult male. Red throughout, but never rosy. Wings and tail, dark brown, without markings. Iris, bill, and feet, brown. Adult female, greenish gray, throughout, brightest on top of head and rump, where there is sometimes a trace of red, otherwise as in the male. Young, like the females and the males, occur in which there are all stages of mixed red and greenish,

and sometimes yellowish. Nestlings, whitish, heavily streaked above and below with dark brown, with a trace of greenish on the rump and back. When the bird is in the nest the bill is straight, but gradually acquires the curved cross at the tip, sometimes the lower mandible crossing to the right and sometimes to the left of the upper.

OBSERVATIONS.

Readily known from others of the Family by the crossed bill, and from the White-winged Crossbill by the plain unmarked wing.

Occurs throughout North America, but chiefly far northward and east of the Great Plains, breeding occasionally on the coast as far south as Maryland and Virginia, and along the mountain regions to Georgia, Tennessee and Kentucky. In winter, migrating southward.

DIMENSIONS.

Length, 5.90 to 6.10; stretch, 10.00 to 10.50; wing, 3.50 to 3.75; tail, 2.40 to 2.55; bill, .76 to .78; tarsus, .65 to .70.

DESCRIPTION OF NESTS AND EGGS.

NESTS, placed in trees, composed of twigs and stripes of bark, lined with moss. EGGS, four or five in number, pale bluish or greenish white in color, sparingly spotted and serawled with lines of dark brown and lilac. Dimensions, .52 by .73 to .56 by .75.

HABITS.

The Red Crossbills are, in every sense of the term, a nomadic species; true Bedouins among birds; a race without a fixed home. As a species their breeding range is wide, and the same is true of them individually. They usually nest in communities, but scarcely ever twice in the same locality. Their time of laying is also variable. They have been known to nest from February until August, as the following instances, among others now on record, show. Mr. G. A. Boardman found them breeding in February in Maine. Mr. Eugene P. Bickwell found a nest containing three eggs at Riverside, New York city, on April 30, 1875. I have a specimen of a bird still in the first plumage which was taken by Mr. G. S. Miller, Jr., at Peterboro, N. Y., July 31, 1885, showing that the egg from which this bird was hatched must have been laid some time in May. Late in August, 1862, I obtained birds in the first plumage at Newtonville, Mass. The eggs from which these birds were hatched must have been deposited in June. Mr. Will Perham obtained nests from a colony which suddenly appeared and nested in a grove near his place in Tyngsboro, Mass., late in August, about 1875.

The chief food of the Red Crossbill in winter is the seeds of coniferous trees, and the abundance or scarcity of this food governs the movements of the species, thus they can scarcely be said to be truly migrating, for they do not pass north and south with any regularity.

The winter note of the Crossbill is loud, clear and quite characteristic. The song which appears to be uttered just before the breeding season, and which I have heard in

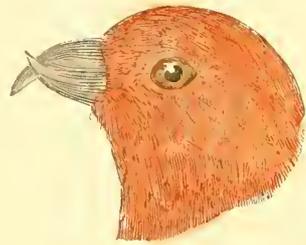


FIG. 57. Adult Male American Crossbill.

Newtonville in April, is a rather low, continuous warble. When feeding, they converse together in low murmuring notes, much as I have heard parrots do under similar circumstances. The Crossbills also resemble parrots in their method of clinging to the cones, from which they extract the seeds so dextrously; for in their efforts to reach the underside of the cones they hang in all positions, frequently even head downward and I have often watched the Paroquets assuming similar attitudes when gathering the huge cones of the large pines of Florida.

LOXIA LEUCOPTERA
White-Winged Crossbill.

DESCRIPTION.

SP. CH. Size, about that of the Red Crossbill, but the former is a little more slender, and the bill much more slender. COLOR. Adult male. Rosy red, with abdomen, under-tail and wing coverts, whitish, slightly streaked with dusky on the flanks. Wings and tail, sooty brown, with the lesser and greater coverts of the wing, and tip of tertiaries, white. Female, with wings similar, but greenish, much as in the Red Crossbill, but rather more yellowish. Young male, similar to the female, and all stages of mixed plumage occur as in the Red Crossbill. Nestlings, streaked throughout with dusky.

OBSERVATIONS.

Distinguished in all stages of plumage from the Red Crossbill by the white on wing. Distribution somewhat similar to that of the Red Crossbill, but the breeding range is higher, from northern New England northward, and they do not wander as far south even in winter.

DIMENSIONS.

Length, 6.00 to 6.75; stretch, 9.20 to 10.55; wing, 3.05 to 3.45; tail, 2.30 to 2.50; bill, .55 to .70; tarsus, .55 to .65.

DESCRIPTION OF NESTS AND EGGS.

NESTS, placed in trees, composed of twigs, lined with fine shreds of inner bark and hair. EGGS, four or five in number, oval in form, pale blue in color, thickly dotted on the larger end with black and ashy lilac. Dimensions, .56 by .80 to .58 by .82.

HABITS.

While in a general way the habits of the White-winged Crossbill resemble those of the Red Crossbill they differ in some important particulars. For example, I think that the White-wings are less true nomads, that is, they have, at least as a species, fixed abodes. Thus I am sure that the White-wings breed every season on the Magdalen Islands. But they appear to nest there somewhat irregularly. I have seen fully grown young taken there in July which must have been hatched from eggs that were deposited in May, at which time the Magdalens are covered with snow. I also heard the males singing on Bryon Island, one of the Magdalens, in July, a number of years ago, exactly as if they were going to breed. Massachusetts is occasionally invaded with White-winged Crossbills, but they are seldom very common here. The most notable visit which we ever had, that came under my notice, was in the winter of 1868-69. That season it appeared in great numbers in Albany, Maine, as early as October 21st, and during the first week in December it was common at Ipswich, Mass., then a few days later appeared in Newton,

where they remained until late April. On June 13th I shot a specimen that was filled with canker worms, but their usual food is seeds, either of coniferous trees or of grass and weeds.

GENUS XXVIII. PINICOLA. THE PINE GROSBEEKS.

GEN. CH. Bill, short, thick, nearly as deep at base as long, with the upper mandible considerably curved. Wings pointed. Tail, quite long (about three-fourths as long as the wing), quite deeply forked. Plumage, quite thick. We have a single species within our limits.

PINICOLA ENUCLEATOR.

Pine Grosbeak.

DESCRIPTION.

SP. CH. Size, large. Form, robust. COLOR. Adult Male Rosy red throughout with feathers of the back showing darker centers. Abdomen and under-tail coverts, gray. Wings and tail, blackish, the former crossed by two bands of white, and the tertiaries and some secondaries are white edged. Female. Gray, throughout, slightly tinged with grayish yellow on top of head, rump, and back, and more faintly across breast. Throat, whitish. Wings and tail, as in the male. Young males are like the females, but show traces of red on the head and rump, and specimens are found in all stages between this immature dress and the adult plumage. Young females are pale yellow on head and rump with faint tings elsewhere. Iris, bill and feet, brown, in all stages.



FIG. 58. Young Male Pine Grosbeak in winter.

OBSERVATIONS.

Known at once by the peculiar form, large size and white bands on wings. Individuals in the fully adult plumage of the male are rare. Occurs in summer throughout the northern portion of the northern hemisphere, migrating south in the eastern sections into the United States, rarely as far as Kentucky.

DIMENSIONS.

Length, 8.75 to 9.00; stretch, 13.70 to 14.00; wing, 4.50 to 4.60; tail, 3.80 to 4.00; bill, .55 to .60; tarsus, .75 to .85.

DESCRIPTION OF NESTS AND EGGS.

NESTS, placed in trees, composed of fine rootlets. They are flat in form. EGGS, oval in form, greenish drab in color, spotted and blotched with pale, purplish brown, and dark purple. Dimensions, .70 by 1.02 to .75 by 1.08.

HABITS.

The Pine Grosbeak is another of the northern-breeding birds which visit us here in Massachusetts at rather irregular times. Thus, although possibly a few may come to us every winter, we do not always have them so abundant some seasons as others. The note of this fine Grosbeak in winter is loud and clear, and even startling, when heard near at hand. Their song is a rather low, continuous warble given by the birds in early spring.

I know of no birds which visit settled portions of the world which are so tame as the Pine Grosbeaks. Specimens which I have captured with a noose of wire, which I have held in my hand, as I climbed up into the trees on which the birds were feeding, have been so fearless as to alight on my hands and shoulders in a few hours after I had brought them home.

GENUS XXIX. COCCOTHAUSTES. THE AMERICAN HAWFINCHES.

GEN. CH. Bill, excessively thick, being nearly as high at base as it is long. Nostrils completely concealed by tufts of feathers. Wings, very long and forked, folding beyond the middle of the rather short, forked tail. We have a single species of this large-billed Grosbeak within our limits.

COCCOTHAUSTES VESPERTINA.

Evening Grosbeak.

DESCRIPTION.

SP. CH. Size, large. Form, very robust. COLOR. Adult male. General color of body, lemon yellow, more or less obscured by sooty, especially on the anterior portions, becoming quite black on top of head, leaving forehead, excepting a narrow line at base of bill, clear yellow. Wings, sooty brown, with a large patch of soiled white on tertiaries and inner secondaries. Upper tail coverts and tail, black. Female, similar, but with top of head brownish, and the clear yellow is obscured with ashy.

OBSERVATIONS.

Distinguished at once from any other North American species by the peculiar soiled yellow color and large bill, with the conspicuous white patch on wings. Occurs as a constant resident in western North America, north to British Columbia, and the Saskatchewan, into Mexico. East, occasionally as far as Massachusetts.

The sound-producing organs of this species are most peculiar. The sterno trachealis, Fig. 60, d, s, s.



FIG. 59. Adult Male Evening Grosbeak.

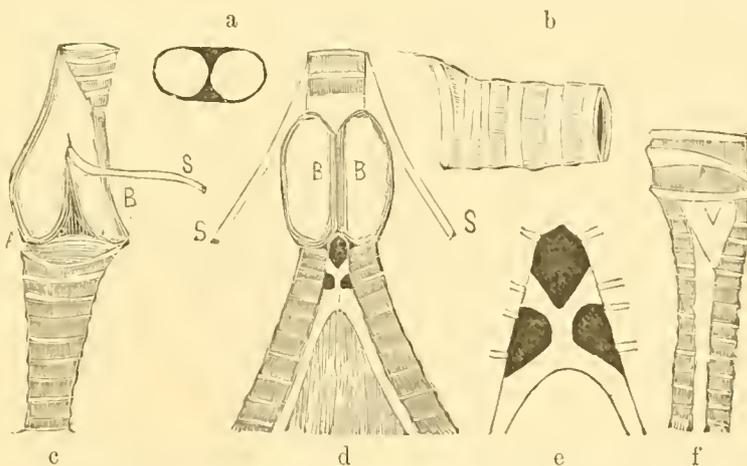


FIG. 60. Sound-producing organs of the Evening Grosbeak.

is moderately well developed, and has its origin below the division of the bronchialis, *ib. c, B, s.* Both divisions of the bronchialis are well developed, *ib. c, B.* The four lowermost tracheal whole rings are fused together, *Fig. 60, b.* and the upper portion of both bronchial muscles are attached to them, and below to the three lower, free tracheal and to the three laryngeal half-rings, but not at all to the bronchial half rings. There is a vibratory space between the upper bronchial half ring and the lower tracheal ring, *ib. f.* that is governed by a singular, thin, Y-shaped muscle, that extends from the two upper bronchial half rings, to a muscle that is spread between the bronchial tubes their entire length. See *ib. d, r.* and *ib. e.* where is given a very greatly enlarged view of this muscle, but all the figures are enlarged twice the natural size.

The tympaniform membrane is peculiar, for the first three half rings it is vibratory, and triangular in shape, then narrows, so as to become nearly or quite functionless, being a mere division of the bronchial rings; *ib. v.* is the vibrating surface; below it is the narrow portion.

Although the *os transversale* is present, and supports a very slight semiluna membrane, the bone is so firmly fixed that it cannot oscillate in any degree, see *ib., a.*

With such a musical apparatus as this, the Evening Grosbeak must give a most peculiar song, and according to accounts, this appears to be a fact.

DIMENSIONS.

Length, 7.50 to 7.70; stretch, 13.00 to 13.75; wing, 4.30 to 4.55; tail, 2.60 to 2.65; bill, .75 to .80; tarsus, .70 to .75.

HABITS.

The Evening Grosbeak appears to be of a restless, wandering disposition and although occurring as a constant resident in the far west occasionally wanders eastward even as far as Massachusetts. They appear of a social disposition, and even when visiting localities distant from their usual haunts appear not as stragglers but in flocks. In the winter of 1890 numbers suddenly appeared in New England, where they remained until late spring.

FAMILY XIV. TANAGRIDAE. THE TANAGERS.

Based mainly upon the genus *Pyrranga*, the characters are as follows:— Bill large, upper mandible slightly curved and notched. Wings and tail not long, slightly emarginate. Coracoid bones shorter than the top of the keel, which is higher than one half the sternum.

This family embraces many species, a greater part of which are inhabitants of the tropics. The Tanagers are closely allied to the Sparrows; in fact, there are some genera in both families which are so nearly alike that it is difficult to decide as to which division they belong.

GENUS I. PYRANGA. THE TOOTH-BILLED TANAGERS.

GEN. C. Commissure of upper mandible provided with a moderately acute, but prominent tooth. Other characters as given above.

PYRANGA RUBRA.

Summer Tanager.

DESCRIPTION.

SP. CH. Form, slender. Size, medium. Sternum, not stoutly built. Tongue, thin, horny, somewhat acuminate, bifid, and provided on the end with coarse cilia.

COLOR. Adult male in spring. Uniform vermilion red, darker above, brightest on the head and lighter below. Inner webs of wing feathers and tips of primaries brownish. Female at all seasons and male in winter. Olive-green above, more yellowish beneath. Wings, brown as in the spring male.

Young of both sexes, similar to the female, but more ochrey below.

OBSERVATIONS.

Adult male readily known by the uniform color. The female differs from the Scarlet Tanager in having a larger bill and in being more yellowish below. The male of the second year is frequently marked in patches with the green of the preceding year. Distributed in summer throughout southern United States, wintering in South America.

DIMENSIONS.

Average measurements of nine specimens from Florida. Length, 7.18; stretch, 11.85; wing, 3.60; tail, 3.00; bill, .72; tarsus, .71. Longest specimen, 7.80; greatest extent of wings, 12.12; longest wing, 3.90; tail, 3.10; bill, .80; tarsus, .75. Shortest specimen, 7.00; smallest extent of wings, 11.50; shortest wing, 3.45; tail, 2.90; bill, .65; tarsus, .66.

DESCRIPTION OF NESTS AND EGGS.

The following is a description of a specimen taken at Mt. Carmel, Illinois, by Mr. R. Ridgway, who has kindly written it out for me:—

“NEST, deeply saucer-shaped, the walls very thin, four inches wide by two and one half deep externally, and three by two internally. Composed entirely of fine wire grasses, the lining of grass tops. Situated at the extremity of a horizontal branch of an apple tree in orchard.”

EGGS, four in number, oval in form, blue in color, spotted and blotched with reddish-brown and umber. Dimensions from .85 by .70 to .90 by .75.

HABITS.

When the cold north winds cease to blow and the air in the piny woods is redolent with the perfume of the sundew, creeping mimosa, and other delicate plants, which only bloom, even in this mild climate, late in spring, the voices of the Summer Tanagers are heard in the tops of the high trees, when their songs are full of wild melody in perfect keeping with the surroundings. I have never met with these birds elsewhere than in the more open woods of the pine barrens, where they are solitary, shy and retiring. Indeed, so closely do they conceal themselves in the thick foliage, that, were it not for the loud song notes, which are constantly repeated, it would be difficult to discover them. The males arrive about April first and are soon followed by the females. I have never found a nest of this species, but judge that in Florida they must build in the tops of the pine trees. Mr. Ridgway, who is familiar with the breeding habits of this species in Illinois, writes me that, “The nest is usually situated at the extremity of the horizontal branch of an oak or hickory tree, generally by the roadside, or in an open.” The Summer Tanagers have all left Florida by the end of October.

PYRANGA ERYTHROMELAS.

Scarlet Tanager.

DESCRIPTION.

SP. CH. Form about the same as that of the Summer Tanager but the bill is smaller. Adult male in summer, bright scarlet, with the wings and tail black. Adult female, greenish; darker above, much

lighter, beneath; wings and tail, brown, with the feathers edged with greenish. The young of both sexes are similar to the adult female, and the adult males in Autumn are green, with black wings and tail. Iris and feet, brown; bill, greenish brown.

OBSERVATIONS.

Sometimes the males have the middle coverts edged with red and occasionally there are two bars of red. Distinguished at once in the adult male plumage by the bright colors contrasting with the black wings and tail. The female is greener than the same sex in the Summer Tanager and lacks the wing bands seen in the Louisiana Tanager. Occurs in summer throughout Eastern United States, north of the Carolinas, wintering in Eastern Mexico, Central America, to middle South America.

DIMENSIONS.

Length, from 6.62 to 7.40; stretch, 10.30 to 12.75; wing, 4.62 to 4.00; tail, 2.43 to 3.00; bill, .40 to .75; tarsus, .65 to .75.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in trees, composed of twigs. They are slight structures and are flat in form. Eggs, three or four in number, oval in form, bluish green in color, spotted, blotched and dotted with purplish brown and lilac. Dimensions, .60 by .85 to .65 by .95.

HABITS.

The Scarlet Tanager usually makes its appearance in Massachusetts from May 10th to the 26th and scatters through the open woodlands. Almost as soon as they arrive the males begin to utter their loud, characteristic song which somewhat resembles that of the Rose-breasted Grosbeak, but the Tanager's song differs from it in having a double intonation. The alarm note given alike by both sexes resembles the syllables "chip, clmr." which has a decided ventriloquial effect, insomuch so that it is often almost impossible to locate the birds when they are uttering it.

The Scarlet Tanagers breed in early June, often placing their nests upon the topmost bough of some swaying maple or oak sapling, generally choosing one that stands on the margin of a woods. The Tanagers are particularly fond of rather scattering young growths of oak and maples and frequent them rather than the more heavily wooded sections. I found them very abundant in woodlands of this nature at Williamsport, Pennsylvania, fifteen or twenty males often being in sight at one time. They were very unsuspecting there, allowing me to approach within a few yards of them. They cannot be considered shy, anywhere, even in Massachusetts one can always approach quite near them by using a little care and moving with caution.

I have proved a number of times, that, most unquestionably, the bright males moult into the green dress of the females in the autumn. Late in August it is not at all difficult to find birds which are actually changing from one plumage to the other, and by the second week in September it is almost impossible to obtain a bright Tanager, all having assumed the dull dress. These Tanagers linger with us until late in September, and during the latter part of this month, and even into October, in Pennsylvania.

PYRANGA LUDOVICIANA.

Louisiana Tanager.

DESCRIPTION.

SP. CH. Size and form about that of the Scarlet Tanager. COLOR. Adult male. Wings, tail and middle of back, black. Wings with two bars of yellowish on tips of middle and greater coverts, and the inner secondaries are marked with yellowish on outer web. Head, all around, scarlet, fading into the yellow of the breast. Other parts, bright yellow. Iris, brown. Bill, yellowish brown. Feet, bluish.

Adult female. Greenish above, with the back dusky, beneath, yellowish green tinged with olivaceous on sides. Wings and tail, brown, the former marked with yellowish as in the male. Young male, similar to the female, but with the colors beneath brighter. Sometimes the head is mottled with scarlet, and all stages of plumage occur between this and the adult dress.

OBSERVATIONS.

This species may be distinguished in all stages of plumage from other North American Tanagers by the bands on the wing. Occurs during the breeding season from the Eastern foothills of the Rocky Mountains and upper Missouri region to the Pacific. Winters south of the United States.

DIMENSIONS.

Length, 7.00; stretch, 12.00; wing, 3.75; tail, 3.00; bill, .60; tarsus, .75.

NESTS AND EGGS.

NESTS, placed in trees, composed of a few twigs, lined with rootlets. EGGS, three or four in number, oval in form, bluish green in color, spotted and blotched with reddish brown and lilac. Dimensions, .65 by .95 to .65 by .93.

HABITS.

In general habits and song the Louisiana Tanager does not appear to differ from the Scarlet Tanager. It is a distinctly western species and the only claim that it has to a place in our fauna is through a single specimen which was taken alive in Salem, Mass., January 20th, 1878. While it is singular that a single specimen should appear so far from its breeding range, the most singular thing of all is that it should have appeared in the dead of winter, when all of its fellows had migrated quite out of the United States.

FAMILY III. HIRUNDINIDÆ. THE SWALLOWS.

Wings, long and pointed. Feet, comparatively small and weak. Bill, small, short, flat and triangular; but with a very wide gape, which extends back quite to the eyes. Coracoid bones, stout, much shorter in length than the top of keel, and set on the sternum with the terminal ends projecting outward, forming a considerable angle with the keel. Furcula, stout; terminal expansion closely approximating the top of the keel, being connected with it by a stout ligature. Primaries, nine.

All the members of this family are birds of strong flight, being capable of remaining on the wing for a considerable length of time; also of performing rapid and graceful aerial evolutions. Their sterna are constructed in such a manner as to insure strength for protracted exertion, as is exhibited in the angularly placed coracoid bones, and in the terminal expansion of the furcula, which closely approximates the top of the keel, a character quite unique among the Oscines which I have examined, being found in but a single genus besides the Hirundinidæ, that of *Corvus*. See Fig. 61, 1, where I have given the sternum of a Barn Swallow. The terminal expansion of the furcula, F, comes directly in contact with the tip of the keel, k, which is projected forward to reach it.

There is a superficial resemblance between the Swallows and the Swifts, but the relationship is analogous not homologous, the differences between the two forms being very wide. Take, for example, the sternum alone, as found in such typical species as the Barn Swallows and the Chimney Swifts. See Fig. 61, where, at 1, I have given a cut of the sternum of the Barn Swallow, and compare it with ib. 2, which is a cut of the sternum of the Chimney Swift. The scapular, *s*, of the Chimney Swift is shorter than that of the Swallow, the coracoids, *c*, *o*, much shorter and stouter; the furcula, *F*, shorter, well arched (See also Plate XVI, fig. 15), with a very small terminal expansion; it is bent downward and does not approach the tip of the keel; the keel, *K*, is high and is perforated with a series of holes along the lower side, a character not seen in the Swallows. The marginal indentations, *M*, so prominent in the Swallows, are absent in the Swifts. The Chimney Swift also has the singular glands in the lower mandible from which it obtains the viscid fluid used for fastening the sticks together with which it makes its nest. See Fig. 61, 3, where an enlarged gland is given, and 4, where the gland may be seen, life size, lying in the mandible, *B*, being the tip of bill and *T* the tongue. Also compare other characters given on Plate XVI.

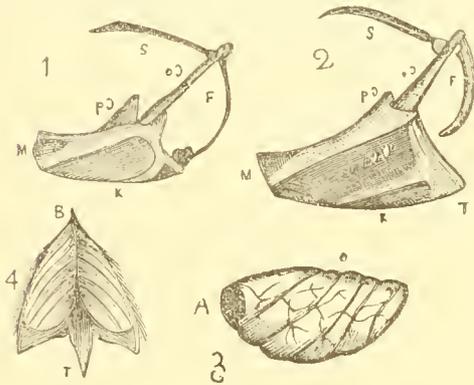


FIG. 61. 1, Sternum of Barn Swallow. 2, Sternum of Chimney Swift; *s*, scapulars; *F*, furcula; *c*, *o*, coracoids; *c p*, costal process; *M*, marginal indentations; *k*, keel, in both figures. 4, glands in lower mandible of Chimney Swift; *B*, bill; *T*, tongue; 3, enlarged gland.



FIG. 62. Head and foot of Adult Purple Martin.

GENUS I. PROGNE. THE MARTINS.

GEN. CH. Bill, stout and large, with the upper mandible curved. Feet, stout and large. Tail, moderately well forked. Sexes dissimilar. We have two species within our limits.

PROGNE SUBIS.

Purple Martin.

Hirundo subis Linn., Syst. Nat., 10th Ed., 1758, 192.

DESCRIPTION.

SP. CH. Size, large. Form, robust. Bill, stout: upper mandible considerably arched. Tail, short and moderately forked. Feet, stout. Sternum stoutly built. Tongue, short, thin, horny, triangular in form, tip rather deeply cleft, but not ciliated.

COLOR. Adult male. Uniform steely-blue throughout, with wings and tail brownish. There is a narrow white patch on the sides beneath the wings. Tibiae are grayish.

Adult female. Similar to the male above but grayish beneath, which becomes nearly white on the abdomen and under tail coverts.

Young male. Like the adult female, excepting that the forehead is grayish, and there are a few scattering feathers of steely-blue beneath. Young female, with the top of the head grayish and with considerable white beneath.

OBSEBVATIONS.

This species is readily distinguished from all other North American swallows by its large size and uniform colors. Found breeding throughout the United States, excepting perhaps, southern Florida, north into Canada. Winters in the West Indies and South America.

DIMENSIONS.

Average measurements of six specimens. Length, 8.27; stretch, 16.15; wing, 5.70; tail, 3.00; bill, .57; tarsus, .58. Longest specimen, 8.35; greatest extent of wings, 16.75; longest wing, 6.00; tail, 3.10; bill, .50; tarsus, .50. Shortest specimen, 8.25; smallest extent of wings, 16.30; shortest wing, 5.50; tail, 2.75; bill, .45; tarsus, .45.

DESCRIPTION OF NESTS AND EGGS.

NESTS, placed in holes of trees or in martin-boxes; composed of dried grasses and leaves, lined with feathers; the structure varying in size with the apartment in which it is placed.

EGGS, from four to six in number, oval in form, white in color. Dimensions, from .80 by .65 to .70 by .60. An abnormal egg of this species, which I have in my collection, that was taken by Mr. Ingersoll at Oberlin, Ohio, is very large in size, measuring 1.00 by .80, and is covered by minute rounded protuberances, similar to those occasionally seen on hens' eggs, but it is of the usual form.

HABITS.

In May, 1872, one of my collectors found Purple Martins nesting in stubs of trees on the western bank of Indian River, near Fort Capron. This style of building appears to be usual with these birds while in the wilderness, but in the more settled portions of the South, as well as in the North, they prefer boxes erected for their benefit. Indeed they invariably flock to places where such accommodations are provided for them and avoid all others. The offspring of those which have inhabited a certain locality will also return and take up their abode there, so that the number of apartments in one box will be constantly occupied. If other domiciles are erected quite near the same spot they will be inhabited, but it is extremely difficult to induce these birds to enter a new house if it stand a mile or more from those occupied by the colony, therefore they are extremely local in their distribution. I know of localities where Martins have bred for years, while they could never be induced to remain in another section which was but a mile distant, although I erected houses in suitable situations. They frequently appeared there in spring, but after examining the place and flying about it for a day or two, invariably returned to the old locality. Although fond of any particular spot they may be easily driven from it. If a few birds are shot in early spring, upon their arrival, the survivors will disappear, and cannot be persuaded to reinhabit the house from which they have been expelled, even after the lapse of many years. Accidents occurring, which are detrimental to them although not caused through the agency of man, appear to produce

the same effect. Some years ago, the Purple Martins, which bred in many boxes in Cambridge, arrived from the south quite early, induced by unusually warm weather, and took possession of their respective domiciles, but unfortunately the instincts which prompted them to come north so soon were at fault, for they were scarcely established in their summer houses when a prolonged cold snap came on and many of the poor Martins were frozen to death in their houses. The remainder left at once and there have been no birds of this kind found nesting in that section of Cambridge since.

The Purple Martin is the only Swallow with which I am acquainted, that will readily perch on trees which are covered with foliage, alighting amid the leaves after the manner of nearly all the passerine birds, but they never hop from twig to twig. The song of the Martin is loud and cheerful; in autumn, when they are more generally distributed than at other times, these clear notes frequently reach the ear when the birds are almost invisible as they sail high in air with a strong and graceful flight. Early in September, these birds migrate south, but do not remain in Florida all winter, and not one is to be seen in the state after the first of November.

PROGNE CRYPTOLEUCA.

Cuban Martin.

DESCRIPTION.

SP. CII. Form, size and general color similar to that of the Purple Martin, but rather more richly colored above, showing a violet tinge; and the bases of the feathers of the anal region are decidedly white, and the tail is more deeply forked.

HABITS.

The first and only time that I ever saw the Cuban Martin was on Biscayenne Bay, Florida. I was rowing along the shore north of Miami, in company with Mr. H. W. Henshaw, when we observed two of these birds flying about a dead stub in the pine woods, which at this point came down to the shore uninterrupted by a hammock. This was in April, 1871, and the birds were evidently searching for a nesting place.

GENUS II. TACHYCINETA. WHITE-BELLIED SWALLOWS.

Bill, shorter than in Progne, with the upper mandible less decidedly curved. Feet, proportionately smaller and the tail is much less forked. We have two species within our limits.

TACHYCINETA BICOLOR.

White-bellied Swallow.

Hirundo bicolor Viell., Ois. Am., Sept. 1, 1807, 61.

DESCRIPTION.

SP. CHI. Form, somewhat robust. Size, not large. Upper mandible, considerably curved. Feet, small. Tail, but slightly forked. Sternum, with the keel proportionately longer than in the preceding. Tongue, horny and triangular, with the end cleft.

COLOR. Adult in spring. Above, uniform, lustrous-greenish blue, with the wings and tail brownish. Beneath, including under tail coverts, pure white. Axillaries and under wing coverts, slaty, the latter

mixed with white. The sexes are similar, with the exception that perhaps the female is greener above. In winter the tertiaries are tipped with white. The young males also have the tertiaries tipped with white, besides not being as bright above. The young females are smoky-brown above, with a tinge of greenish and a dark band across the breast. Nestlings of both sexes are smoky-brown above; white beneath, with a more or less distinct band of dusky across the breast, the sides are also tinged with dusky.

OBSERVATIONS.

Readily known by the uniform steely blue color above and white below. Distributed throughout the United States, south into Mexico. Winters in the more southern portion.

DIMENSIONS.

Average measurements of thirty-two specimens. Length, 5.85; stretch, 12.45; wing, 4.55; tail, 2.25; bill, .35; tarsus, .45. Longest specimen, 6.25; greatest extent of wings, 13.35; longest wing, 4.93; tail, 2.50; bill, .50; tarsus, .75. Shortest specimen, 5.10; smallest extent of wings, 12.00; shortest wing, 4.10; tail, 1.30; bill, .25; tarsus, .40.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in holes of trees, bird boxes, etc.: composed of dried grasses and lined with feathers. Varying in size with the compartment in which they are placed. Eggs, six in number, white in color: form, from a short oval to a long pointed oval. Dimensions, from .83 by .55 to .63 by .45.

HABITS.

The White-Bellied is the only Swallow that I have ever seen in Florida during winter. They are quite abundant there but as they move across the country in large straggling flocks are not often seen in one locality for many days in succession. While in the state they do not utter a note, but skim silently over the large inland lakes, or sail above the almost limitless piny woods. In early spring they leave for the north, arriving in New England the earliest of all the Swallows. Here they have a song, which is however, not as clear and warbling as that of the Barn Swallow; their flight is also heavier, neither do they move as swiftly. These birds breed in Martin boxes, holes in out-buildings, or in hollow stubs; while nesting in the last named situation they usually choose a hole formed by nature, but I found a colony busily engaged in excavating domiciles in partially decayed birch stubs which stood in the waters of Lake Umbagog, Maine. The work was performed with the bills, not after the manner of Nuthatches, Titmice, etc., but by simply breaking away small pieces of the punky wood and removing them.

The White-bellied Swallows deposit their eggs during the first week in June; the young leave the nests early in July; after this time they all congregate on the sea-shore in vast flocks. During some years the numbers which assemble in early autumn are almost incredible, for I have seen the air over the broad marshes of Ipswich so filled with

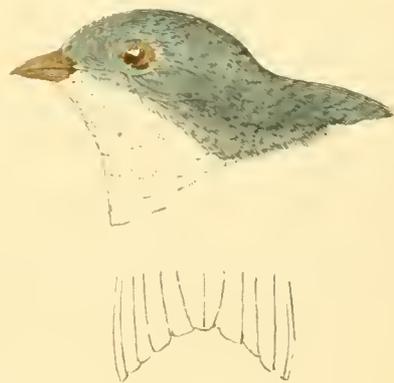


FIG. 63. Head and tail of Adult Male White-bellied Swallow.

them that it was impossible to discharge a gun in any direction without killing one or more. I always imagined that the great quantity of insects which occur near the salt water in the latter part of summer was the cause of this vast concourse, until I discovered another reason. I was walking about the hills near the coast one day in August when I observed large numbers of White-bellied Swallows hovering over some bayberry bushes (*Myrica cerifera*), which grow abundantly in this section. Curious to know what they were doing I shot several, and was much surprised to find their crops and stomachs filled with the aromatic berries. This fruit is about the size of unground black peppers, and is coated with a waxy substance, of which the bayberry-tallow is made. This was formerly used for manufacturing candles; indeed, it is now employed for this purpose in some sections of the country. I have since taken many specimens and found that it is a confirmed habit of this species to feed on the bayberry. An examination of the fruit in the process of digestion shows that only the outer waxy covering is consumed; the inner or harder portion being voided. It is probable that this substance is highly nutritious, as the birds become very fat from feeding upon it. The great mass of White-bellied Swallows depart early in September, but a few remain later than any other members of the family. The last straggler, however, disappears by the middle of the month.

TACHYCINETA CYANEOVIRIDES.

Bahama Swallow.

Hirundo cyaneovirides, Bryant, Proc. Boston Soc. Nat. His. Vol.

DESCRIPTION.

Sp. Cu. Size, rather small, about that of the Rough-winged Swallow (*S. serripennis*). Bill, short, triangular in form, being as wide at base across nostrils as it is long from nostrils to tip, exceedingly flat, not being as deep at nostrils as one half the distance from nostrils to tip. Tarsus, equal in length to the middle toe and claw, naked to the heel below. Wings, long and very pointed, the difference between the 1st and 4th quill being 1.10 inches; in a larger bird, however, this only amounts to 1.00. The ends of the outer feathers are quite pointed, beginning to taper .75 from the tip. They are slightly falcate, that is, the shaft turns a little inward and the outer web narrows toward the tip for about .25. Tail, deeply forked, the difference between the outer feathers and the central being 1.00. Outer quill of outer feather not narrowing toward the tip but simply rounded at the extreme termination, the inner web, however, begins to narrow at 1.20 from the termination and then gradually tapers to about .10 of the tip, where it suddenly rounds to the shaft. All the other feathers taper somewhat on the inner webs, the inner, however, very slightly.

The sternum presents all the peculiarities of the genus. In the present example the marginal indentations are shallow, not equalling in depth the height of the keel. The coracoids are short, much shorter than the tip of the keel, which is much higher than one half the width of the sternum. The costal processes are exceedingly well developed.

Tongue, short, triangular, .10 by .25, and slightly bifid at extreme tip. Larynx, 1.25, being slightly flattened. There are six pairs of laryngeal muscles, including the sterno trachealis, which however, is very slight, and the other muscles are not especially well developed. The tympaniform membrane, short, provided with a singular lateral membrane. Os transversale present, but the semiluna membrane is not well developed.

Heart, small, .40 by .25, not very pointed. Right lobe of liver, considerably exceeding left in size. Proventriculus, short, provided with simple oval glands arranged in a zonular band, .25 wide. Oesophagus, dilated laterally into a crop. Stomach, rather elliptical in form, .60 by .45 by .35; walls very thin, .08; lined with a smooth, not much wrinkled yellow membrane. The duodenum is short, about 1.00 long, enclosing

a balloon-shaped pancreas, which does not extend along the intestines. Intestines, 4.70 long; coeca very small.

COLOR. Adult male. Above, velvety green, showing golden reflections in some lights. Wings, with the coverts, steely blue, edged on outer webs with greenish, secondaries and primaries becoming brown on inner webs. Rump, upper tail coverts and tail, steely blue, with greenish reflections. The outer webs of the tail feathers are narrowly margined with whitish, excepting terminally, and the central portions of the inner webs are more widely marked with white. The tip and inner edges of the secondaries are narrowly margined with grayish white. Spot in front of eye, black. Beneath and sides of head in a line from gape below, black, spot, including anterior and middle portion of lower eyelid and lower half of ear coverts, under wing and tail coverts, pure white. Iris, brown. Bill, black. Feet, dark brown.

Adult female, similar above, but duller. The outer webs of the secondaries show whitish margins near the tips. Beneath the white is much less pure, being inclined to slaty beneath the eye, on the ear coverts, across breast and on sides of breast. Young male. Quite similar to the adult female, there being an indication of a band across the breast and the colors above are dull. Young female, nearly uniform dull ashy greenish above: only slightly lighter on the rump and upper tail coverts and the under wing coverts are tinged with ashy, while the ashy collar on the neck is more clearly indicated.

DIMENSIONS.

Wing, 4.50; tail, 3.00; fork, 1.00; bill, .25; tarsus, .40.

OBSERVATIONS.

Of the fourteen specimens examined those of the same age and sex vary but little. In the type described the line of demarkation between the greenish of the back and the bluish of the rump is well defined, but in others there is an intergrade, and in these specimens the blue comes higher up on the back, but judging from the purity of the white beneath this is mere individual variation, not an indication of greater maturity. As given, the indication of the collar and soiling of the lower parts is a mark of immaturity, thus doubtless the nestlings will first be plain gray above with a well defined collar of ashy. In the elliptical form of the stomach, its thin walls, and length of intestines this species agrees more closely with *T. bicolor* than with any other species which I have examined. The sternum, however, in every particular, resembles *H. riparia*. In the small, cylindrical, straight spleen and peculiar lateral membrane of the tympaniform this species differs from any of our Swallows which have come under my observations, viz., *H. horreorum*, *S. serripennis*, *H. riparia*, and *T. bicolor*, all of which have the spleen thickened on the anterior portion or bent upon itself. I should judge, however, that this might be a variable character, changing possibly with the season, as I have often found the spleen greatly enlarged during the breeding season, and for some time after it in many species of birds.

The resemblance in color and texture of the feathers to those of the Violet Green Swallow is noticeable but it may at once be distinguished from this and other species by the uniformity of the green from forehead to rump. This species was described in Proceedings Boston Society Natural History, Vol. VII, September, 1859, page 111.

HABITS.

The following extract from my note-book between the dates of January 23 and 28 will give my first impressions of this Swallow.

"I have seen this species flying along Kemp's Road, Wulf's Road and the Village Road every day between the dates mentioned above. They appear common, flocks consisting of from ten to perhaps thirty individuals appearing, and I have already secured quite a number. They fly high or low according to inclination, the peculiar state of the weather, or perhaps according to the flight of insects. The course which they were pursuing has generally been from west to east and they usually move steadily onward but they occasionally remain in one locality for some time.

The flight of this lovely Swallow somewhat resembles that of *H. bicolor* (White-bellied Swallow) and somewhat that of *H. horreorum* (Barn Swallow), or better, it is half way between the two, being a little swifter than that of the former and not quite as swift nor as graceful as that of the latter. They have the habit of pausing, or seemingly pausing in the air, observed in the White-bellied, especially when flying against the wind. Their movements are, I think, influenced by the heat as they fly more slowly on a warm, still day. The deeply forked tail and slender form causes them to be at once recognized. No note whatever has yet been heard."

Through February we saw them at intervals, but not in large flocks, and all appeared to move from west to east, the flight beginning in the morning, but they seldom returned by the same route by which they went and only on one occasion did we see them turn back toward the west.

On March 8th we came upon a flock of some twenty or more in a cup-like hollow in the piney woods far to the west of the town of Nassau where the trees had been cut away for the purpose of making charcoal, leaving an open space of some five or six acres. The birds were darting gracefully and rapidly about, much lower than I had ever seen them keep before, often nearing the tops of the low herbage. Here we shot four fine males, the first of which fell only wounded. As I approached him he uttered a clucking note, which attracted the attention of his hurrying comrades and they darted down at me as they dashed past, some answering the cries of the prostrate bird with a low, musical chirping. Upon shooting two or three times at them, however, they speedily dispersed, and in a few minutes disappeared. Upon dissecting these specimens I found the generative organs slightly enlarged indicating that the birds would breed at no distant time.

From this date until our departure for Andros we did not see a single specimen excepting a solitary individual observed flying over a marsh near Rock Creek. We did not meet with the species on Andros.

On May 27th I saw a single Swallow flying over the harbor at Nassau, the first observed since our return to the city, but they did not become common until June 4th, and on the 10th they were flying about the streets moving quite slowly and heavily as all Swallows move when about to breed. A few days later I saw the Swallows alighting on the ground about the house late in the day picking up strings, feathers, etc., for the nests, and when on the schooner, "Isle of June," just before sailing for New York I saw one enter a hole under the eaves of a building which stood on the wharf, so it is highly probable that in breeding habit they resemble the White-bellied. In 1859 this species was evidently much more numerous on the Bahamas than now, for Dr. Bryant speaks of them as abundant during his stay from June 20th until May 14th, and constantly resident to the west of the town. Mr. Cory did not find them on Nassau in winter at all and only observed a small colony on Andros in January. Evidently those observed by us during our visit were all members of the same company seen at different times and I do not think that the entire number inhabiting the island of New Providence, even in June, amounted to over fifty individuals, nor do I think that the species occurs elsewhere on the Bahamas in summer, for I could learn nothing of it from the inhabitants of other islands. A species represented by so small a number is certainly quite liable to become extinct. A great

mystery connected with the species is the place of its residence in the interim between the time of its disappearance from New Providence, along in March, to its appearance in June. The reason of the departure from the Bahamas was evidently the scarcity of insects, for they feed upon diptera and coleoptera during the dry season, and the weather being unusually dry the last of the season, in April and May, it is evident, then, reasoning upon this supposition, that they desire to seek some more humid land when the season chances to be dry on the Bahamas. Where this favored land may be is, of course, only a matter of conjecture but I should not be at all surprised to find this beautiful Swallow common in Florida for the distance which it would have to traverse from Andros to the Florida keys is not much greater than from New Providence to Andros.

On November 20th, 1887, I saw a few Swallows sailing over the sea to the eastward of Nassau, and some days later, about December 1st I saw a large flight of Swallows at Middle Bight, Andros, which was repeated twice about a week from one another. On all three occasions the birds were flying out the Bight from west to east.

On March 30, 1893, during a cold and severe "norther," the Swallows, which had previously been absent, suddenly appeared in large numbers. I did not find the Bahama Swallow at Inagua in February, 1888, and could not learn that it ever came there.

These last notes, written some time after the concluding hypothesis that the Bahama Swallows pass the winter outside of the islands, tend to confirm this opinion. The reason why I had made the foregoing remarks was that upon two occasions in the winter I had seen the Bahama Swallow in Florida. Once I saw quite a flock of them sailing high in air over Key West, and once a single specimen passed within a few feet of my head as I stood on the banks of Indian River. This last bird was in company with White-bellied Swallows, but on both occasions the deeply-forked tail rendered the birds at once distinguishable.

The Bahama Swallow has since that time been actually taken in Florida, a single specimen having been procured on the keys. I am, certain, however, that this fine bird will be found to occur regularly in the State.

GENUS III. CHELIDON. THE BARN SWALLOWS.

GEN. CII. Bill, similar to that of the last genus but rather more slender. Tail, deeply forked, with the outer feather narrowed and elongated. Feet, rather slender; toes, long; tarsus, feathered a little way down from tibial joint above. We have a single species with us.

CHELIDON HORREORUM.

Barn Swallow.

Hirundo horreorum Barton, Fragments N. H. Penna.: 1799, 17.

DESCRIPTION.

SP. CII. Form, slender. Size, not large. Bill, not stout; upper mandible straight, with the tip slightly curved. Feet, small. Tail, long and very deeply forked; the two outer feathers are considerably elongated and exceedingly narrow. Sternum, not slightly built, and precisely similar in form to that of *IL. subis*. Tongue, rather fleshy and triangular; cleft at the tip.

COLOR. Adult male, above, uniform steely-blue, wings and tail browner. The latter has a subterminal band of yellowish-white caused by spots upon the inner webs of all the feathers excepting the two middle ones. Forehead, throat and upper part of the breast, chestnut. The remaining under portions, including under wing and under tail coverts, rich chestnut-brown. The steely-blue of the back extends down the sides of the upper portions of the breast and frequently forms a band quite across it. Adult female, similar, but paler beneath. Young male, similar to the adult female. Young female, very pale beneath, becoming yellowish-white on those parts which are chestnut-brown on the adult. Nestlings of both sexes, are much duller above, have the frontal band narrower and are very pale beneath in comparison with the adult, but some female specimens are as deeply colored as the year-old birds of the same sex. In this stage, the throat and upper portion of the breast are frequently uniform with the other portions beneath. The outer tail feathers are not as elongated nor as narrow at the tips; these feathers being acquired after the first moult.



FIG 64. Head, and tail feather of Adult Male Barn Swallow.

OBSERVATIONS.

Easily distinguished from all other North American Swallows by the elongated tail feathers. The intensity of color beneath is extremely variable; one adult male now before me, which was taken at Ipswich, in summer, is so exceedingly rich in color on these portions that the lower breast, abdomen, etc., are nearly as dark as the throat and upper breast. This specimen has also concealed spots of chestnut on the feathers of the nape, back and scapularies; indications of these spots occasionally appear on other specimens, but not to the extent seen in this finely colored bird. The blue band across the breast is also quite changeable; it is nearly always indicated in the adult, but sometimes it is very plainly marked. One adult male taken at Ipswich has a band three-fourths of an inch wide, starting on either side, dividing in the middle of the breast and enclosing a spot of chestnut which contains some blue feathers. Distributed during the breeding season throughout the United States and Canada, wintering in the West Indies and Central America.

DIMENSIONS.

Average measurements of fourteen specimens. Length, 6.89; stretch, 12.98; wing, 4.85; tail, 2.75; bill, .45; tarsus, .45. Longest specimen, 7.60; greatest extent of wings, 13.00; longest wing, 4.85; tail, 3.19; bill, .55; tarsus, .48. Shortest specimen, 6.35; smallest extent of wings, 4.66; shortest wing, 4.50; tail, 2.15; bill, .40; tarsus, .35.

DESCRIPTION OF NESTS AND EGGS.

NESTS, fastened against beams, etc., in barns and out-buildings; composed of mud mixed with grasses and lined with fine grasses and feathers. Dimensions, external diameter, 5.00; internal, 3.00; external depth, 2.50; internal, 1.50.

EGGS, five or six in number, long oval in form, rather pointed; pure white in color, spotted and blotched irregularly with reddish-brown and lilac. Dimensions, .50 by .75 to .56 by .94.

HABITS.

On some frosty morning in April, not long after the snow has disappeared, two or three Barn Swallows may be seen perched on the roof of some out-building, looking like little balls, for each feather stands at right angles with the body to prevent the ingress of the cold. Later in the day these few individuals may be seen roaming about in the clear air; then, after a week or so, when spring is fairly set in, hundreds are rapidly pur-

suing the minute insects and performing various rapid and elegant aerial evolutions. Of all the members of this family which inhabit our country, the Barn Swallows are the most graceful and have the most delightful song. All through the long, summer days they fly over the green meadows and about the farmhouse, twittering loudly and continuously with bubbling, rippling notes which sound as if the birds were brimming over with happiness and glee. Darting through the wide doors they fill the capacious barn with their enchanting melody as they warble to their mates who sit in the snug nests, which are neatly fastened to the strong beams overhead. The females peer out of their feather-lined structures and gaze quietly upon the farmers who are busily engaged in filling the broad bins with fragrant new mown hay.

All this forms a well known picture of New England rustic life in midsommer, no feature of which is more prominent and enjoyable than the coming and going of the Barn Swallows. These birds lay their eggs in early June, and late in July the young emerge from the nests and perch on fences or buildings. Soon they follow their parents through the air and are often fed by them without alighting, the two coming together breast to breast with fluttering wings, when the offspring receive the supply of dipterous insects which the parent has collected in its capacious mouth; then they quickly separate. As autumn approaches, the Barn Swallows assemble on the coast and spend a short season flying over the marshes, but by the first week in September depart for the south. None, as far as my knowledge extends, winter in Florida or breed there, but simply pass through the state in the spring and fall migrations.

On March 30th 1888, the Barn Swallows made their appearance on the island of Cayman Brae. They became common in a few days and remained about this island or the neighboring island of Little Cayman until April 22d. In order to have reached the northern portion of the United States by the last week in April or even the first of May, at which time they are due there, these Swallows must have flown over the intervening hundreds of miles of sea and land very rapidly.

GENUS IV. PETROCHELIDON. THE CLIFF SWALLOWS.

GEN. CH. Bill, rather shorter and broader than that in the two last genera. Tail, short and nearly even. Feathers about the bill rather more bristly than in other groups, especially in the angle of the lower mandible. Feet, much as in those of Chelidon. We have a single species within our limits. Sexes, similar.

PETROCHELIDON LUNIFRONS.

Cliff Swallow.

DESCRIPTION.

SP. CH. Size, medium. Form, robust. COLOR. Adult. Above, and spot and throat, steel blue, about as in the Barn Swallow, slightly streaked on the back with ashy, and there is an ashy collar on back of neck. Forehead, creamy buff. Rump, pale chestnut. Sides of head and throat, deep chestnut. Beneath, white, slightly tinged with ashy on breast, sides and flanks. Under wing and upper and under tail coverts, ashy brown. Bill, black. Iris and feet, brown. Young. Similar, but duller.

BANK SWALLOW.

OBSERVATIONS.

Readily distinguished from our other Swallows by the conspicuous chestnut rump. Occurs in the breeding season throughout North America, excepting possibly Florida, south to Northern Mexico. Winters in South America.

DIMENSIONS.

Length, 5.75 to 5.85; stretch, 12.15 to 12.30; wing, 4.30 to 4.85; tail, 2.00 to 2.10; bill, .55 to .58; tarsus, .30 to .35.

DESCRIPTION OF NESTS AND EGGS.

NESTS, placed under cliffs or eaves of buildings, globular in form; composed of mud. EGGS, four to six in number, oval in form, white in color, spotted and blotched with reddish-brown and lilac. Dimensions, .30 by .75 to .56 by .85.

HABITS.

The Cliff Swallow is among our most common Swallows, but is somewhat local in distribution, as they breed in colonies in the settled districts placing their singular globular or bottle-shaped nests in long rows under the eaves of buildings. They arrive from the south in New England about the first week in May and may be seen in company with other Swallows flying over the meadows in pursuit of insects, but the Cliff Swallow is at once distinguished from all of our other Swallows, even when too far away to see its conspicuously chestnut rump, by the comparatively heavy flight, it being much less graceful and easy in movement on the wing than the other Swallows. The note is a rather harsh twitter, which is not as musical as the song of the Barn Swallow, but is enlivening when heard about the farm buildings.

The Cliff Swallows are among the first to leave us in autumn, departing in August. They appear to migrate both north and south, through Mexico, avoiding Florida and the West Indies.



FIG. 65. Head and tail of Adult Cliff Swallow.

GENUS V. CLIVICOLA. THE BANK SWALLOWS.

GEN. CH. Bill, proportionately stout. Tail, slightly forked. Tarsus, with a tuft of feathers near hind toe (See Fig. 67, D, T). We have one species within our limits. Sexes similar.

CLIVICOLA RIPARIA.

Bank Swallow.

Hirundo riparia Linn., Syst. Nat. 1, 1766, 344.

DESCRIPTION.

SP. CH. Size, small. Form, slender. Upper mandible, slightly arched. Feet, not small and provided with a tuft of feathers which grow from the heel. Tail, moderately forked. Sternum, quite similar to that

of the preceding species, but not as stoutly built. Tongue, stout, not very triangular, horny and quite acuminate, with the tip cleft but not ciliated. The nestlings have fleshy, triangular tongues.

COLOR. Adult. Above, band across the breast, under wing coverts and sides, slaty brown; with the wings darker and tips of the feathers of back hoary. The band usually extends down in a point on the breast. Remaining under portions, pure white. The young are similar.

Nestlings, with a rufous washing above, on the band of the breast, sides and white of throat, which is occasionally obscured by dusky. Sexes, alike. Irides, brown. Bill, black. Feet, brown in all stages.

OBSERVATIONS.

Readily distinguished from the closely allied *S. serripennis* by the smaller size and white throat. The tuft of feathers on the heel is always present, but is frequently represented by two or three feathers; there are, however, many more on others, and on some young birds taken at Grand Menan, they extend with very little interruption along the back of the tarsus quite to the tibial joint. Bank Swallows are distributed throughout North America during the breeding season, excepting possibly Florida, wintering in Mexico and the West Indies. They are also found throughout the northern section of the Old World.

DIMENSIONS.

Average measurements of seventeen specimens.—Length, 5.25; stretch, 10.75; wing, 3.95; tail, 1.95; bill, .25; tarsus, .45. Longest specimen, 5.45; greatest extent of wings, 11.10; longest wing, 4.20; tail, 2.10; bill, .28; tarsus, .50. Shortest specimen, 5.00; smallest extent of wings, 10.10; shortest wing, 3.00; tail, 1.75; bill, .23; tarsus, .42.

DESCRIPTION OF NESTS AND EGGS.

NESTS, placed in holes formed in banks of earth, composed of dried grass, lined with feathers. They are very shallow. Dimensions, external diameter, 5 inches, internal, 4; thickness, 1 inch. Eggs, from four to six in number, oval in form, and pure white in color. Dimensions, from .70 by .45 to .60 by .40.

HABITS.

Although Audubon states that the Bank Swallow is abundant in Florida during the winter, yet I have never seen it in the state at that season. It arrives about the first of April, but I have not found it at all common and do not think that any ever remain to breed. These are the last of all the Swallows to make their appearance in New England, arriving about the middle of May. They then quickly repair to some sandy bank and begin to dig burrows in which to place their nests. They excavate the holes with their feet, aided by their bills, and although these members are seemingly weak the birds manage to get on quite rapidly, often penetrating a bank to the depth of three or four feet in a few days. These birds are highly gregarious, and from five hundred to a thousand pairs may be found breeding in a favorable locality. They are quite numerous in the interior, but seem to have a predilection for the coast, and will even inhabit islands; in fact, I found a small colony nesting on a lonely islet, one of the Magdalen group, called Shagg Rock, which stands in the midst of the Gulf of St. Lawrence, more than a hundred miles from the mainland. This rock rose abruptly from the water to the height of ninety feet, but

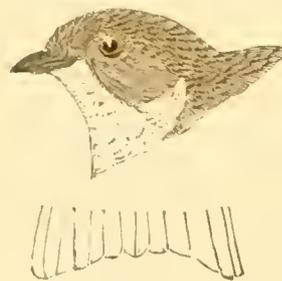


FIG. 66. Head and tail of Adult Bank Swallow.

the top was covered with soil, portions of which overhung the water, affording the Swallows a fine opportunity to build. The rocky face of the cliff was inhabited by Cormorants; hundreds of Terns, that were breeding on the upper surface, hovered confusedly about and filled the air with their harsh, continuous cries, but amid all this discord the soft twitter of the Bank Swallows could be heard as they flew quietly about their strangely chosen homes.

Either this species do not mate until they begin to construct their nests or else they are polygamous, for it is quite common to see two or three males in pursuit of a single female, but I think the former hypothesis more probable, as both sexes incubate. The Bank Swallows bring out their young early in July, and by the latter part of that month they accompany their parents in their aerial flight in search of insects; later, in August, they all disappear, being the first of all the Swallows to depart for the south.

GENUS VI. STELGIDOPTERYX. THE ROUGH-WINGED SWALLOWS.

GEN. CH. General form and color much as in the Bank Swallows but with the stiffened ends of the outer webs of the first primary converted into a series of recurved hooks. (See Fig. 67, S. n, n, being the hooks). Tarsus slightly feathered above only.

STELGIDOPTERYX SERRIPENNIS.

Rough-winged Swallow.

Hirundo serripennis Aud., Orn. Biog., iv, 1838, 593.

DESCRIPTION.

SP. CH. Form, quite robust. Size, not large. Bill, medium, and slightly curved at tip of upper mandible. Feet not as large as in the preceding. Tail, slightly forked. The outer webs of the outer primaries provided with hooks, which curve forward. Tongue, triangular in form and slightly bifid at tip.

COLOR. Adult. Above, uniform, smoky-brown. Chin, throat, under wing coverts, axillaries, sides and flanks, pale, smoky brown. Remaining under parts, including under tail coverts, white.

OBSERVATIONS.

This species is larger than *C. riparia*; it also differs from it in having no feathers on the heel, but is provided with sharp hooks on the outer webs of the outer primaries. These appendages are more prominent near the middle of the feather, being scarcely perceptible at the base, then grow larger, reaching the maximum in the centre, gradually diminish toward the terminal portion, until the extreme tip is perfectly devoid of them. Bank Swallows occasionally have indications of this singular character, especially young birds. This is readily seen by comparing the outer primary web of some which I now have before me, with that portion of the wing of *S. serripennis*, where the hooks are nearly obsolete. I have never seen a nestling of *S. serripennis*, but the hooks are said to be less prominent on their

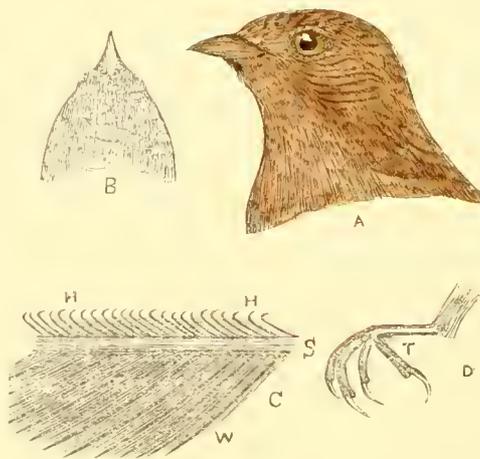


FIG. 67. A, head, B, upper mandible of Rough-winged Swallow. C, portion of outer feather of wing (enlarged); s, shaft of feather, w, web, n, n, hooks. D, foot of Bank Swallow, t, tuft of feathers.

wings. Distributed during the breeding season throughout the United States, exclusive of New England. Winters in South America.

DIMENSIONS.

Length, 5.20 to 5.50; stretch, 11.50 to 12.25; wing, 4.25 to 4.90; tail, 2.10 to 2.15; bill, .25 to .30; tarsus, .40 to .42.

DESCRIPTION OF NESTS AND EGGS.

NESTS, placed in holes: composed of coarse grasses and roots, the lining consisting of grass blades. EGGS, from four to seven in number, rather long and pointed in form, pure white in color. Dimensions, from .70 by .55 to .65 by .50.

HABITS.

The quaint and ancient city of St. Augustine is situated on an arm of the ocean: consequently it is necessary to protect the lower section by a sea-wall, which extends the entire length of the town. This wall, being broad upon the top, is used as a promenade by the inhabitants. While sauntering along this walk one day in April, I observed some Swallows alighting in front of me. I saw at once that they were a species which I had never seen before, but a closer view proved them to be Rough-winged Swallows. At first there were only four or five to be seen, but in a few days there were quite a number flying about the place. This is the only time I ever met with this species living, and I have never found it breeding in the State; but having met Mr. Allen, in Jacksonville, a few weeks later the same season, he informed me that he found a small colony evidently about to breed on some bluffs along the St. John's river not far from the mouth.

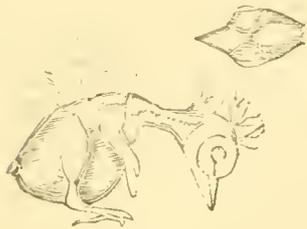


FIG. 68. Newly-hatched young of Rough-winged Swallow.

I found the Rough-winged Swallow common at Williamsport, Pennsylvania, the first week in May, 1876. These birds fly quite heavily and are much less agile in all their movements than are the Bank Swallows. They appear to be fond of the vicinity of the water and pass a greater portion of their time in flying over it. In fact, they usually, in the vicinity of the Susquehanna River, build near the water. Contrary to opinions given, the Rough-winged Swallow here does not, as a rule, dig a hole for itself, but always, as far as my experience goes, finds some cavity ready made in which to place its nest. During the season of which I speak above, I had considerable experience with the species, for I traversed the Susquehanna between Williamsport and Watontown, exploring both banks quite thoroughly.

I found my first nest May 19th, in a large hole which had been evidently excavated by a Kingfisher the previous year, but this nest contained no eggs, being partly constructed. On the 25th of the month I found nests with eggs. The favorite nesting place is an old Kingfisher's hole, but on some occasions they occupy old holes of the Bank Swallow and I have seen the nest in holes of wooden bridge piers, also occasionally in the masonry of stone bridges, and once I saw a pair entering a hole under the eaves of a portico over a door of a house that stood a short distance from the river.

The Rough-winged Swallow does not nest in communities like the Bank Swallow, but singly, the nest is also much more bulky than that of the Bank Swallow, and is not as a rule placed as far back from the entrance of the hole, often not more than a foot. The eggs are all deposited and incubation begins by the last of May.

FAMILY IV. AMPELIDÆ. THE CHATTERERS.

Based mainly upon the single genus *Ampelis*, the characters are as follows: Bill, short and triangular; gape, wide, nearly as much so as in the *Hirundinidæ*. Wings, quite long. Tail, square and not emarginate. Sternum, quite similar to that of the preceding family. The expansion of the furcula does not approach the keel nearly as closely, however, and the tip of the keel is not as pointed, neither does it project as far forward. Marginal indentations of *Ampelidæ* are deeper than those of the Swallows, and the coracoid bones are not set on at such a wide angle. A peculiar family, whose proper place in the systematist's catalogue is at present doubtful.

GENUS I. AMPELIS. THE WAXWINGS.

GEN. CH. Head, crested. Plumage, soft, silky and well-blended. Tips of secondaries, provided with a horny expansion, which resembles red sealing-wax. Sternal characters, as described above.

This is a singular genus, which should, judging from the anatomical and osteological characters, be placed quite near the order Clamatores. Still the sterna very closely resemble those of *Hirundinidæ*. This latter named family cannot be considered as clamatorial birds, but they are now, in my opinion, placed much farther from this order (Clamatores) than is consistent with certain characters exhibited in the sterna, which will be mentioned at some future time.

AMPELIS CEDRORUM.

Cedar Bird.

Ampelis cedrorum Selater, P. Z. S., 1856, 299 (Cordova).

DESCRIPTION.

SP. CH. Form, robust. Size, medium. Bill, not large. Sternum, quite stoutly built. Tongue, triangular, with the base fleshy, but becoming thin and horny, the tip being bifid and provided with coarse cilia.

COLOR. Adult. Top of head and crest, deep brown, which gradually but imperceptibly changes along the back into the slaty of the upper tail coverts and top of tail, which is tipped with yellow. Wings, with the exposed portions, excepting the tips of primaries, slaty; remaining parts, dark brown. Chin, deep chocolate, gradually changing along the under parts into the pale yellow of the abdomen. Under wing coverts and axillaries, smoky-brown. Under tail coverts, dirty white. Secondaries, and occasionally the tail, tipped with the red horny expansion of the shaft of the feathers. Young birds are paler and generally lack the red tips of the wings. The yellow marking of the tail is also narrower. Nestlings are not only quite slaty, but are streaked longitudinally underneath with dusky. Sexes, similar. Irides, brown. Bill and feet, black in all stages.

OBSERVATIONS.

The well known Cedar Bird may readily be distinguished from *Ampelis garrulus* by the smaller size, white under tail coverts and absence of white markings on the wings, but in regard to this latter character it may be well to state that rarely specimens of *A. cedrorum* may be found, with longitudinal stripes of white on the tips of the primaries, although I never saw any indications of a white bar across the wings. The young generally lack the red tippings of the secondaries, yet I have seen nestlings which were provided with them on both wings and tail. The proportion of adults which have red-tipped tails is, as far as I have observed,

about one per cent., while those with white markings on the wings are much rarer. Some localities appear to produce many specimens in both of these conditions, whereas they are scarcely to be found in others. I have collected quite a number thus marked about Newton, Mass., yet I never found a single specimen at Ipswich. I can find no difference between individuals taken in Florida and those taken in New England, excepting that I never saw one from the former locality which had the red tippings, and I have taken a considerable number there. Distributed as a resident species or an irregular migrant throughout North America north to Hudson's Bay, breeding in the more northern portions.

DIMENSIONS.

Average measurements of thirty-two specimens. Length, 7.20; stretch, 11.65; wing, 2.75; tail, 2.25; bill, .42; tarsus, .65. Longest specimen, 7.50; greatest extent of wings, 12.25; longest wing, 4.00; tail, 2.75; bill, .45; tarsus, .70. Shortest specimen, 6.75; smallest extent of wings, 11.00; shortest wing, 3.60; tail, 2.00; bill, .27; tarsus, .25.

DESCRIPTION OF NESTS AND EGGS.

NESTS, composed of cedar bark, fibrous roots and dried grasses. Dimensions, external diameter, 4 inches, internal, 3; external depth, 3 inches, internal, 2.50.

Eggs, oval in form, bluish-white in color, with the larger ends covered with round spots of black; there are also spots showing beneath the surface. The smaller ends are occasionally marked with black. Dimensions, from .80 by .60 to .90 by .65.

HABITS.

The singular hissing notes of the Cedar Bird may be heard during winter almost anywhere in Florida north of Lake Monroe. They move in large flocks here as is their custom elsewhere, but mainly frequent open places near settlements. As their food at that time consists mostly of insects, they doubtless find a large supply in those localities. I do not think they breed in the state, but linger until May, when they go farther north. The migrating movements of this species in eastern Massachusetts are quite singular. In May, when the apple-trees are in bloom, they appear in great numbers and subsist upon the larvae of various species of Lepidoptera, which infest these trees, occasionally interlarding their repast with the petals and stamens of the blossoms. About the middle of June, they build their nests, the young are out in July, and later may be seen, in company with their parents, chasing insects. They are especially abundant at this time in the vicinity of bodies of fresh water, and will often alight upon lily-leaves and other aquatic plants, in order to secure their prey; or will take their food by plunging downward from a limb which overhangs the water and hovering for a moment over the surface. By the first of September, they are gone and we seldom see them again until the following February, then, when the cedar and savin berries are fully ripe, they appear in immense flocks and feed upon them. They will then also eat largely of the fruit of the mountain ash and asparagus. By the middle of March, they once more disappear and we do not see them again until the following June. These birds usually place their nests on the limbs of apple trees or in their favorite cedars. The parents are very solicitous for the safety of their eggs or young, and will alight quite near the intruder, continually uttering their sharp hissing notes. While incubating they pay very little attention to the presence of men; indeed, I once knew a pair that constructed their nest in a small red cedar, which stood near a path along which many people were constantly

passing, yet the female kept her place although the heads of pedestrians came within two or three feet of her; in fact, she became so accustomed to all this bustle that it was only by endeavoring to take her in the hand that she could be induced to fly.

AMPELIS GARRULUS.

Bohemian Waxwing.

Ampelis garrulus Linn., Syst. Nat. 1, 1766, 297.

DESCRIPTION.

SP. CH. Form, similar to that of the Cedar Bird, but the size is larger and the general coloration is similar, but differs in having the throat abruptly black, the forehead and sides of head chestnut; the color beneath is paler but without any yellow, the under tail coverts are chestnut; the secondaries edged on outer web near tips with white, and the primaries with yellow or white.

OBSERVATIONS.

During the winter of 1880 I received some fifty specimens of this species, in the flesh, from Mexico, N. Y. and Clayton, Minn., and was thus afforded an excellent opportunity of examining the vocal and other organs.

As I knew it to be a mooted point among ornithologists as to whether the Bohemian Waxwing is capable of uttering anything like song, it was with considerable interest that I examined the inferior larynx.

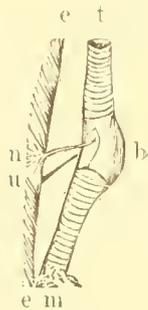


FIG. 69.

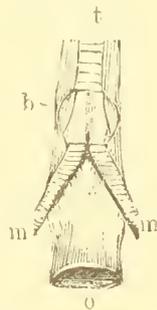


FIG. 70.

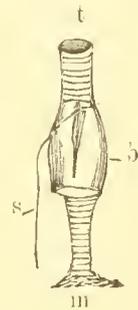


FIG. 71.

The sterno trachealis is present, but it is not only reduced to a mere transparent thread, but has no sternal attachment. This muscle has its tracheal origin, as in all of the true singing birds that I have examined, below the division of the broncho trachealis, which muscle is present and well developed, from thence the sterno trachealis proceeds upwards, at a slight angle backward, and becomes firmly attached to the muscles of the neck.

This arrangement can be seen at FIG. 69; t, being the trachea, b, the broncho trachealis, m, the lungs from which emerge the bronchial tubes; e, e, represents a portion of the neck to which the short sterno tracheal muscle adheres, n being the right, and u the left of these. All three of these figures are life size.

Although it is not unusual for the lower larynx to receive support from filamentous tissues which are attached to the neck, this is the only case that has come to my knowledge where the sterno trachealis is so attached.

Owing to its point of attachment, this muscle must be quite functionless so far as being an aid toward producing sound, thus we are not surprised upon examining the bronchial tubes to find that there is no tympaniform membrane. The bronchial rings, although extending round the tubes, are not entire, but there is a narrow division on the inside in the place usually occupied by the tympaniforms. I also find that the

bronchials are connected firmly together by a thick membrane that adheres by a close attachment to the outer walls of the oesophagus. See Fig. 70, t, trachea; b, broncho tracheal muscles; o, oesophagus; m, m, bronchial tubes with the connecting membrane between, while the dark lines above it represent the division where the tympaniforms should be.

A careful examination shows that the os transversale, a thin bone that extends across the trachea between the openings of the bronchials, is present, and that it usually supports a semiluna membrane, but I have found several individuals of both sexes in which this is absent, and in no case is it well developed. The tympaniforms being absent, we must then look to this partly-developed membrane, for all the sounds that this species is capable of uttering, and as it is absent in some specimens, we must conclude that if the Bohemian Waxwing sings at all, it sings as individuals, not as a species.

Here then, is a bird in which the power of song is being developed or is being lost, for analogy teaches us that organs having functions so important do not long remain in a half developed condition. In order to throw some light upon this point, we naturally turn to the Cedar Waxwing, *A. cedrorum*, and examine its trachea. Here we find that the sterno-trachealis is exactly as variable as in the Bohemian. In many cases we find a decided sterno trachealis (See Fig. 71), although it is reduced to a mere white thread, but it has a sternal attachment. In an adult female taken in Newtonville, September 14th, 1889, the sterno trachealis was attached to the neck as in some specimens of *A. garrulus*. A young male taken at the same date shows a decided sternal attachment for the sterno trachealis, while in one case, that of a young male, also taken the same day, there are two pairs of thin muscles, both arising together on the trachea, but one pair goes to the muscles of the neck and the other to the costal process of the sternum.

DIMENSIONS.

Extreme dimensions of twenty specimens taken at Mexico, N. Y., Feb. 23d, 1880. Length, 7.75 to 8.50; stretch, 13.15 to 14.25; wing, 4.36 to 4.75; tail, 2.50 to 2.85; bill, .40 to .50; tarsus, .60 to .75.

DESCRIPTION OF NESTS AND EGGS.

NESTS, placed in trees, composed of rootlets, moss, grass, and lined with feathers. EGGS, four to six in number, oval in form, yellowish gray in color, spotted and blotched with yellowish brown, dark purple and black, with lighter shading around the spots, as seen in eggs of the Cedar Bird. Dimensions, .60 by .80 by .70 by .88.

HABITS.

The beautiful Bohemian Waxwing is a summer inhabitant of the northern portions of the northern hemisphere, migrating southward in winter along the Rocky Mountains to Colorado; eastward irregularly as far as Minnesota, more rarely to New York and more rarely still to Massachusetts.

FAMILY V. LANIIDAE. THE SHRIKES.

Bill, short, stout; upper mandible strongly curved and deeply notched. Sternum, almost precisely similar in form to that of the Vireonidae. Wings, proportionately short and rounded. Tail, long and also rounded.

Although the sternum of this family closely resembles that of the succeeding, showing their affinity, yet all of our species may readily be distinguished from the Vireonidae by the more strongly curved and deeply notched bill. The wings are proportionately shorter and the tail longer.

GENUS I. LANIUS. THE BUTCHER BIRDS.

GEN. CH. Bluish or brownish-ash above: beneath, white, banded with black, in some stages. Wings and tail marked with black and white. Other characters as given above.

The peculiar bills of these birds give them a hawk-like aspect, yet their other anatomical and osteological features are those of the passerine birds, while their well-executed songs proclaim them to be true Oscines.

LANIUS LUDOVICIANUS.

Loggerhead Shrike.

Collurio ludovicianus Baird, Review of American Birds, 1866, 443.

DESCRIPTION.

SP. CH. Form, robust. Size, medium. Sternum, stoutly built. Tongue, thin, horny and acuminate; with the end bifid and provided with cilia, which in young specimens extend along the sides.

COLOR. Adult. Above, slaty-blue, darkest on the head and lightest on the rump, but never whitish. Line on the forehead, stripe extending through the eye and down on the neck, wings and tail, black. Outer webs of tertiaries, tips of secondaries, basal third of primaries, terminal band on all, excepting the two central tail feathers and under portions of body, including under tail coverts, white. Sides, flanks, axillaries and under wing coverts, bluish-ash. Young, similar, but browner above and obscurely barred below with dusky, especially on the breast. Nestlings differ in having the two central as well as the other tail feathers tipped with white. The white on the secondaries is marked with yellowish, while there are indications of yellowish barrings above the terminal markings. Both rows of upper wing coverts are finely barred with yellowish white. The remaining upper and entire lower parts, excepting the throat and abdomen, crossed with fine wavy lines of dusky.

OBSERVATIONS.

Known from the closely allied *L. borealis* by the smaller size and continuous line over the forehead and absence of bandings below; otherwise the markings of these two species in adult plumage are very similar. The young of the northern species are browner above than the same stage of *ludovicianus* and the dusky lines below are much more prominent. Distributed as a resident species throughout Florida.

DIMENSIONS.

Average measurements of seven specimens. Length, 9.20; stretch, 12.35; wing, 3.85; tail, 3.90; bill, .70; tarsus, 1.05. Longest specimen, 9.50; greatest extent of wings, 13.20; longest wing, 3.90; tail, 4.00; bill, .75; tarsus, 1.20. Shortest specimen, 3.75; smallest extent of wings, 12.25; shortest wing, 3.75; tail, 3.75; bill, .65; tarsus, .95.

DESCRIPTION OF NESTS AND EGGS.

NESTS. A specimen now before me, which was taken in Florida, from a pine tree forty feet from the ground, is composed of roots and dried grasses, among which is interwoven cotton that the birds procured from a supply which was taken from a vessel by the wreckers and spread out to dry. It is lined with fine grasses and cotton. Dimensions, external diameter, 6 inches, internal, 4; external depth, 2.75 inches, internal, 1.50.

EGGS, four to six in number, oval in form, grayish-white in color, spotted and blotched with reddish-brown and lilac. This marking is often distributed irregularly over the surface, but sometimes the spots are more numerous on the larger end. Dimensions from .80 by .70 to 1.00 by .75.

HABITS.

There was no bird for which I looked with greater interest than the Loggerhead Shrike. The first specimen which I ever saw was perched on the top of a stake which stood in a vacant lot near Jacksonville but which is now occupied by houses. The bird

was busily engaged in taking his dinner of grasshoppers, which he captured by diving downwards from his elevated position, and, after seizing them in his strong bill, he returned to his former position to devour them. These and other insects appear to form the only food of this species in Florida; at least such is the result of my observations, after having seen many specimens while living, and after dissecting two or three scores that had been shot. I can therefore say in favor of the Shrikes that I have never seen them attempt to capture small birds although they were abundant, nor have I found aught else than insectivorous food in their stomachs. Another good proof of their harmlessness to the smaller species may be seen in the fact that the Warblers, Sparrows, etc., never appear to exhibit any fear of the Shrike. Another peculiarity of these birds in this section is, that they do not have the general habit of impaling insects upon thorn bushes, etc., although other Shrikes are reported as so doing in other states. Indeed I can recall but one or two instances where I have seen them thus employed; the abundance of food may also be the cause of this.

It is a universal habit with the Loggerhead to resort to localities like that in which I found my first specimen, especially in the neighborhood of settlements, and one is almost certain to find a pair in the immediate vicinity of any lonely house which is built in the woods if it has a small clearing about it. In the wilder portions where there are no inhabitants they resort to the edges of the open savannas or prairies, but it is difficult to find more than two in the same locality. They are quite unsuspecting when accustomed to the presence of man, but in the wilderness are very shy. The Shrikes breed in April, generally placing their nests in trees at some distance from the ground. The only one which I ever found was in a fork of a branch on a pine tree, more than forty feet from the ground. The structure was pointed out to me by some wreckers who had a house within a few rods of the place, and who kindly assisted me in procuring the eggs, which was not an easy task as the birds had placed their domicile upon a slender limb at some distance from the trunk. I managed, however, to secure it by means of a long cleft stick which I pushed under it, as I clung to the tree, and raising it from its place drew it towards me until within reach. This performance was rendered somewhat perilous by the wind, which, as it was blowing almost a gale at the time, nearly threw me from the tree. The birds were very solicitous for the safety of their home, for they flew excitedly about, alighting upon the neighboring trees and uttering their harsh alarm notes. This guttural sound, usually expressive of annoyance, is occasionally given during winter in place of the song, which is quite fine although not equal to that of the Northern Shrike. While giving this melody, the bird is perched in an upright situation, resembling the Mocking Bird in this respect. The general coloration and manner of flight of the Loggerhead are also like that of the latter-named species, but one who is at all familiar with the habits of these two birds would readily detect the Shrike by his more erect carriage while sitting, and stouter, shorter form while flying. The Loggerhead breeds in Florida in the latter part of April, and I have taken the newly fledged young about the fifteenth of May.

LANIUS LUDOVIGIANUS EXCUBITORIDES.**White-rumped Shrike.**

DESCRIPTION.

SUB SP. CU. Form and general coloration of the Loggerhead Shrike but the size is a little larger, the bill more slender and as a rule, but not always, the rump is decidedly whitish; white areas are more extended.

While it is safe to say that Shrikes coming from the west are quite distinct from the Loggerheads in possessing lighter colors, larger size and more slender bill, when we approach the Gulf of Mexico and the Atlantic sea board we find that color means but little, and in the Carolinas we find birds as dark as in Florida. But the bills of these birds are more slender than those of Florida specimens, and this thicker bill of the Florida Loggerheads is about the only distinctive character by which they can be separated from the White-rumped Shrike.

HABITS.

On October 21st, 1872, Mr. H. A. Purdie obtained a White-rumped Shrike in West Newton, Massachusetts. In February, 1875, I captured a specimen in a bird trap in Newtonville, a third specimen was shot at Lynn, in November, 1870, while still a fourth was taken at Brookline, in February, 1879. Thus the Loggerhead is occasionally found in Massachusetts during the migrations. It is not uncommon about Bangor, Maine, during the breeding season, and at Rutland, Vermont, and has been known to nest in both places.

The specimen that I captured at Newtonville lived for some time in confinement and was very fond of small birds which he ate much after the manner of a hawk by placing one foot on them and tearing them to pieces with his strong bill.

LANIUS BOREALIS.**Northern Shrike.**

DESCRIPTION.

SP. CU. Form and general coloration of the Loggerhead Shrike, but rather more rusty above, where the shade of ash is light, with less white on wings, the black on head does not extend across forehead, and the under parts are constantly bordered with black. The size is also larger. Young birds are often so red above that the ashy is nearly obscured.

DIMENSIONS.

Length, 9.80 to 10.00; stretch, 14.50 to 16.60; wing, 4.50 to 4.85; tail, 4.45 to 4.60; bill, .58 to .70; tarsus, 1.00 to 1.05.

DESCRIPTION OF NESTS AND EGGS.

NESTS, placed in trees or bushes, composed of twigs, grass, rootlets, etc., lined with mosses, lichens, and downy feathers. **EGGS**, four to six in number, oval in form, pale ashy green in color, spotted and blotched with purple, brown and lilac. Dimensions, .75 by 1.05 to .78 by 1.07.

HABITS.

The Northern Shrike breeds from Canada northward, wintering from Maine to Pennsylvania and from Minnesota to Kansas. When with us in Massachusetts they are solitary in habit and of a restless, roving disposition, moving constantly from place to

place in search of insects, mice and small birds, all of which form their prey. They have the singular, well known habit of killing more birds and insects than they can eat, by often hanging them up on thorns, possibly thus storing them for future use. I once saw a Northern Shrike hang up several Red-polls which I had shot in some neighboring bushes, by placing their necks in crotches of twigs. They are quite bold when impelled by hunger and I have known of their attacking Canary Birds when their cages were placed near open windows.

The song of the Northern Shrike bears some resemblance to that of the Loggerhead but is finer and louder. They also emit a harsh cry of alarm or of rage when disturbed. This large Shrike appears in Massachusetts in November and often remains until the middle of April.



FIG. 72. Head of Adult Northern Shrike in winter.

FAMILY VI. VIREONIDAE. THE VIREOS.

Bill, not wide at base nor deeply cleft; but curved and notched at tip. Coracoid bones, nearly equal in length to the top of the keel. Keel, moderately high, equaling in length one half the width of sternum.

These are birds of plain markings, being greenish above and yellow or white beneath; but like many species with inconspicuous plumage, they are fine songsters.

GENUS I. VIREO. THE GREENLETS.

GEN. CH. Sternal characters as given above. Wings, long. Tail, moderate. Bill, shorter than the head.

VIREO OLIVACEUS.

Red-eyed Vireo.

Vireo olivaceus Vieill., Bon., Obs. Wils.: 1826. 124.

DESCRIPTION.

Sp. CH. Form, rather slender. Size, moderate. Sternum, not stoutly built. Tongue, thin and horny, deeply cleft at the end, with the extreme tip provided with minute cilia. In young birds the tongue is not as deeply cleft, and the cilia extend along the sides. COLOR. Adult male. Above, olivaceous-green, with the wings and tail, excepting on the outer web, which is, like the back, dark brown. Top of head, slaty-blue. Superciliary stripe, dirty white, preceded above by a narrow line of black. A dusky line extends from the base of the bill, through the eye, to some distance behind it. Under parts, pure white, with the sides, flanks, under wing coverts, axillaries and under tail coverts, greenish. Irides, red. Adult female, and young in all stages, similar, but paler, with the black markings about the head often nearly obsolete. The irides are quite brown, especially in the young. In all stages the bill is dark brown on the upper mandible, and bluish on the lower. The feet are blue.

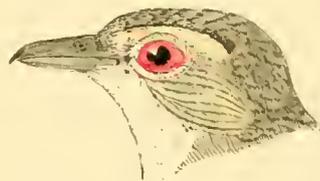


FIG. 72. Head of Adult Red-eyed Vireo in spring.

OBSERVATIONS.

Readily known from all other Vireos by the slaty-blue head, accompanied by the white and black superciliary line. Distributed during summer throughout eastern North America west to the Rocky Mountains, wintering in the West Indies and South America.

DIMENSIONS.

Average measurements of sixteen specimens. Length, 6.25; stretch, 10.10; wing, 3.25; tail, 2.25; bill, .53; tarsus, .63. Longest specimen, 6.50; greatest extent of wings, 10.65; longest wing, 3.48; tail, 3.00; bill, .55; tarsus, .65. Shortest specimen, 6.00; smallest extent of wings, 9.88; shortest wing, 3.20; tail, 2.10; bill, .56; tarsus, .60.

DESCRIPTION OF NESTS AND EGGS.

NESTS. Pensile, placed in trees or bushes. Composed of strips of bark or dried grasses, while the whole is neatly overlaid with cobwebs; lined with finer grasses. Dimensions: external diameter, 3 inches, internal, 2; external depth, 2 inches; internal, 1.50.

EGGS, four in number, oval in form, pure white in color, spotted rather sparsely with deep umber. Dimensions from .85 by .60 to .80 by .55.

HABITS.

Throughout the entire extent of New England, even in the immediate vicinity of the larger cities, are patches of woodland of varied extent, and many of them are composed of ancient trees which once partly formed the vast primeval forest that in former times overspread the land. It is very pleasant in summer to wander beneath the shade of these sylvan patriarchs; for, no matter how brightly the sun may be shining upon the broad open fields and meadows, the moment we enter the woods we seem transported to another sphere. Without, the air is hot and dry; now, a cool, refreshing breeze sweeps through the dimly-lighted vistas, slightly moving the ferns which grow at the bases of the gigantic trunks that stretch their arms high overhead, where the deep green foliage sweeps to and fro disclosing glimpses of the blue sky. A murmur pervades the air, caused by the rustling leaves, the hum of insects and the songs of birds. The experienced ear at once detects the notes of the various Thrushes and those of other species, but the last one noticed will be that of the Red-eyed Vireo. There may be several of these birds singing at one time quite near, yet so nearly do the gently given lays accord with the general harmony around, that they mingle with the whole and are not observed, but when a Vireo that has been continually singing pauses for a moment, its voice is missed and one is apt to notice when it commences again.

When the attention is attracted and one wishes to see the author of these melodious strains, it is exceedingly difficult to catch sight of the little green-backed birds, for they generally remain high in the tree tops, where their leisurely movements correspond with their slowly-given song. Although the Red-eyed Vireos are generally found at such an elevation, yet they often place their nests quite near the ground. They usually select a swaying oak or maple and build their pensile nests in the forks of slender boughs. During this time, and in fact throughout the entire breeding season, both birds keep together, exhibiting considerable solicitude for each other's safety. If one is shot and falls to the ground the survivor alights near it and evinces intense sorrow by every note

and action. These Vireos continue to sing until the middle of September, but do not give the full song after July. By the first of October they depart for the south. I have never met with this species in Florida, but Mr. Boardman has seen it upon one or two occasions.

VIREO BARBATULUS.

Black-whiskered Vireo.

PLATE XXXVIII. Adult Male.

DESCRIPTION.

SP. CN. Size, a little larger than that of the Red-eyed Vireo; the bill, on the average, is proportionately larger. The wings are long and pointed. Either the third or fourth quills are the longest or both are equal. The second quill is generally slightly longer than the sixth, is rarely equal to it and seldom shorter. The tail is slightly rounded, the graduations amounting to about .10. The sternum is so similar to that of the Red-eyed Vireo that those of the two species are indistinguishable, and other internal characters are also similar.

COLOR. Adult. Above, olivaceous green tinged with ashy on the middle of the back. Top of head and nape ashy. Wings and tail brown, edged with greenish white internally and with greenish externally. All of the wing feathers are narrowly tipped with whitish. Sides of head, grayish, and there is a grayish superciliary line, extending from bill to nape, bounded above by a narrow line of dusky. There is a dusky line through eye and a narrow maxillary line of the same color extending nearly to the posterior end of the ear covert. Beneath, white, slightly tinged with yellowish, which becomes more decided on under wing and tail coverts. Sides and flanks, greenish. Iris, red. Bill, brown, lighter at base of lower mandible. Feet, bluish.

OBSERVATIONS.

In color there is but little variation, but there is considerable difference in size, as will be seen by consulting Dimensions. Out of thirty-two specimens examined sixteen have the third and fourth quills longest and equal; seven have the fourth the longest, and eight the third. Twenty-five have the second longer than the sixth, the extreme difference being about .15. Four have the second equal to the sixth and in three the second is slightly shorter than the sixth.

The color above is very nearly like that of *Vireo olivaceus*, even to the slaty on the top of the head, the only appreciable difference being the slight ashy obscuring the olivaceous on the back of *V. barbatula*. Beneath, the present species is slightly yellowish on the white, but the principal difference between the two species may be seen in the prominent dusky maxillary line in the Black-whiskered Vireo. On the average, the bill of *V. barbatulus* is longer and larger than in *V. olivaceus*. But specimens of the Red-eye occur which have as large bills as some of the smaller-billed specimens of the Black-whiskered. From *Vireo altiloquas*, from the more southern of the West Indies this species may be distinguished by the pure ashy of the sides of the head, which in the more southern species is overwashed with ochraceous. *Vireo barbatulus* was described by Gambell, in the Proceedings of the Academy of Natural Science, of Philadelphia, in 1848, from a specimen obtained in Florida.

DIMENSIONS.

Largest specimen: wing, 3.20; tail, 2.75; bill from base, .65; from nostril, .50; depth at nostril, .20; width, .20; tarsus, .65. Smallest specimen: wing, 3.00; tail, 2.15; bill from base, .62; from nostril, .40; depth at nostril, .18; width, .17.

DESCRIPTION OF NESTS AND EGGS.

NESTS, purse-shaped, composed of grass, leaves, and fragments of palm fronds, lined with rootlets. EGGS, two or three in number, oval in form, white in color, spotted and dotted with purplish brown and black. Dimensions, .53 by .78 to .55 by .88.

There were few birds among those known to inhabit the Bahamas, which I looked forward to finding with greater interest than this species. And during the migration of small birds on Andros and the neighboring keys, I kept eager watch for its appearance. It was not, however, until our return to New Providence on May 18th, 1884, that we saw our first specimen of the Black-whiskered Vireo. Their loud, peculiar songs could be heard in all directions, not only in the scrub, but also in the gardens and in the trees along the streets of the city of Nassau. Indeed, the first specimen that I saw was perched on a high limb of one of the fine almond trees which grew among many others on a small public park, known as the Parade, situated to the eastward of the city.

In habit this species is quite peculiar in some ways. They keep well in the tops of the trees, seldom, if ever, feeding in the low scrub. They are exceedingly agile in movement, having a peculiar briskness of action which is quite unvireolike. They are, almost without exception, shy, and when they perceive an intruder, which they are apt to do very quickly, as they are ever on the alert, they erect the feathers of the head, droop the wings, spread the tail and utter a series of scolding notes quite unlike those of any other Vireo I ever heard. Then after flying restlessly from bough to bough for a moment or two, they utter a shrill scream of anger and off they go, generally flying several hundred yards in a straight line before alighting again. Even while feeding by themselves, they are exceedingly restless birds, and a pair will not remain long on one tree. Quickly searching it over, they will leave it, almost invariably taking a long flight before selecting another feeding ground.

On the 27th of May I found the Black-whiskered Vireo mated, the female being, if anything, more shy than the male and unusually silent. As late as June 3rd I did not find any evidence of enlargement of the ovaries of the female and only a slight change in the organs of the male.

Although closely resembling the Red-eyed Vireo in form and color, neither in song nor habit does the Black-whiskered even suggest this species. So wide is this variation and so impressive, that even when I held the freshly-shot red-eyed, green-backed birds in my hand, the associations connected with them were so much at variance with our familiar New England Vireo, that I could never familiarize myself with the idea that the two species are closely-allied. Even now every time I compare the skins of the Black-whiskered Vireo with those of the Red-eyed I am actually surprised at their close resemblance. How evident it is that in order to thoroughly understand his science an ornithologist must have a wide field experience, for only in this way can the varied methods, which nature employs in evolving species be appreciated. In some instances we find species widely different in coloration agreeing so nearly in habit as to be indistinguishable in this respect, but with the Black-whiskered Vireo we find that a slight enlargement of the bill, a few dusky-tipped feathers in a maxillary line, and a streak of more brilliant coloration separates it from the Red-eye, yet we have as good and distinct a species as was ever turned out of Nature's Laboratory.

The song of the Black-whiskered Vireo is loud and clear, noticeable in this character among all other of the smaller species of Bahaman Birds. "Whip Tom Kelly," is the

nearest rendering of the lay that I can give, with an occasional fourth syllable added, sounding like "phue." These notes are repeated quite rapidly, with a decided accent on the "kelly." The fourth syllable when given is rather less energetically rendered, being a little plaintive. But the whole song is uttered with such carelessness, not only as to intonation, but also in detail, that it is seldom that the rendering which I have given can be distinctly heard. Either the syllables are run together, as is often the case, or the first one or two are given so low, or omitted altogether, that it is not uncommon to hear a bird uttering the "kelly" only, at rather wide intervals in a preoccupied and careless tone as if too busy about other matters to stop and sing. When heard in the distance on a still morning the notes remind one of the far away song of the Whippoorwill. When heard close at hand the song somewhat recalls the lay of some of the Orioles and the resemblance is partly carried out by the movements of the bird, but unlike the Orioles these Vireos never sing as they fly. Although they sing all day long, unlike the Thick-billed Vireo, they do not begin until sunrise and end at sunset.

All through the latter part of May of this year (1884) there was evidently a migration of these Vireos at New Providence, but in June they became much less common, being scattered irregularly over the entire key, but were nowhere abundant. I did not find them on either Green Key nor on the Ship Channel Keys the first week in June.

On March 26th, 1888, I saw the first arrival of Black-whiskered Vireos on Cayman Brae and they became common by April 8th. They were soon followed by the closely-allied Vireo altiloquas, this species becoming common and easily distinguished by the song, April 22d. On April 17, 1893, I obtained a male at Fresh Creek, Andros, and got a female three days later, and by the 22d of the month the species was common.

VIREO PHILADELPHIA.

Philadelphia Vireo.

PLATE XI. Adult Male.

DESCRIPTION.

SP. CH. Size, small. Form, slender. Spurious quill, apparently absent. COLOR. Adult. Above brownish green, becoming ashy on crown and sides of head. Supercilaries' stripe, and beneath, whitish, tinged with sulphury yellow on breast, sides and flanks. Young, similar, but duller above and rather more yellow below. Iris, brown. Bill, brown, lighter on lower mandible. Feet, bluish.

OBSERVATIONS.

This species closely resembles the Warbling Vireo, but there is a little more yellow below than in that species, but the chief difference is found in the apparent absence (it being really misplaced) of the spurious, or first, primary, this being present in the Warbling Vireo and about .50 long. Confined during the breeding season to northern Eastern North America from northern New England to Hudson's Bay, passing southward in winter beyond our limits.

DIMENSIONS.

Length, 4.80 to 5.10; stretch, 8.50 to 9.25; wing, 2.65 to 2.10; tail, 2.20 to 2.25; bill, .45 to .50 tarsus, .66 to .70.

DESCRIPTION OF NESTS AND EGGS.

NESTS. Placed in trees. Composed of strips of bark, moss, etc., lined with finer material. EGGS, three or four in number, oval in form, white in color, spotted and dotted with purplish brown and black. Dimensions from .48 by .70 to .50 by .75.

HABITS.

The Philadelphia Vireo is a rare autumnal visitor to Massachusetts, occurring in September, and I found them rather common from September 7th to the 22d at Watson-town, Pennsylvania, in 1875. In general habit while migrating this pretty little Vireo resembles the Warbling, but occurs more frequently in the woods than that species. This is especially true concerning it in its northern home. Here it frequents the topmost branches of the high pines and spruces, where its presence is revealed only by its song which is somewhat similar to that of the Red-eyed Vireo.

VIREO GILVUS.

Warbling Vireo.

DESCRIPTION.

SP. CH. Form, slender. Size, small. Spurious quill, present. COLOR. Brownish green above, becoming ashy on crown and darker on wings and tail. Superciliary line, and beneath, whitish, becoming greenish on sides. Iris, brown. Bill, brown, lighter on lower mandible. Feet, brown. Young, duller, throughout, but somewhat tinged with greenish above and more strongly with yellow below. Nestlings are ashy white, above, and silky white, below.

OBSERVATIONS.

Known from the closely-allied Philadelphia Vireo by the presence of the spurious quill which is about .50 long. Breeds throughout eastern North America excepting perhaps the more south-eastern portions. Wintering south of our limits.

DIMENSIONS.

Length, from 5.00 to 6.00; stretch, 8.45 to 9.25; wing, 2.66 to 3.00; tail, 1.85 to 2.25; bill, .45 to .47; tarsus, .70 to .75.

DESCRIPTION OF NESTS AND EGGS.

NESTS, purse-shaped, placed in trees. Composed of moss, strips of bark, etc., lined with finer material. EGGS, three or four in number, oval in form, white in color, finely spotted and dotted with black. Dimensions, .53 by .75 to .56 by .83.

HABITS.

The Warbling Vireos make their appearance in Massachusetts the second week in May. Unlike most of the Vireos they do not frequent the woodlands, but resort to the shade trees along roadsides or in public parks, thus the highways are enlivened by their continuous warbling song. This rings out clear and distinct throughout the long summer days, from the tree-tops, where the plainly-colored author of all this melody is often quite invisible.

The poplar trees are favorite resorts of this Vireo and I will venture to say that there is scarcely a tree of this description in Massachusetts, that has acquired a sufficient size, which does not form the summer home of a pair of these birds. The nest is

generally hung from a fork of one of the outermost branches, high in air. The Warbling Vireo descends from its airy perch during early morning to feed upon insects which occur



FIG. 74. Head of Adult Warbling Vireo in Spring.

on apple, pear and other fruit trees. I was once watching one thus engaged, admiring the careless ease with which it uttered its continuous song, without pausing a moment in its search for insects, when, having come within three or four yards of my head, it discovered me. It suddenly ceased singing, looked at me a moment, opened its beak in threatening manner, gave a series of querulous notes, then, after examining me a moment, as if satisfied that it had intimidated me, and convinced that after such a display of valor I would not venture to do it any harm,

flew a few yards and again began its song.

The Warbling Vireos deposit their eggs the first week in June, and the young are seen following their parents in July. All depart for the south by the middle of September.

VIREO FLAVIFRONS.

Yellow-throated Vireo.

DESCRIPTION.

SP. CH. Size, large. Form, robust. Spurious quill, apparently absent. COLOR. Adult. Above, yellowish green, becoming ashy on the rump. Wings, brown, with the secondaries edged and tipped and the primaries tipped with white. There are also two white bars across wing. Tail, brown, edged with white. Superciliary line and anterior half of body, below, bright sulphur yellow. Posterior half of body, beneath, including under wing and tail coverts, white, tinged with greenish on sides and flanks. Iris, brown. Bill, brown; bluish at base of lower mandible. Feet, bluish.



FIG. 75. Head of Adult Yellow-throated Vireo, in Spring.

OBSERVATIONS.

This large, robust Vireo may be at once distinguished by the prominent yellow anterior half of the body. Occurs in summer in eastern United States north of the Carolinas, and adjacent British provinces. Winters south of our limits.

DIMENSIONS.

Length, 5.50 to 6.00; stretch, 9.50 to 10.00; wing, 3.10 to 3.23; tail, 1.05 to 2.10; bill, .45 to .50; tarsus, .50 to .55.

DESCRIPTION OF NESTS AND EGGS.

NESTS, placed in trees, composed of strips of bark, grass, and pine leaves, covered with lichens. EGGS, three or four in number, oval in form, boldly marked with purplish brown spots, that show lighter edges. Dimensions, .60 by .88 to .65 by .95.

HABITS.

The Yellow-throated Vireos arrive from the south about the second week in May. They scatter about the country, generally preferring the edges of woods or open wood-

lands, from which they occasionally wander into the orchards. The song, although it has a decided Vireo-like intonation, is loud and clear, excelling all others, excepting possibly the Solitary Vireo. They breed in early June, generally placing the nest in an oak at no great elevation from the ground. The birds watch the nest quite closely, even before laying. This Vireo departs for the south the first week in September.

VIREO SOLITARIUS.

Solitary Vireo. Blue-headed Vireo.

Vireo solitarius, Viell., *Nouv. Dict.*, xi.; 1817.

DESCRIPTION.

Sp. Ch. Form, robust. Sternum, rather strongly built. Tongue, thin, horny, rather acuminate; tip, quite deeply cleft and provided with cilia which extend along the sides for a short distance.

COLOR. Adult. Above, very dark olivaceous green, with the wings and tail dark brown, edged with greenish. Wing coverts, tipped with white, forming bars. The outer webs of the tertiaries, outer and inner webs of outer tail feathers, and inner webs of many others, are also edged with it. Top and sides of head, dark slaty-blue. Under wing coverts, axillaries, sides and flanks, yellowish-green. Line from bill to eye, ring around the latter and under parts, including under tail coverts, pure white. Young and nestlings, paler. The green of the back is obscured with dusky, and the top of the head with greenish. The white of the wings and tail is rather more extended. The under parts are also washed with greenish. Sexes, similar. Irides, brown. Bill, dark brown on the upper mandible, bluish on the lower. Feet, blue, in all stages.



FIG. 76. Head of Adult Solitary Vireo, in Spring.

OBSERVATIONS.

Easily known by the conspicuous blue head and white ring around the eye. This latter character is quite variable, being larger in some specimens than in others. Northern United States during the breeding season; winters in more southern sections.

DIMENSIONS.

Average measurements of six specimens. Length, 5.55; stretch, 9.20; wing, 3.00; tail, 2.20; bill, .45; tarsus, .74. Longest specimen, 6.00; greatest extent of wings, 9.75; longest wing, 3.30; tail, 2.40; bill, .49; tarsus, .78. Shortest specimen, 5.00; smallest extent of wings, 8.35; shortest wing, 2.80; tail, 1.94; bill, .40; tarsus, .70.

DESCRIPTION OF NESTS AND EGGS.

NEST. A specimen found by Mr. Brewster about ten feet from the ground in an oak was composed of fibrous bark covered with that of birch; lined with pine leaves. Dimensions: external diameter, 3 inches, internal, 2; external depth, 2 inches, internal, 1.50. Eggs, from Mr. Brewster's nest, four in number, oval in form, pure white in color, sparsely spotted with black. Dimensions, from .78 by .55 to .80 by .57. Mr. Brewster thinks the eggs of this species are apt to be rounder than those of other Vireos.

HABITS.

The Solitary Vireos are quite abundant in the hummocks of the more northern sections of Florida, and although seldom seen in the piney woods of these parts, I never

found them elsewhere in the vicinity of Miami. Here they usually accompanied the various species of warblers and were, at that time, always silent. They migrate northward quite early in the spring, being the first of the family to appear in New England, for they are often seen during the latter part of April as far north as Massachusetts. Here they are no longer noiseless, but make the woodlands ring with their loud and oft-repeated song. These Vireos are truly a sylvan species, seldom being found, while in the north, out of the thick woods.

They are, as their name implies, rather solitary in habit, especially in spring and summer, at which time it is difficult to find more than one pair in any one locality at the same time.

Although a few of the Solitary Vireos remain to breed in some localities in Massachusetts, notably at Concord and Dedham, the majority pass on further north. The nests, like those of the Red-eyes, are often placed in the fork of a swaying limb, usually at no great distance from the ground. This species migrates early in September and I found them common at Watsonstown, Pennsylvania, from the twelveth to the last of this month in 1875. At this time they, as well as the Red-eyes which were also common, were singing a low warbling song, quite different from the loud lay given in spring. These Vireos reach Florida late in October or early November.

VIREO SOLITARIUS ALTICOLA.

Mountain Solitary Vireo.

Vireo solitarius alticola Brewster, Auk, Jan. 1886, p 111.

DESCRIPTION.

SUB. SP. CH. Similar to the Solitary Vireo but larger, bill stouter and colors darker, that is the color above including head is nearly uniform blackish plumbeous with the tail tinged with olivaceous, there being no sharp line of demarkation between the tail and head as in *Vireo solitarius*. Wing 3.00 to 3.30. Tail 2.25.

OBSERVATIONS.

This well marked form of *Vireo* occurs in summer in the mountains of North Carolina, spreading out in winter to the low lands quite to the coast and as far south as Florida.

VIREO NOVEBORACENSIS.

White-eyed Vireo.

Vireo noveboracensis Bon., Obs ; 1825.

DESCRIPTION.

SP. CH. Form, robust. Size, rather small, wing bands present. Tongue, thin, horny, but not acuminate and slightly cleft at tip, but in the single specimen before me, taken from an adult bird, there is not the slightest appearance of any cilia; they would, however, quite likely be present in younger specimens. Spurious quill present and about one-half as long as the second quill.

COLOR. Adult. Uniform yellowish-green; brightest on the forehead. Wings and tail brownish, edged with same color as that of the back. Greater and lesser wing coverts, tipped with white, forming bars. The outer webs of the tertiaries are edged with white and the wings are lined with it. Stripe at base of bill, ring

around the eye, sides, flanks, under tail coverts and axillaries greenish-yellow. Remaining under portions white, strongly tinged on sides and across breast with clear yellowish; sides of head also yellowish. Irides, white. Winter adults are more strongly tinged with yellowish, both above and below.

Young and Nestlings, similar to the adult but paler, and with a suffusion of slaty above. The white markings on the wings are also more extended. In these stages the irides are yellowish. Sexes, similar. In all stages the bill is dark brown on the upper mandible, bluish on the lower, and the feet are bluish.

OBSERVATIONS.

Readily known by the uniform greenish-yellow above, accompanied by the bars on the wing and the white irides. Specimens from the main land of Florida, which breed there, are, as remarked under head of *V. olivaceus*, rather more dusky and have slightly larger bills. Distributed during the breeding season from the Rocky Mountains to the Atlantic, north to Maine,



Fig. 77. Head of White-eyed Vireo.

DIMENSIONS.

Average measurements. Length, 5.25; stretch, 8.25; wing, 2.45; tail, 2.05; bill, .45; tarsus, .75. Longest specimen, 5.50; greatest extent of wing, 8.45; longest wing, 2.55; tail, 2.10; bill, .50; tarsus, .80. Shortest specimen, 5.00; smallest extent of wings, 7.50; shortest wing, 2.40; tail, 2.00; bill, .40; tarsus, .70.

DESCRIPTION OF NESTS AND EGGS.

Nests, pensile, placed on bushes or low trees. The following description is taken from a nest found in Florida, May 8, 1872. Composed of fragments of palmetto fronds, leaves and Spanish moss, fastened together with spiders' webs and lined with fine grasses. External diameter, 3 inches, internal, 1.75; external depth, 2.50 inches, internal, 1.75.

Eggs, four in number, oval in form, pure white in color, spotted very sparsely with minute dots, more numerous on the larger ends. Dimensions, from .75 x .50.

HABITS.

The Vireos of Eastern North America may be divided into two groups, those having bands on the wings and those without bands. Those without bands are the Black-whiskered, Red-eyed, Philadelphia, and Warbling. Those with bands are the Yellow-throated Solitary, Mountain, White-eyed, and Key West. Rather singularly, the difference between these two groups as indicated by the plumage is also indicated by the habits and songs of the birds which compose them. Those without bands are, with a single exception, (the Black-whiskered) birds of rather slow movement and their songs are uttered deliberately, without any great display of vigor. On the other hand the species with banded wings are quite restless, seldom remaining long in one place, and their songs are given with considerable force.

Among this latter named group the White-eyed Vireos are one of the most noticeable, not only being restless birds, but also singing with an energy which exceeds the songs of nearly all of the species of Vireos which occur with us. Two or three detached notes are usually given, but these are uttered with almost startling vehemence, while the birds move restlessly about among the low shrubbery. I have related elsewhere that the Bahama Vireo utters similar detached notes in winter but that in spring all are given as one continual song, rendered much more sweetly and less abruptly than at other times. Although I never heard the White-eyed Vireo sing in this way they are said to do so

and I have no doubt but what they do in a similar manner utter a continuous series of notes.

These birds prefer dense thickets usually in swampy localities and place their nests in them. This structure resembles that of other Vireos but is almost always placed low and I have found them within a foot of the ground. The birds appear in New England about the middle of May, the eggs are deposited about the first week in June, and the birds depart for the South early in September. In Florida, where they are constantly resident, they breed in April. In New England the White-eyed Vireos are most common near the coast and are not of regular occurrence north of Massachusetts.

VIREO NOVEBORACENSIS MAYNARDI.

Key West Vireo.

Vireo noveboracensis maynardi Brewster, Auk April 1885, p. 148.

DESCRIPTION.

Sp. Ch. Size, about that of the White-eyed Vireo but the bill is proportionately larger being nearly the size of that of the Bahama Vireo (*V. crassirostris*). The colors are darker or grayer above than those of the White-eyed, and the sides of the head are much grayer, with often a decidedly ochraceous tinging, which also pervades the yellow below. This and the superciliary line is never as clear as is typical *V. noveboracensis*.



Fig. 78. Head of adult Key West Vireo. A. upper mandible of same. B. bill of Bahama Vireo; C. upper mandible.

OBSERVATIONS

Although as an average the bills of *V. crassirostris* are larger than those of *V. maynardi*, (See Fig 78) some are exactly the same size, and an example of this is given in the cut. Above, many specimens of *V. maynardi* do not differ from *V. crassirostris*, but I have never seen one which shows quite as much clear yellow below, especially on the sides and flanks as does this latter named species, and the average *V. crassirostris* is very much more ochraceous yellow beneath. Occurs as a constant resident, as far as absolutely known, on Key West, at Miami on Biscayne Bay, and at Tarpon Springs, probably also on the other Florida Keys. Mr. Brewster tells me that a specimen has also been taken in Georgia.

DIMENSIONS.

Longest specimen, 5.50; greatest extent of wing, 8.00; largest wing, 2.55; tail, 2.16; bill, .64; tarsus, .81; depth of nostril, .20. Shortest specimen, 4.76; smallest extent of wing, 7.45; smallest wing, 2.11; tail, 1.90; bill, .50, depth of nostril, .18; tarsus, .75.

HABITS.

I found the first specimens of the Key West Vireo that I ever saw, on Nov 11, 1870. At this time only a small portion of Key West was settled; the principal part of the city being on the northern side of the western end of the island. To the east and north and some extent to the southward the land was covered with a thick growth of shubbery. These thickets, which were in many places impassable, formed the retreat of hundreds of birds and among them were a large number of the Vireo. About fourteen years after, in Jan. 1884, I again visited the island and found the city greatly enlarged while the scrub was proportionately diminished. The Vireos were, however, very common

in fact I found them even more abundant than during my previous visit. Upon both occasions I found them on high land and in full song. That is they were uttering the fragmentary notes similar to those so characteristic of the White-eye, the Bahama and of Allen's Vireos. These notes, however, were exceedingly variable and reminded me more of the Bahama Vireo than of the White-eye and it is probable that like this species, the Key West Vireo utters a continuous song in the spring.

I found them quite abundant at Miami, and in the vicinity from January until April during that same winter and secure, a large number of specimens there. I did not find them on the keys which I visited between Miami and Key West. It is highly probable, however, that the Vireo is not restricted to the island of Key West in this direction as Stock Key lies only a mile distant; other keys are near this; in fact, the whole chain of Florida keys are closely connected, quite to the main land and the exact distribution of the birds upon them is still a question to be settled.

VIREO BELII

Bell's Vireo.

DESCRIPTION.

SP. CH. Size, small with the general coloration of the Warbling Vireo but with decided wing bars. Spurious quill present. COLOR, above, olive green, brightest on the rump, with the head markings similar to those of *V. gilvus*. Wings, grayish brown, with two rows of coverts tipped with whitish. Beneath, white, tinged on breast and tail coverts with sulphury yellow. Sides and flanks sulphur yellow tinged with olive. Iris, brown, bill, brown, paler on lower mandible. Feet, bluish.

OBSERVATIONS.

Known by the small size and presence of wing bars. Occurs from Illinois and Minnesota west to the Rocky Mountains.

DIMENSIONS.

Length, from 4.75 to 4.90; stretch, 7.00 to 7.15; wing, 2.10 to 2.15; tail, 1.80 to 1.90; bill, .38 to .40; tarsus, .68 to .67.

DESCRIPTION OF NESTS AND EGGS.

NESTS, deeply cup-shaped, placed in trees and bushes, composed of hemp like fibers of plants and bits of leaves, lined with fine weeds and grass, sometimes with hairs. EGGS, four in number, oval in form, white in color, thinly dotted around the large end with dark reddish brown. Dimensions, from .68 by .48 to .70 by .50.

HABITS.

According to description, this species appear to inhabit the thickets in the open country where it has much the same habits as those of the White-eye, but the song is not quite so emphatically given.

FAMILY COEREBIDAE. THE FRUIT CREEPERS.

Primaries, nine. Bill, slender and curved, not notched at tip which is very sharp. Wings when closed, reaching to the middle of the tail. Tongue, deeply bifid and provided with a long terminal cilia. (See Fig. 79.)

This is a small family of birds containing less than fifty species of about three genera. They occur in tropical and sub-tropical America, and are especially common in the West Indies.

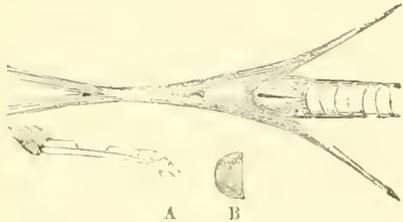


Fig. 79. Tongue of Honey Creeper enlarged. A, tarsus of same. B, section through tongue.

GENUS COEREBIA. THE HONEY CREEPERS.

GEN. CH. Bill, shorter than the head, strongly curved and acutely pointed. Tarsus longer than middle toe; colors black or brown above, lighter below, usually conspicuously marked with yellow. There are some fifteen species of this genera, mostly West Indian.

COEREBIA BAHAMENSIS.

Bahama Honey Creeper.

Plate XIII. Adult, from Nassau.

DESCRIPTION.

SP. CH. Size, about that of the Yellow-rumped Creeper. Bill, strongly arched, conical and acutely pointed. Wings, long, but rounded, the second, third and fourth quills being usually the longest, while the fifth is but little shorter and the first is generally equal to the fourth. Tail, well rounded, the outer feathers being about .25 shorter than the middle. Feet, quite large and stout, middle toe and claw a little shorter than the tarsus, which is slightly feathered on its anterior face. (Fig. 79) but naked from the heel behind. There are six scales in front and but one behind.

The coracoid bones are equal in length to the top of the keel, which is low, about equal in height to one-half the width of the sternum. Marginal indentations, quite deep, a little exceeding the height of the keel. Furcular, measured in a straight line, shorter than the coracoids. Terminal expansion of furcula long and narrow, being more than twice as long as wide. It does not approach the keel closely, but usually reaches the manubrium, which is well developed, the forks being nearly equal in length to the body of the bone. Costal process with the terminal angle rounded, but with the anterior portion acutely angled. The scapulars are about equal in length to the coracoids, and the terminal portion is curved downwards.

The tongue (Fig. 79) is quite remarkable; it is .65 long to the fleshy base; is rather flat above, rounded below, bifid for .35 of its terminal length, and provided with long, coarse cilia, at the tips of each division. Larynx, straight, 1.25 to inferior larynx, the muscles of which are well developed. Heart, small and pointed .25 x .40. Both lobes of the liver are equal in size. The oesophagus is straight, without special dilatation 1.50 to proventriculus, which is provided with very short simple glands, arranged in a zonular band, .35 wide, (Fig. 80.) stomach, remarkably small, flat and elliptical or bean-shaped in form, .35 by .24 by .10 (IB. E). The walls are exceedingly thin and the lining membrane is smooth. The fold of the duodenum is short, .45 long, (IB. O) but the pancreas (IB. I) is .60 long, thus it extends along the intestines. Intestines, long, 3.80, but the coeca are exceedingly minute.

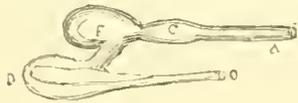


Fig. 80. Organs of Honey Creeper. E, stomach; C, proventriculus; A, gullet; D, duodenum; I, pancreas; O, intestine.

COLOR, adult male. Above, sooty black, darkest on head. Large patch on rump bright yellow. Wings and tail of a similar color to the back but of a rusty shade. Base of primaries, extending along both webs and on inner web of secondaries, white, thus forming a patch about .25 long. Tertiaries, quite prominently margined with white,

while the secondaries and primaries are very narrowly edged with whitish. Terminal patch of white on outer tail feather .40 wide, a smaller patch on next, then they gradually decrease in size on each successive feather until the central feathers are merely tipped with it. This color extends along both webs for about an equal distance, but the line of demarkation is not straight across the feathers, as the dark encroaches more in the center than along the sides. Shafts of feathers of tail black above, white below. Superciliary line, extending from bill to nape, and lower parts, ashy white, clearest in front, tinged with brownish on flanks. Edge of wing and large patch on breast, running down into a point on abdomen, pure yellow. Iris, brown. Bill, blue black, lighter at base of lower mandible, while the protruding soft edges of the mandibles are pale lake. Feet, dark brown.

Adult female, similar to the male, but decidedly paler above. There is less yellow on the rump and the wings are browner, while the yellow below is not as extended.

Young of both sexes are similar, but browner above, especially on top of the head, the males resembling the adult females, and the females are much browner. Nestlings of both sexes. Above, plumbeous brown, slightly yellowish on rump, and a little darker on head. Wings, much as in the adult, but the white markings are not as extended. Tail, dark brown, edged with grayish. The outer feathers are narrowly margined with white on terminal portion of outer web, which is also tipped with white for about .10, and there is a terminal spot of white on inner web .35 long; the second feather has a smaller spot of white, the third feather is merely tipped with white, and the remainder is tipped with brownish ash. The superciliary line is only indicated by a whitish patch, mixed with dusky, directly over the eye. Sides of head, dusky. Beneath, ashy white, tinged everywhere, excepting on under wing coverts, with yellowish, this being stronger on the middle of the body. There are a few dusky spots on throat. Edge of wing, yellow.

OBSERVATIONS.

Out of sixty-eight specimens examined forty-seven have the second, third and fourth quills the longest; nine have the third and fourth; five, the fourth; four, the second and third; two, the third; one, the second, third, fourth and fifth. Fifty have the first and sixth quills equal in length; nine, the first and fifth; two have the first longer than the fifth and sixth; one has the first equal to the seventh. The graduation of the outer tail feather is from .10 to .32. There is but little variation in color aside from that due to age and sex. The amount of white on the outer tail feather varies from .25 to .55 in length and the exposed patch on the wing from .15 to .30 in length and from .20 to .31 in width. This species may be distinguished from all other birds of our section by the curved bill and conspicuous patch of yellow on breast and rump. From other members of the genus by the decidedly white throat and slaty and black back. The nearest approach to *C. bahamensis* is *C. sharpii* from the Cayman Islands, but this latter named species has the throat more ashy and the colors above darker. The situation of the white areas on head, wings, and tail and the darkening below in the nestling indicates a return toward some of the more southern and darker species of this genus, which were beyond doubt the progenitors of the Bahama Honey Creeper.

In sternal characters, this species closely resembles the American Warblers, especially those of the genus *Dendroeca*, that is, the relative portion of the keel, width of sternum, length of furcula are similar, but in the acutely angled, well curved terminal portion of the scapula we have an approach to the finches, but the scapular is not longer than the coracoids, as in the Fringillidae. In the peculiar tongue, long narrow proventriculus, small, thin-walled, bean-shaped stomach, we find an approach toward the Humming Birds. Yet the duodenum is short, not long, as in the Humming Birds, but the intestines of both are long and the heart of the Creeper is large, while both lobes of the liver are equal, characters which are shared in common with the Hummers. From these observations it would seem as if the Honey Creepers were differentiated Warblers which have retained the osteological characters of their progenitors, but have assumed peculiar modifications of the digestive organs acquired by a change of diet.

The Bahama Creeper was first discovered by Catesby, but was introduced into binominal nomenclature by Dr. Ludwig Reichenbach in *Handbuch der Speciellen Ornithologie*, 1853, p. 253. Resident throughout the Bahamas, accidental on the Florida Keys.

DIMENSIONS.

Wing, from 2.10 to 2.55 ; tail, 1.60 to 1.70 ; bill, from base, .55 to .60 ; from nostril, .40 to .46 ; depth at nostril, .17, width, : 15 ; tarsus, .65 to .68. Females average a little smaller than the males.

DESCRIPTION OF NESTS AND EGGS.

NESTS, very large for the size of the birds, supported by forking twigs in a bush, or small tree, with the entrance on one side above the level of the bottom. Composed of the stems of a small vine, hemp-like fibers woven closely, forming either a spherical or balloon-shaped structure. The lining is composed of finer material. Dimensions of nest, externally, 4.40 by 5.00 ; internal, 3.00 by 3.50 ; entrance, 1.25 in diameter.

EGGS, two or three in number, oval in form, not pointed, ashy white in color, spotted, dotted, and slightly blotched with a dull brown, which is inclined to reddish. The markings are distributed quite regularly over the entire surface, excepting on the larger end where they sometime accumulate and become confluent, and here may be seen a few dots of amber. The eggs agree quite closely with those of the Grassquit, but are, as a rule, more ashy white in ground color, not inclined to bluish, and the spottings are more scattered. Dimensions from .73 by .59 to .75 by .52.

HABITS.

The Honey Creeper is an abundant and widely distributed species throughout the Bahamas, being found on all of the larger islands which I have visited and they also occur on some of the smaller keys, for example, I found them very common in June, 1884, on the Green Key which lies south of New Providence. They inhabit the scrub, and in the neighborhood of settlements live on the borders of the plantations being attracted there by the fruit. Although they are called Bahama birds by the natives, I do not remember having seen one eat any bananas. They are, however, very fond of sapodillas and will eat them greedily. They also abstract honey from the flowers of various plants and trees. When obtaining honey from flowers, they alight on a convenient twig and insert their bills into the calix, or when this is too deep, as in the case of the long flower of the life leaf, they make an incision near the base, much as is done by bees under similar circumstances and thus remove the honey.

The flight of this species is swift and strong, quite unlike that of our warblers. They dash quickly through the foliage, alight suddenly, and remain perfectly motionless for a time ; then when ready to move again they will fly, even for a short distance, rather than to hop from bough to bough. I have never seen any movement which would suggest creeping, thus it is difficult to see why the name of creeper is applied to the species. They are not at all quarrelsome, and I have seen half a dozen cling together on one sapodilla feeding from an orifice in one side. They are not shy and I have had them alight within a foot or two of my head as I have been standing in the scrub, but they appear to vary individually in this respect. Three, which were brought to me by some children, exhibited different degrees of tameness. One male, which sang the full song, was not at all shy, tasting sweetened water out of a spoon which I held in my hand. Another male was moderately tame, while a female was so shy that she would not allow me to approach her, but flew about the room in which they were all kept, whenever I attempted to offer her food.

The song of the Bahama Honey Creeper consists of a series of low crackling notes, quite unlike the sounds emitted by any other bird, excepting very closely allied species. They also produce a chattering with the bill when disturbed and utter a sharp chirp of alarm.

The time of breeding seems to be in March, April, and May, as the following notes will show; on March 8th, 1884, my attention was attracted to a female which was carrying material to a nearly completed nest, and on the 17th it contained two eggs which were slightly incubated. This nest was placed low in the scrub within easy reach as I stood on the ground. On March 9th I followed a female which was carrying weed stalks in her beak. I soon came to the nest that was placed in a small bush about on a level with my face. On the 15th the nest contained three eggs, and on the same day that I found the first nest, I found another, this time by following the male. The first two nests were near a road, but this bird led me deeper into the scrub, and when I came to the nest it was placed in a small tree some ten feet from the ground.

I continued to find nests up to the last of the month of March, but during the last week all contained embryos considerably advanced. On April 17th we visited Andros and found fully fledged young of the Creeper. At Deep Creek, April, 27th, saw a pair mating. Upon our return at Nassau, the last week in May I found the young fully grown, and on the 30th saw a female building a nest. Upon visiting Green Key south of New Providence, June 6th, I found nothing but empty nests from which the young had recently flown. On April 10th, 1893, Mr. Curtiss found a nest on U Key, near Highburn, Key which contained two young about a week old and one abortive egg.

As a rule, neither male nor female pay much attention to the intruder when the nest is visited. In most cases, I find that I have recorded that the female slipped quietly out of the nest and instantly disappeared. This was especially noticeable when the eggs were fresh. The nest on the U Key was placed in a low bush not over three feet from the ground; both parents were present and neither exhibited the slightest solicitude for the safety of their offspring. Both were very tame, coming within a foot of our heads as we sat on the ground near the nest. This last mentioned was placed the lowest of any I ever saw and the one I have mentioned as finding in the scrub ten feet up, was by far the highest. The usual distance from the ground is between four and five feet. The nests are seldom fastened securely to the bushes, but are usually laid in the forks formed by twigs.

In Kingston, Jamaica, two pairs of the closely allied Jamaica Honey Creeper began to build their nests in a huge mango which stood beside my window. These nests were placed nearly twenty feet from the ground. On March 27th, I found Sharp's Honey Creeper nesting on Cayman Brae, and the nests were placed over the base of the cocoa-nut leaves fifteen or twenty feet from the ground.

FAMILY MNIOTILTIDAE. WOOD WARBLERS.

Primaries, nine. Bill, destitute of permanent lobe on cutting edge of lower mandible. Coracoid bones about equal in length to the top of the keel, sometimes being a little longer or shorter. Marginal indentations exceeding in depth the height of the keel. Feet, of moderate size. This is a large family, embracing several genera and many species. All, with four exceptions, are small birds and all are inhabitants of the American Continent and adjacent islands.

GENUS MNIOTILTA. THE CREEPING WARBLERS.

GEN. CH. Hind toe and claw, exceeding in length the middle toe and claw; also equaling the tarsus in length. Bill, long and slightly curved. Colors, black and white.

MNIOTILTA VARIA.

Black and White Creeper.

DESCRIPTION.

SP. CH. Form, slender. Size, medium. Tongue, long, thin, horny, bifid at termination and fringed with cilia for about one-third its terminal length.

COLOR. Adult male. Black above. Stripes on back, superciliary and median stripes on head, tips of feathers of both rows of coverts forming bars, outer margin of tertiaries and outer edges of upper tail coverts, elongated terminal spots on outer web of three outer tail feathers, white. Wings and tail narrowly margined with grayish, externally, and more broadly internally, with white. Beneath, white, broadly streaked on throat and sides with black. Females, similar, but paler, with less black. Young, of both sexes, similar to the female, but are inclined to be tinged with rufous on top of head, back and flanks. Iris, bill, and feet, brown.

OBSERVATIONS.

Specimens vary in the amount of black markings below, some having the throat nearly white. Southern specimens have a longer bill than more northern birds. Distinguished at once by the prominent black and white stripings. The only species in our section with which it can be confounded is the Black-poll'd Warbler, but this has the crown wholly black. The Black and White Creeper occurs in summer from the Gulf coast north to Hudson's Bay, west to the Great Plains, but is rare north of Massachusetts. Winters in Florida, the Bahamas, and Greater Antilles.

DIMENSIONS.

Length, from 5.00 to 5.50; stretch, from 8.40 to 9.00; wing, 2.60 to 3.00; tail, 1.85 to 2.15; bill, .45 to .58; tarsus, .60 to .70.

DESCRIPTION OF NESTS AND EGGS.

NESTS, usually placed on the ground. Composed of mosses, grasses and leaves; lined with fern-cotton, fine grasses and hairs. Dimensions, external diameter, 3.50; internal, 1.50. External depth, 2.50; internal, 1.00. Eggs, three or four in number, oval in form, bluish white in color, spotted and blotched irregularly, but often more thickly on the larger end, with lilac and amber. Dimensions from .70 by .50 to .80 by .86.

HABITS.

The Black and White Creepers make their appearance in New England among the earliest of the warblers, often being found as early as the last week in April. They frequent low growths of Oak and Maple, when the peculiar sharp lisping chirp of alarm may be heard, as the birds make their way restlessly about the trunks or limbs of the trees, creeping rather than hopping, often clinging head downward in order to reach some minute object hidden in the cavities of the bark. If the weather should be warm, they begin to sing almost as soon as they arrive. The song is made up of the syllables "we-se", repeated five or six times in a lisping tone, beginning rather loud and sharp, but ending more faintly. Some individuals sing longer than others, but more especially is the terminal note prolonged. This somewhat feeble, but withal pleasant contribution to our woodland melodies, is uttered while its author is moving about in search of food.

The Black and White Creepers breed the first week in June, usually placing the nest on the ground, or beside of a stone or log, or at the foot of a tree, always I think in the woods. The young leave the nests early, and I have seen them flying about the undergrowth on June 17th. When the nests or young are approached, both parents exhibit considerable solicitude, and they show their displeasure by giving utterance to low sharp cries of alarm.

The Black and White Creepers are among the first of the warblers to take their departure for the South, leaving the first week in September. A few remain in Florida all winter; I found them common, although not abundant, on the Bahamas at this season. I found them common everywhere in the neighborhood of Kingston, Jamaica, in March, 1888, also on Cayman Brae during the same month and year. When off the south shore of Andros, Bahamas, April 27th I saw them migrating among a large number of other warblers and alighting with them to feed on the little keys.

GENUS PROTONOTARIA. THE ORANGE WARBLERS.

GEN. CH. Bill, long, rather stout, slightly curved. Wings, longer than the tail. Under tail coverts reaching within .50 of the end of the tail. COLOR of body nearly uniform orange without patches. No wing bands. There is a single species in this genus.

PROTONOTARIA CITREA.

Prothonotary Warbler.

DESCRIPTION.

SP. CH. Size, large, tail, slightly rounded. COLOR. Head all around, and lower parts, excepting under tail coverts, which are white, deep cadmium yellow, tinged with orange anteriorly. Back, orange green. Rump, and upper tail coverts, bluish ash. Wings, brown, with the feathers edged internally with whiter, and more narrowly externally with bluish ash. Tail, dark brown, with all but narrow center of

middle feathers, and outer edge of all the others, bluish ash. There is a long patch of white on the inner webs of all but central pair of feathers, extending almost from base to tip, occupying a greater portion of the web. Iris, bill and feet, brown. Adult females, similar, but duller, with the top of the head olive, and the ash of tail and wings less pure. Young similar to the adult female. Nestlings have the yellow replaced by olive; wings and tail as in the young.

OBSERVATIONS.

Readily known by the bright general yellow color, large size and absence of wing bars. Occurs in summer in the Mississippi Valley where it is common, but is found regularly east to the Atlantic as far north as Georgia, then casually to Massachusetts or even to New Brunswick. In the west, north to Iowa and Nebraska. Winters, in Cuba, Central America and northern South America.



Fig. 81. Head of Adult Prothonotary Warbler and terminal spot on outer tail feather.

DIMENSIONS.

Length, 5.30 to 5.50; stretch, 8.60 to 9.00; wing, 2.75 to 2.90; tail, 1.95 to 2.15; bill, .50 to .55; tarsus, .60 to .65.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed in woodpeckers' holes or a natural cavity of a tree, or even occasionally in a hole about buildings. Composed of mosses, grasses, straws, dry leaves, etc., lined with hairs. Eggs, five or six, sometimes seven or eight in number, rounded oval in form, creamy white in color, heavily and thickly spotted and blotched with lilac, purple and dark reddish brown, the spots being often confluent on the larger end. Distinguished from the eggs of any of the other warblers by the rounded form and dark markings.

HABITS.

With this unique species among our warblers, I have never had any personal experience when living. The Prothonotary Warbler appears to prefer swampy land in which it lives. The singular habit of placing their nests in holes of trees is, I think, as far as known shared by one species only.

GENUS HELMITHERUS. WORM-EATING WARBLERS.

GEN. CH. Bill, large and stout, equal in length to the top of the head. Tarsus, not longer than the middle toe and claw. Height of keel, exceeding one half the width of the sternum. Coracoid bones equal in length to the top of the keel. Wings, rather long. This genus, as I have defined it, embraces two species, both birds of dull plumage. Sexes, similar.

HELMITHERUS VERMIVORUS.

Worm-eating Warbler

DESCRIPTION.

SP. CH. Form, rather stout. Size, not large. Bill, slightly curved. Feet, rather large. Tail, short, square and slightly emarginate. Sternum, stoutly built. Tongue, thick and fleshy, something like those of the sparrows, not ciliated.

COLOR. Adult. Above, uniform, olivaceous green, with the top of the head black, but having a median and superciliary stripe of buff. Beneath, pale buff, becoming olivaceous on the sides and flanks. Under tail coverts, olivaceous, margined with buff. Sides of head, buff with the lores and ear coverts darker. Young, similar, but rather darker in shade, as are also the winter adults. Nestlings differ in being paler and in having a reddish suffusion throughout, but the stripes on the head are clearly defined. Iris, brown, bill, brown lighter at base of lower mandible. Feet, very pale brown.

OBSERVATIONS.

Distinguished at once from all other warblers, by the plain colors and stripes of buff on the head. Occurs in summer throughout Eastern United States, north to Southern New England, West to Eastern Nebraska and Texas. Winters, sparingly in Florida and the Bahamas, but more abundantly in Cuba and Jamaica.

DIMENSIONS.

Length, 5.00 to 5.50; stretch, 8.10 to 8.40; wing, 2.55 to 2.60; tail, 1.25 to 1.60; bill, .50 to .51; tarsus, .60 to .65.

DESCRIPTION OF NESTS AND EGGS.

NESTS, placed in the ground, composed of dried grasses, leaves and fibrous roots. They are rather bulky for the size of the bird. **EGGS**, four in number, rather elliptical in form, white in color, plentifully spotted and dotted everywhere with reddish brown, but rather more thickly on the larger end. Dimensions, .55 by .73 to .56 by .75.

HABITS.

When I was observing birds at Williamsport, Penn., in the spring of 1876, I found that the Worm-eating Warbler arrives about May 11th. Here they were not common, and had not begun to sing, the only note being a faint chirp, uttered as they clung to low shrubs and herbage near the ground. Later in the month, I found them common at White Deer Valley further down the Susquehanna, and had an excellent opportunity of observing their habits. They keep near the ground when feeding, only occasionally flying up among the lower branches of the larger trees. Here the males were in full song; their efforts in this direction are, however, not particularly musical, for their notes consist of a few rather feebly given chirps which remind one quite closely of the Chipping Sparrow, given as the birds move leisurely about in search of food. I found several nests, and all were placed on the ground on the slopes of the hills, but never far up from the bottom of the valley, and they were in open sight, among the fallen leaves of the previous year, without any attempt at concealment. The eggs were all deposited by the last week in May, and in a few cases, I found well grown young by June 7th. The young appear to acquire their wing feathers more quickly than do most warblers. It is probable that they leave the nests sooner. See figs. 82 and 83, in the first of which, I give a life size figure of a bird about a week old. At fig 83, may be seen a wing of a slightly older specimen. The Worm-eating Warbler migrates south late in August.

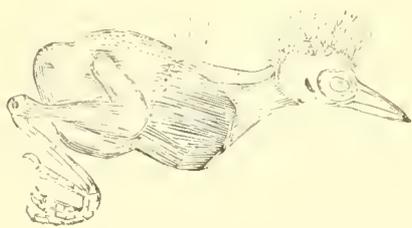


Fig. 82. Young of Worm-eating Warbler.

I have found this plainly colored warbler upon several occasions in Eastern Florida, in winter, I

I found a few at New Providence, Bahamas, from the last of January, until April 8th, 1884. They were common about Kingston, Jamaica in February, 1888, and I shot a single specimen on April 5th of the same year on Cayman Brae.

HELMITHERUS SWAINSONI.

Swainson's Warbler.

Helmitherus swainsoni Bonap., *Conspectus*, 1850, 314.

DESCRIPTION.

Sp. Cn. Form, rather robust. Size, quite large. Bill, long, stout and acuminate. Wings, long. Tail short and slightly rounded. COLOR. Adult. Above, reddish brown which is brightest on the top of the head and palest on the back where there is a tinge of olivaceous. Stripe over the eye and entire under parts, including under wing and under tail coverts, yellowish white, with a tinge of pale olivaceous across the breast. The sides and flanks are also pale olivaceous. Lores, dusky. Neck, brown. Bill, brown, lighter on the lower side of the lower mandible. Feet, pale brown. Sexes similar. Darker in the male and young plumage.

Description of the first Plumage of *Helinaia swainsoni* from a specimen in the collection of Mr. G. S. Miller, Jr., taken near Charleston, S. C., June 14, 1886.

Above, uniform reddish brown, with a slight indication of the lighter superciliary stripes of the adult, becoming olivaceous on the edges of the wing and tail feathers, which are of a clear, rather slaty brown. Beneath, quite light rufous brown, with the middle of the breast slightly darker, and the abdomen, under wing and tail coverts, yellowish white, tinged with rufous. Bill, dark brown. Feet, pale brown.

OBSERVATIONS.

There is no need of confounding this species with *H. vermivorus* as the latter has the top of the head striped, while this has a rufously colored crown. Habitat, South Carolina, Georgia, Florida and other Gulf States, during the breeding season; winters in Cuba and Jamaica.

DIMENSIONS.

Measurements of Mr. Thaxter's specimen taken from the skin.—Length, 5.25 to 6.00; wing, 2.75 to 2.80; tail, 1.90 to 2.00; bill .65 to .70; tarsus, .70 to .80.

DESCRIPTION OF NESTS AND EGGS.

NESTS, placed in high grass some distance above the ground. Composed of grasses and weeds. Eggs, three or four in number, oval in form, pure white in color, usually unspotted, but occasionally faintly marked with dots of reddish on the larger end. Dimensions, from .52 by .68 to .92 by .79.

HABITS.

The first Florida specimen of Swainson's Warbler was taken by Mr. L. L. Thaxter on the St. John's River, April 15th, 1869. At that time, this was an exceedingly rare bird in collections, but since that time, many specimens have been taken mainly in the vicinity of Charleston, South Carolina. They have also been found to breed there in May, June, and July. The nest is placed among the stalks of high grass on fresh water marshes.

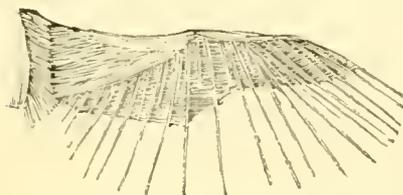


Fig. 83. Wing of Young Worm-eating Warbler,

Judging from the number of skins which I found in the Museum of the Institute of Jamaica at Kingston, this must be a common winter species on the island, although I did not see any specimens in my walks about Kingston nor about Spanish Town.

GENUS HELMINTHOPHAGA. THE ACUMINATE-BILLED WARBLERS.

GEN. CH. Bill, about equal in length to the head, slender, and very acuminate. Tarsus, longer than the middle toe and claw. Height of keel, equal to one-half the width of the sternum. Coracoid bones, shorter in length than the top of the keel.

Members of this genus are closely related to those of the preceding, but may readily be distinguished from them by the smaller, more acuminate bill. As far as is known, with a single exception, they all place their nests upon the ground. The colors are generally dull with occasionally prominent markings on throat and breast.

HELMINTHOPHAGA CELATA.

Orange-crowned Warbler.

Helminthophaga celata Baird. Birds of North America.

DESCRIPTION.

Sp. CH. Form, quite slender. Size, not large. Bill, slender, not long. Tail, slightly emarginate, wing bars, white spots on tail absent. Sternum, quite stoutly built. Tongue, long, narrow, thin and horny, with the end cleft and coarsely ciliated; these cilia do not extend along the sides, however.



Fig. 84. Head of Adult Orange-crowned Warbler.

COLOR. Adult male, uniform dull olivaceous green, brightest on the rump and lighter beneath. There is a slight indication of a greenish superciliary line. There is a concealed patch of bright orange on the crown. Tail and wings, brown with the outer webs edged with greenish. The adult female is similar but has less orange on the crown. The young are without the orange crown and have a suffusion of ashy over the entire surface of the body which is more perceptible on the sides of the head. The colors beneath are paler and there are two whitish bands on the wing.

OBSERVATIONS.

The birds which I have described are from Florida. Those from the West are greener above, and much yellower beneath; there is no more orange on the crown of specimens from the latter locality than from the former. The adults may be known from all other Warblers by the orange crown. The young are more ashy than any other members of the genus. This species appears to be distributed throughout Eastern temperate North America in summer, but is rare east of the Alleghanies; common westward; winters in Florida, Cuba and northern South America.

DIMENSIONS.

Average measurements of six specimens from Florida. Length, 4.94; stretch, 7.88; wing, 2.50; tail, 1.80; bill, .44; tarsus, .65. Longest specimen, 5.30; greatest extent of wings, 8.25; longest wing, 2.90; tail, 2.00; bill, .50, tarsus, .70. Shortest specimen, 4.75; smallest extent of wings, 7.10; shortest wing, 2.10; tail, 1.75; bill, .40; tarsus, .60.

DESCRIPTION OF NESTS AND EGGS.

The following description was made by Mr. Ridgeway, from specimens in the Smithsonian Institute, taken by Mr. Kennicott, at Yukon River, Alaska.

NESTS, composed entirely of grasses, which are finer in the lining. It is deeply cup-shaped. Dimensions, external diameter, 3 inches, internal, 2; external depth, 2.50 inches, internal, 1.75. EGGS, six in number, oval in form, pure white in color, finely sprinkled around the larger ends with reddish brown and lilac.

HABITS.

The Orange-crowned Warblers appear to be somewhat irregularly distributed throughout Florida. They can be seen almost any day in autumn or winter on the trees in the streets of Jacksonville, in company with other Sylvicolidae, and are tolerably common in the hammocks in the neighborhood of the city. I have frequently found them in a narrow strip of woodland lying between the St. John's River and some cultivated fields; indeed, it was in this place that I shot the first specimen that I ever saw. These birds are rare at Blue Spring, for in course of two months' collecting we found but two or three. These were procured in a hammock near the head of the spring, and I never met with them elsewhere in the vicinity.

We searched in vain for them at Salt Lake, and I have never seen a single individual on Indian River or Mosquito Lagoon, yet we took several in the dense thickets back of the old fort at Miami, but I did not find them at Key West. The Orange-crowned Warblers are lively little birds, usually frequenting hammocks and the underbrush which grows about them. I think they rarely visit the pine woods. These birds are unsuspecting and may be approached quite nearly but when alarmed will utter a quick, sharp chirp and instantly conceal themselves in the nearest thicket. I never heard them sing, and never have seen a specimen during the nesting season, yet it is probable that a few breed in the state. I obtained a single specimen at Williamsport, Pennsylvania, May 15th, 1876.

HELMINTHOPHAGA RUFICAPILLA

Nashville Warbler.

Helminthophaga ruficapilla Baird, Birds of North America, 1858, 256.

DESCRIPTION.

Form, slender. Size, small. Bill, not long. Tail, slightly emarginate. Wing bars and white spot on tail absent. Sternum, rather slightly built and although a little smaller than that of the preceding, it is of the same form and proportions. Tongue, not long, thin, narrow and horny. The end is quite deeply cleft, but it is only ciliated on the extreme end, and there the cilia are very short.



Fig. 84. Head of Adult Nashville Warbler.

Color. Adult male. Above, bright olivaceous green, with the head and neck above, and on the sides ashy. There is a partly concealed patch of chestnut on the crown. The wings and tail are brown, edged on the outer webs with greenish. Beneath, very bright yellow, with the abdomen white. There is an indication of a yellowish superciliary line, and a ring around the eye is whitish. Adult female, very similar, but paler above and below, and having less chestnut on the crown. The young lack the chestnut crown. The head and neck are brownish instead of ashy; there is a brownish suffusion over the back, and the yellow beneath is quite pale; there is even a tinge of

ashy on the throat. Irides, feet and bill, brown, but with the lower mandible lighter.

OBSERVATIONS.

Easily known in the adult stage by the chestnut crown, ashy head and yellow under parts. The young are also distinguished from those of *H. celata* by the yellow beneath, *celata* being very ashy gray on these

portons. Found in summer throughout Eastern United States from Florida to Maine, west of the Great Plains; winters in Mexico and Central America, also rarely found in Florida at this season.

DIMENSIONS.

Average measurements of fourteen specimens from New England. Length, 4.75; stretch, 7.50; wing, 2.35; tail, 1.70; bill, .40; tarsus, .67. Longest specimen, 5.51; greatest extent of wings, 7.75; longest wing, 2.50; tail, 1.85; bill, .45; tarsus, .67. Shortest specimen, 4.55; smallest extent of wings, 2.30; shortest wing, 2.22; tail, 1.60; bill, .38; tarsus, .60.

DESCRIPTION OF NESTS AND EGGS.

NEST, composed outwardly of green moss, then dried grasses, lined with finer grasses and some white hairs. Dimensions, external diameter, 3.50 inches, internal, 2.25; external depth, 2.75 inches, internal, 1.25. Eggs, four in number, rather pointed, creamy white in color, spotted and blotched on the larger end with reddish-brown and lilac, where they sometimes form rings. The remaining surface of the egg is also sparsely dotted with brown. Dimensions, .66 by .50. The above description was made from a nest taken at West Newbury, by my young friend, Gilman Brown.

HABITS.

I shot the first specimen of these little birds, that I had ever seen, many years ago, in Newton. As this was the first knowledge I ever obtained of their existence, and as they appeared entirely different from any birds which I had hitherto observed, I, like most young collectors when they obtain an unfamiliar bird, considered them a new species. I had taken two, one of each sex, and hastened home with my prizes to ascertain for a certainty if they had been described, eagerly thinking over the matter that I might decide upon an appropriate name for such pretty birds; but I found that I had counted a species before it was hatched, for upon consulting the proper books, discovered, much to my disappointment that the Nashville Warblers had not only been known for years but that they were not even rare; all the ornithologists agreeing in pronouncing them common. Consequently, the little yellow-breasted and red-crowned birds fell many degrees in my estimation.

The first specimens were taken in a cluster of yellow pines which stood in an open field, but near a somewhat extensive grove. I have always found these birds in similar situations, for they inhabit the borders of woods, and are seldom found in the deeper portions. Even in the vast forests of northern New England, the Nashville Warblers are invariably found near the open marshy spots which are of frequent occurrence in these wilds. The males are quite easy to find, for they sit on the topmost bough of some tall tree and sing their loud songs throughout the entire day; but the females are not as frequently seen, for they are very quiet, and generally keep among the thick branches where they are constantly searching for insects. These birds place their nests on the ground, usually in the edge of the wood. They are careful to keep them concealed so that it is impossible to discover one unless the bird is accidentally started. But the chances of doing this are quite as small, as, while incubating, she will sit so closely that it is extremely difficult to make her rise, and she will allow herself to be nearly trodden upon before flying. There is another method by which the nest may be discovered however, and indeed one that may be practised to advantage in finding the eggs of all ground breeding Warblers.

If, while the collector is walking in the woods in early June, he observes a female bird that appears uneasy, he should quietly retreat for a short distance and after watching a short time will generally see the anxious Warbler enter her nest. I have found rare eggs in this way which would otherwise have remained undiscovered, but have always found that it is useless to search for a nest which is concealed on the ground without having more knowledge of its whereabouts than is imparted by the uneasy actions of the female.

I have several times searched for the unknown eggs of the Tennessee Warbler while the female was flying frantically about, chirping loudly and frequently alighting within a yard of my head. In spite of these assurances that I was very near the nest, I have always given up the search in disappointment, after having, perhaps, unconsciously crushed the concealed prize at my feet. In these instances, a half hour spent in carefully watching the bird from a little distance would probably have been rewarded; but the mosquitoes and black flies are so numerous in the sections where the Tennessee Warblers breed (Northern New England), that during a single moment of inaction their stings become unendurable and one cannot remain quiet for any length of time.

It is singular that, although, as far as is known, with the single exception of Lucy's Warbler, all the members of the genus *Helminthophaga* place their nests on the ground, the males perch in elevated situations while singing, and, excepting during the breeding season, neither male nor female is often seen upon the ground. They all frequent the tops of trees which stand on the borders of woods or in open fields, and none of them are apt to be found in the deep forest; of the five species which occur commonly in eastern United States, the Tennessee and Nashville are found on the borders of woods, while the Blue-winged Yellow, Orange-crowned, and Golden-winged prefer the more open sections.

The latter named species may occur rarely in northern Florida as it is quite abundant in Georgia. I once saw a small Warbler at Key West which I thought might be the Tennessee, but, as it was flitting quickly through the thick bushes I could not be certain, but it is more probable that this was a specimen of Bachman's Warbler, but I was not aware at that time that this species occurred in Florida. The Nashville arrives in Massachusetts about the middle of May, breed during the first week in June, and depart in early September. They are very rare in Florida, and to my knowledge there has been but one specimen taken in that state; this was captured by Mr. Boardman, at Jacksonville, on March 13th, 1869.

HELMINTHOPHAGA PEREGRINA.

Tennessee Warbler.

DESCRIPTION.

SP. CN. Size, small. Wing bars and spots on tail absent. Bill, not long. Tongue, thick, narrow and horny, deeply bifid, and the terminal portion is provided with large, coarse cilia. COLOR. Adult male. Top and sides of head and neck, all around, ashy gray. Remaining upper parts, olive green, brightest on the rump. Beneath, white, faintly tinged everywhere, but more especially on the sides with olivaceous. The

eyelids and a line over the eye are whitish. There is a dusky line from bill to eye. Outer tail feathers, with a spot on the inner web near the tip. Females, similar, but duller, and the under parts are more strongly tinged with yellowish. There is a strong tinging of greenish yellow; this is especially noticeable in young birds.

OBSERVATIONS.

Known from all allied species by the plain colors and absence of any concealed colored patch on the head. Young birds may be distinguished from those of *H. celata* by the elongated white patch on the outer tail feathers of *H. peregrina* this being absent in the Orange-crowned. Occurs in summer from Northern New England, northward to Hudson's Bay and the Great Slave Lake region. Migrating southward in winter to Cuba and Northern South America.

DIMENSIONS.

Length, from 4.62 to 5.05; stretch, from 7.40 to 8.31; wing, from 2.35 to 2.60; tail, from 1.51 to 1.80; bill, from .64 to .80; tarsus, from .38 to .43.

HABITS.

The first specimens of the Tennessee Warbler which I ever saw was at Newtonville, Massachusetts, when I shot four specimens, all males, between the 18th and 24th of May, 1869. In the spring of 1870, when in company with Messrs. Wm. Brewster and Ruthven Dean, I was at Upton, Maine, I found this species common. It was common at that time in all the wooded region of that section, where beyond doubt, it breeds. The song is similar in some respects to that of the Nashville Warbler, but the notes of the first part are more divided, and the notes of the latter part shriller. As related on a previous page, we searched in vain for the nest at that time, and rather singularly, perfectly authentic specimens remain unknown at the present time.

On September 7th, 1876, I found the Tennessee Warbler migrating through Watsonstown, Pennsylvania. They were quite common and were in company with several other species of warblers, and I found them at intervals for about a week when they disappeared.

HELMINTHOPHAGA BACHMANI.**Bachman's Warbler.**

DESCRIPTION.

SP. CH. Size, small. Wing bars absent, spots on tail present. Bill, short. COLOR. Above, yellowish green, including sides of head and neck, tinged with ashy on the back part of head. Forehead and lower portions, bright yellow. There is a black line separating the yellow forehead from the ashy of back of head and a broad patch on throat, and breast, black, but this is surrounded by yellow. Wings, dark brown, with the feathers margined with olivaceous. Tail, dark brown, with a spot of white on the inner web of the three outer feathers, but this does not extend along the vein to the termination of the feathers. Females, smaller, but duller, showing traces only of the throat patch.

OBSERVATIONS.

Known at once by the black spot on throat surrounded by the yellow. Occurs in North and South Carolina, Georgia and Louisiana during the breeding season, and during migrations, on Key West. Winters in Cuba.

DIMENSIONS.

Length, from 4.25 to 4.50. Wing, from 2.30 to 2.35; tail, 1.90 to 2.00.

HABITS.

Bachman's Warbler, discovered by Audubon, in 1834 from specimens obtained near Charleston, South Carolina, was for many years represented by the type specimen, in the cabinet of the Smithsonian Institution. It was rediscovered by C. S. Galbraith in Louisiana near, Lake Pontchartrain, in 1886. Since that time, many specimens have been taken there as well as in other sections, but noticeably at Key West during migration.

HELMINTHOPHAGA CHRYSOPTERA.

Golden-winged Warbler

DESCRIPTION.

SP. CH. Size, medium. Bill, rather long. Wing bars and spots on tail present. Color. Adult male. Above, bluish ash, with top on head and broad band on wing, lemon yellow. Wings, brown with the primaries edged with ashy, and the secondaries with greenish. Tail also brown, margined with ashy and with an elongated white spot on the inner webs of the three outer feathers; this does not, however usually extend along the vein to the termination of the feathers. Beneath, including sides of head, ashy white, slightly tinged with bluish on sides and flanks. A broad patch on sides of head, through eyes, and on throat, but surrounded by white, black; iris, bill, and feet brown. Female generally similar, but there is not as much white on the tail, the black markings of the head and throat are replaced by slaty or dusky, the upper parts are tinged with greenish and the under parts with yellowish. Young, quite similar to the female.



Fig. 85. Head of Adult male Golden-Winged Warbler. A, second tail feather. B, tongue.

OBSERVATIONS.

Known by the combination of the black throat, patch on sides of head with the black back and white under parts. Occurs during summer throughout Eastern United States, north to Southern Vermont and New Hampshire. Winters south of our limits.

DIMENSIONS.

Length, 5.00 to 5.30. Stretch, 7.75 to 8.00; wing, 2.40 to 2.55; tail, 1.80 to 1.90; bill, .50 to .55; tarsus, .70 to .75.

DESCRIPTION OF NESTS AND EGGS.

NESTS, placed on the ground, composed of dried leaves, grape vine bark etc., lined with fine grass and horse hair. EGGS, four in number, oval in form, white in color, spotted and blotched with reddish brown, rather more thickly on the larger end. Dimensions, .55 by .67 to .50 by .66.

HABITS.

These beautiful little warblers arrive in Massachusetts in the spring during the second or third week in May. Here they are much more common in some sections than in others, this is especially true during the migration. A number of years ago, I found them abundant in some detached pieces of woodland around the salt marshes in the town

of Rowley, but not many remained to breed there. Here in Newton they are always to be found along a line of hills which lies in the center of the city, and fortunately the settlement of this section does not appear to have driven them away, for I saw several there during June of this year, 1895, inhabiting the little parks in the vicinity of the houses.

It was on this hill, on the side of a little valley, the bottom of which was occupied by a swampy thicket, that I found the first well authenticated nests of this species that had ever been taken. This was on June 12th, twenty-six years ago. Since that time, however, quite a number of nests have been found in the vicinity, all of them on slopes which rose from swampy thickets. The nest which I found was placed in an open glade, and the same was true of some of the others which have since been taken. The exact spot in which I found my nest is now included in the grounds of a residence, but aside from a few changes made by the landscape gardener who laid out the estate, the direct environment remains much as it was when I first saw it. I even heard a Golden-wing singing near, last June, and can well believe that either he or another had a nest in the same little valley.

The song of the Golden-winged Warbler is one of the most characteristic of the groups, and consists of four or five rather harsh lisping notes, often given as the bird sits upon the topmost bough of some high tree, at which time he gives his entire attention to his rather unmusical efforts, but at other times he sings as he feeds, flying restlessly from tree to tree.

This species leaves Massachusetts by September 1st, but I failed to find it at Watertown among the great migration of warblers during the first and second week of this month, and thus it is possible that these birds may pass further west on their way to the South.

Helminthophaga chrysoptera leucobronchialis.

Brewster's Warbler.

Plate XXII. Adult male in Spring, (upper figure).

DESCRIPTION.

SUB SP. CN. Size, form and general color of the Golden-winged Warbler, but lacks the black of the breast in the male and the slaty in the female, and the black of the cheeks is reduced to a narrow line passing through the eye. The white of the lower parts is very slightly tinged with yellow on the breast, and lacks the bluish tinting of the sides, being pure silky white everywhere.

OBSERVATIONS.

This bird has proved a puzzle to ornithologists ever since its discovery by Mr. Brewster, twenty-five years ago. The chief difficulty appears to be that some specimens which have been taken show considerable yellow below, have whitish wing bars and in some other ways exhibit an approach to the Blue-winged Yellow Warbler, *H. pinus*. Hence, these and all other specimens of Brewster's Warbler have been considered as hybrids, between the Golden-winged Warbler and the Blue-winged Yellow by some ornithologists. Others, however, maintain that Brewster's Warbler is a color phase of the Golden-winged. The hybrid theory is partly corroborated by some apparent evidence that Brewster's Warbler mates with both the Blue-winged Yellow and with the Golden-winged. Now I have carefully read all of the published statements which I can

find regarding the finding of the three forms mated, and must say that in no case do I think that the evidence that the birds of two forms, found in the vicinity of the nests, or young, were mates, is absolutely certain. Certainly no one can collect either eggs or nestling birds long without becoming aware of the fact that birds of many species are very sympathetic, and exhibit nearly, or quite as much solicitude when the nest or young of another bird is approached, as they do when their own offspring is in real or fancied danger. Keeping this point in view, I think, that, while acknowledging that some cases as given by collectors of wide experience are apparently strongly in favor of two forms mating together, the absolute fact of Brewster's Warbler mating, with either the Blue-winged Yellow or with the Golden-winged, yet remains to be proved. See further remarks upon this subject under head of observations in the succeeding sub-species.

Up to date, some fifty or more specimens of this singular form of warbler have been taken, two only however, in Massachusetts, the remainder have been collected in Connecticut, New York, New Jersey, and southward.

HABITS.

All I can say of the habits of this sub-species from personal observation, is that just twenty-five years ago, the 18th of last May, I accompanied Mr. Wm. Brewster in a collecting trip to the hill in Newton, of which I have spoken, in order to show him the habitat of the Golden-winged Warbler. Hearing what I thought was one sing, I called his attention to it. Mr. Brewster shot the bird which proved to be the first specimen of the White-throated Warbler known to science.

Helminthophaga chrysoptera lawrencii. Lawrence's Warbler.

Plate XXII. Adult male in Spring (lower figure).

DESCRIPTION.

SUB SP. CH. Size, and form of the Golden-winged Warbler but differs in being deep yellow beneath, much as in the Blue-winged yellow Warbler, and in having whitish wing bars as in that species, while the black line through the eye is narrow as in *H. c. leucobronchialis*, but the full sized black throat patch is developed as in *H. chrysoptera*. Adult female, similar, but with the throat patch indicated only, much as seen in the female of *H. bachmani*.

OBSERVATIONS.

Since writing the article on the Brewster's Warbler I have had the opportunity, through the kindness of Mr. Brewster, of carefully studying the large series of Warblers of this genus in his collection. Previous to this I had noticed one point of difference between the Golden-winged Warbler and the Blue-winged Yellow which I do not remember having seen mentioned, that is that in the Golden-winged Warbler the terminal white spot on the inner web of the second tail feather does not extend along the vein quite to the termination of the feather, (See Fig. 85, A.) whereas, in the Blue-winged Yellow, this spot does extend along the vein quite to the termination of the feather. (See Fig. 86.) Upon examining Mr. Brewster's series, (between fifty and sixty of each species) I find that in a large percentage of both this character holds good. In about five percent of the Golden-wings I find that the white does extend along the vein to the termination, and in one or two cases it even encroaches upon the dark color on the outer web, thus crossing the vein. In still a less percentage of the Blue-winged Yellows, I find that the spot on the second tail feather does not extend along the vein quite to the termination of the feather, but possibly this may be a mark of comparative immaturity. I also find that in quite a number of specimens the white crosses the vein and occupies an elongated space on the outer web. Both sexes, in both species, share alike in these markings. Now it had occurred to me that this test regarding the spots on the tail feathers applied to both Brewster's and Lawrence's Warblers, might settle in some measure the vexed question of their specific status. As far as Brewster's Warbler was concerned, all examined were like the typical Golden-wing in having a small dark space

on the inner web at the termination of the vein. But when I came to apply the test to the only two apparently mature birds which Mr. Brewster has, one is like the Golden-wing and one like the Blue-winged Yellow. A half a dozen other younger birds were like the Golden-wing, all having the dark spaces on the vein at the termination of the second feather. Thus far then, the evidence shows that the tail coloration of both Brewster's and Lawrence's Warblers is similar to that of the Golden-wing, excepting in the one case noticed above, and in regard to this, I think that an examination of a larger series will show that this is simply one of the small percentage also found in typical Golden-wings.

Now, looking at the question regarding the status of these two forms of birds in a broad light, guided by the facts as they are presented to us, I cannot avoid considering both Lawrence's and Brewster's Warblers, not as hybrids between *H. pinus* and *chrysoptera*, nor as color phases of either, or both, but as incipient species, derived, and that recently, within, at least, the last fifty years, directly from the Golden-winged Warbler. That Lawrence's Warbler has yellow below and white wing bars may be accounted for by supposing that, as is quite probable, both *H. pinus* and *H. chrysoptera* had a common ancestor (possibly *H. bachmani*) which was yellow below, and this hypothesis is borne out by the fact that Brewster's Warbler is inclined to become yellow below, thus showing an inclination to exhibit a strong ancestral character. My studies in other fields of zoology, among invertebrates, have taught me that incipient species are apt to remain for some time in an unsettled condition; they not only exhibit remote ancestral characters not prominently shown in their immediate progenitors, but also assume new correlative features, thus becoming quite different from any ancestor, near or remote. In short, I see nothing in either Brewster's or Lawrence's Warblers which may not have been produced through the action of well-known laws of evolution, and all within a very few years or within ten or a dozen generations of bird life. I must now return for a moment to the so-called hybrids between *H. pinus* and *H. chrysoptera*. A specimen so labeled in Mr. Brewster's collection has all the coloration, tail feathers included, of *H. pinus*, excepting that it has yellow wing bars much as in *H. chrysoptera*. Now I find upon examining the series of *H. pinus* that there is almost always a tinge of yellow on the wing bars, and that from this mere tinging all stages may be found between it and as perfectly yellow wing bars as are seen in the so-called hybrid. In fact, one or two in the *pinus* series are as highly colored as this is. In conclusion, I ought, perhaps, to say that in writing the above statements, regarding the hybrids, I have simply taken the labels on the skins as I find them, and do not know whether they express Mr. Brewster's opinion in regard to names or not, for although he kindly gave me permission to examine his specimens, he was absent at the time, and I have not since seen him.

Lawrence's Warbler occurs in summer in Southern Connecticut, where it appears to be not uncommon, and southward as far as Virginia.

HELMINTHOPHAGA PINUS.

Blue-winged Yellow Warbler.

DESCRIPTION.

SP. CH. Size medium, form rather slender. Wing bars and spots on tail present. COLOR, adult male. Top of head orange yellow. Remainder of upper parts of body, including upper tail coverts, greenish yellow. Wings brown with the primaries edged with bluish and the secondaries, especially the upper, with greenish tips of both rows of wing coverts white, often strongly tinged with yellow. Tail brown edged with bluish. There is an elongated spot on the termination of the inner web of the three outer tail feathers, which on the outer does not quite reach the termination of the vein, but which on the next two, extends along the vein quite to its termination. Sides of head and lower parts, excepting under wing and tail coverts, which are white tinged with yellow, rich golden yellow. A narrow black line extends through eye, and by contrast above, is a superciliary line of yellow. Iris, bill, and feet brown. Female similar, but duller in color.



Fig. 86. Head and termination of second tail feather of adult Blue-winged Yellow Warbler.

OBSERVATIONS.

As already related under observations in the two previous articles, there is some variation in the spots on the tail, a small percentage having the dark spot at the tip of the vein seen in *H. chrysoptera* (see Figs. 85 and 86) but on the other hand, a larger number of specimens have the white enlarged so as to cross the vein. Some specimens also have the wing bars as golden yellow as in the average of *H. chrysoptera*, and we find all gradations between this and the white of typical *H. pinus*. Occurs during summer throughout Eastern United States, north to Southern New England and Minnesota, west to Nebraska, middle Kansas and Texas; winters in Eastern Mexico and Guatemala.

DIMENSIONS.

Length, 4.50 to 5.00; stretch, 6.85 to 7.50; wing, 2.25 to 2.40; tail, 1.85 to 2.00; bill, .40 to .45; tarsus, .95 to .68.

DESCRIPTION OF NESTS AND EGGS.

NESTS, placed on the ground composed of weed stalks, strips of bark, leaves, moss etc., lined with finer material. EGGS, four or five, oval in form, white in color finely sprinkled with reddish brown, amber and black. Dimensions, .47 by .65 to .50 by .67.

HABITS.

I have met with this fine warbler upon very few occasions, thus can add nothing of interest to our knowledge of its habits, which do not appear to differ from those of nearest relatives.

GENUS. COMPSOTILYPIS. THE LITTLE WARBLERS.

GEN. CH. Bill, considerably shorter than the head, slender and acuminate. Tarsus, longer than the hind toe and claw. Height of keel, not exceeding one-half the width of sternum. Coracoid bones, equal in length to the top of keel. Birds of this genus, although small in size, are rather stout in form.

COMPSOTILYPIS AMERICANA.

Blue Yellow-backed Warbler.

Parula Americana Bon., List of Birds of North America, 1838.

DESCRIPTION.

SP. CH. Size, small. Wings, rather long. Tail, square and slightly emarginate. Sternum, not stoutly built. Tongue, rather thick and fleshy at the basal half, then suddenly becomes thin and acuminate. The end is cleft for five-hundredths of an inch and the divided portions are coarsely ciliated. This tongue is quite unique among Warblers, differing from any others that I have seen in having a fleshy base, terminating abruptly in a thin point.

COLOR. Adult male. Above, slaty blue, brightest on the head; with a large patch of greenish yellow in the middle of the back. Wings and tail, brown, edged with bluish; the six outer feathers of the latter are spotted subterminally, on the inner webs, with white. The two rows of upper wing coverts are tipped with white, forming rather broad bars. The blue above extends down on the sides of the head and neck, but is rather dusky on these parts. The lores are black, and there is a spot of white on the upper and lower eyelids. The sides and flanks are tinged with pale bluish. Throat and breast, yellow, with a patch of chestnut brown across the upper part of the latter, which is sometimes preceded by a narrow line of the same color as the sides of the neck. The remaining under surface, including under tail coverts, under wing coverts and closed wing beneath, white. Ventral region, tinged with yellow. Adult female, similar to the male, but the chestnut of the breast and the yellow of the back is not as bright nor as extended. Young male, similar

to the adult female. The young female has the yellow beneath less extended and without a trace of chestnut. There is also but a slight indication of the yellow patch above. In all stages the irides are brown; upper mandible, brown; lower, whitish; feet, brown.

OBSERVATIONS.

This pretty little species may be distinguished at once from all others by the ever present yellowish green patch upon the back, combined with yellow throat. Distributed during the breeding season throughout Eastern United States from Virginia north to Canada, west to the Rocky Mountains; winters in Mexico, Central America, Bahamas, West Indies and Key West.

DIMENSIONS.

Average measurements of twenty-three specimens. Length, 4.75; stretch, 7.30; wing, 2.30; tail, 1.70; bill, .40; tarsus, .63. Longest specimen, 4.90; greatest extent of wings, 7.70; longest wing, 2.85; tail, 1.85; bill, .49; tarsus, .75. Shortest specimen, 4.25; shortest extent of wings, 7.70; shortest wing, 2.20; tail, 1.40; bill, .35; tarsus, .59.

DESCRIPTION OF NESTS AND EGGS.

NESTS placed in trees composed of the drooping sprays of the long gray moss, which are looped up often into purse shaped nests, having a hole in the side, or other specimens are hammock shaped and open at the top. All that I have seen were constructed wholly of the moss. Eggs three or four in number, pure white in color, spotted and dotted everywhere with light reddish-brown and lilac, but more sparsely at the smaller end. Dimensions from .66 by .48 to .70 by .50.

HABITS.

A careful observer of birds can readily determine each species of the Warblers, even when they are at a distance, by their motions. Some are full of nervous activity, while others are more deliberate in their movements. A few closely resemble one another in their evolutions among the trees, but no one who has ever studied their habits will fail to recognize the Blue Yellow-backs at a glance; for none of the Sylvicolidae conduct themselves so peculiarly. They sometimes glide along the limbs like Creepers or cling to the under surface of the bark after the manner of Nuthatches; but the next instant finds them skipping nimbly from bough to bough, until they perch on the topmost twig, from which they dart into air to secure some rapidly moving insect. Thus they are ever changing position and there are but few species which so constantly assume so many varying and graceful attitudes.

These birds are found in Florida throughout the winter but most abundantly in spring, when the great avian waves sweep northward. While in this state they frequent the hammocks, but more generally avoid the piny woods. They arrive in Massachusetts during the latter part of May, when they are found among apple trees, and in deciduous woods. A few remain in Southern New England to breed, but the majority spend the summer in the more northern sections, where they build their pensile nests amid the long, gray moss, which so plentifully drapes the trees in these wilds. The song of the Blue Yellow-backed Warbler consists of a few simple, lispng notes, yet they are given with energy and an accent so peculiar as to distinguish them at once from those of all other Warblers. The males continue to sing until August, after which various families, composed of parents and young, congregate in small flocks; then in early September, join the

other little birds in their southern migration. This is an abundant species on the Bahamas, also about Kingston, Jamaica, and on Cayman Brae in winter and spring. They were singing on March 15th about Nassau. But after that, about the first of April, began to moult, and began to migrate the last week in this month, but remained common until the first week in May.

The presence of the long gray moss on the trees settles the question of the summer distribution of this little warbler. Wherever a tree, no matter how isolated, appears covered with the moss, a pair of these birds are sure to find it and breed there. I know of a cedar tree in Wayland which has no other tree near it, similarly draped with moss, which served as the home for one or two pairs of Blue Yellow-backs for several years, and they only gave up breeding there after the moss had blown away.

CENUS II. DENDROICA THE WOOD INHABITERS.

GEN. CII. Bill, shorter than the head, slender, but not very acuminate. Tarsus, longer than the middle toe and claw. Height of keel, a little exceeding one-half the width of sternum but not as high as in the preceding genus. Coracoid bones, shorter in length than the top of the keel.

DENDROICA VIGORSII.

Pine Warbler.

Dendroeca pina BAIRD, Birds of North America, 1858, 277.

DESCRIPTION.

SP. CII. Form, rather robust. Size, large. Bill, stout and conical. Feet, wings, and tail of moderate size, the latter emarginate, with white spots confined to two pairs of outer feathers. Sternum, stoutly built. The keel is considerably higher than one-half the width of the sternum in comparison with other members of the genus. Tongue, narrow, thin and quite acuminate, with the end divided into rather coarse cilia about three-hundredths of an inch in length, which extend along the sides, growing gradually shorter until they disappear, occupying about one-fourth of the terminal length.



Fig. 87. Head of Adult Pine Warbler, and outer tail feather.

COLOR. Adult male. Above, olivaceous green, brightest on the back and palest on the upper tail coverts, with the feathers of the top of the head showing darker centers. Wings, dark brown with the two rows of wing coverts tipped with white, and forming bars. Tail, also brown but having spots of white on the inner webs of the two outer pairs of feathers, which seen from above, extend on

the outer terminal portion of feather, along the vein usually not quite in contact with it, excepting for a small, terminal spot, about one-half the length of the feather, also along outer web from bases to more than one-half the length. Beneath, this feather is wholly white on outer web, also on terminal portion of inner. The white on the second pair of feathers is not more than half as extended, and does not come in contact with the vein anywhere. See Fig. 87 for form of this spot. The feathers of the wings and tail are also slightly edged with whitish. Throat, breast, sides and flanks, yellow, but becoming paler on the latter. Abdomen, under tail coverts and under wing coverts, white. Lores, dusky. There are also dusky lines along the sides caused by the feathers having darker centers. In autumn there is a bluish white washing above; the yellow beneath is a little more extended; the dark lines on the sides are not as conspicuous, but the lores and the ear coverts are quite dusky.

The young male is somewhat like the autumnal adult but there is a brownish cast to the washing

ground among the grass. But the birds do not remain long in one spot and soon pass on; thus these great avian waves are constantly passing over the barrens through the winter, and generally more than half the birds of which they are composed are Pine Warblers. Of all the thousands of this species which spend the colder season in Florida but few remain to breed, and by the middle of March the greater portion leave for the North. They arrive in New England in early April, and by the first of May begin to construct their nests, which are commonly placed in a fork of the topmost limb of a pine tree. They keep close watch of their homes and when any one chances to approach them will chirp loudly; but although the collector can thus ascertain when he is in the vicinity of a nest, he will find that the birds have been careful to place it in such a position that it cannot be seen from below; therefore it is exceedingly difficult to discover. I have frequently searched a long time for a nest and then been obliged to abandon the attempt to find it, although I was confident, by the actions of the birds, that it was near. Since the above was written, I have found several nests. They have all been placed at the extremity of a limb as described by Mr. Brewster, and most of these nests were built in May, but I found a nest the last week in July on my place built in a low pitch pine not fifteen feet from the ground, also near the extremity of a branch. This contained three eggs which were, however, eaten by some Crow Blackbirds. Another nest built near this one, was placed in a similar situation on a higher tree, but this was abandoned by the birds after being completed.

During the spring season the males have a louder song than when in the South; it consists of several short notes which commence low but increase in volume and end abruptly, reminding one somewhat of the song of the Chipping Sparrow. After leaving the nests the young follow their parents, and are thus found in small companies until after the moult, which takes place in August; then several families will come together and the flocks thus formed will increase in size until the first of October, when the Pine Warblers depart for the South, arriving in Florida about the middle of November.

DENDRICEA STRIATA.

Black-poll'd Warbler.

Dendricea striata Baird, Birds of North America, 1858, 280.

DESCRIPTION.

SP. CH. Form, stout. Size, large. Bill, stout and somewhat conical. Wings, feet and tail, moderate, the latter square but not emarginate, with white spot confined to the two outer pair of feathers. Sternum, stoutly built and precisely similar in proportion to that of the preceding species. Tongue, rather wide at the base where it is fleshy, but becomes thin, horny and quite suddenly acuminate. The end is ciliated but not as much as in *D. pinus*, the fringes not being as long or as much extended along the sides.

COLOR. Adult male in spring. Above, slaty, with an olivaceous tinge, and streaked with black. Top of head, black. Wings, dark brown, edged with olivaceous which becomes whitish on inner secondaries. Upper wing coverts, black, edged all around with ashy, tipped with white, forming two bars. Tail dark brown, with the two pairs of outer feathers spotted terminally on the inner webs with white. The spot on the outer feather occupies about one-third of its length, that on the central about one-half as much as this; neither touch the vein and both are encroached upon basally by a triangle of the dark area. (See Fig. 88.)

All the tail feathers are also more or less edged with white on the inner, and with slaty on the outer webs. Sides of head and lower portions of body, including under tail coverts and under wing coverts, white, with black maxillary stripes. Sides and flanks, well streaked with black.



Fig. 88. Head of Adult male, Black-pollled Warbler and outer tail feather in spring.

Adult female in spring, like the male in general coloration. The top of the head is olivaceous, streaked with black. There is a greater suffusion of olivaceous over the back, fewer spots beneath, where the white is tinged with buff. Adult male in autumn, somewhat similar to the female in spring, but the top of the head has fewer streaks, there are also not as many black stripes beneath. The autumnal female resembles the male, but has the top of the head unspotted. The young of both sexes in autumn are olivaceous green above, streaked on the back and sometimes on the head with black. The sides of the head and entire under parts are greenish, varying with individuals in intensity, and more or less streaked with dusky on the sides. Nestling plumage, similar, but paler and with each feather having a central spot of black or dusky. In all stages, the irides are brown and the bill dark brown, lighter at the base of the lower mandible. The feet of the adult birds are pale brown, but in younger stages of plumage they are darker.

OBSERVATIONS.

In the adult stages this is a well marked species and will not be confounded with any other, but the young in autumn closely resemble *D. castanea* in the same stages. They may be distinguished by the absence of any dark streaks beneath in *castanea* and by the pure white under tail coverts of *striata*, even when there are no traces of chestnut to be seen in *castanea*. The under tail coverts of *castanea* are always tinged with buff, and the white spots on the tail are of a different form, (See Figs. 88 and 90.) A young female taken in autumn, in Newtonville, shows an inclination to assume a superciliary stripe, (See Fig. 89), which probably indicates a reversion toward some ancestral type. Distributed during the breeding season throughout Eastern North America from Northern New England to the Arctic Ocean, and west to the Rocky Mountains. In migrating they pass through the eastern section of the United States, Bahamas, and some other of the West Indies, wintering in South America. Although abundant in Florida during the spring migration, I have never seen it there in autumn or winter.

DIMENSIONS.

Average measurements of twenty-six specimens. Length, 5.41; stretch, 8.85; wing, 2.60; tail, 2.02; bill, .51; tarsus, .66. Longest specimen, 5.75; greatest extent of wings, 9.70; longest wing, 3.10; tail, 2.10; bill, .75; tarsus, .75. Shortest specimen, 5.35; smallest extent of wings, 8.32; shortest wing, 2.45; tail, 1.80; bill, .45; tarsus, .65.

DESCRIPTION OF NESTS AND EGGS.

NESTS, placed in trees; composed of small twigs and grasses, mixed with black, hair-like lichens. It is very bulky. Dimensions; external diameter, 4 inches, internal, 2; external depth, 2.50 inches, internal, 1.50. EGGS, four in number, oval in form, pure white in color spotted and dotted with lilac and amber, the spots becoming more confluent on the larger end. Dimensions from .67 by .52 to .75 by .58.

HABITS.

In April when the great magnolia is in full bloom the Black-pollled Warblers may be found in Florida. Later, in May, when all the apple orchards of New England are snowy with blossoms, the same birds appear and linger a time, then depart for the North, arriving in the British Provinces and Labrador when nature has assumed her most festive garb. Thus, in all their long passage from the South to their summer home, they revel

on their happy way, amid bursting buds and the spicy fragrance of a continuous spring.

The Black-poll'd Warblers breed quite commonly in the neighborhood of Eastport Maine, and I found them abundant on the Magdalin Islands during the breeding season. The nest is usually placed on the limb of a fir, close to the trunk. The eggs are laid during the latter part of June, and by the first of August the young are fully fledged; a little later the old birds moult; then, as the season becomes cooler, commence the southern flight.



Fig. 89. Head of young female Black-poll'd Warbler in autumn, showing inclination to assume a superciliary stripe.

It is difficult to believe that the little green birds, which come trooping in by thousands, are the same which passed us in the bright springtime; then the low lisping songs of the males were constantly heard; now they flit silently and hurriedly through the changing foliage which too shortly precedes the season of desolation.

While sailing down the coast of Andros Island, Bahamas, a little south of Deep Creek, April, 27 1884, we began to observe flocks of warblers, consisting of from two or three individuals to a hundred or more. Some flocks flew very near the water, not over six feet above it, and none over twenty feet from the surface. The birds were coming from a south-easterly direction and the flocks continued to increase in number as the day advanced, the first having been seen about eight o'clock. The night before we had showers, accompanied by thunder and lightning and on the morning of which I speak, the wind was light but from the north. Towards noon it increased in violence and blew a stiff breeze by two o'clock in the afternoon. A little later in the day we drew around the south shore of Andros and landed on a small Key. We found this little spot of land, which consisted of about two acres, fairly covered with warblers which were constantly arriving and departing. Of all the thousands which we saw, by far the greater number were Black-polls. On the next day the flight continued, the birds being as abundant as on the previous day, and the quantities of Black-polls seen were so immense that their numbers were far past estimation. The wind this day was also northerly, but was not blowing quite as fresh as on the previous afternoon. Thus closed the twenty-sixth of April. On the twenty-seventh and eighth the flight continued, but with somewhat abated numbers. On the twenty-ninth but few were seen, and on the thirtieth none whatever passed; the flight was over.

Both sexes were seen from the first, but throughout the males predominated. During the first two days when the birds had to fly against quite a stiff wind, many must have perished from sheer exhaustion. We picked up two dead floating on the water, and found two or three lying dead on barren patches of the Key, where they evidently died upon landing. The stomachs of these were empty and it is probable that the birds could not procure much, if any food upon these nearly desolate keys. Nor could they do much better on the main island, for the season had been particularly dry, and insects were not

plentiful, while it is extremely doubtful if they could have procured any fresh water from natural sources until they came to Middle Bright, where there was a small open spring. These facts accounted for the evident haste of the birds to reach some more fertile section.

While migrating the flight of these little warblers was comparatively slow, but steady, that is when the members of a certain flock had chosen to fly at a certain elevation above the water, they kept this course for a long distance, the tendency however, being to fall towards the surface, but when well down they would rise simultaneously a few feet and thus return to their original level.

As an observer of quite a wide experience, I have of course seen a great many Black-pollled Warblers but I think, without the slightest exaggeration, that I can affirm that I saw more birds of this species in the few days when they were passing Leaf Key than I ever saw before during all of my previous observations. This was on but one little spot out of a wide belt which must have been covered by their migrations. How vast then must have been the numbers which during the three or four days swept across the Caribbean Sea from South America! This is a rather late migrant in spring in Massachusetts, but those which passed Leaf Key first would have but little over two weeks to travel across the thousand miles of land which lay between them and any portion of New England.

DENDROICA CASTANEA.

Bay-breasted Warbler.

Plate XXXI—Adult male in Spring.

DESCRIPTION.

SP. CH. Form and size, about that of the Black-pollled Warbler. Spots on tail confined to two feathers. COLOR. Adult male. Above, greenish buff, shaded with black. Top of head dark chestnut, with forehead, and broad line through eye, black. Patch behind this, on neck, buff. Wings, brown, edged with greenish. Upper coverts, black, edged with greenish, and both rows are broadly tipped with buffy white. Tail, also brown, edged with ashy; the outer terminal white spot is a little over .60 long and the inner is about half its size, both quite touch the vein, and both terminate in a slightly diagonal line basally, while there is a considerable colored area at tip, (See Fig. 90.) Beneath, including under wing and tail coverts, buff, with throat, upper part, sides and flanks, chestnut, a little paler than that on top of head. Iris, bill and feet brown. Adult female, quite similar to that of the Black-pollled, but always in the spring shows more traces of the chestnut below, as does always the autumnal adult male. Young birds are somewhat difficult to distinguish from those of *D. striata*, but they always have the buff under tail coverts.

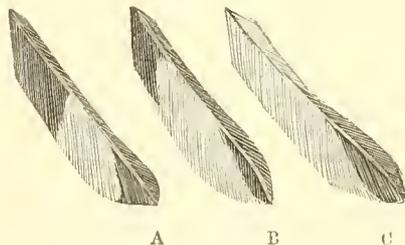


Fig. 90. A, outer tail feather of Bay-breasted Warbler. B, same of Yellow-throated. C, same of Black-burnian.

OBSERVATIONS.

Known from the closely allied Black-pollled, as given above, and by the peculiar form of the white spot on outer tail, (See Figs. 88 and 90.) Occurs in summer from Northern New England, northward; winters south of our limits.

DIMENSIONS.

Length, from 5.20 to 5.90; stretch, 8.25 to 9.25; wing, 5.75 to 6.00; tail, 1.80 to 2.18; bill, .40 to .45; tarsus, .71 to .90.

DESCRIPTION OF NESTS AND EGGS.

NESTS, placed on horizontal branches of evergreens, composed of fine dead twigs from the larch, and long moss, lined with fibrous roots, moss and hair. Dimensions, diameter, externally, 6.00; internally, 3.00. Depth, externally, 2.50; internally, 1.75. EGGS, four to six in number, oval in form, pale bluish green in color, spotted with brown over the entire surface, and the spots often become confluent and form a ring on the larger end. Dimensions, .50 by .65 to .53 by .70.

HABITS.

The Bay-breasted Warbler is not a common bird at any season in Eastern Massachusetts, but I found it abundant in the thick evergreen forests of Northern New Hampshire in the vicinity of Lake Umbagog in June, 1871. Here they live high up in the tree tops among other warblers, but their singular song, the first part of which resembles the low lispings notes of the Black-poll, but which terminates with a warble similar to that uttered by the Redstart, betrays them. It was here at that time that I took the first nest and eggs known to science. It was placed on the horizontal branch of a hemlock twenty feet from the ground. On June 8th it contained three fresh eggs. Other nests taken by Messrs. Brewster and Dean corresponded essentially in method of building, situation etc. with the first.

I found the Bay-breasted common and migrating with other warblers at Watsonstown, Pennsylvania September 3d, 1875, but did not find many during the following spring at Williamsport. I got a few, however, about the middle of May when the flight of the northward going warblers was at its height.

DENDROICA DOMINICA.

Yellow-throated Warbler.

Dendroica dominica Baird, Review of American Birds, 1865, 205.

Plate VIII. Adult Male and Female.

DESCRIPTION.

SP. CH. Form, quite stout. Size, rather large. Bill, long, rather slender, with the upper mandible slightly curved. Wings, somewhat long and pointed. Tail, very slightly rounded, terminal spots extending over or at least three feathers. Feet, small. Sternum, rather stoutly built. Keel, low, not exceeding in height one-half the width of the sternum. Tongue, long, thin, horny and acuminate, with the end cleft and divided into rather coarse cilia which extend along the sides for one-third of the terminal length, but they are shorter on these parts than on the tip.

COLOR. Adult. Above, uniform slaty blue with the top of the head black on the front part. The feathers of the back part of the crown are also black, but this color is more or less obscured with slaty. Dark spots occasionally appear on the back. Wings, dark brown, with the outer webs edged with slaty, and the inner with white; both rows of wing coverts are tipped with white, forming bars. Tail, dark brown, edged on the outer webs with slaty, all the feathers excepting the two middle are spotted terminally on the

inner webs with white: these spots are very small on the inner feathers but becoming gradually larger towards the outer, and occupying nearly one-half of the length of first feathers, (See Fig. 90.) Line from the eye to the base of the bill, chin, throat, and upper part of the breast, bright yellow: remainder of under parts, including under wing and tail coverts, superciliary stripe, spot on the under eyelid, patch on the side of neck, white. Young, similar, but glossed with greenish above. The yellow of the throat is not as bright and the yellow and black markings are not as extended or as conspicuous. Sexes alike. Irides, feet and bill, brown, with the base of the under mandible lighter in young birds.

OBSERVATIONS.

In some specimens the terminal white spots on the tail are confined to the three outer feathers. This species presents some peculiarities which are not shared by any other members of the genus described in these pages. The bill is extremely long, the sexes are very similar in plumage, and in habits it resembles the Black and White Creeper. The sternum, however, agrees in form with those of the other *Dendroica*, and in many characters it is closely allied with the other members of the genus. It need not be confounded with any Warbler excepting *D. graciae* and *adelaïdae*, from which it may be known, by the white superciliary line. Distributed during the breeding season through the southern portion of the eastern section of the United States, North to Virginia, also, perhaps, the West Indies. A resident in Florida, Bahamas and the West Indies, but I never found it on the Keys. Bahama birds differ in being more yellowish or creamy beneath and in having the throat slightly orange. The yellow line in front of eyes is faint but in two males was confined to a mere dot, showing an approach to the sub species next given.

DIMENSIONS.

Average measurements of eight specimens from Florida. Length, 5.26; stretch, 8.35; wing, 2.70; tail, 2.10; bill, .53; tarsus, .62. Longest specimen, 5.75; greatest extent of wings, 8.75; longest wing, 2.80; tail, 2.25; bill, .57; tarsus, .70. Shortest specimen, 4.70; smallest extent of wings, 8.15; shortest wing, 2.57; tail, 2.00; bill, .50; tarsus, .60.

DESCRIPTION OF NESTS AND EGGS.

The following descriptions were made for me by Mr. Ridgeway, from specimens in the Smithsonian Institute. They were taken by Mr. N. Giles, at Wilmington, North Carolina. NESTS, entirely hidden in a thick pendant tuft of Spanish moss (*Tillandsia*); composed of the same material and formed like those of the other *Dendroica*. It is a very pretty edifice. EGGS, oval in form, dull white in color, with a ring of lilac, purplish sepia and black spots around the larger ends. Dimensions, .70 by .52.

HABITS.

The Yellow-throated Warblers are found throughout the entire extent of Florida, frequenting alike, piny woods and hammocks, associating with Titmice, Nuthatches, and other small birds, wherever they chance to find them. I have shot this species upon the banks of the St. John's when it was searching for insects on the low trees in the numerous swamps which abound there; then again I have seen them on the topmost boughs of the high trees in the trackless piny woods. They are very slow of movement for Warblers and have many of the habits of the Black and White Creeper, clinging to the limbs and running up and down the tree trunks, after the manner of that species. I have even seen a specimen climbing about the roof of a house. They are very unsuspecting and may be found almost any day in autumn and early winter, on the live and water oaks which grow in the streets of Jacksonville.

The song of this bird is simple, and resembles the trill of the Pine Warblers, or perhaps, the continuous lispng chirp of the Black and White Creeper sounds more nearly like it. I think this species must breed in Florida, as I have specimens taken in the State in June. I have never found the nest, but had the pleasure of seeing a specimen in the Smithsonian Institute, that was taken at Williamton, North Carolina. It was entirely concealed in a streamer of Spanish moss, and consequently must have been found in a hammock, as this plant rarely grows in the piny woods. As the *Tillandsia* nearly covers the live oak, magnolia and other trees, it must be exceedingly difficult to distinguish the bunch which contains the nest. Some of these birds are constant residents of Florida, but the majority leave in May with other Warblers and return in early November. On the Bahamas the Yellow-throated Warblers live mostly in the piny woods, associating with the Pine Creeping Warblers, but I have seen them on the plantations. I saw one March 4th 1884, on the steps of the Government House in Nassau. One came every day to feed in a large mango tree which stood by the side of my window in Kingston, Jamaica, in March 1888.

Dendroica dominica aibilora.

White-browed Warbler.

DESCRIPTION.

SUB SP. CH. Similar in size and general coloration to typical *D. dominica*, but with the yellow line in front of eye wholly white, and there is a line of white at base of lower mandible, cutting off the yellow. This is the common form in the Mississippi valley as far north as Ohio, Indiana and Illinois, west to Kansas and Texas, east casually to South Carolina. NESTS and EGGS, similar to those of the typical form.

DENDROICA BLACKBURNIAE.

Blackburnian Warbler.

DESCRIPTION.

SP. CH. Size, rather small. Form robust. Terminal white spots extending over three tail feathers. COLOR. Adult male. Black above, shaded with yellowish white on back, with a broad streak of orange on crown. Wings, brown, edged with greenish, and both rows of coverts are broadly edged with white, forming a patch on wing. Tail, brown, edged with greenish, the basal portion of outer webs of three pairs of outer feathers is white and the terminal white spot of inner web extends along the vein for two-thirds its length. The second feather has a very little less, but the spot on the third has a V shaped mark, which does not touch the vein, and in none of the feathers does the white follow the vein to its termination. Spot above and below eye, superciliary line, throat and upper part, bright orange chrome. Spot in front of eye, and patch back of it, black, and behind this on neck is a patch of yellow. Remainder of under parts, not described, yellow, palest behind, streaked on sides with black. Adult female and young most obscured above with greenish, the white on wing is reduced to two bars and the orange below is paler, but the general markings may be seen, and the white of the tail is as in the male.

OBSERVATIONS.

There is some variation in individuals regarding the amount of white on the wings and tail, the white patch on the latter being narrower in some than in others, and in the former the white probably sometimes

extends over four tail feathers, in which case the third feather will have nearly as much white as the second. This is true regarding one male taken in Boston, May 5, 1884, but the extended white is found on the third feather on the right side only, that on the other having the usual striped mark, and there is no white on the fourth feather on either side. Readily known in the adult male by the beautiful orange breast and black back, and in all other stages by the resemblance to this stage and the peculiar V shaped mark on the third tail feather. Breeds throughout Northern New England States and along the mountains, at least, as far south as Pennsylvania; winters south of our limits.

DIMENSIONS.

Length, 4.75 to 5.30; stretch, 7.60 to 8.55; wing, 2.60 to 2.75; tail, 1.70 to 1.90; bill, .37 to .45; tarsus, .60 to .80.

DESCRIPTION OF NESTS AND EGGS.

NESTS, placed in trees, composed of strips of bark, moss, etc., lined with feathers. EGGS, three or four in number, pale greenish white in color, spotted and blotched, usually around the larger end, with brown and black of varying shades. Dimensions, .40 by .63 to .45 by .65.

HABITS.

Although the Blackburnian Warblers are rather rare in Eastern Massachusetts during migrations, some are to be found every season. They are, however, very common in central Pennsylvania both spring and fall. I found them abundant at Williamsport as early as May 9, 1876, and their short, pleasing warble could be heard on all sides. A few apparently remain to breed, for I took a female on May 27 which contained eggs nearly ready to deposit, and I also occasionally heard the songs of the males along the mountain sides even later than this. These are most emphatically arboreal warblers, for they are apt to frequent the tops of the highest trees of the woodlands, through which they pass, or in which they live in summer. Thus I found them among the tops of the high spruces and hemlocks at Upton in the spring of 1874, and they place their nests at a considerable elevation.

During the autumnal migration the Blackburnians pass through middle Pennsylvania, and I found them common at Watsonstown as early as September 6, 1870. Thus, they would seem to avoid the eastern coast region; for they pass through Mexico and Central America to reach their winter quarters in South America. Dr. Bryant records seeing a pair at Nassau, Bahamas, April 30, 1859 (Proceedings Boston Society of Natural History, Vol. VII, 1859, page 110.) but I have never seen it there.

DENDROICA VIRENS.

Black-throated Green Warbler.

DESCRIPTION.

Sp. Ch. Size, small. Form, slender. Tail, a little rounded, and the terminal white spots extend over four pairs of feathers. COLOR. Adult male. Above, bright greenish or golden yellow. Wings, brown, edged with whitish, and the two rows of coverts are tipped with white, forming bars. Tail, brown, white edged, with outer web of basal two-thirds of two outer feathers white, and two-thirds of inner web of outer also white. The basal line of demarkation slopes back at an acute angle from the vein to the inner

margin and at this point a white spot begins on the next feather, which in turn slopes to the beginning of a spot on the third feather, but the spot on the fourth begins lower than the marginal termination of the spot on the third, and is V shaped. This spot does not touch the vein but all of the others do, yet some of them follow it quite to the termination. Sides of head, yellow, with line through eye, greenish. Beneath, white, with patch on the throat and upper breast, and streaks on the sides, black. Iris, bill and feet, brown. Adult female, generally similar, but with the black markings less distinct, and the white on the tail is less extended, and the young male is similar. Nestlings, have two indistinct wing bars. Sides of head, dark slate. Above, dark slaty brown, each feather of back being edged with dark greenish. Beneath, soiled white, each feather on sides and breast with a terminal spot of black. Otherwise as in the young.

OBSERVATIONS.

Known from all of our Warblers by the continuous golden color above, combined with the black throat. Occurs during summer from middle United States, northward into Canada. Winters in Mexico and Central America; not common in the West Indies.

DIMENSIONS.

Length, from 4.70 to 5.31; stretch, 7.35 to 8.00; wing, 2.35 to 2.61; tail, 1.85 to 2.03; bill, .40 to .45; tarsus, .60 to .70.

DESCRIPTION OF NESTS AND EGGS.

NESTS, placed in trees or bushes: composed of twigs, grasses and fibrous stems of plants, lined with downy substances. EGGS, four in number, oval in form, white in color, blotched over the entire surface with brown and purplish of varying shades. Dimensions, .50 by .70 to .52 by .75.

HABITS.

Wherever the stately white pines are found growing thickly enough together to form a grove of much extent, the singularly pleasing song of the Black-throated Green Warbler may be heard, at nearly any time during daylight, from the middle of May until the last of July. Excepting when actually migrating these warblers usually keep well up in the tops of high pines, and were it not for the pleasant song, which is given with an intonation that is almost in perfect accord with the whispering of the summer breezes through the pines, we should often be unaware of their presence. I have seen many interpretations of this melody, but to my ears the bird says quite distinctly "Good Saint Theresa" and reiterates this invocation at rather wide intervals, with a rising inflection, and with a decided accent upon the last syllable of the last word.

The Black-throated Greens usually build high up on a limb of their favorite pines, but I once found a nest built in a barberry bush that stood on a sloping hillside near some white pines. On May 22nd, 1895, as I was endeavoring to point out a male of this species, which was singing in some high pines in Waltham, to a class of pupils, a female suddenly appeared near and began to gather the webs from the nest of a tent caterpillar, within a few yards of where we all stood. She pursued her labors calmly in spite of the



Fig. 91. Head and outer tail feather of Adult male Black-throated Green Warbler, spring plumage.

numerous field glasses which were leveled upon her, and was soon joined by the male, shortly after which they both disappeared in the neighboring foliage, but not until both had displayed their beautiful plumage so that all could see it, while the male sang several times near us.

I think that the Black-throated Green Warblers are among the first of the family to depart for the South, leaving Massachusetts during August. I looked for it without success August 29th, 1875, and later at Watsonstown, Pennsylvania, among the immense numbers of migrating warblers, where I took almost all of our eastern species, even including the Yellow Warbler, of which I found a few on the 29th and 30th of the month.

DENDROICA TOWNSENDI.

Townsend's Warbler.

DESCRIPTION.

SP. CH. Size, about that of the Black-throated Green, and the general coloration is quite similar. The top of the head in the male is black and some of the back feathers show black centers, and the patch on the side of the head, which in *D. virens* is greenish, in *D. townsendi* is black. Beneath, the black of the throat is not quite as much extended and is followed by a wide yellow band (not a tinting as in *D. virens*) but the white does not extend over more than three feathers.



Fig. 92. Head of Adult Male, Townsend's Warbler, and outer tail feather in spring.

OBSERVATIONS.

Known as above described. Occurs during the breeding season throughout Western North America from Sitka, southward, east to Western Colorado. Accidental in Pennsylvania. A single specimen recorded by Dr. Wm. Turnbull, in *Birds of East Pennsylvania*, p. 42, as follows: "A full plumaged male was shot in Chester County, near the Brandywine, May 12, 1868, and now enriches my collection."

DESCRIPTION OF NESTS AND EGGS.

NESTS, placed in trees, composed of hemp and fibers of plants, fine twigs, and lichens, lined with soft bark and hair. EGGS, four in number, creamy white, spotted around the larger end with brown, amber and lilac. Dimensions, .50 by .60 to .51 by .62.

DENDROICA KIRTLANDI.

Kirtland's Warbler.

Plate XVII. Young Female from Ann Arbor, Mich.

Plate XXI. Adult Male from Nassau, Bahamas, Both in Spring Plumage.

DESCRIPTION.

SP. CH. Size large, rather exceeding the maximum of other members of the genus. The wings are quite long with either the third or second and third quills usually the longest, while the fifth is generally shorter than the first. The tail is slightly rounded, the outer feather being .20 shorter than the central. Spots on tail extending over three feathers.

The keel slightly exceeds in height one-half the width of the sternum. The marginal indentations are a little deeper than the keel in height. The coracoids are a little shorter than the length of the keel. Manubrium, well developed, the forks being a little shorter than the body of the bone. Costal process, tapering gradually to the tip. The entire sternum closely resembles that of the Yellow-rumped Warbler. The tongue is thin, flat and horny, bifid at tip, which is provided with a few coarse cilia. Trachea, straight to the inferior larynx, which has six pairs of well-developed muscles. Heart, not large, .40 by .25, pointed. Right lobe of liver greatly exceeding the left in size. Oesophagus, without special dilatation, straight, and 1.60 long. Proventriculus, provided with numerous small, oval glands, arranged in a zomular band, .35 wide. Stomach, rather round, .45 by .45 and quite thick (.25), not very muscular, walls, .10, lined with a rather smooth, and not very hard membrane. The fold of the duodenum is .50 long, inclosing a singularly formed pancreas which lies deep in the fold. The spleen is cylindrical, lying partly on the proventriculus and partly on the stomach. Intestines, 4.50 long. Ceca, very small, about .10 long.

COLOR. Adult male in spring. Above, slaty blue, brightest on the crown, tinged with ashy on nape and back. Concealed centers of the feathers on top of head, dusky. Middle of back and scapularies, broadly streaked with black, and the feathers of these parts are margined with rufous. The upper tail coverts show small streaks of black. Wings, including upper coverts, dark brown, becoming lighter on the inner webs of the feathers, which are all edged with ashy white, purest on the tertiaries, but elsewhere tinged with rufous. Greater coverts tipped with white, forming a bar. Tail, dark brown, with the outer web of outer feathers narrowly margined with white, and with all the outer webs of the other feathers edged with ashy. There is a spot of white on the inner web of outer feather, about .80 long, which extends along the vein for .40, then runs acutely to the tip of the feather. The upper margin of the spot runs obliquely from the vein to near the margin, then turns abruptly upward, along the edge for a short distance. A spot on the second feather is much the same form, but does not quite touch the vein anywhere, and is only about .60 long. There is a mere dot on the third feather at the tip. Beneath, pure yellow, but rather pale, lighter than the same color on the Yellow-throated Warbler, with the sides distinctly streaked with a double row of black spots, the upper of which begins at the lower corner of the black patch on ear coverts, the breast being unspotted. Under wing and tail coverts, white, the latter very slightly tinged with yellowish. Narrow frontal line, loreal region, narrow line over eye, extending behind it, then broadening out on the ear coverts, black, with ear coverts slightly tipped and margined with ashy. Elongated patch on upper and lower eyelid, white. Iris, brown. Bill, brown, lighter at base of lower mandible. Feet, dark brown, soles, yellow.

Adult female in spring, similar, but the blue of the head shows the dark lines more distinctly, and the ashy of the nape is more tinged with rufous as are the upper parts, excepting the rump and upper tail coverts, which are like those of the male. The white band on wing is replaced by one of ashy. The white on the tail is not as extended, and there is no indication of any spot on the third feather. Beneath, paler yellow than in the male; the sides are tinged with rufous; the dark markings are not as distinct, and the black of the sides of the head is not quite as well developed. The bill is very pale, the light portions of the under mandible being more extended. Adult male in autumn, similar to the spring plumage in general markings, but the entire upper parts are overwashed with rufous, and this tinting extends down on the ear coverts. The colors beneath are paler, especially on the chin and upper breast, while the under tail coverts are more slightly tinged with yellow. Adult female in autumn, differs from the spring plumage in being even more strongly tinged with rufous above, the blue of the head being usually obscured with it, while the white wing bar is wanting. The under parts are quite pale, but the under tail coverts are very yellow, and show black shaft streaks on the tips. Young males of the second year, above, have much of the colors of the adult female, and is similar beneath, being pale yellow, but the upper breast is crossed by a wide band of indistinct spots of dusky, and the streakings on the sides are narrower. The white on the second tail feather is replaced by a small spot. Females of this age are even duller, with the spot on the second tail feather reduced to a round dot.

Young males of the year, in winter, have the black of the back wholly obscured with ashy rufous, especially on the upper tail coverts, where the black shaft lines are quite prominent. The black lines on the back

are indistinct, but the top of the head shows dusky markings. The sides of the head are wholly rufous, with no signs whatever of black markings, and the white of the eyelids is plainly distinguishable. Beneath, the yellow is not very pale, but is obscured on the sides with ashy rufous, but the black markings across breast and along sides are quite distinct. There is a small spot only on the outer tail feather which is nearly terminal. The wing bars have not appeared, and the feathers are broadly margined with rufous ash.

OBSERVATIONS.

Out of twenty-four specimens now before me, six have the second and third quills the longest, nine have the third, three have the second, two the third and fourth, and four the fifth. In color there is but little variation in adult specimens of the same age and sex. Some have the dark markings on the head not as well concealed as others, and the streakings on the back are broader, and in some cases extend down quite to the rump, and it is only in the most adult specimens that there is any indication of white on the third tail feather, in fact, only one in the series has this. The adult male plumage which I have described and figured, does not appear to have been given before. The sexes differ some, as shown, but not as much as I expected. There is considerable variation beneath in what I consider as birds of the first and second years, this is usually shown in the greater or less amount of spottings on the breast. In a young male of the first year, this extends over the entire breast and throat, quite to the chin; the space thus mottled being 1.50 broad, from this, we find specimens in all stages of markings, to a few dots on the upper breast.

The first specimen of this fine Warbler, which was ever taken, was captured at sea, between the Island of Abaco and Cuba in 1845, but it was not until the veteran ornithologist, the late Jared P. Kirtland, killed a specimen at Cleveland, Ohio, in May, 1851 that the species was known to science. It was first described by Prof. S. F. Baird in *Annals of the New York Lyceum*, Vol. V, June, 1852. The Cleveland specimen being used as the type. Previous to my visit to the Bahamas in 1885, there were but nine specimens in collections, seven of these having been obtained in the United States, one at sea, as stated, and one on Andros, Bahamas, by Mr. Chas. B. Cory.

DIMENSIONS.

Length, 5.50; wing, 5.85; tail, 2.90; bill, .47; tarsus, .73.

HABITS.

I shot the first specimen of Kirtland's Warbler that I ever saw living on June 23d, 1884, two days after my arrival in Nassau. Walking along a road, which, excepting a narrow foot path, was grown up to bushes, I observed a warbler feeding on the ground. It was elevating and lowering its tail after the manner of a Water Thrush, in fact, had it not been for its small size I might have passed it as that species. Upon our approach it flew up into the scrub, and as it was disappearing in the thick foliage I fired at it with my collecting gun. It was too far away for the shot to kill it instantly, thus it flew into the thicket for some distance, but my dog found it. This was a fine male, yet it never uttered a sound of any kind. Although I saw another on January 30th, I did not secure another until February 1st. On this day I got two, and the remaining twenty-one specimens were taken all in the vicinity of Nassau, between that date and April 4th of that year.

Kirtland's Warblers are shy birds of solitary habits, for never in any case did I find two together. They inhabit the low scrub, preferring that which is only three or four feet high, but retire at night to roost in the higher, more dense shrubbery near the spots

which they frequent during the day. Those taken were, with one or two exceptions, found in an exceedingly limited area, within a mile or two of the city, and always in old fields grown up to low shrubbery. I have never heard Kirtland's Warbler sing, the only note that they uttered was a harsh chirp, with which they greeted me when alarmed at my approach. When one was not secured at first sight, it generally retreated into the bushes and silently disappeared. The thick and tangled character of the scrub rendered any quiet or swift pursuit impossible, thus a retreating bird was never seen again that day, and a number seen escaped in this way.

As with many shy birds, however, these warblers presented strange exceptions to the usual rule: twice at least as I was making my way through the thickets in search of the Greater Yellow-throat, I was confronted by a Kirtland Warbler. In both instances the birds appeared from out of the thicket within a yard of my path, remained a few seconds then darted off into the scrub. One of these I lost, the second one I shot it as it was disappearing in the foliage. It flew on and it not been for the assistance of my intelligent and remarkably sagacious dog Spot, I should never have seen it again, but she found it for me at least twenty yards from where I had shot it lying among the dense shrubbery.

Kirtland's Warbler is evidently a winter visitor on the Bahamas, for although I saw one on Southern Bright, Andros, April 18th, I did not find a single specimen on New Providence upon my return later in May, and I searched for it with great care throughout its haunts until June 10th. I searched for it in vain in November and December, 1887, both about Nassau and on Andros, but I secured two, a male and a female, March 23d 1893, in the old locality near Nassau, but did not find them elsewhere either that month or in April.

These Warblers moult late in February, and the new plumage is assumed by March 10th at which time there appears to be a migration, that was at its height the last week in the month. Specimens taken as late as April 4th did not exhibit any indication of breeding, nor even at this late date was there the slightest attempt at a song. Where this species habitually spends the summer is still a mystery. It certainly leaves the Bahamas, and that in advance of the great migration of warblers which sweeps over the islands quite late in April, about which time, warblers like the Yellow Redpoll, Redstart, Black-throated Blue that pass the winter on the keys, leave. I know that most of the specimens which have been taken in the United States, occurred there in May. The young female which I have figured on plate XVII was killed by Mr. A. V. Covert at Ann Arbor Mich. in May had the eggs in ovaries so far advanced that it was evident that she would have laid them in about two weeks, but in spite of this fact I cannot help regarding the few specimens of Kirtland's Warblers which have appeared in the United States as mere stragglers, possibly swept away in the great avian waves during their migrations, far from their regular breeding ground, but where their breeding grounds are, it is at present difficult to say. In passing I will say that this fine warbler is not the only bird which winters on the Bahamas, the breeding ground of which is unknown. The Bahama King Bird, *Pitangus bahamensis*, remains through the winter there but disappears

in spring, whither no one knows, but it is certainly not found after April on any of the islands which I have visited. It is possible that we have in these two species of birds examples which migrate north in winter and which return south, to perhaps the mountains of Cuba to breed. I have no proof whatever to offer to support this suggestion, but the idea occurred to me a number of years ago and I merely mention it in lack of anything else.

DENDROICA CORONATA.

Yellow-rumped Warbler.

Dendroica coronata Gray, Genera, 2d ed., Suppl., 1842, 8.

OBSERVATIONS.

St. Ch. Form, not slender. Size, moderate. Bill, shorter and more slender than in *D. striata*, and distinctly notched. Feet, rather small. Wings and tail, moderate, the latter square and slightly emarginate. Sternum, precisely similar in form to that of *D. striata* and *pina*. Tongue, rather short and fleshy, somewhat acuminate, slightly bifid, the end fringed with short cilia which extend a short distance along the sides.

Color. Adult male in spring. Above, slaty blue, streaked with black. Spot on top of the head, on each side of the body, and the rump, bright yellow. Wings, dark brown, edged with slaty and whitish. Upper wing coverts, black, margined with slaty, and tipped with white, forming two bars. Tail, also brown, with the three outer feathers spotted terminally on the inner webs with white. Beneath, including the throat, under tail coverts and under wing coverts, white. Sides of head, breast, and broad lines on the sides, black, with streaks of the same on the flanks; the black of the breast and sides is frequently mixed with white. There is a white superciliary line over the eye.



Fig. 93. Head and outer tail feather of Yellow-rumped Warbler. Adult male in spring.

Female, in spring, differs from the male in having less black above and below. There is a brownish cast over the back. There is less yellow on the sides, rump and head, while the feathers of the latter are tipped with dusky. The ear coverts are nearly dusky

and the superciliary line is not as well defined. The adult male, in autumn, almost exactly resembles the female in spring excepting that the patches of yellow are larger; there is also more of the brownish suffusion above and rather more white beneath. The adult female, in autumn, is much browner above than the male and has also a brownish suffusion beneath. The young male resembles the autumnal female. The sides of the head, yellow of the crown, and sides are somewhat obscured with brownish. The young female is so brown above as nearly to obscure the black markings of the back and the yellow of the crown. The black beneath is nearly obsolete, and the yellow of the sides is only faintly indicated. The young, in the nestling plumage, have the tail and wings like the young in autumn, but the body above and below is streaked with black and white, over which is a rufous suffusion; this is caused by every feather having a black center with lighter sides. The sexes are similar. Occasionally a specimen in this stage will have a yellow rump; out of five which I collected on Grand Manan, one is thus marked, and strangely this individual proved a female by dissection. A nestling collected by Mr. Herriek, in the above named locality, has acquired the yellow rump through moulting before shedding any other feathers. In all stages the irides are brown; the feet and bill, black.

OBSERVATIONS.

Just before the moult, in autumn, the yellow patches grow much paler, in fact, become lemon-colored. I have taken very brightly plumaged males in spring with considerable yellow in the white of the throat, in

this respect approaching the *D. audubonia* of the West. Aside from the yellow throat, *audubonia* closely resembles *D. coronata*; it has, however, less black above, more white on the tail and wing coverts and it lacks the superciliary stripe of *coronata*, but the eyelids are white as in that species. The Yellow-rump need not be confounded with any other species except *audubonia*. Breeds from Northern New England north to the Arctic Ocean, and, according to Prof. Baird, in Jamaica. Winters from Southern New England south to Florida. Also in the Bahamas and Greater Antilles.

DIMENSIONS.

Average measurements of thirty-two specimens. Length, 5.52; stretch, 8.71; wing, 2.89; tail, 2.22; bill, .48; tarsus, .70. Longest specimen, 5.75; greatest extent of wings, 9.30; longest wing, 3.00; tail, 2.77; bill, .49; tarsus, .90. Shortest specimen, 5.00; smallest extent of wings, 8.00; shortest wing, 2.58; tail, 2.00; bill, .32; tarsus, .60.

DESCRIPTION OF NESTS AND EGGS.

NESTS, placed in evergreen trees but a short distance above the ground; composed of sticks and roots, lined with feathers and horse hairs. Dimensions: external diameter, 4 inches, internal, 2; external depth, 2 inches, internal, 1.50. EGGS, four in number, oval in form, white in color, generally with a ring of partly confluent spots and blotches of amber, brown and lilac around the largest part of the eggs. The remaining surface is more or less dotted with pale brown. Dimensions from .72 by .55 to .70 by .50.

HABITS.

The Yellow-rumped Warbler is one of the most abundant winter birds of Florida. This active little species frequents the hammocks of the mainland everywhere, and one can scarcely approach a thicket without seeing one or more of them, but by the middle of March they commence the northern migration, passing Massachusetts during the last week in April or the first in May; at this season these birds frequent the swamps. They breed abundantly in northern New England.

I well remember when I first saw a nest of this species, Mr. H. B. Bailey and myself were searching among a low growth of young firs and spruces for the eggs of the Snow Bird when he found a structure in a tree but a short distance from the ground which, from its small size, we knew must belong to some warbler. I had not examined it when a little bird made its appearance and began chirping loudly while it fluttered from limb to limb near us behaving as if solicitous for the safety of its home; I quickly shot it, for night was approaching and I had not the slightest doubt but that it was the owner of the nest. Upon picking it up I was delighted to find that it was a Tennessee Warbler, for I knew that the eggs of this bird had never been found. We were naturally jubilant over this discovery, but, upon looking into the nest and perceiving the large size of the eggs, our ardor was somewhat dampened. The fact of its being in a tree was also against it belonging to the bird which I had killed, for all members of this genus are apt to place their domiciles upon the ground. Subsequently, much to our disappointment, our doubts were confirmed by finding several similar nests which undoubtedly belonged to the Yellow-rumped Warbler. Although the eggs of this last named species are a prize, yet such was the impression left upon my mind by finding the first I had ever seen, under the circumstances narrated, that I have ever since regarded them with a kind of disgust.

These birds usually select very low trees in which to breed, but I found a nest, containing four young, on Grand Manan, that was placed in a spruce twenty feet from the

ground. This was as late as July 22d, and as the usual time for depositing their eggs is about the first or second week in June, they must rear two broods in a season: in fact, a day or two before I discovered this nest, I shot several fully fledged young. The notes of the Yellow-rump are lively and interesting; they sing from May until late in July when they moult. After this the small companies, composed of parents and their offspring, which have hitherto kept apart, collect in large flocks and prepare for the southern migrations. The last stragglers have left Maine by the middle of October but some linger about Massachusetts as late as the 20th of November, when they move onward, arriving in Florida about the 15th of December. I found them migrating southward at Middle Bright, Andros, Bahamas December 16th, 1887, and have always found them common throughout the winter on these islands even as far south as Inagua. They frequent alike the scrub and pine woods, and on Hog Island near Nassau, I found them feeding on the berry-like fruit of a species of palm. They remain on the Bahamas as late as the first week in April.

DENDROICA AUDUBONI.

Audubon's Warbler.

DESCRIPTION.

SP. CH. Size and general markings, similar to those of the Yellow-rump, but differs in having the sides of head decidedly grayish, with the superciliary patch nearly absent, but on the other hand, the patch on the upper breast is almost, or quite, unmixed with ashy; the wing bars are usually fused together, forming a white blotch, and above all, the throat is yellow, not white. Young birds vary much as in those of the Yellow-rump.

OBSERVATIONS.

Known at once from the closely allied Yellow-rump by the yellow throat and markings, as given above. Occurs from the Eastern borders of the Great Plains, west to the Pacific, north to British Columbia. Breeding throughout its northern range; wintering in Southern Arizona and California. Accidental in Massachusetts: a young male having been taken in Watertown, Nov. 15, 1876, by Mr. M. A. Frazar.

DESCRIPTION OF NESTS AND EGGS.

NESTS, placed in evergreen trees, composed of strips of fine bark, pine needles fibrous plants, etc., lined with fine roots, hairs and a few feathers. EGGS, four or five in number, oval in form, creamy white in color, spotted and dotted rather thickly, especially on the larger end, with brown of varying shades and pale lilac. Dimensions, .65 by .50 to .68 by .52.

DENDROICA TIGRINA.

Cape May Warbler.

Dendroica tigrina Baird, Birds of North America, 1858, 286.

Perissoglossa tigrina Baird, Review of American Birds, 1864, 181.

Plate XXIX. Adult Male in Spring.

DESCRIPTION.

SP. CH. Form, rather slender. Size, not large. Bill, not long, rather slender and acuminate. Wings and tail, moderate, the latter slightly emarginate. Sternum, quite stout, coracoid bones, a little shorter than

the keel, which exceeds in length one-half of the width of the sternum. Tongue, rather thick at the base, where it is fleshy, but tapers suddenly into a thin, horny end, which is also somewhat acuminate and deeply cleft; the end is provided with long coarse cilia, which do not extend along the side beyond the divided portions. The cut is about ten-hundredths of an inch in depth in adult specimens, but in young birds it is some less. The cilia are about six-hundredths of an inch long.

Color. Adult male. General color throughout, bright yellow, which becomes greenish on the back, where each feather has a broad center of black. The rump, however, is pure yellow. The top of the head is black, with a few chestnut feathers intermingled. Wings and tail, brown, edged with greenish, with a patch of yellowish white on the upper wing coverts. All the tail feathers, except the two central ones, have a spot of white on the inner webs, which extends over nearly half the terminal length on the outer, but does not quite reach the tip. There is a patch of chestnut on the sides of the head which includes the ear coverts, and extends around the eye; there is also sometimes a tinge of chestnut on the throat and breast. Spots before and behind the eye, black. Streaks and spots on the middle of the throat, across the breast, along the sides and flanks, black. Abdomen and under tail coverts, white, with the latter tinged with yellow. Closed wing beneath, nearly white, which is caused by the feathers being edged with it. Under wing coverts, also white, but tinged with yellow. Edge of wing, yellow, mixed with black.

Young male, similar to the adult but with the black of the head washed with greenish, and merging gradually into the color of the back. There is much less white on the tail and only a trace of yellow on the edge of the wing. The yellow beneath is not as pure. Adult female, differs greatly from the male being of a rather pale olivaceous green above and dirty white below, with the sides of the head, throat and breast, tinged with yellow. There is also a superciliary line of brighter yellow over the eye, and the rump and upper tail coverts are quite yellow. There is no indication of any chestnut on the sides of the head, but the black stripes beneath are plainly distinguishable. The wings and tail are as in the young male, with the exception that the white is less extended. The young female is pale slaty above, especially on the head, but becomes slightly olivaceous on the back, then yellowish on the rump and upper tail coverts. The white spot on the wing is only barely perceptible and but four tail feathers are marked with it. Beneath, grayish white without a trace of yellow, but the black stripes are tolerably well indicated. In the adult stages the feet and bill are black, but young birds have the basal portion of the under mandible, brown.

OBSERVATIONS.

This is a well marked species in the adult stages and will not be confounded with any other, but the young female bears a resemblance to the immature of *D. palmarum*, but may be distinguished from it by the pure grayish white under tail coverts, which in *D. palmarum* are always tinged with yellow. The young *D. tigrina* also resembles *D. pina*, but the latter has no indication of stripes beneath, such as are always present in *D. tigrina*.

The tongue of this species is singular, being more deeply cleft than that of any other warbler that I have ever seen. *Helminthophaga perigrina*, however, has a tongue of about the same form but not quite as deeply cleft. On account of this peculiar member, in connection with the acuminate bill, *D. tigrina* has been placed in a separate genus. But I do not consider these characters of sufficient value to raise the bird to a generic rank, for other species have similar slight peculiarities which have been rightly considered as only specific differences. I can see no difference, upon the whole, between specimens taken in the Bahamas and in New England, but on the average birds from the islands are more highly colored. The Cape May Warblers have a singular distribution, inasmuch as they breed in Jamaica and in the more northern sections of the United States without being found in the intermediate localities. Winters in Key West, the Bahamas and other of the West Indies.

DIMENSIONS.

Average measurements of twenty-five specimens. Length, 4.20; stretch, 8.11; wing, 2.19; tail, 1.85; bill, .40; tarsus, .80. Longest specimen, 5.40; greatest extent of wings, 8.50; longest wing, 2.60; tail, 2.03; bill, .50; tarsus, .95. Shortest specimen, 4.70; smallest extent of wing, 7.60; shortest wing, 2.33; tail, 1.76; bill, .42; tarsus, .70.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on trees composed of strips of bark, moss and fibrous stems of plants, lined with finer materials. Eggs, oval in form, dull white in color with blotches of lilac, spots and occasional scraggy lines of black around the larger end. Dimensions, .75 by .55.

HABITS.

Upon visiting the extensive coniferous forests of northern Maine in summer, I was much surprised to find these beautiful little warblers abundant there. They frequent the tops of the huge spruces and pines often more than one hundred feet in air. The birds were ever busy in searching for insects among the thick foliage so that it was almost impossible to see one. But the lively and varied songs of the males, which came floating downward through the perfumed air and mingled with other harmonious sounds, which are constantly heard in these sylvan retreats, during the pleasant June weather, informed us of their presence, even though we could not see the authors of the melodious strains.

The Cape May Warbler doubtless breeds in the tops of these densely foliaged trees, for we shot several females which bore signs of incubation. We also observed a female that appeared extremely uneasy whenever we approached a certain spruce tree; but, although we ascended it and searched carefully among the branches, we were unable to discover the nest. This warbler is extremely rare in Eastern Massachusetts, passing through the interior during the migrations.

They were very abundant at Key West, in November, frequenting the gardens near the houses where they were searching among the tropical trees and shrubs for insects. The birds were very unsuspecting, often clinging to branches which overhung the sidewalks within a few feet of passengers. They appeared to prefer the inhabited portion of the Key, for I rarely found them in wooded districts. The majority left the island before the first of December, but a few remained all winter. They are common, however, throughout the State in the spring and may then be found in almost any hammock in company with other warblers.

These birds are also common on all of the northern Bahamas which I have visited, occurring in the thickets about gardens as well as in the dense scrub. I found them abundant on Inagua in February, 1888. Here they were feeding upon the juices of a large tubular flower of a peculiar species of vine, in company with the Bahama Honey Creeper and the Lyre-tailed Humming Bird. I found a number of their skins in the collection of birds at the Museum of the Institute of Jamaica at Kingston, but I did not find them at all on the Caymans in 1888. I have always considered it probable that a few remain in the Bahamas to breed, but have no proof to offer of this, in fact I find that I have no actual record of their appearance in the Bahamas later than the last week in April. On the 27th of this month, 1884, I found them migrating with other warblers off the south shore of Andros.

DENDROICA MACULOSA

Black and Yellow Warbler.

Dendroica maculosa Baird, Birds of North America, 1858: 284.

Plate XXVIII—Adult male in spring

DESCRIPTION.

SP. CH. Form, quite slender. Size, not large. Bill, short, not acuminate. Tail, slightly rounded. Sternum, rather slender; coracoid bones, equal in length to the top of the keel, which is only as high as one-half the width of the sternum. Tongue, rather short, thin, horny and not very acuminate; tip, slightly cleft and ciliated on the extreme end.

COLOR. Adult male. Top of head, slaty blue. Back, patch on the side of the head, including a narrow frontal line, upper tail coverts and tail, black, the latter having a median band of white across the inner webs of all but the two central feathers. Beneath, bright yellow, with the lower part of the throat, sides and flanks streaked with black. These streaks sometimes congregate on the throat and form a large patch. Abdomen, under tail coverts, stripe over the eye, extending down on the neck, spot on the under eyelid and on the side of neck, edging on the inner webs of wing feathers, under wing coverts and upper wing coverts white, the latter having black centers. Wings, dark brown, edged externally with slaty. The rump is yellow.

Young male, similar, but the colors beneath are paler. The black of the back is obscured with greenish and the top of the head is not as pure slate. Adult female resembles the young male, but the top of the head is paler and the patches on the sides of the head are also obscured with greenish. Young female. The head is obscured with greenish. The back is olivaceous green without any appearance of black, the upper tail coverts are greenish, the spots and stripes of the head are obsolete, the streaks beneath are barely perceptible, and the white on the upper wing coverts is less extended than in the adult. Irides, brown; feet and bill black in all stages, excepting in the young female, where the latter is brown, lighter at the base of the lower mandible.

OBSERVATIONS.

This fine warbler may always be known by the white band on the tail, which is always present in all stages. Distributed throughout the northern portions of the eastern section of the United States and British Provinces. Winters in Mexico, Cuba, and rarely in Florida and the Bahamas.

DIMENSIONS.

Average measurements of sixteen specimens from New England. Length, 4.97; stretch, 7.55; wing, 2.35; tail, 1.90; bill, .35; tarsus, .80. Longest specimen, 5.10; greatest extent of wings, 7.80; longest wing, 2.75; tail, 1.93; bill, .40; tarsus, .90. Shortest specimen, 4.75; smallest extent of wings, 7.12; shortest wing, 2.20; tail, 1.70; bill, .34; tarsus, .90.

DESCRIPTION OF NESTS AND EGGS.

NESTS, placed in low evergreen trees. They are composed of small twigs, weeds and dried grass, not very compactly interwoven, lined with fibrous roots and horsehairs. The structures are very neat, but quite shallow. Dimensions; external diameter, 3 inches, internal, 2; external depth, 1.75; internal, 1.25. Eggs, four in number, oval in form, ashy white in color, spotted and blotched somewhat irregularly with brown and lilac. The largest blotches, however, are inclined to accumulate on the larger end where they sometimes form rings.

HABITS.

I never experienced more pleasure in finding a bird's nest that was new to me than when I discovered the nest domicile of this fine warbler. I was searching, in early June, among some low firs, which grew on a hillside in northern Maine, for the nests of the Olive-backed Thrush, when I started a female Black and Yellow Warbler from a little tree in which she had her home. The pretty little structure was placed in the fork of a limb about five feet from the ground, and contained four fresh eggs. The bird was extremely shy, keeping at a distance, but did not appear very solicitous, only occasionally uttering a low chirp, and the male did not make his appearance. I afterwards found several nests, one or two of which were placed near a travelled road within a few feet of passing vehicles. They were always built in low evergreen trees, but a few feet from the ground and in such a position as to be concealed. The females were all shy, generally darting from the nest and instantly hiding in the nearest thicket. I never remember of having seen the males in the immediate vicinity of the nest, but constantly heard their peculiarly short songs in the forests, and frequently saw them among the trees or flying through the woods in pursuit of their mates.

These warblers are not common in Massachusetts during the migrations, but are oftener met with in spring than in autumn. They appear with other Sylvicolidae in May and frequent the tops of trees which grow in swampy places. The few which pass in the fall are found in similar situations. I have never seen this species in Florida, but Mr. Boardman says that he has taken a single specimen at Green Cove Spring, in February. I therefore introduce it into the fauna of the state upon his authority; Dr. Bryant also records it from the Bahamas, but I have never seen it there.

DENDROICA DISCOLOR.

Prairie Warbler.

Dendroeca discolor Baird, Birds of North America, 1858, 290.

Plate XXVII Adult Male in Spring

DESCRIPTION.

SP. CH. Form, slender. Size, not large. Tail, slightly rounded. Bill, slender and rather acuminate. Sternum, of the same form as that of the preceding; in fact, the sternum of *D. maculosa*, *aestiva*, and *discolor* are so nearly alike in size and form, that if the labels were removed it would be impossible to decide to which species any particular sternum belonged. Tongue, thin, horny, rather short, not very acuminate, quite deeply cleft, ciliated at the end and along the sides for one-third the terminal length.

COLOR. Adult male in spring. Above, greenish yellow, with the middle of the back abruptly marked with more or less confluent blotches of chestnut. Wings, brown, edged on the outer webs with greenish. The upper wing coverts are tipped with yellowish white. Tail, also brown, edged on the outer webs with greenish, and with long spots of white on the inner webs of the six outer feathers. This color extends over two-thirds of the terminal length of the two outer feathers, but the inner are barely marked with it. Beneath, including sides of head, superciliary line, under wing coverts, under tail coverts, and edge of wing, bright yellow; with a line through the eye, beginning at the base of the bill, a maxillary line or spot, spots on the sides of the neck, streaks on the sides and flanks, black.

Adult male, in autumn, has the chestnut of the back obscured with greenish; the black of the under portions is also washed with yellow. Adult female, similar to the young male, but the young female is without a trace of chestnut above, where the greenish is washed with whitish. The lower portions are paler and exhibit but a few faint lines of black. Young, similar to the adult but paler and often without spottings, especially on the back.

OBSERVATIONS.

This is a well marked species in the adult plumage and will not be confounded with any other. The young females closely resemble those of *D. maculosa* but may be readily distinguished from them by the white bar on the tail of the latter as described under that head. In this young stage of plumage, *D. discolor* may be known from all other warblers by the faint streaks of black on the sides. Specimens found breeding in Florida do not differ essentially from those taken in New England, except they are, perhaps, a little smaller. Nor do Bahama specimens appear to differ from those taken on Key West.

DIMENSIONS.

Average measurements of twenty-eight specimens from New England and Florida. Length, 5.75; stretch, 7.03; wing, 2.25; tail, 1.85; bill, .45; tarsus, .70. Longest specimen, 5.20; greatest extent of wings, 7.35; longest wing, 2.40; tail, 2.10; bill, .55; tarsus, .74. Shortest specimen, 4.50; smallest extent of wings, 6.30; shortest wing, 2.00; tail, 1.70; bill, .40; tarsus, .60.

DESCRIPTION OF NESTS AND EGGS.

NESTS. The following description was kindly given me by Mr. Brewster: "The nests, of which I have found numbers, agree so nearly in detail that a description of one will suffice for all. They are usually placed in a barberry bush, but sometimes in a hazel, and are fastened into the fork of some upright twig or almost hung, as it were, between three or four disconnected shoots. The nest is a closely woven structure, formed externally, of coarse weeds and strips of bark; internally, of a soft coating of yellow down from some wild plant, and lined with extremely fine, dry grass. Horse hairs are, I think, never used." **EGGS,** from three to five in number; the usual number is four, but Mr. Brewster has frequently found five. They are white in color, spotted and blotched irregularly with reddish brown and lilac. Those which I have before me are oval in form and quite large for the size of the bird. Dimensions, .60 by .50 to .65 by .55.

HABITS.

The Prairie Warblers were very abundant in the dense thickets on the island of Key West during the autumn and early winter of 1870. They frequented the drier portions of the Key but did not sing. A little later, in February, I found them common in the mangroves along the coast of the mainland. The mangroves always grow in submerged districts and frequently occupy a vast area of country, yet in these gloomy retreats, the chosen resorts of Cormorants, Herons, and other aquatic birds, these little warblers were numerous, being often found miles from any dry land. I have heard the males singing their peculiar songs in such places in May, and they were evidently breeding there.

Although these birds are found in localities of this description in Southern Florida, those which migrate northward pass over the drier portions of the state, and I found them associating with other warblers in the thickly wooded hammocks on Indian River. In Massachusetts, however, they prefer an entirely different kind of country, for they are always found in dry fields which have partly grown up to bushes. Here they build their nests, in June, commonly placing them in a bush but a few feet from the ground. The

song of the Prairie Warbler is singular, and quite unlike that of any other member of the family, for the birds trill a species of musical scale, commencing low down and ascending rapidly. The notes are indescribable, but if once heard will not easily be forgotten. This lay has a pleasing effect when heard on sunny days in early summer and always forcibly reminds me of the pleasant open valleys amid the green hills of New England, so that when I heard these birds carolling in the gloomy swamps of Southern Florida I could scarcely persuade myself that they were the same species, for it seemed impossible that Prairie Warblers could live in such places. Those birds which go north migrate in April, arriving in Massachusetts about the middle of May, and depart early in September.

The Prairie Warbler is by far the most abundant of all the genus on the Bahamas, even as far south as Inagua, throughout the winter, remaining as late as the last week in April. They are found everywhere, in pine woods, scrublands, fields, and even among the mangroves of the little outlying keys. I found them also abundant about Kingston, Jamaica, and a few on Cayman Brae from March 23d to the 28, 1888, but these were evidently migrating and do not remain long. They begin to sing on the Bahamas about the 20th of March.

DENDROICA CAERULESCENS.

Black-throated Blue Warbler.

Dendroica caerulescens Baird, Review of North American Birds, 1864, 186.

DESCRIPTION.

SP. CU. Form, rather slender. Size, moderate. Bill, rather slender. Tail, slightly rounded. Tongue, rather broad, bifid and ciliated for one-fourth of its terminal length.

COLOR. Adult male. Above, uniform slaty blue, which is brightest on the head, where the feathers show narrow central lines of black. Wings, dark brown, edged on the outer webs with greenish. Inner webs of the secondaries margined with white, which extends to the shaft of the basal third. Primaries, also edged with white on the inner webs, but this color extends entirely across the basal third of all the feathers excepting the outer, forming a patch upon the wing that is partly concealed by the spurious wing, which is black. Tail, black, with the six outer feathers spotted, terminally on the inner webs with white. The outer webs are edged with slaty. Throat, sides of head, upper part of breast, sides, flanks, and narrow line on forehead, black. Remaining under parts, including under tail and under wing coverts pure white.



Fig. 94. Head of adult Black-throated Blue Warbler in spring. A, section of primaries of female, showing white at the base. B, outer tail feather of male.

the male, excepting that this color is not as much extended. Beneath, yellowish white, with a superciliary stripe of the same color. Ear coverts and lores, dusky. Adult, in autumn, scarcely different from the spring dress. Young male, similar to the adult but the head is washed above with olivaceous, on the black

Adult female. Above, olivaceous green. Wings and tail, brown, edged with olivaceous, which inclines to bluish on the latter. The wings and tail are also marked with white much as in

beneath with whitish and on the white with yellowish. The white of the wings is more extended, the outer web of the first quill being white for its basal half. The young female is slightly browner above and has the white patch on the wing less decided than in the adult. Nestlings. Male. Above, olive brown. Sides of head very dark, with lores black. Throat, lower eyelids and a line over eye, pale buff. Abdomen, bright sulphur yellow. White spot on base of primaries, prominent. Females, with wings and throat as in the same sex in autumn. Above, greenish brown, with superciliary line, both eyelids, throat and abdomen, light buff. Breast and sides, olive.

OBSERVATIONS.

The male of this species is well marked and may easily be known by the descriptions. The female does not resemble the male, in coloration, but may be distinguished from all other warblers by the white patch on the wings at the base of the primaries, which is always present. The young birds of this species, from which I have taken the above description, were kindly loaned me by Mr. Brewster. I am also indebted to this gentleman and Mr. Deane for several specimens of this and other species. The habitat of these birds during the breeding season is the eastern section of North America from latitude 44 degrees, north, to about 52 degrees. They winter at Key West and the West Indies.

DIMENSIONS.

Average measurements of six specimens. Length, 5.12; stretch, 7.96; wing, 2.44; tail, 1.94; bill, .40; tarsus, .73. Longest specimen, 5.10; greatest extent of wings, 7.88; longest wing, 2.57; tail, 2.02; bill, .47; tarsus, .77. Shortest specimen, 5.00; smallest extent of wings, 7.12; shortest wing, 2.19; tail, 1.75; bill, .37; tarsus, .70.

DESCRIPTION OF NESTS AND EGGS.

NESTS, placed in trees or bushes, composed of strips of bark, twigs and roots, lined with fine rootlets and hair. EGGS, four or five in number, oval in form, ashy white in color, spotted and blotched with brown and lilac of varying shades. Dimensions, .61 by .47 to .65 by .50.

HABITS.

Just to the eastward of the lighthouse, at Key West, is a little pond which is very deep; indeed, it is reported to have no bottom. The edges are covered with a luxuriant growth of grass and aquatic plants which gradually merge into a higher mass of shrubs and low trees that surround the pool. I frequently visited this little pond, when I was on the island in 1868, because its shores and waters abounded with bird life. The thicket, especially, was nearly always swarming with various members of the feathered tribes, the majority of which were Warblers.

These little songsters were most active in the early morning, hopping about on the trees or searching among the lower shrubs for insects. I was collecting in this place one day, just before sunrise, when I was surprised by shooting a fine male Black-throated Blue Warbler. This was the first and only time that I ever saw this species in Florida. It was on the ground at the time, which is the usual habit of this species during the autumnal migrations in Massachusetts. But on the contrary during the spring they usually keep in the tops of the highest trees, where the peculiar lisping song of the males may be heard at intervals. I have found them common in summer among the deciduous forests of Northern Maine. Here they also frequent the topmost branches and possibly sometimes construct their domiciles there, but I do not know of a single instance of the nests being found high, they being usually placed in bushes or small trees.

The Black-throated Blue Warblers pass Massachusetts on their way north in May, returning in September. I found them abundant in September at Watsonstown, Pennsylvania on the third of the month and they continued common for a few days. They do not appear to be a winter visitor to the more northern of the Bahamas, but some appear in spring and autumn: thus I found a few near Nassau on March 4th, 1881, and observed some on Andros during April of that same year. I shot a single female in Nassau November 15th, 1887. Farther south they winter, for I obtained a few on Inagua in February, 1888. Their skins were common in the collection of the Institute of Jamaica at Kingston, but I did not find any on the Caymans until April 21st, when I shot a single male.

Dendroica palmarum hypochrysea.

Yellow Red-pollled Warbler.

Dendroica palmarum Baird (in part.) Birds of North America, 1858, 288.

DESCRIPTION.

SUB SP. CH. Form, rather slender. Size, not large. Bill, moderate, quite slender, and somewhat acuminate. Wings, moderate. Tail, rather long, slightly rounded and emarginate. Feet, quite small.



Fig. 95. Head and outer tail feather of adult male Yellow Red-pollled Warbler in spring.

Sternum, narrower than those of the three preceding species and slightly built. Tongue, narrow, rather thin, bifid, and fringed on the end with quite long cilia, which extend along the side for one-third of its terminal length.

COLOR. Adult male. Above, yellowish olive becoming brighter on the rump. Top of head, chestnut red. Wings and tail, brown, with the feathers edged with the same color as those of the back.

The two outer tail feathers have terminal spots of white on their inner webs: that on the outer occupies about one-third of the length of the feather, almost the entire space from vein to margin, leaving a very small spot of dark at the termination and ending in very slightly oblique lines toward the base. (See Fig. 95.) The

spot on the next quill is of the same form, but is only about one-half as long. Beneath, including under wing coverts and under tail coverts, bright yellow, streaked or spotted across the breast, on the sides of the throat and sides with chestnut red. There is a superciliary stripe of yellow. The lores and ear coverts are dusky, the latter mixed with chestnut red.

Adult female, similar to the male but without as much chestnut on the crown. In autumn there is a brownish suffusion above which extends over the crown. The yellow beneath is also obscured by a whitish suffusion. Young male, deep olive brown above, with scarcely a trace of chestnut on the crown. Beneath, dirty white, with a faint indication of yellow on the breast and sides, but which become brighter on the under tail coverts. In place of the chestnut stripes of the breast, sides, etc., the feathers have dusky centers. Young female, similar, but with no trace of chestnut on the crown and but little yellow below excepting the under tail coverts. In all stages the irides, feet, and bill are brown: the latter lighter at the base of the lower mandible. Nestlings. Description of a specimen obtained in Nova Scotia in August. Bill, very short and slender, (.40 long by .12,) black at base. The bill of the adult is .16 thick. Above, rufous ashy, streaked everywhere with dusky. There is a spot of yellow at base of upper mandible but no decided superciliary line. Wings, brown, edged with reddish ashy, and which broadens out into drop shaped marks, which, in a measure, form bands. Beneath, soiled white, tinged on throat and across breast with yellow,

shaded everywhere with chestnut. Tail, about as in the adult but with the white spot of the second feather nearly enclosed by brown. (See A, Fig. 96).

OBSERVATIONS.

The young are very much like the immature *D. tigrina* but may be distinguished from them by the yellow under tail coverts and the browner upper parts; absence of decided white wing bars, and peculiar form of spot on outer tail feather, (See B, Fig. 96). It may readily be known from all others in the adult stages by the chestnut crown. Habitat, during the breeding season, Eastern North America from Northern New England north to Hudson's Bay. Winters in the Southern states, including the Keys of Florida, as far north as Key West. This form has been separated with propriety from the Western, but, through a possible necessary, but unfortunate adherence to the rules of priority, the newly discovered Red-poll'd Warbler from the West retains the old name as the type species, and the more commonly known Eastern bird becomes the sub species. The Eastern form differs from the Western as given in the following description.

DIMENSIONS.

Taken from specimens obtained in Massachusetts in spring. Length, from 5.20 to 5.65; stretch, from 8.00 to 8.55; wing, from 2.12 to 2.80; tail, 2.05 to 2.60; bill, .45 to .47; tarsus, 75 to 80.

DESCRIPTION OF NESTS AND EGGS.

NESTS, usually placed on the ground; composed of weeds, grasses and moss rather carelessly arranged; lined with fine roots and pine leaves. EGGS, four in number, rather oval in form, creamy white in color, with blotches of pale brown around the larger end. Dimensions, .68 by .55.

HABITS.

On the eastern side of Key West, between the wooded portions of the island and the sea, is a narrow strip of land which is destitute of trees. It is a grassy plain, while a few bunches of low scrubs grow at irregular intervals over it; flowers bloom here in abundance throughout the season, and myriads of butterflies and other insects are floating over them attracted by their fragrance. Many birds are also found here, but the most common species are the Yellow Red-polls. They are quite abundant and may be seen flitting among the brightly colored lepidoptera or springing into air to catch some rapidly moving fly or beetle, then alighting on the low bushes or pieces of coral rock which are scattered about. They are seldom quiet an instant; for when perching, they are ever turning their little heads right and left while their bright eyes are carefully scanning everything far or near; their tails are also constantly moving up and down; this latter peculiarity at once distinguishes the Yellow Red-polls from all other North American Warblers, for none besides have this habit.

The constant watchfulness of these birds, which is exhibited by every movement, is necessary for their existence, for they usually inhabit open places where they are in constant danger from the attacks of enemies. At Key West this vigilance frequently saved their lives, for a Sparrow, Pigeon, or Broad-winged Hawk would often come sweeping over

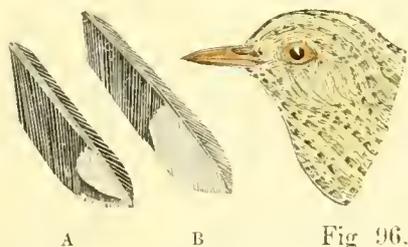


Fig. 96.
Head of nestling of Yellow Red-poll'd
Warbler. A, second tail feather, B,
outer tail feather.

them and without a moments warning would dart like a flash at a warbler; but such forays almost always proved unsuccessful; for although the swoop of the hawk was so rapid that the eye could scarcely follow its movements yet the Red-poll was on the alert, and uttering a shrill chirp of alarm would instantly shoot into the nearest prickly pear, or mass of tangled vines where it was safe from the pursuer. The song of the Yellow Red-poll is a low rather feeble warble, consisting of several rather detached notes, rising from the beginning to the middle then following to the termination.

In March, this species leaves Florida, arriving in Massachusetts in April; here they frequent low bushes by the side of woods spending much of their time upon the ground. At this season the males have a low warbling song; after lingering here a few weeks they migrate northward. Mr. Boardman informs me that these birds occasionally breed about Calais placing their nests on the ground. In autumn they pass Massachusetts during October, but they are not as abundant then as in the spring.

DENDROICA PALMARUM.

Red-poll'd Warbler.

Dendroica palmarum Ridgway, Bull. N. O. C., Vol. I, Nov. 1876, p. 85.

DESCRIPTION.

SP. CH. General coloration and form, similar to that of the Yellow Red-poll'd but the size is a little smaller and the upper parts are grayer in shade, with the yellow of the under parts bright and continuous on the throat only, but sometimes showing in irregular tints elsewhere, but the under tail coverts are always yellow. Young, vary much as in the last, but are always grayer.

OBSERVATIONS.

This well marked form, which is always readily distinguishable in all shades of plumage, excepting, nestling birds, breed in the central region of North America, migrating in autumn southward (often at this season appearing in New England) to Florida and the keys and to the Bahamas. NESTS and EGGS, indistinguishable from those of the Yellow Red-poll'd.

HABITS.

The Red-polls made their appearance at Sandford, Florida on October 1st, 1887, and by the 16th of the month they were common. I have always found them abundant in company with the Yellow Red-poll in all sections of Florida, even at Key West when both forms mingled together. On the Bahamas, however, I have never seen any but the present form. Here they frequent the neighborhood of settlements and I have even seen them on the streets of Nassau. I have also met them in the scrub in various places. One which frequented my yard at Nassau, coming every day to feed about the house, had but one eye. It remained until the last of March when it disappeared. This same year (1884) I found them on Andros where they remained as late as April 29th, about which time, the last one departed. In February, 1888, I found them common on Inagua especially near the salina and on the borders of the lake. That same year I observed them to be common on Cayman Brac in March. Here they were found in open spaces along the sea, sometimes even appearing on the beach. In general habit, the Red-poll does not differ from its near ally, but I have never heard it sing.

DENDROICA CAERULEA,**Cerulean Warbler.**

DESCRIPTION.

Sp. Ch. Size, small, wing bars two, and the white spots on the termination of the tail feathers extend over all but the central pair. COLOR. Adult male. Above bright blue, darkest on top of head and tinged with ashy on rump. Middle of back, scapulars, upper tail coverts and sides of crown streaked with black. White beneath, with band across breast and streaks on sides, dusky blue. Line from base of bill, through eye and behind it, also dark blue. Wings and tail, brown the former with two white bands, and the latter with a terminal spot on the inner web of all the feathers excepting the two middle. Female, greenish blue above, brightest on top of head. Whiter beneath tinged with greenish yellow and indistinctly streaked on sides with dusky. Eyelids and superciliary line, greenish white. Autumnal adults do not differ from the spring plumage. Young males are quite similar to the adult females but are whiter beneath, and less uniform blue above, while the dull streakings are more conspicuous. Young females are similar but duller green above without any tint of blue, and are light buffy yellow below.

OBSERVATIONS.

This species can be at once distinguished from all of our warblers by the small sizes, two wing bars, and spots extending over all but the central pair of tail feathers. Occurs, during the breeding season throughout Eastern United States and Southern Canada. North, in the east, as far as central New York. Winters in Cuba, Yucatan, Honduras and Panama.

DIMENSIONS.

Length, from 4.75 to 4.90; stretch, 7.85 to 8.00; wing, 2.60 to 2.65; tail, 1.70 to 1.80; bill, .35 to .40; tarsus, .60 to .65.

DESCRIPTION OF NESTS AND EGGS.

NESTS, placed on horizontal limbs at a considerable elevation above the ground, in woodlands, composed of fine grasses, mosses, hempen fibers of plants, and bits of hornets' nests, sometimes sparingly covered with bits of lichen, all overwound with spiders' webs. EGGS, three or four in number, oval in form, creamy or greenish white in color, sprinkled with reddish brown and lilac, which sometimes combine and form a ring around the larger end. Dimensions, .58 by .45 to .47 by .60.

HABITS.

The only specimen of the pretty little Cerulean Warbler which I ever saw was at Williamsport, Pennsylvania, May 22d, 1876. This was in a low growth of woodland along the Alleghany Mountains. At that time I heard no song, but it is said to sing rather continuously in summer, uttering a clear soft, but rather feeble melody which, however, ends in a creaking manner. This warbler breeds about the middle of June and the nest is usually saddled upon a branch of a lofty tree often at a considerable elevation from the ground: thus in breeding habit it somewhat resembles the Wood Pewee and, in fact, the nest is not often dissimilar.

DENDROICA PENNSYLVANICA.**Chestnut-sided Warbler.**

DESCRIPTION.

Sp. Ch. Size, medium. Wing bars, present. White spots on tail extending over three outer feathers. COLOR. Adult male, top of head orange yellow. Back, greenish yellow, broadly streaked with black.

Wings, brown, with the feathers, greenish, edged with two broad nearly connected greenish white bands. Tail, brown, with feathers edged with ashy, with white spot on inner web of outer, occupying about one-half

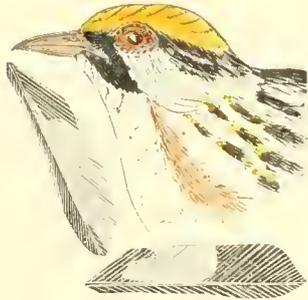


Fig. 97. Head of adult Chestnut-sided Warbler. A, outer tail feather of same, B, outer tail feather of Black and Yellow Warbler.

its length, and coming in contact with the vein the entire length excepting for a small space terminally; at base it runs along the vein in an acute point, (See Fig. 97.) The spot on the second and third feathers are each successively shorter but are of a similar form. Sides of head and neck, and beneath, white, with a stripe extending from bill through eye and back of it, and a short triangular mark below eye, black, and a broad stripe on sides, chestnut. Females, similar, but greener above, with the black and chestnut markings not as prominent. Young, greenish above, without black markings and with traces only of the chestnut on sides, which in some female specimens is quite absent, and the sides of head and neck are tinged with ashy.

OBSERVATIONS.

Adult, known in spring plumage by the chestnut sides and in the young stage by the green upper surface combined with the wing bars, tail spots and white under parts. Specimens vary greatly in the amount of chestnut on the sides, and in some young females, even in spring, this is absent. Occurs in summer throughout Eastern North America from

about latitude 40 degrees north to Canada; west, to the Great Plains; migrates northward in winter to Eastern Mexico and Southern Central America; rare in the Bahamas.

DIMENSIONS.

Length, from 5.00 to 5.25; stretch, 8.00 to 8.25; wing, .30 to .35; tail, 1.90 to 2.05; bill, .35 to .40; tarsus, .62 to .75.

DESCRIPTION OF NESTS AND EGGS.

NESTS, placed in bushes, composed of the hempen fibers of plants, fern-moss, weed stalks, etc. Eggs, usually four in number, rarely three and sometimes five, oval in form, white in color, spotted and blotched usually more thickly around the larger end with varying shades of brown and lilac. Dimensions, .60 by .45 to .60 by .53

HABITS.

The Chestnut-sided Warblers make their appearance in Massachusetts the first week in May, generally a short time before the trees and bushes have assumed their leaves. They frequent low growths of oak, maple, and other deciduous trees in either high or low land, but when breeding they are rather inclined to prefer swampy thickets. I have, however, occasionally found the nest in barberry bushes on high land. This species is one of the most sensitive in regard to its nest of any of our birds, for they will desert their home, even if it be only partly constructed, if they perceive an intruder near it. When the eggs are in the nest one has only to touch them, and although the parent birds be absent at the time, they appear to be aware of the fact that an unwelcome visitor has disturbed their household arrangements, and will instantly depart never to return.

The ordinary song of the Chestnut-sided Warbler so nearly resembles that of the Yellow Warbler as to be indistinguishable, and is uttered as the birds move briskly about through the foliage in search of insects which form their food. These warblers migrate early, most of them leaving New England by the last week in August, and I found them in full migration with other warblers at Watsonstown, Pennsylvania, on the 26th of this

month. Dr. Henry Bryant records having seen a few on the Bahamas in the spring of 1856, but I have never seen a specimen there.

DENDROICA AESTIVA.

Yellow Warbler.

Dendroica aestiva Baird, Birds of North America, 1858, 282.

DESCRIPTION.

SP. CH. Form, quite slender. Size, not large. Bill, rather short, not acuminate. Tail, slightly emarginate. Sternum, exactly like the preceding in size and form. Tongue, not long, thin and horny, quite acuminate; end, cleft and fringed with moderately short, delicate cilia, which sometimes extend for a little way along the sides; but on these portions they are much shorter, being in fact, invisible to the unassisted eye. COLOR. Adult male, yellow throughout, brightest beneath, but becoming olivaceous on the back. Wings and tail, brown, with the feathers edged on both webs with yellow. Upper part of breast, sides and flanks, streaked with reddish brown; this color also appears on the crown. Adult female, similar, but having fewer streaks beneath. Young male, like the adult female in general coloration. Young female, paler, especially beneath, with the crown uniform with the back. There are seldom any streaks beneath. Nestlings of both sexes, very pale yellow, sometimes almost white beneath, otherwise similar to the young female; occasionally, there are indications of streaks on the lower portions. Irides, bill and feet, brown.

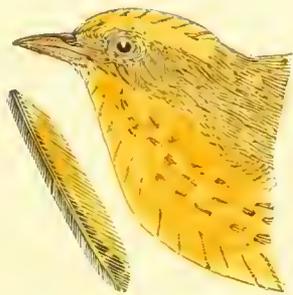


Fig. 98. Head and outer tail feather of adult male Yellow Warbler in spring.

OBSERVATIONS.

The Yellow Warbler may be distinguished from all other North American Warblers, excepting, perhaps, the West Indian *D. petechia* which has the top of the head chestnut, by the uniform yellow color. Distributed during the breeding season throughout the entire continent of North America; wintering in Mexico, Central and South America and rarely in the West Indies.

DIMENSIONS.

Average measurements of sixteen specimens from New England. Length, 4.97; stretch, 7.55; wing, 2.35; tail, 1.90; bill, .35; tarsus, .89. Longest specimen, 5.10; greatest extent of wings, 7.80; longest wing, 2.75; tail, 1.93; bill, .49; tarsus, .90. Shortest specimen, 4.75; smallest extent of wings, 7.12; shortest wing, 2.20; tail, 1.70; bill, .34; tarsus, .90.

DESCRIPTION OF NESTS AND EGGS.

NESTS, placed in low evergreen trees. They are composed of small twigs, weeds and dried grass, not very compactly interwoven, lined with fibrous roots and horse-hairs. The structures are very neat, but quite shallow. Dimensions; external diameter, 3 inches, internal, 2; external depth, 1.75 inches, internal, 1.25. Eggs, four in number, oval in form, ashy white in color, spotted and blotched somewhat irregularly with brown and lilac. The larger blotches, however, are inclined to accumulate on the larger end where they sometimes form rings.

HABITS.

The Yellow Warbler is one of the most familiar summer residents in New England, frequenting the orchards, gardens, and fence rows, but are seldom seen in the deep woods

They build their nests in every available situation; sometimes, in a barberry bush in the open field, on the limb of an apple tree or among the ornamental shrubbery, beneath the windows of the farmhouse. They are very unsuspecting, and a pair constructed their domicile last summer in a little plum tree which stands in the garden within five feet of an arbor in which I kept two tame White Herons. These fine birds attracted many visitors who constantly passed under the nest, which was only about seven feet from the ground, yet the female yellow bird would sit upon her eggs with the utmost composure all the time, and succeeded in rearing a fine brood of young. These warblers breed during the first week in June, and the song of the males is uttered constantly at this season. It is loud, clear, and divided into two parts, the first of which consists of three or four quick chirps; the latter portion is more continuous, but is somewhat varied. The force with which these notes are delivered causes the little performer's body to quiver all over, quite to the end of the tail. While singing the head is raised, the bird ceases its search for insects for a moment and gives its entire attention to the song, then will pursue its avocations. Thus these little birds are constantly pouring forth their lays at intervals through the day and continue to warble until late in the summer. They are not very active in comparison with other members of the family. We may expect to see the Yellow Warblers about the first week in May; they moult in August and depart for the South in early September.

Back of the old fort at Miami was a piece of ground which had formerly been cultivated, but which at the time of our visit was grown up to weeds and bushes. These dense thickets formed an excellent collecting ground which we frequently visited in search of warblers. Mr. Henshaw was passing through this place one day when he shot a Yellow Warbler. The bird fell and he advanced to pick it up, and was stooping to take it in his hand when, being only winged, it fluttered into the bushes, thence into some thick weeds, where it managed to conceal itself so successfully that its would-be captor failed to discover it. This is the only instance of our finding this well known warbler in the state; I am, therefore, obliged to introduce it into the fauna of Florida without having taken a specimen. They doubtless occur rarely, however. I obtained a single specimen of typical *D. aestiva* on the islands of Little Cayman, April 21st, 1888 but this is the only one that I ever saw in the West Indies, but the closely allied *D. petechia* is common everywhere in spring and summer.

GENUS. *GEOPHILYPIS*. THE GROUND WARBLERS.

GEN. CH. Bill, shorter than the head and rather stout. Wings, short. Feet, large. Tarsus, longer than the hind toe and claw. Coracoid bones, slightly exceeding in length the top of the keel, which is low, not being higher than one-half the width of the sternum. Marginal indentations quite deep.

The sternum of this genus at once distinguishes it from all other members of the *Sylviolidae*, inasmuch as it is produced forward in a degree quite remarkable; the coracoid bones are longer and proportionately stouter than any other member of the family.

GEOTHILYPIS TRICHAS**Maryland Yellow-throat.**

Geothlypis trichas Cab., Mus. Hein., 1859, 16.

DESCRIPTION.

Form, robust. Size, not small. Bill, stout, not acuminate. Tail, long and well rounded. Sternum, stontly built. Tongue, thin, horny, with the edges straight, not acuminate; bifid, the tips fringed with cilia which extend along the sides for about one third of the terminal length, but become shorter near the base.

Color. Adult male. Above, olivaceous green, becoming brownish on the top of the head. Wings and tail brown, edged with the same color as the back. A broad frontal band, extending over the eye and on the head, black, preceded above by a whitish margin. Throat, breast, bend of wing and under tail coverts, bright yellow. Abdomen and under wing coverts, paler. Sides and flanks, olivaceous. There is no change of plumage in autumn excepting that the bill, which in spring is entirely dark brown, then becomes lighter on the lower mandible. Young male differs in being duller and lacking the whitish margin to the black mask, which is almost entirely obscured by a rufous suffusion on the forehead and is washed with whitish on the side of the head. Adult female is without the black mask and with the yellowish beneath quite dull. The young female has a suffusion of rufous on the sides of the head, and the colors are very dull and undecided.

OBSERVATIONS.

The adult males may be known from all others of our species, excepting the Southern Yellow-throat next given, by the black mask. The females may be distinguished by the yellowish throat and the under tail coverts. Distributed during the breeding season, excepting Georgia and Florida, throughout eastern North America, wintering in the more southern sections.

DIMENSIONS.

Average measurements of twenty-six specimens. Length, 5.25; stretch, 7.20; wing, 2.24; tail, 2.00; bill, .45; tarsus, .70. Longest specimen, 5.75; greatest extent of wings, 7.76; longest wing, 2.56; tail, 2.15; bill, .56; tarsus, .80. Shortest specimen, 5.10; smallest stretch of wings, 6.70; shortest wing, 2.00; tail, 1.70; bill, .42; tarsus, .64.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground, composed of dried leaves and grasses, lined with finer grasses. These are the usual materials, but a specimen in my collection, found on Grand Menan by Mr. Harold Herrick, is partly composed of feathers from domestic fowls. Dimensions; external diameter, 3.50 inches, internal, 2.50; external depth, 2.75 inches, internal, 2. Eggs, usually four in number, pure white in color, spotted everywhere, but more particularly on the larger end, with reddish brown, lilac and umber; the lilac spots being the smallest. Dimensions, from .70 by .52 to .75 by .55.

HABITS.

Among the most common birds everywhere in Eastern North America are the Maryland Yellow-throats. Their harsh alarm notes greet the ear of the pedestrian whenever he passes a lonely hammock in the more northern portions, or approaches the tangled thickets among the Florida Keys. Their cheery songs also ring out from the swampy margins of the rivers and lakes of the middle districts: in fact there is no place in the state, however desolate, which will afford concealment, that is not inhabited by them. Indeed I have found them breeding in every favorable locality which I have visited, throughout Eastern North America. They readily adapt themselves to circumstances, and appear

equally contented under the thorny cacti of Key West, in the hedgerows of New England, or amid the cold boggy heaths of the Magdalen Islands. The ordinary song of the Maryland Yellow-throat somewhat resembles that of the Golden-crowned Thrush, but has less volume and the notes are more detached; they also have in addition a rather harsh warbling song which is uttered by the males when flying through the air or when dropping downward after a short flight.

The Maryland Yellow-throats are the most terrestrial of all the warblers, seldom appearing in trees but frequenting low bushes. The nests are placed on the ground, generally concealed by a tussock of grass, often near a stream or other body of water. Those which pass the summer in New England arrive early in May and lay their eggs about the first of June; the young may be found in August, and they all depart in October. They are constant residents in Florida and breed there in April.

Geothlypis trichas ignota.

Southern Yellow-throat.

Geothlypis trichas ignota Chapman, Auk, Jan. 1890, p. 11

DESCRIPTION.

SEX SP. CH. Size and form, similar to that of the Maryland Yellow-throat but the black mask is wider, both on the forehead and sides of neck, where it does not end as squarely as in northern birds, but extends on in a point which occasionally reaches the upper part of the breast. The grayish white line on the head, back of the mask, is usually paler and broader, while the color beneath is deeper. The bill and feet are large and the tail longer, but the first primary is shorter.

OBSERVATIONS.

As early as 1878 I pointed out the main difference between the Florida Yellow-throats and the more northern birds, and although I also indicated what are now considered sub species, and indeed, in some cases specific characters in other southern birds at that time, in the earlier parts of the first edition of the present work, then known as the "Birds of Florida," I did not name the forms so noticed. My reason for not so doing was, that then the wave of conservatism, which was sweeping over the ornithological portion of North America was at its height, and I was then too inexperienced to attempt to make a stand against such powerful and almost universal opposition which would have then had to be met; a change has, however, most happily come and now he who has the most microscopic eye to note the most minute differences between local races or sub species, is rightly considered the best ornithologist, the one to whom scientists of the future, in all departments, will be the most indebted. In this connection it may be well to call attention to the Bahama Yellow-throat, I named *Geothlypis restreeta*, in which, rather singularly the black mask is less extended, being narrower on forehead and neck, but also pointed behind, while the colors generally are paler. In richness of coloration *G. t. ignota* resembles the Greater Yellow-throat, *G. rostrata* from the Bahamas.

The Southern Yellow-throat occurs in Georgia and Florida as a constant resident. NESTS and EGGS and general habits, similar to those of the Maryland Yellow-throat.

GEOTHYLPIS PHILADELPHIA.

Mourning Warbler.

DESCRIPTION.

SP. CH. Size, and general form, similar to that of the Maryland Yellow-throat. COLOR. Adult male. Head, neck, throat and upper breast, dark ashy gray, which, beneath, is more or less mixed with black, re-

remainder of under parts pure gamboge yellow. Adult female, similar, but with the chin and throat whitish or brownish, and the colors are duller. Young, similar to the female but are more tinged with brownish.

OBSERVATIONS.

Readily distinguished from all others by the dark ashy head and throat, excepting the Connecticut Warbler, which also has dark markings arranged in a similar manner, but in this species the wings are long, reaching when folded, beyond the middle of the tail. Breeds throughout Northern New England west in about the same latitude to Eastern Dakota and along the Alleghanies south to Pennsylvania. Winters in Southern Central America.

DIMENSIONS

Length, 5.30 to 5.45; stretch, 7.62 to 8.00; wing, 2.40 to 2.50; tail, 1.87 to 1.95; bill, .40 to .45; tarsus, .85 to .94.

DESCRIPTION OF NESTS AND EGGS.

NESTS, placed on the ground or near it, composed of leaves and grass, lined with finer materials. EGGS, four or five in number, oval in form, white in color, blotched and dotted with purplish brown. Scarcely to be distinguished from those of the Maryland Yellow-throat.

HABITS.

This is a rare spring and a more rare autumnal migrant through Southern New-England, but is locally common in the more northern portions. Thus I found it common and evidently breeding at Upton in June, 1871. Here they frequented bushes along fence rows, stone walls, and on the edges of woods usually on high land. They were very expert at hiding in these retreats, but in the early morning the males could be seen perched in some conspicuous place singing. The song is loud, clear and pleasing, somewhat resembling that of the Water Thrush. When migrating the Mourning Warblers are found in tangled thickets along the borders of woodlands. I obtained one in a similar thicket at the bottom of a little valley at Williamsport, Pennsylvania, during the last week in May, 1876. Mr. Brewster says that it breeds in "positive abundance on Mount Graylock in Western Massachusetts." See Minot, Land and Game Birds of New England, 1895, p. 86 (foot note).

GENUS OPORORNIS. BUSH WARBLERS.

GEN. CH. Form, robust, more so than in either of the last two genera (*Dendroica* and *Geothlypis*). The coracoid bones are not produced as far forward as in *Geothlypis*, and the keel is proportionately higher, wings are longer, reaching beyond the middle of the tail and considerably longer than it. Colors, comparatively dull, with wings and tail unmarked. Sexes similar.

OPORORNIS AGILIS

Connecticut Warbler.

DESCRIPTION.

SP. CH. Size, medium. COLOR. Adult in spring. Head, chin, throat and back, dark ash, with a whitish ring around the eye. Above, olive green, including wings and tail. Under parts not described, gamboge yellow, becoming olive on sides. Adults in autumn are much duller, the ashy being most obscured by

olivaceous above and dull yellow below, much overwashed, especially on sides, with olive, and the head is all around decidedly brownish.



Fig. 99. Head of young male Connecticut Warbler in autumn.

OBSERVATIONS.

Known in spring from the similarly colored Mourning Warbler by the different form (the wings being longer) and white ring around the eye. Breeds in Eastern North America north of the United States: probably winters south of our limits.

DIMENSIONS.

Length, 5.40 to 5.50; stretch, 8.50 to 9.00; wing, 2.75 to 3.00; tail, 2.00 to 2.20; bill, .40 to .45; tarsus, .70 to .75.

DESCRIPTION OF NESTS AND EGGS.

NESTS, placed on the ground, composed of roots, leaves, etc., compactly arranged. EGGS, four in number, oval in form, creamy white in color, sparsely spotted with purple, brown, lilac and black, which are inclined to form a ring around the larger end.

HABITS.

The first specimen of the Connecticut Warbler that I ever saw was taken on September 16th, 1867, in Newton Center, Massachusetts, by Mr. L. L. Thaxter. The next year about the same date I procured another, and in 1870 Mr. H. W. Henshaw discovered them in large numbers in the Fresh Pond swamps, a locality in which they have since been found to be common every year during the latter part of September. They have also been taken in many places in the vicinity of Boston, in autumn. At this season the Connecticut Warblers are not shy as a rule, in fact I saw one in an apple tree on my place this last autumn (1895) which allowed me to come within a few feet of it and watch it for some time, but after a time it took refuge in some bushes near. In spring this is an exceedingly rare warbler in Massachusetts, but I have known of a half dozen instances of its capture in May, in the vicinity of Boston, May, 1890. I once saw one in a thicket of bushes and low shrubbery near my place and watched it for some time. It was moving leisurely about sometimes on the ground, and at others in the lower branches of the bushes and small trees. At intervals it uttered a low, but exceedingly sweet warble, the hearing of which first attracted my attention to the bird. This song reminded me more nearly of the melody of the Greater Yellow-throat (*G. rostrata*) of the Bahamas than of any bird I ever heard, and was quite unlike the song of any of our warblers which I ever heard. When moving about on the ground the Connecticut Warbler somewhat resembles a Water Thrush for it has the same habit of raising and lowering its tail.

OPORORNIS FORMOSA.

Kentucky Warbler.

DESCRIPTION.

SP. CH. Size, large; form, rather slender. COLOR. Adult. Olive green above, with the forehead and sides of head, black, and with the feathers of the top of head tipped with slaty. Superciliary line and lower

parts, pure gamboge yellow. Young, brownish olive above, including top and sides of head, becoming decidedly brown in the middle of the back. Wing coverts tipped with light brown. Beneath, plain, dull greenish, becoming more yellow behind. There is no black nor yellow on the sides of the head.

OBSERVATIONS.

Known at once by the yellow beneath, with the black markings on the side of head, in the adult, and in the young stage from the closely allied Connecticut, in the same stage, by the browner color above and indication of the brownish wing bars which the Connecticut never has. Breeds in Eastern United States, west of the Alleghanies, north to New York and Southern Wisconsin; winters in Eastern Mexico and Northern Central America; rare in the West Indies.

DIMENSIONS.

Length, 5.15 to 5.50; stretch, 8.10 to 8.60; wing, 2.50 to 2.70; tail, 1.90 to 2.15; bill, .42 to .45; tarsus, .85 to .87.

DESCRIPTION OF NESTS AND EGGS.

NESTS, placed on the ground in thickets, composed of an outside layer of leaves and coarse grasses, loosely arranged in which is a more compact structure of finer grasses, stems, and rootlets, lined with horse-hair. Eggs, four or five in number, oval in form, creamy white in color, and finely dotted with umber, reddish brown and pale lilac, usually more thickly around the larger end. Dimensions, from .56 by .72 to .58 by .74.

HABITS.

I have never seen a living specimen of this fine warbler, but the late Col. N. S. Goss in his birds of Kansas says that it inhabits low land thickets near water, and that it is of shy and retiring habits seldom visiting the open woodlands. In their chosen retreats they run actively about over the ground much like Water Thrushes, raising and lowering their tail as is practiced by this species. He says "The song is loud and resembles that of the Maryland Yellow-throat." They breed about the 20th of May.

GENUS. SETOPHAGA. THE REDSTARTS.

GEN. CH. Bill, quite wide and flat, not acuminate, with the upper mandible slightly curved at the tip. Wings, quite long and pointed. Tail, long. Feet, small. Coracoid bones, a little less in length than the top of the keel. Marginal indentations barely exceeding in depth the height of the keel, which is considerably higher than one-half the width of the sternum.

SETOPHAGA RUTICILLA.

Redstart.

Setophaga ruticilla Swainson, Zool. Jour., III, 1827, 358.

DESCRIPTION.

SP. CH. Size, small. Form slender. Sternum, stoutly built. Tongue, thin, horny, wide, somewhat rounded at the end, which is slightly cleft and fringed with delicate cilia that extend along the sides for about one-fourth the terminal length.

COLOR. Adult male. Entire upper parts, sides of head, throat and upper portions of the breast, glossy black. Basal half of primaries and secondaries, basal two-thirds of tail feathers, except the two central, sides, flanks, under wing coverts, under lining of wings, including auxiliaries and under wing coverts, edging on the outer webs of primaries, and a narrow, irregular band across the breast, bright orange. Remaining under parts, including under tail coverts, white, more or less tinged with orange; center of the feathers of the latter, dusky. Ring around the eye also white. The adult male in autumn sometimes has the back

REDSTART.

tinged with orange. Adult female. Above, plain greenish brown; the tail is darker and has the basal two-thirds of all except the two central feathers, pale yellow. Beneath, dirty white, with the sides, under wing coverts, and under surface of wing tinged with yellow, which color is faintly visible near the middle of the outer side. Young male of the second year has the body, above and below, colored as in the female, excepting that there are more or less black feathers on those portions which are dark colored in the adult. The lores are always black. The wings, tail, and other parts which are orange in the mature specimens, are yellow, but with an occasional irregular tingeing of orange. Young male of the first year exhibits but few or no black feathers, and no orange tingeing on the yellow. The young female is similar to the adult, but with the yellow of the tail less extended. The nestlings of both sexes resemble the young female with the addition of two yellowish white bars across the wings, and a general suffusion of the same color over the entire surface of the body. At this age the lower mandible and feet are inclined to be light brown, but in all other stages the bill and feet are dark brown. The irides are always brown.

OBSERVATIONS.

This species is very much inclined to intermingle the black frequently extending down on the breast and obscuring the orange. It is also quite common to find traces of albinism. Another peculiarity may be seen in the fact that the orange is not so agreeable where, especially on the back. Mr. Ruthven Deane has a specimen singularly marked with orange, white and black. The colors appear to be in about the usual proportions, but are mixed in a peculiar manner.

The well marked Redstart does not become confounded with any other species, as there are no others which are colored with orange. Distributed during the breeding season throughout Eastern United States north to Labrador. Winters in the Bahamas and other of the West Indies, Mexico and Central America.

DIMENSIONS.

Average measurements of twenty-eight specimens. Length, 5.37; stretch, 7.75; wing, 2.59; tail, 2.18; bill, .36; tarsus, .55. Largest specimen, 5.65; greatest extent of wings, 8.10; longest wing, 2.60; tail, 2.50; bill, .40; tarsus, .70. Smallest specimen, 5.25; smallest extent of wings, 7.50; shortest wing, 2.31; tail, 2.00; bill, .30; tarsus, .53.

DESCRIPTION OF NESTS AND EGGS.

NESTS, placed in trees. They are compact structures, composed of the soft, fibrous bark of trees, pine leaves, dead grasses, weeds and fine roots, neatly woven together; lined with horse-hairs, feathers or fine grasses. Dimensions, external diameter, 2.50 inches, internal, 1.50; external depth, 2 inches, internal, 1.50. Eggs, usually four in number, spotted and blotched with reddish-brown and lilac. These spots are not numerous on the smaller end but generally become confluent on the larger and form a ring. Dimensions, from .66 by .47 to .70 by .50.

HABITS.

In May the dark forests of Florida are enlivened by the sprightly Redstarts. They dart about among the rich foliage, now in shadow, now in sunlight; displaying their brilliant orange and jetty black plumage to fine advantage in contrast with the sombre color of the tree trunks or long, hanging moss. Ever active, slender and lithe of form, they leap quickly into air or pause for an instant on a twig, with widely expanded tail and half open wings, while the flashing black eyes are peering quickly from right to left in search of food; then they are off like meteors into the deciduous masses above; thus they are always busy, chasing bright winged insects all day long. But their stay is short in Florida, and in company with the great migratory body of warblers they pass onward to the north.

WILSON'S WARBLER.

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While in the South the Redstart does not sing, but in the deep shady woods of New England its short, abrupt, though not unmusical notes constantly ring out with an energy which surpasses that of all other smaller songsters. They sing without pausing in their avocations, and even while they are flying rapidly through the trees, in playful pursuit of one another, snap out a note or two, then, as they engage in a mock battle in which several males often participate, utter a sharp twitter. The only other note I ever heard them emit was a chirp of annoyance or alarm when they perceived an intruder. Although it is not difficult to recognize a Redstart by its peculiar song, yet I have seldom heard two sing exactly alike, and the young males, which have not acquired the plumage of maturity, have a weaker and more lisping melody.

Although the mimic wars in which the Redstarts engage in early spring are mere sportive affairs, yet when any particular pair begin to construct their nest, all such conflicts assume a more serious aspect. Then woe betide the young swain that unfortunately approaches too near the entrance of his brighter colored relative! for he meets with a hostile reception, and, unless he quickly beats a retreat, will likely mourn the loss of many feathers. Small birds of other species are also unnecessarily attacked by this irritable tyrant and rudely expelled from the vicinity of its nest. Those which breed in New England arrive from the South in early May, and lay their eggs the first week in June. In July the hissing voices of the newly fledged young may be heard in the woods as they follow their parents and supplicate for food; then in September all depart for their southern home.

I found the Redstart in the winter of 1884 on the island of New Providence, Bahamas, but they were not common until the migration of warblers on April 27th, when they became abundant. I did not find them at all on Inagua in October, 1888, but they were common in Jamaica that year, yet I did not find them on Cayman Brae until the migration which began April 5th, when a few appeared, but they did not become common until the 12th of the month.

GENUS SYLVANIA. THE FLYCATCHING WARBLERS.

GEN. CII. Bill wide and flat as in the last genus (Setophaga) and like it furnished with long, stiff bristles at the base, but the wings are not as pointed nor is the tail so long. The wings are not banded, and in two out of three species the tail is not spotted. All species are yellow beneath and are prominently marked on head or breast, or both, with black. Members of both this and the last genus somewhat resemble Flycatchers in habit of feeding. The eyes are very large.

SYLVANIA PUSILLA.

Wilson's Warbler.

Plate XXVI. Upper figure male, lower, female in adult spring plumage.

DESCRIPTION.

SP. CII. Size, small; tail, unspotted. Color. Adult male. Above, greenish olive, with top of head lustrous blue black. Forehead, sides of head and lower parts, gamboge yellow. Wings and tail, brown

edged with greenish. Iris, feet and bill, brown, the latter paler on lower mandible. Adult female, similar to the male, but with the black of the head less extended and mixed with yellow. Young, like the female. Autumnal birds do not differ much from the spring dress.

OBSERVATIONS.

We have no other warbler with which this species can be confused, for no other has the black top to the head combined with the yellow under parts. Occurs during the breeding season throughout Eastern and Northern North America from Northern United States north to Hudson's Bay, and on the west to the Arctic coast. Winters in Eastern Mexico and Central America.

DIMENSIONS.

Length, from 4.75 to 5.00; stretch, 6.75 to 7.00; wing, 2.00 to 2.25; tail, 2.10 to 2.20; bill, .32 to .35; tarsus, .65 to .70.

DESCRIPTION OF NESTS AND EGGS.

NESTS, placed on the ground, composed of leaves and grasses, lined with finer grasses and hairs. EGGS, four or five in number, oval in form, varying from white to creamy white in color, spotted with reddish brown and pale lavender, usually more thickly around the larger end. Dimensions, .60 by .48 to .62 by .50.

HABITS.

In Eastern North America we know Wilson's Warbler chiefly as a migrant, although a few remain to breed in Northern Maine. These pretty little birds make their appearance during the second and third weeks of May in Eastern Massachusetts, frequenting willows and alders along water courses, and are not at all uncommon some seasons. In movement and color they quite closely resemble the Yellow Warbler and unless observed quite closely might be taken for that species. The song, however, is quite different from that of the Yellow Warbler, consisting of a series of three or four rather harsh "zeeing" notes. My experience with this species in spring tends to show that it does not linger when migrating at that season, but passes through our section quite hurriedly, after occupying a day or two only in its northern passage through Eastern Massachusetts. It is much less hurried when southward bound, but is then rather rare in Massachusetts. I found them at Watsonstown, Pennsylvania, as early as August 30th, 1875, and they lingered, or rather perhaps it may be better to say, continued passing until the 28th of September, upon which date I find that I have recorded taking two individuals.

SYLVANIA CANADENSIS.

Canadian Warbler.

DESCRIPTION.

SP. CII. Size, medium. Tail, without white spots. COLOR. Adult male. Above, slaty blue. Wings and tail, brown, edged with bluish. There are numerous lance shaped black spots on the top of the head which are usually crowded and continuous on the forehead. A narrow line through the black of the forehead, a short line from base of upper mandible to eye, a ring around eye and under parts, (excepting under tail coverts, which are white) bright yellow. Line in front of eye and under it, extending down on ear coverts, then broadening up into spots which extend in a broad line across breast, forming a necklace, black. Iris and bill, brown, feet pale brown. Female, similar but paler and with the black markings less decided.

Young males similar to the female, but the females of this age are paler and show few traces of the black markings. Autumnal adults scarcely differ from the spring dress excepting that the yellow below is rather more orange, and the black feathers of the necklace are tipped with it.

OBSERVATIONS.

Readily known by the flattened bill, absence of white spots on the tail, bluish color above and yellow below in all stages and in adults by the necklace of black spots. Occurs during the breeding season commonly from Northern New England (rarely south to Connecticut) north to Newfoundland, Southern Labrador and Lake Winnipeg, west to Minnesota; winters in Eastern Mexico and Central America.

DIMENSIONS.

Length, from 5.03 to 5.70; stretch, 7.65 to 8.20; wing, 2.35 to 2.60; tail, 1.95 to 2.20; bill, .35 to .42; tarsus, .75 to .80.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the face of low mounds or cliffs, dome shaped, with the entrance hole near the top, composed of dry leaves, lined with pine needles and a little horse-hair. Eggs, from three to five in number, oval in form, white or creamy white in color, spotted and dotted chiefly about the larger end, with reddish brown and lilac. Dimensions, from .68 by .50 to .70 by .52.

HABITS.

The Canadian Warbler makes its appearance in Massachusetts about the second or even the third week in May. As a rule they are fairly common only, but during a few seasons I have seen them positively abundant. I did not, however, find them at all common during the spring migration at Williamsport, Pennsylvania, but in May, 1876, got a few from the 12th to the 15th of the month. Their distribution during the breeding season is rather scattering and local. Thus they breed rather rarely in Connecticut, commonly in Berkshire and Worcester counties, and about Boston, but in small numbers in the towns of Milton, Dedham, Belmont, Bedford and Concord, and numerous throughout Northern New England. Such a singular distribution would suggest that, this species, in common with some others which are similarly scattered in summer, like the Hermit Thrush and the Solitary Vireo, in the past, where the forests were more continuous, nested over all the intermediate region which they now avoid.

The song of the Canadian Warbler is sweet and pleasing and quite unlike that of any other bird with which I am acquainted, but is heard mainly when the birds are breeding. During the autumnal migrations they are not common in Eastern Massachusetts, but I found a few at Watsontown, Pennsylvania, from August 30th until September 7th, 1875. Usually when migrating or breeding, the Canadian Warblers prefer swampy thickets or bushes along the margin of woodland, but when abundant they scatter everywhere, over orchards, gardens and fields.



Fig. 100. Head of adult male Canadian Warbler in spring.

SYLVANIA MITRATA.

Hooded Warbler.

DESCRIPTION

Size, medium. Tail feathers spotted with white. COLOR. Adult male. Above olive green. Forehead, sides of head, and lower parts, including under tail coverts, gamboge yellow. Top of head to back of neck, extending down to throat and upper breast, black. Wings, brown with the feathers greenish edged, tail brown, with the feathers greenish, edged with a white spot on inner web of outer, occupying two thirds of its terminal length, extending along vein excepting for a small space to tip. A spot on the second feather is of a similar form but shorter and the third is also similar but still shorter. Females similar but paler and with the black markings less extended or occasionally absent. Young, similar to the female, but are usually without the black on the head. Autumnal adults do not differ greatly from the spring dress but the black feathers of the throat are tipped with yellow.



Fig. 101. Head and outer tail feather of adult male Hooded Warbler in spring.

OBSERVATIONS.

Adults may be at once distinguished by the black hood. The young without this may be known from the Canadian Warblers of the same age by the yellow, not white under tail coverts and white spots on the tail. Breeds from Southern Connecticut through New York, west to Iowa and southward. Winters in Eastern Mexico and Southern Central America; accidental in Cuba and Jamaica.

DIMENSIONS.

Length, from 5.00 to 5.25; stretch, 7.90 to 8.25; wing, 2.50 to 2.65; tail, 5.30 to 2.35; bill, .38 to .40; tarsus, .75 to .78.

DESCRIPTION OF NESTS AND EGGS.

NESTS, placed in low bushes usually in swamps. Composed of leaves, fine bark of plants and vines and grasses, lined with finer material. EGGS, usually four, occasionally three or five in number, oval in form, white in color, spotted and sprinkled around the larger end with reddish brown and pale lilac. Dimensions, .70 by .50, to .35 by .75.

HABITS.

This beautiful bird is always associated in the minds of all collectors who have seen it, with the mountain laurel, for wherever this shrub grows, naturally the Hooded Warbler is found, from Southern Connecticut, south and west. It appeared at Williamsport, Pennsylvania, on May 11th, 1876, and instantly attracted my attention by its loud, clear song which it utters constantly all day long, and which reminded me somewhat of the song of the Water Thrush. The alarm note is a sharp, low chirp. The birds were always found in swampy thickets of laurel along the mountain valleys.

In the autumn of the previous year I found them more scattered, but always in swampy thickets at Watson town, where I procured specimens from September 6th until the 18th. All members of this genus (Sylvania) in migrating appear to avoid the South Eastern section of the United States, but pass west to their winter's home in Mexico and southward, hence are very commonly observed in Florida and the West Indies. It has occurred to me that the migration of birds, which is often different in different genera, may, if carefully studied, furnish a clue to the origin of species.

FAMILY SEIURIDAE. WOOD WAGTAILS.

Primaries, nine. Bill, destitute of prominent lobe on either mandible. Coracoid bones shorter than the top of keel, the tip of which is produced well formed. Wings, not very pointed, the first, second and third quills being about equal in length, and the wings are much longer than the square tail.

The birds which I have thus elevated to the rank of family, have for a number of years been placed with the warblers, but I have never been satisfied with this arrangement, and in the first edition of this book placed them as a genus of the Thrushes. I did this on account of the resemblance of the sternum to that of members of that family. (See Fig. 102) A, where I give the keel of a Louisiana Water Thrush, and compare

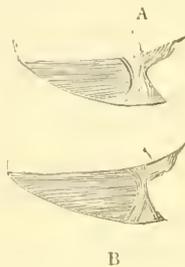


Fig. 102. A, keel of sternum of Water Thrush, B same of Wilson's Thrush.

with B, the keel of a Wilson's Thrush, also see plate XXXIII, Figs five and six, for sternum of Robin and compare all with plate XXXIV, Fig. 1, sternum of Orange Crowned Warbler, 4, of Blue Yellow-back, 7 of Maryland Yellow-throat, 24, of Redstart, 26.

Black and White Creeper) but although they are evidently closely allied in many ways to the Thrushes, I do not now consider that they should be placed with that family. The Wood Wagtails differ from the thrushes and the warblers, inasmuch as they walk and do not hop when moving along a plain surface; as in this and in some other habits, they appear to resemble the true Wagtails (*Motacillidae*) I have placed them between that genus and the warblers. Audoborn and some other of the older authors considered them Wag-

tails, an arrangement which did very well for a time when groups of animals were much broader and more comprehensive than they are today. Now we are learning two things in regard to systematic classification, one is that we cannot crowd different species and genera into groups to which they have no real affinity simply because they would otherwise stand alone; and second, that we cannot arrange groups of animals in regular sequence, one behind the other, and present a perfect chain of unbroken relationships.

The key note to the whole system of nature's relationships is struck by the oscillations of individual variations; when we study closely we find that the pendulum does not swing directly back and forth, but describes an irregular circle with prominent points here and there. As it is with individuals so it is with groups. This point may be illustrated by almost any group of birds; take for example this very family of Wood Wagtails; as shown, they strongly resemble some of the warblers, for they have nine primaries and a form not unlike that of the members of the genus *Oporornis*: in habit they are like the true Wagtails, while in sternal characters, which are the least changeable of all, they are quite like the true Thrushes.

GENUS. SEIURUS. THE WAGTAIL THRUSHES.

GEN. CH. Size medium. Sternum, precisely similar in form to that of the Thrushes. Bill, conical and rather long in proportion to the size of the bird.

SEIURUS AUROCAPILLUS.

Golden-crowned Thrush.

Seiurus aurocapillus Swainson. Zoological Journal, III, 1827, 171.

DESCRIPTION.

SP. CH. Form, somewhat robust. Tongue, rather acuminate, slightly bifid and fringed with delicate cilia for about one-sixth of its terminal length. Marginal indentations of sternum not exceeding its breadth.

COLOR. Above, pale olive green, with a broad central stripe of orange yellow on the head, margined with black. Beneath, pure white, with numerous triangular spots of black upon the breast, flanks, and sides of throat; in the latter place they are clustered, forming maxillary stripes. A ring around the eye, and the sides of the head, similar to the back, but paler. Flanks, olivaceous. Under wing coverts and auxil-

aries, pale green. Iris, brown. Upper mandible, brown; lower, paler. Feet, pale brown. Young, similar to the adult, but with a dull, reddish tinge over the back. The central stripe of the head is also obscured with dusky. There is a faint, greenish suffusion over the white of the under parts. The wing coverts are sometimes tipped with pale yellow, forming bars. The feet and bill are darker. Sexes alike in all stages of plumage.

OBSERVATIONS.

This little species will be easily distinguished from all others by the above description. Individuals vary much in the number and intensity of color of the spots beneath. A specimen taken at Miami, besides being smaller in size, has the spots of the breast much broader than usual. The back is also more dusky. This species is found during the breeding season throughout Eastern United States, north to Hudson's Bay. They winter in the Southern States, Bahamas, West Indies and Central America.

DIMENSIONS.

Average measurements of seventeen specimens. Length, 6.00; stretch, 9.37; wing, 3.01; tail, 2.22; bill, .49; tarsus, .81. Longest specimen, 6.50; greatest stretch of wings, 10.40; greatest length of wing, 3.35; of tail, 3.10; of bill, .55; of tarsus, .90. Shortest specimen, 5.40; smallest stretch of wings, 9.45; smallest length of wing, 2.25; of tail, 2.00; of bill, .45; of tarsus, .70.

DESCRIPTION OF NESTS AND EGGS.

NESTS, composed outwardly of dried leaves and grasses, compactly interwoven, and lined with finer grasses. This material is usually arranged so as to form a hollow cylinder, with a hole for entrance at the side. Dimensions. External diameter, 5 inches; internal, 3 inches. Eggs, four or five in number, pure white, spotted and blotched throughout, but generally more thickly on the larger end, with pale brown, lilac and amber. Form, rather round. Dimensions, from .75 by .50 to .80 by .64.

HABITS.

Upon visiting Florida for the first time, one is surprised to hear the term "hammock" applied to certain species of woodland, which appear flat, and indeed, where in many cases the ground is somewhat lower than the surrounding surface. This, to a northerner, to whom a hammock means a small hill, seems a misnomer. After a time, however, the traveller becomes accustomed to it, and, if he is ornithologically inclined, will learn to look upon the mass of vegetation which it represents with great interest, for in them he will find many valuable specimens.

These hammocks are usually found along the streams or other bodies of water; and as the trees, of which they are composed, grow thickly even on the edge, they appear like islands rising abruptly from the surrounding scrub, piny woods or savannas. They vary in size from a few square rods to miles in extent. Upon entering them, one generally passes first through a thicket of tangled briars and shrubs, which commonly grow among the trees on the margins of all hammocks. Once through this and the collector finds himself in a dense wood, nearly free from underbrush. He will pause here, if unaccustomed to such scenes, for everything appears somewhat strange. Beside him stands a huge live oak with its immense trunk thickly covered with parasitical ferns and orchids, of a delicate green, while upon the branches may be seen large air plants, the drooping leaves of which are surrounded by long streamers of Spanish moss that partly conceal

them. Near by, a straight, smooth-barked magnolia raises its head; while the sweet gum, bay, black walnut and other trees stand so thickly around that their tops are crowded together. The air is perfumed with the peculiar odor of the leaves of the prickly ash; and, although it is midwinter, the green fronds of the filices, which grow under foot, together



Fig. 103. Head of adult Golden-crowned Thrush in spring.

with the yellow flowers of the climbing jessamine that are seen on either hand, give one to understand that he is in a semi-tropical clime.

Passing onward through this wonderful scene farther into the forest, he sees a deer suddenly start up from a bunch of saw palmetto, which is near, and bound quickly away. Then perhaps the startled pedestrian catches a glimpse of the yellow eye and tawny hide of a wild cat, as with a loud snarl it rushes away to hide itself in the deeper woods; or the low, ominous cry of the puma is heard, as he circles around the intruder, as if endeavoring to ascertain who dares

disturb his peace, but ever careful to keep at a respectful distance. All these sights and sounds remind one that he is in a locality which is seldom disturbed by man.

Few bird notes are heard in this shadowy wilderness, for the songsters are generally silent at this season; therefore the collector is obliged to use his eyes attentively. While so doing he will perceive a small bird making its way quietly about on the ground. Upon closer examination he will be surprised to find that it is the Golden-crowned Thrush, seemingly as much at home as when in the groves of the North. They are quite numerous in Florida during the winter, and are not to be found in pairs while here, but live singly, are very shy and retiring, always silent, and seldom leave the ground, where they may be seen busily engaged in searching for insects, as if their chief business was to look out for luxuries. They may be found in Florida about the first week in November, and remain until April 15th, when they leave for the North, arriving in New England the first week in May, where they soon scatter through the woods.

Just before the season of incubation they have much the same habits as the other thrushes; the male is as attentive to his female as any of them, paying court to her by singing his loud and well known melody. While giving his song he commonly perches upon the lower limb of a tree and devotes himself entirely to the performance. When he has finished, he stalks gravely along the limb occasionally moving his tail up and down somewhat slowly. His notes may be heard at irregular intervals through the day and sometimes in the night. Although they now spend considerable time among the trees they may frequently be found upon the ground, where they are perfectly at home, running swiftly over the fallen leaves, occasionally pausing to scratch among them in search of insects. At such times they are full of nervous activity.

About the first week in June they commence the work of reproduction. The situation chosen for this purpose is usually upon some sloping hillside in the deep woods: 1

have, however, found the nest among low bushes in a swampy place. On account of the singular oven-shaped nest being composed of dried leaves and covered with them, it is very difficult to find, and I have often searched in vain for it, when I was certain that it was within a few yards of me. When startled suddenly from her eggs the female will counterfeit lameness, to draw off the attention of the intruder, and, unlike the other small thrushes, both sexes exhibit great solicitude whenever they are disturbed during the season of incubation, sounding their sharp alarm notes, but taking care to keep at a safe distance; yet they can hardly be called shy.

After breeding, this little species retires to the swamps to moult, and then keeps in such close seclusion as to be seldom seen. About the middle of September they leave for the South. The Golden-crowned Thrush has familiarized itself to us by means of its loud, cheerful song and has thus become one of the elements of beauty in our woodland retreats.

This is an exceedingly common species on the Bahamas during winter and is singularly called Night Walker by the natives. Here they frequent the thick growth of shrubbery and remain until the first week in May. I found them also common on Inagua, in Jamaica, and on both Cayman Brae and Little Cayman in 1888.

SEIURUS NOVEBORACENSIS.

Water Thrush.

Turdus (*Seiurus*) *Novaboracensis* Nuttall. Man. 1, 1832, 353.

DESCRIPTION.

SP. CH. Form, slender. Bill, not stout. Sternum, of the same form as that of the preceding species, but the keel is proportionately higher. The tongue is rather narrow, and differs from that of any Wagtail Thrush, which I have seen, in having the extremity divided into numerous cilia, about five hundredths of an inch in length. The sides of one-fourth of its terminal length, are also fringed with shorter ones.

COLOR. Adult. Above, uniform dark olivaceous brown. Superciliary stripe extending back along the sides of the head, and entire under parts, pale greenish yellow, with the chin, throat, breast and sides covered with triangular spots of the same color as the back. The top of the head is sometimes streaked with darker. Feathers at the base of the upper mandible have a concealed spot of pale buff. The tints, above and below, vary much in intensity. The line over the eye in some individuals is much purer than in others. The spots also vary greatly in number, especially on the chin and throat; they are also darker and broader on the breast, but in one small specimen from Key West, they are so much larger and crowded, as to form a band. Bill, brown, lighter at base of lower mandible. Iris and feet, brown. Young, similar to the adult, but are rather more reddish above; the under parts are greener. There is also a faint indication of a reddish central stripe on the head. Young in the nestling plumage, with the feathers above more spotted with red.

OBSERVATIONS.

This differs from the closely allied species, *S. ludovicianus*, by the greater number, and darker color of the spots beneath, and by the under parts being greener. The line over the eye in *ludovicianus* is pure white; the feet are also very pale, being nearly white. This species is found during the breeding season throughout Eastern United States, north to Hudson's Bay. It winters in Southern Florida, Bahamas and the West Indies; may also pass into South America.

DIMENSIONS.

Average measurements of seven specimens. Length, 5.88; stretch, 9.33; wing, 2.91; tail, 2.02; bill, .52; tarsus, .78. Greatest length, 6.10; greatest extent of wings, 10.03; greatest length of wing, 3.10; of

tail, 2.15; of bill, .61; of tarsus, .86. Smallest length, 5.50; smallest stretch of wings, 8.60; smallest length of wing, 2.80; of tail, 1.90; of bill, .50; of tarsus, .80.

DESCRIPTION OF NESTS AND EGGS.

NESTS, composed of leaves, mosses, and fine grasses; lined with fine mosses and roots. Dimensions. External diameter, 5.00 inches; internal, 3.50 inches. External depth, 3.00 inches; internal, 2.00 inches. EGGS, four or five in number, flesh colored, spotted throughout with light, reddish brown. Dimensions, from .75 by .60 to .83 by .65.

HABITS.

The island of Key West is about six miles in length, and is of an irregular form, being nearly divided in the middle by a deep cove which opens to the westward. A creek also makes in from the eastward, and forms an outlet to a large, shallow basin of water, which is called "The Salt Pond." An artificial canal connects this sheet with the cove, so that the key is really separated into two islands. The city stands upon the southernmost one, which, owing to a rich deposit of soil, is covered with a luxuriant growth of vegetation. The northern islet is entirely uninhabited, being somewhat barren; even in the interior, one sees but a few species of trees or shrubs, and these are dwarfed by the extreme heat which prevails at certain seasons, for the vegetable mould is thinly spread upon the coral that forms the foundation of all the Florida keys, but as we approach the western shore this scanty supply of vegetation vanishes and the surface of the rock is exposed. This limy formation is comparatively soft, and the action of the elements has worn it into jagged points; while the surface water, caused by rains, has formed numerous small channels, of a foot or eighteen inches in depth, through which it escapes into the sea. A few hardy plants grow along the borders of these little fissures, but all else is a rough plain of blackened rocks, until we come to the high-water line. Here grows one of the true products of the tropics, — the mangrove. One unaccustomed to the habits of these trees would be surprised to see them existing in so desolate a spot, especially where they are so constantly washed by the salt waves, yet they appear in a flourishing condition, and not only mark a line along the shore, but form many little verdant islands far out in the light green waters of the Gulf of Mexico. Their manner of growth is singular; the roots are not only long, but flexible, and grasp any projection of the surface that presents itself, or thrust themselves into the crevices of the rocks when they come within their reach. But this support would be of little avail in enabling the tree to maintain an upright position during the heavy winds which often occur in this region. Nature, however, has provided powerful braces in the shape of aerial roots which are thrown out from various heights, and growing downward reach the rock and fasten themselves firmly. Shoots start up from these, which in their turn throw out others, and thus the whole forms a dense thicket with interlacing branches and root-stalks, through which it is extremely difficult to force a passage.

The mangroves, which form the narrow edging along the western shore, were not high, yet they were chosen as an asylum by a large number of birds, and consequently I frequently visited them in search of the rarer species. While so engaged I observed some

small birds running about among the roots, apparently searching for aquatic insects, which were left by the tide, that flowed over that place at high water. They were extremely shy and it was only with great difficulty that I could obtain a shot at one, which when taken proved to be the common Water Thrush. Although I saw them occasionally on other parts of the key, among the mangroves, yet they were particularly abundant in this place, and I always found them there, even after nearly all the other birds had left the island. [The foregoing account of Key West was written after a visit to the island in the winter of 1887. Now much of the territory of which I have spoken as being covered with shrubbery is built over.] I think they remained all winter, for I saw them as late as the latter part of December; I did not, however, meet with them at Miami until March 15th. One was picked up dead in Indian River, and brought to me, on April 1st, but they did not become common until the 20th of that month.

They pass Massachusetts during the middle of May when they frequent the swamps. I found them common in June, at Lake Umbagog, Maine, in the thick woods along the edges of water courses, where they generally remain concealed beneath the mass of fallen trees and thick underbrush. Indeed, they are so shy, and so seldom leave these inaccessible places, that were it not for the song of the males, one would scarcely believe that they were at all common there. They breed in these swampy localities. The nest is placed beside a decaying, moss-covered log, or at the foot of some tree, generally in the everlasting shadows of the thick evergreens. It is seldom covered like that of the Oven Bird. While the female is sitting the male is ever near, and the angler who invades this wilderness, so seldom trodden by man, in search of the speckled trout, hears its indescribably sweet warbling song, sounding all the more melodious because his curious eye fails to detect its author. So all through the long summer days, amid the mountain valleys, this bird melody is mingled with the splash of cool waters, and the gentle sighing of breezes, which come laden with the fragrance of hemlock and spruce.

These birds are remarkable for their love of water, and are seldom seen far from it. They are exceedingly active, and run very rapidly; on this account they resemble the Sandpipers, especially when they are feeding by the side of a pool or stream. They also have the habit of jerking their tails in a nervous manner. By the 1st of September they commence their southern flight. While passing Massachusetts at this season they may be usually found searching the bottom of recently dried up pools and ditches for insects, especially if these places are overhung with bushes. They are but little tamer than at other times, and upon the slightest alarm will instantly dart into the nearest thicket. I found this species to occur sparingly on the Bahamas about Nassau, and on Andros in March and April, 1884, and rather commonly on Cayman Brae the last week in March, 1888.

SEIURUS LUDOVICIANA.

Louisiana Water Thrush.

DESCRIPTION.

SP. CH. Size, similar to that of the preceding species. The bill is not as long as the head but is proportionately stout. COLOR. Above, including wings and tail, dark olivaceous brown, slightly rufescent

on nape and upper tail coverts. Line from bill, passing over eye to nape, pure white, slightly obscured with dusky. There is a narrow median line of whitish on forehead. Beneath, white, slightly tinged with buff, which becomes more decided on flanks and under tail coverts, marked with a maxillary line, a line through eye, on ear coverts and in triangular spots across breast, on sides and flanks, with olivaceous brown, of the same shade as the back. Iris, brown. Bill, dark brown, lighter at base of lower mandible. Feet, pale brown.



Head of adult Louisiana Water Thrush in spring.

OBSERVATIONS.

Distinguished from the closely allied Water Thrush by the darker colors above, white superciliary line and color beneath, and most individuals of the Louisiana Water Thrush are not spotted on the throat. A female specimen obtained at Nassau, Bahamas, in spring, is decidedly rufescent below and is even tinged above with it. Breeds in Eastern United States, north to Southern New England and Southern Minnesota, and west to the edge of the Great Plains. Winters in the Gulf States, Eastern Mexico, Central America and the Greater Antilles; rare on the Bahamas.

DIMENSIONS.

Length, 6.00 to 6.20; stretch, 9.75 to 10.00; wing, 3.10 to 3.25; tail, 2.05 to 2.30; bill, .53 to .62, tarsus, .73 to .90.

DESCRIPTION OF NESTS AND EGGS.

NESTS, placed on the ground usually beneath a projecting root, or old log, or in a fissure of rock. Composed of leaves or mosses, lined with fine grasses, plant fibers, and hairs. EGGS, usually four, occasionally three, rarely five or six, oval in form, white or creamy in color, spotted with varying shades of reddish brown and lilac, usually more thickly around the larger end. Dimensions, .75 by .53 to .76 by .59.

HABITS.

The first specimen of the Louisiana Water Thrush that I ever saw living was on May 11th, 1879, when I started a pair by the side of a creek between two spurs of the Alleghanies near Williamsport, Pennsylvania. As they rose they gave a harsh cry of alarm, and the female hovered around me reiterating this note, hence I concluded that the birds were breeding and had a nest near, but I failed to find it. I afterwards found the birds quite abundant in the laural swamps and heard them sing. The song is low, clear and pleasing but is rather short. The bird when uttering his melody, usually sits perfectly quiet. I found both sexes quite shy when in the thickets, and they proved very expert at hiding.

I found a single specimen (a female) on the borders of one of those singular sink holes, or, as they are called in the Bahamas, ocean holes in which the tide rises and falls, and in which consequently the water has direct communication with the sea through subterranean passages. This particular ocean hole was situated in the middle of a field back of the city of Nassau, and I chanced to visit the spot when the tide was out on April 1st, 1884, and found the first and thus far I believe the only specimen of the Louisiana Water Thrush ever seen in the Bahamas, running about on the exposed mud.

FAMILY MOTACILLIDAE. WAGTAILS.

Bill, shorter than the head, slender, not curved, and notched at the tip. Few or no bristles at base of bill. Primaries, nine. Wings, not very pointed. Tail, at least as long as wing. Members of the present family agree with those of the last in having nine primaries, in the absence of any very large bristles at the base of the bill, and in two noticeable habits, namely, they walk and do not hop, and move the tail up and down both when sitting or when in motion. This is a large family but is represented mainly by Old World species, one of which reaches us as a straggler and two of which are natives.

GENUS MOTACILLA. WAGTAILS PROPER.

GEN. CH. Size, medium. Form, slender. Tail, much larger than the wing. Secondaries, longer than the end of the longest, reaching to the tip of the closed wing. Feet, slender.

MOTACILLA ALBA

White Wagtail.

DESCRIPTION

SP. CH. Size, medium. Form, slender. COLOR. Adult male in spring. Head, and upper breast, black, with a broad mark of white on forehead and on ear coverts. Wings, dark brown with the feathers edged and tipped with white. Tail, black, with two outer feathers mostly white. Females, similar, but with the black less extended and in part replaced by grayish. Young, gray above, grayish white beneath.

OBSERVATIONS.

Known at once by the black and white colors and slender form. Occurs as a widely distributed species in Europe and Asia. Occasional in Greenland.

DIMENSIONS.

Length, 7.00 to 7.25; wing, 3.00 to 3.25; tail, 3.75 to 3.80; bill, .50 to .55; tarsus, .90 to .95.

DESCRIPTION OF NESTS AND EGGS.

NESTS, placed on the ground, composed of leaves, weed stalks, etc. EGGS, five and six in number, oval in form, grayish white in color, thickly spotted and dotted with ashy and black. Dimensions, .75 by .55 to .79 by .59.

GENUS ANTHUS. THE TITLARKS.

GEN. CH. Marginal indentations of sternum, equal in depth the height of the keel. Coracoid bones, shorter than the top of the keel. Keel, higher than one-half the width of the sternum. Hind claw, more than twice the length of the anterior claws. Tail, shorter than the wing. Secondaries greatly elongated, the longest reaching nearly to the tip of closed wings.

ANTHUS PENNSYLVANICUS.

Titlark.

Anthus ludovicianus Licht. Verz., 1823, 37. No. 421.

DESCRIPTION.

SP. CH. Form, slender. Size, not large. Bill, shorter than the head, slender and acuminate. Wings, long and pointed. Tail, rather long and slightly emarginate. Sternum, not stoutly built. Tongue, thin, horny, very acuminate with the tip bifid and ciliated.

COLOR. Adult in spring. Above, olivaceous brown with each feather having a darker center. Beneath, reddish white with a maxillary line of dark brown spots, which also extends across the breast and along the sides. Wings and tail, dark brown, with the outer webs edged with yellowish white. The two outer tail feathers are tipped with white; this color extends along the outer web of the first feather for three-fourths its length. The third tail feather is also sometimes tipped with white. The under wing coverts are pale yellowish white streaked with dusky. There is a yellowish ring around the eye and a stripe over it of the same color. In autumn the colors beneath are paler. The young differ from the adult in being paler and having less white on the tail. Sexes alike. Irides, feet and bill, brown, the latter lighter at the base of the lower mandible.

OBSERVATIONS.

In a large series of specimens before me there is considerable variation in the number and size of the spots beneath, and those which are most spotted are darker above. The only bird with which this is likely to be confounded is the Missouri Skylark, but this is whiter on the under portions, and has the outer tail feathers pure white, and the feet and bill yellow. This species breeds from Labrador northward but is found during the migrations throughout North America, and winters from the Gulf States southward through Mexico to Guatemala.

DIMENSIONS.

Average measurements of twenty-nine specimens. Length, 6.55; stretch, 10.30; wing, 3.30; tail, 2.55; bill, .48; tarsus, .80. Longest specimen, 7.00; greatest extent of wings, 11.00; longest wing, 3.60; tail, 2.75; bill, .50; tarsus, .60. Shortest specimen, 6.15; smallest extent of wings, 6.95; shortest wing, 3.15; tail, 2.45; bill, .50; tarsus, .90.

DESCRIPTION OF NESTS AND EGGS.

The accompanying descriptions were made from a nest and eggs, now in the Smithsonian Institution, by my friend Mr. Ridgway, who kindly forwarded them to me. The specimens were taken at Rendezvous Lake, Arctic Coast, on the 25th of June, 1864, by Mr. R. McFarland.

NEST, composed entirely of coarse grass, lined with finer material; it is quite compact and deeply saucer-shaped. Dimensions; external diameter, 4 inches, internal, 2.50; external depth, 2 inches, internal, 1.50. Eggs, five in number, oval in form, dull gray in color, with spots of chocolate-brown thickly sprinkled over the whole surface.

HABITS.

The Titlarks make their appearance on the coast of New England in September; they come pouring in from the North in large flocks and frequent the barren, wind-swept hills which lie along the shore. These birds are very restless, never remaining long in one spot, and will seldom alight in masses but scatter along the beaches; sometimes a company of several hundred will spread over a quarter of a mile of shore, yet so prone are they to take flight that if a single individual becomes frightened enough to rise and sound its clear cry every bird in the flock will take alarm and instantly depart. They fly with an undulating motion, uttering a shrill double note. When once in air they seem to dislike to alight, for although they will frequently sweep downward and appear about to stop will often proceed for a mile or more without settling.

The Titlarks appear to subsist mainly upon insects, and I have observed them darting upwards from the ground to catch passing flies. They remain in New England until the middle of November, when they depart for the South. These birds are exceedingly abundant about Jacksonville, in Florida; here they frequent open fields along the river.

behaving much as when at the North, with the exception of being tamer. I have, while there, approached within a few feet of a flock without starting them. They occur in all sections of the state, even at Key West, but are not common much south of Jacksonville. In March the Titlarks leave Florida for the North, passing Massachusetts in April. They breed in Labrador and the fur countries.

ANTIUS PRATENSIS.

Meadow Pipet.

DESCRIPTION

Sp. Ch. Size, a little smaller than that of the American Titlark, and the form is similar. Color, Adult. Above, pale greenish brown with each feather having a distinct center of dark brown. Wings and tail dark reddish brown edged with greenish gray. Tail, dark brown with the feathers edged with greenish, and with the outer obliquely white for nearly half its length. Under parts brownish white tinged with greenish, with a maxillary line of spots which broaden out into a band on the breast, and extend along the sides.

OBSERVATIONS.

Known from the American Titlark by the more distinct spottings above, where the general color is more greenish, and by the greenish tinting beneath. Occurs in Europe. Accidental in Greenland.

DIMENSIONS.

Length, from 6.00 to 6.10; stretch, 9.25 to 9.50; wing, 3.00 to 3.25; tail, 5.50 to 2.75; bill, .45 to .50; tarsus, .70 to .75.

DESCRIPTION OF NESTS AND EGGS.

NESTS, placed on the ground composed of leaves, weed stalks, grass, etc. EGGS, five or six in number, oval in form, reddish brown in color, mottled thickly with darker brown. Dimensions, .78 by .58 to .80 by .60.

FAMILY ICTERIADAE CHATS.

Primaries, nine. Tail, about as long as the wings, moderately rounded, the outer feather being about .35 shorter than the middle. Wings, rounded, the third and fourth feathers being the longest. Bill, shorter than the head, without bristles at base, but the feathers nearly reach the large circular nostrils; the upper mandible is well curved, about as wide at its base as the bill is high, but contracts rapidly toward its tip. Feet, of moderate size; tarsus, fused into a continuous plate.

This family, of which some of the members have been placed by the older authors in the family of the Manikins, has of late been placed with the warblers with which to my mind it shows scarcely any affinity, therefore I have elevated the birds contained in it, to the rank of family.

GENUS ICTERIA. OLIVE AND YELLOW CHATS.

GEN. CII. Size, rather large. COLORS, olive above, yellow below. The tongue is pointed, rather fleshy and without cilia at tip. The oesophagus is without special dilatation, and merges into a proventriculus, which is provided with a zenular band of simple, oval glands and measures .30 wide. The duodenum is .50 long and encloses a short balloon-shaped pancreas, .50 by .22. The stomach is moderately muscular, with the walls .30 thick, and is lined with a hard rugose membrane. The intestines are 4.80 long to the coeca which are very small and adhere to the intestines for their entire length. The above dissection is based upon *I. virens*.

ICTERIA VIRENS.
Yellow-breasted Chat.

DESCRIPTION.

Sp. Ott. Size, large. Form, robust. COLOR. Adult male. Above, uniform olive green, with the tips of the feathers of the top of head obscurely tipped with dusky, and the tail is marked with numerous obscure bands of the same. Beneath, from base of lower mandible to middle of body, including under wing coverts, bright gamboge yellow. Lores, extending back beneath eye, black. Line from nostrils to eye, both eyelids and a short maxillary stripe and unmentioned parts beneath, white. Iris and feet brown. Bill, black. Females, similar, but with the head markings not as distinct. In winter both sexes are tinged with brown above and ochraceous beneath. Nestlings, with the wings and tail as in the adults, but the head is grayish, and the yellow below is much obscured with grayish, and the flanks are buff.

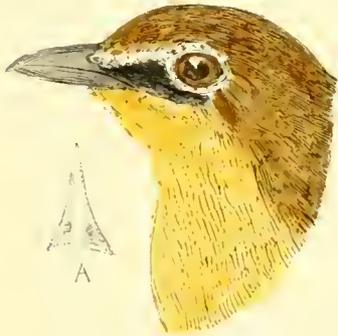


Fig. 104. Head of Yellow-breasted Chat in spring; A, upper mandible of same.

OBSERVATIONS.

Known at once by the peculiar form, olive above and yellow below. Breeds throughout Eastern United States north to Southern New England, locally as far as the neighborhood of Boston, Massachusetts, Ontario and Iowa; west to the edge of the Great Plains.

DIMENSIONS.

Length, from 7.10 to 7.35; stretch, 9.70 to 10.00; wing, 3.10 to 3.20; tail, 3.10 to 3.25; bill, .50 to .55; tarsus, .95 to 1.00.

DESCRIPTION OF NESTS AND EGGS.

NESTS, placed in trees and bushes, composed of leaves, coarse grass and plant stems, lined with finer material. EGGS, usually four, often three, rarely five in number, oval in form, inclined to be elliptical, glossy white in color, spotted and blotched with reddish brown and lilac, usually more thickly on the larger end, where the markings sometimes form a ring. Dimensions, .85 by .65 to .90 by .70.

HABITS.

As intimately under observations, the Yellow-breasted Chat was by the older authors up to Audubon's time, considered as a species of the large family of Manikins most of which are tropical species, and many of which are similarly strongly colored with black, yellow and white. While it is probable that this singular bird is not closely related to the Manikins, it is also clear to my mind that it should not be regarded as a member of the family of the American Warblers, for in no character, excepting in the very general ones of having nine primaries, does it exhibit any approach to them, and as is well known it possesses many habits which are quite at variance with all of them.

The first specimen of the Yellow-breasted Chat that I ever saw, I procured in the spring near my place in Newtonville nearly thirty-five years ago. It was perched on a small tree which overhung a little stream of water, and my attention was attracted to it by its singular song. I did not meet with another specimen until I found them not un-

common along the sides of the Alleghany Mountains at Williamsport, Pennsylvania, in

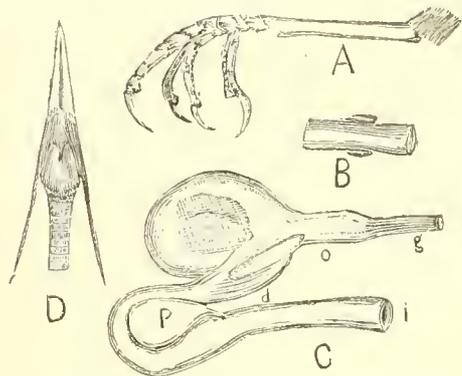


Fig. 105. Organs of Yellow-breasted Chat. A. foot; B. coeca; C. digestive organs; s. stomach; p. pancreas; d. duodenum; o. proventriculus; g. gullet; i. intestine; D. tongue. The spleen lies partly on the stomach.

May, 1876. Here the birds were in full song and were displaying the singular habit of dropping downward through the air, dancing about on the top of a bush with outstretched wings as they uttered their finely given melodious strains. When in company with my friend, Mr. C. W. Chamberlain at Scituate, Massachusetts, the first week in June, 1891, I observed a specimen of the Yellow-breasted Chat perched on the top of a bush. This bird soon began to sing and also entertained us with its odd aerial dance.

The distribution of this fine species in New England is rather local, thus they breed regularly in Southern Connecticut, about Lynn, Massachusetts and in Berkshire County those being its northern limits, but is rare and scattering south of these points.

FAMILY TROGLODYTIDAE. MOCKING BIRDS, THRUSHES, WRENS ETC.

Bill, usually long, with the upper mandible more or less curved. Tarsus, covered with several scales in front. First primary, well developed extending beyond the tips of the coverts. It is with some hesitation that I include the Mocking Birds and Thrushes in the same family as the Wrens; I have not however, sufficient material at hand at present to decide the matter quite to my satisfaction, therefore follow the more recent opinions upon the subject.

GENUS. MIMUS. THE MOCKING BIRDS.

GEN. CII. Bill, shorter than the head; straight, but with the tips of the upper mandible curved, and but slightly notched. The sternums differ from those of the thrushes proper in being broader, and in having a lower keel; the sternum being twice as broad as the keel is high. The marginal indentations are also shallower; being only as deep as one-third the length of the keel. Wings, a little shorter than the tail, which is unusually graduated. These characters are framed so as to include the Cat Bird, as I can find no features whereby this species can be separated generically from the true Mocking Bird, unless it be in color, but surely this slight difference must be considered as simple sub generic.

MIMUS POLYGLOTTUS.

Mocking Bird.

Mimus polyglottus Boie. Isis, Oct. 1826, 972.

DESCRIPTION.

SP. CII. Form, slender Tail, long. Bill, moderate, rather wide at base. Tarsus, distinctly scutellate. Sternum, strongly built. Tongue, rather deeply cleft, with the forked portion ciliated on the ends and outer sides. COLOR. Adult. Above, ashy. Wings, brown; base of all the primaries, their tips and edges, and tips of secondaries, wing coverts, and the entire spurious wing, white; the latter, however, has central stripes of brown. The white extends over more than half the length of the inner quill feathers, but is more

restricted on the outer. Tail, very dark brown; the outer feathers, pure white; the next two white on the tip, and for one-half the terminal length of the inner web. The next two are tipped with the same. Chin, white. Ring around the eye, a faint superciliary line, and the remainder of under parts, dirty white, more dusky on the flanks, breast and tibiae. The crown and ear coverts are sometimes streaked with dusky. The under tail coverts are generally tinged with pale buff. Bill and feet black, with the base of the under mandible brown. Irides, pale yellow. Young, similar, but with the white more restricted, and a reddish suffusion throughout. The flanks are streaked with dusky. Young, in the nestling plumage, has the breast streaked with dusky. The white edgings of the scapulars are also broader.

OBSERVATIONS.

There are no others with which this species can be confounded, excepting, perhaps, some of the West India forms. Specimens vary much in amount of white on the tail; one, from Key West, has all the feathers of the tail tipped with it. Specimens from this place, evidently constant residents upon the key, are generally of much smaller size than those from further north. They are, however, not darker than those taken about Jacksonville. Occurs as a constant resident throughout the United States to Southern New England, Iowa, and Northern Wyoming, rarely as far north as Boston, Massachusetts. Probably rare in Cuba.

DIMENSIONS.

Average measurements of thirty-seven specimens from Florida. Length, 9.77; stretch, 13.32; wing, 4.16; tail, 5.53; bill, .72; tarsus, 1.19. Longest specimen, 10.20; greatest extent of wings, 14.25; greatest length of wing, 4.69; of tail, 5.66; of bill, .81; of tarsus, 1.65. Shortest specimen, 9.00; smallest stretch of wings, 12.80; shortest wing, 3.20; tail, 3.50; bill, .60; tarsus, 1.00.

DESCRIPTION OF NESTS AND EGGS.

NESTS, composed outwardly of twigs and weeds; lined with fibrous roots. One which I now have before me, that was collected at Dunn's Lake, by Mr. Burton, is composed outwardly of dried everlasting (*Antennaria*) and smoothly lined with horse-hair, fibrous roots and cotton. There is also a piece of blue cotton cord woven into the structure. It is rather shallow. Dimensions. External diameter, 6 inches; internal, 3.50 inches. External depth, 2 inches; internal, 1.50 inches. EGGS, usually five in number; pale greenish blue, spotted and blotched irregularly with amber, of varying shades, and pale lilac. These spots are usually accumulated more thickly at the larger end, and sometimes cover it completely. Dimensions, from .94 by .73 to 1.00 by .74.

HABITS.

The Mocking Bird, like the Robin, seems to have acquired a love for the habitations of man. This peculiarity is perhaps due in a measure to the projection which such localities afford against various natural enemies. Not only because hawks, wild cats, opossums and other animals are apt to avoid the presence of mankind, but as the country is open about plantations it enables the birds to perceive more readily the approach of any intending disturber of their peace. I think it probable that before the land was inhabited they avoided the thickly wooded sections, for the few that are found in the wilds of Florida live in little isolated hammocks and clumps of bushes that grow in the open pine barrens. The security afforded them by civilization must have tended to concentrate them, or has caused them to increase rapidly, for they are very abundant in the vicinity of plantations and towns, and comparatively few are found away from them. For example, there were hundreds on the inhabited section of Key West, while but few were to be seen on the other portions of the island, or on keys which were not settled.

One reason for their abundance at Key West may have been owing to the plentiful supply of the edible fruit of a species of prickly pear (*Opuntia ficus-indica*) on which they feed. This plant grows abundantly all over the richer portions of the key, but in one section there was a space containing several acres, which had been cleared from trees and bushes, which was so completely covered with them that it was impossible for any large animal to pass through it. Some of the caeti in this were of an immense size, being over ten feet in height, and nearly all the flat leaf-like stalks bore several of the pear-shaped fruit, from which this cactus derives its name. These are ripe during the latter part of November, when they become bright scarlet; then they are very juicy, and of an agreeable acid flavor. The outer skin must be carefully removed, however, before attempting to eat them, as it is nearly covered with long, slender spines that grow in bunches, and which readily enter the flesh when brought in contact with it. They are barbed, and therefore exceedingly difficult to remove when once fixed. The Mocking Birds visit this place in large numbers, when the fruit becomes dead ripe, and avoiding the spines by pecking a hole in the upper end, which is free from them, greedily devour the contents. The juice is bright vermilion, and not only stains their bills, heads, and throats, but those which I dissected, that had been feeding on the pears, had the stomachs and intestines completely dyed by it.

These birds are quite capricious in their way, and not only eat prickly pears, but feed upon oranges, the berries of the palmetto, and other small fruits. They also eat worms, beetles, flies, and the larvae of other insects. I have found the stomach of a single individual crammed with nearly all these articles of food, with the addition of a tonic in the shape of small pebbles or pieces of shells. On account of this changeable diet it is difficult to make specimens, taken when adult, live in confinement; they must be captured when quite young, and thus become accustomed to such food as can be readily procured for them. When they are brought north, however, the change of climate destroys a great many; but they are more easily kept in the south, and nearly every one who has a taste for pets possesses one or more. I visited a museum at Savannah, Georgia, in which living animals were exhibited; and where among other attractions was an immense cage in which were many species of small birds, including several Mocking Birds, one of which behaved in a very odd manner. It would fly violently at my hand when I placed it against the bars of the cage, twittering angrily, and would not be satisfied until I withdrew it. It paid no attention to the keeper, however, who informed us that it always assailed strangers in this way. Individuals in a state of nature also appear to have eccentric habits; I knew one that had taken a fancy to perch on the top of an old stub, and which was always found there at certain times during the day. If driven away it would return when we had moved to a little distance. Indeed it seems to be a general habit with this species to perch on some elevated situation; in this they resemble the Shrikes, and their method of flight is similar, being slow but steady.

The breeding season in Florida is about the first of April, but the young were barely hatched at Williamton, North Carolina, in the last week in May. In Florida the nests are usually placed in orange trees within a few feet of the ground, and often quite near

dwellings. Indeed I once found one within five yards of an inhabited negro shanty. The birds would alight upon the tree without the slightest apparent fear, although I stood at the foot of it; in fact I have always found this species unsuspecting when in the vicinity of habitations, but in the wilder sections they are shy, and extremely difficult to approach.

Contrary to the usual habits of birds I have never known these to sing their full song previous to the season of incubation. In winter they are generally silent, having only some harsh alarm notes; but as spring advances they commence a low sputtering song, as if they had not yet acquired sufficient energy to render it loud and clear. I heard them singing in this manner at Jacksonville, while they were building their nests, and for a long time was under the impression that the Mocking Birds of Florida could not sing as well as those from Virginia. I frequently questioned the inhabitants about this peculiarity, when they always informed me that the birds could sing very finely, and were indignant when I told them that I had heard better songs from caged birds at the north. I was not undeceived upon this point until I visited Lake Harney, in the latter part of May, 1872. We had crossed the portage from Indian River, where these birds are not very common during the breeding season, and had arrived at Lake Harney after dark. We pitched our tents by the side of a palmetto grove, and retiring slept soundly after our fatiguing journey, but we were awakened in the morning by what seemed a perfect concert of bird voices, which, as they came from one point, we knew must be produced by a single individual; but it was not until I had satisfied myself by actual inspection that I would believe it to be a Mocking Bird; and when we perceived it was so we paused in amazement to listen. The clear, mellow whistle of the Red Bird, the garrulous notes of the Jay, the continuous warble of the Great Carolina Wren, Bob White's abrupt call, the low but lovely song of the Pine-wood Finch, followed by the harsh scream of the Hawk, were all mingled, without system, with strains of his own, and those of many other birds, but in such a manner, and were given with such power, that the effect was surpassingly fine. He had even caught the Bobolink's fragmentary attempts, which it first practices while passing northward, and incorporated this into his lay, in the right place and with charming exactness. He not only mimicked other birds but excelled them, and after we had heard him their individual efforts seemed quite tame and spiritless. The bird seemed unconscious of his merits, for he sat carelessly on a tree top, occasionally pausing in the midst of it all to arrange his feathers, or he would fly from place to place without interrupting his musical carol. There were several in the vicinity, and they were all in full song, so there was scarcely any time during the day, though the heat was excessive, that we did not hear at least one of them. After these repeated cantatas we could no longer doubt the vocal superiority of the Florida Mocking Birds, for we had never before listened to such melody from feathered throats, and it became evident that all other of our native species must yield the palm to this, the King of Song. The Inagua Mocking Bird, *M. elegans* and the Jamaica Mocking Bird, *M. orpheus*, both sing as well as ours and imitate songs of other birds, but the Bahama Mocking Bird, *M. bahamensis*, as far as my experience shows, although a fine singer, never attempts to imitate the melodies of other species. I have seen the Mocking Bird a number of times in Eastern Massachusetts on two or three occasions in winter.

MIMUS CAROLINENSIS**Cat Bird.***Mimus carolinensis* Gray, Genera, 1844-49.

DESCRIPTION.

Sp. CII. Form, rather slender. Bill, slender, gently curved. Scutella on anterior tarsi in adult specimens fused into a continuous plate. Sternum, rather weaker than that of the preceding species, in comparison to its size, but of the same relative proportions. COLOR. Adult. Prevailing color, dark plumbeous, lighter beneath. Crown, nape, and upper part of tail, sooty black; the outer edges of the latter are edged with plumbeous. Quills and secondaries, very dark brown, also edged with plumbeous. Under tail coverts, chestnut. Bill, black. Iris and feet, brown. Young, similar to the adult, with the crown lighter, especially at the base of bill. The under tail coverts are streaked with ashy. Sexes, similar in all stages. Young in the nestling plumage, every way paler, especially the chestnut of the under tail coverts. There is also a tinge of reddish on the upper wing coverts.



Fig. 106. Head of adult Cat Bird.

OBSERVATIONS.

This well known species may be readily distinguished from all others by the above descriptions. Specimens from Key West are not only smaller in size, but much darker in color, the top of the head being entirely black. Bahama specimens agree more nearly with northern birds than with those from Florida. (See Appendix). Found during the breeding season throughout Eastern North America; winters from the Carolinas to Florida, and from Indian Territory to Southern Central America. Common on the Bahamas at this season of the year, and occasional in Cuba.

DIMENSIONS.

Average measurements of nine specimens from New England. Length, 8.91; stretch, 11.73; wing, 3.49; tail, 3.82; bill, .63; tarsus, 1.07. Longest specimen, 9.35; greatest stretch of wings, 12.00; greatest length of wing, 3.82; of tail, 4.00; of bill, .65; of tarsus, 1.10. Shortest specimen, 8.45; smallest stretch of wings, 11.26; shortest wing, 3.50; tail, 3.60; bill, .60; tarsus, 1.05.

DESCRIPTION OF NESTS AND EGGS.

NESTS, composed of leaves, grape-vine bark and weeds, lined with fine roots. Dimensions. External diameter, 6 inches; internal, 3.50 inches. External depth, 3.50 inches; internal, 2 inches. Eggs, four or five in number, rather pointed, and deep green in color. Dimensions, from .90 by .60 to .95 by .75.

HABITS.

Nearly every one in the eastern section of the United States is familiar with this species; and it is one, among a few, that is known by the same name throughout that portion of the country in which it occurs. This is owing solely to a peculiar alarm note, which bears a strong resemblance to the mewling of a cat. This sound is only emitted when the bird perceives an enemy; then, if it does not apprehend much danger, the mew is given quite plaintively; while it hops from bough to bough, and peers through the bushes in an inquisitive manner. But, if it thinks its eggs or young are in peril, it loses

its quiet demeanor, and flits rapidly around the disturber; then, if he approaches too near the nest, it dashes into his very face, uttering the alarm note in a quick nervous manner, occasionally raising it to a sudden scream of rage, or now and then giving an angry cackle. It persists in these frantic efforts to repel the invader until he leaves the locality. This feline-like note is not very agreeable to the ear, but the song is quite lively and pleasant. It is somewhat hurried, and consists of a series of rather inaccurate imitations of the songs of the Robin, Blue Bird, and of a few other species, mingled harmoniously with some finer snatches of its own. While singing, the bird is perched in some elevated situation, and, as it renders some of the more difficult parts, the wings are fluttered, the head thrown back, and the bird gives undivided attention to its lay; but during other measures of the song it often hops from place to place, in a careless, though restless manner.

It sings well in confinement, and I knew of one, that was kept by a friend, which particularly excelled in this respect. It was very tame, seeming to enjoy the caresses of the various members of the family, and lived a long and contented life; but at last met its fate in a singular manner, for a bird. It possessed an immoderate liking for mince-pie and ate all that was presented to it; but unfortunately this unnatural food did not agree with it, for if it took a large quantity it would almost immediately be thrown into convulsions; therefore it was seldom indulged in this luxury. But one day it escaped from its cage, when no one was by, and finding one of its favorite pies upon a table, ate its fill. When its owner entered the room it was insensible, and as all efforts to restore it to consciousness failed it soon died, falling a victim to its appetite.

The Cat Bird is in full song just before the season of incubation and continues to sing while the female is setting. The time for nesting, in New England, is about the first week in June, and by the middle of July the young are fully fledged. The situation chosen for a summer home is usually some thicket by the side of fence rows, often at no great distance from a dwelling. The nest is commonly placed in a barberry bush, but a few feet above the ground. After rearing its young, it retires to the swamps to moult. This occurs during the latter part of July, and about the second week in October it takes its departure for the South. I found it very abundant at Key West in the first part of November after which the majority disappeared. At this time it moved in large flocks, and fed, with the preceding species, on the fruit of the prickly pear. It did not, however, subsist wholly upon this food, but varied its diet by eating insects. It lives entirely upon insectivorous food from the time of its arrival in New England, May 1st, until July; after which it eats greedily of the smaller fruits; but as the beetles, larvae of the lepidoptera, etc., destroyed by it, earlier in the season, are generally injurious to vegetation, we may justly pardon it if it does help itself liberally to our cherries and strawberries. This poor bird, however, has a bad reputation among farmers, owing partly to its annoying note, and partly to its supposed propensity to dine upon the eggs of other birds. Of this latter charge it is innocent, and, moreover, as we have shown, does a great deal of good and if it were to be banished from the land the husbandman would find his crops far lighter when

the time for harvest came. I have found the Cat Birds common on New Providence when I first visited that island in January, 1884. At this time they had no song, but had all of the other characteristic notes. On March 8th a few began to sing, but not the full melody as heard in New England, the lay being shorter with lower notes. Upon visiting Andros in April, however, I then heard the full song, but singularly the birds uttered it while concealed in the thick scrub. About the 17th of the month all disappeared. In November, 1887, I found them common at Middle Bright, Andros, and again on New Providence in April, 1893, but saw none on Inagua in February, 1888, yet there were a few on Cayman Brae from April 17th to the 28th of this year. Here they did not sing, however.

GENUS. HARPORHYNCHUS. THE CURVED-BILL THRASHERS.

GEN. CH. Bill longer than the head, with both mandibles more or less curved. The sternum differs from that of the Minus in having the coracoid bones proportionately longer, and the marginal indentations proportionately deeper.

HARPORHYNCHUS RUFUS.

Brown Thrasher.

Harporynchus rufus Cabanis, Mus. Hein., 1851, 82.

DESCRIPTION.

SP. CH. Size, large. Tail, long and somewhat graduate. Bill, but little longer than the head, not slender; both mandibles slightly arched, and with the upper considerably curved at the tip. Tongue, rather straight, being but little narrower at the tip than in the middle: the end is slightly rounded: in some specimens minutely cleft, and always fringed on the tip. Sternum, quite stoutly built.

COLOR. Adult in spring. Above, uniform bright rufous; darkest on the rump and lower part of the back, but becoming lighter on the crown, while the forehead has a bleached appearance. Beneath, rather dirty white; with the breast, sides of the throat, and sides and flanks, covered with triangular spots of dark brown, becoming rufous on the sides of the upper parts of the breast: they are generally smaller and more numerous on these parts than on others. There is a tinge of buff on the breast, flanks, and under tail coverts. The sides of the neck, the lores, and ear coverts are ashy, streaked with dusky. The upper parts of the wings are like the back, excepting the inner webs of the secondaries and primaries, which are dusky; this color becomes darker on the outer quills. The two rows of coverts are tipped with white, which is narrowly preceded by black, forming two bars. The spurious wings are dusky, edged with white on the lower sides. The under portions of the wings are pinkish, excepting the terminal portions of the outer primaries, which are dusky. Axillaries and under wing coverts, pale buff; the latter are spotted with brown. The upper part of the tail is like the back, with two or three of the outer feathers narrowly tipped with yellowish white. One specimen, now before me, has a single small spot of brown on the center of each of the outer feathers, just above the white of the tips. Bill, dark brown; lighter at the base of the lower mandible. Feet, brown. Irides, orange yellow. In autumn the colors above are deeper and more uniform; there is also a more reddish suffusion beneath. Young, differs from the adult in being much deeper colored above, and in having a generally rufous suffusion beneath, especially on the breast. The tertiaries are tipped with white, which is preceded by a dusky band. The secondaries are also narrowly edged with whitish. The yellowish white of the tips of the tail is not as restricted and extends over more feathers. Nestling plumage, differs from the adult in being paler, especially on the rump. The feathers of the middle of the back and lesser wing coverts show darker centers. The spots on the back are narrower and darker. The irides are yellowish white.

OBSERVATIONS.

This species differs from all others, in the bright rufous color of the back. It is distributed throughout the Eastern United States during the breeding season, excepting perhaps the more Northern portions. Winters in the Southern States.

DIMENSIONS.

Average measurements of twelve specimens. Length, 11.24; stretch, 13.28; wing, 4.02; tail, 4.86; bill, 1.00; tarsus, 1.39. Longest specimen, 11.72; greatest extent of wings, 14.60; greatest length of wing, 4.25; of tail, 4.89; of bill, 1.05; of tarsus, 1.40. Shortest specimen, 10.30; smallest extent of wings, 13.25; smallest length of wing, 3.15; of tail, 4.40; of bill, .95; of tarsus, 1.10.

DESCRIPTION OF NESTS AND EGGS.

NESTS, composed outwardly of dried leaves, weeds and roots, lined with not very fine roots. They are of moderate depth, and well proportioned to the size of the birds. Dimensions. External diameter, 5 inches; internal, 3 inches. External depth, 3 inches; internal, 1.50 inches. EGGS, four or five in number, pale blue in color, spotted and dotted everywhere with reddish brown. These spots cluster on the larger end, and in some specimens they form rings around it, of varying diameters. Form, generally, rather elliptical. Dimensions, from 1.00 by .75 to 1.10 by .80.

HABITS.

At the commencement of my first campaign in Florida, in December, 1868, we had pitched our tent in the pine barrens, about three miles south of Jacksonville. It was a very pretty spot. To the northward was an immense plain, covered with a verdant carpet, from which rose the huge, brown trunks of innumerable pine trees, crowned with dark green foliage. An isolated magnolia stood near us, just to the southward, with its glossy leaves brought into fine relief by a drapery of Spanish moss. Beyond this rose abruptly a hammock, composed of live oaks, sweet gum, bay, black walnut, and various other trees, beneath which, especially on the margin, was a luxuriant growth of high saw palmettos, mingled with shrubs. The whole was covered and interwoven with a tangled mass of vines.

This dense thicket was literally filled with birds, and we were awakened in the morning by the numerous sounds which issued from it. We could distinguish the whistle of the Towhee, the chirp of the Cardinal, the faint lisp of the Gnatcatcher, the enchanting song of the Great Carolina Wren, and the notes of many other species, coming to our ears in the wildest confusion, and forming a complete medley. But prominent among them all we could hear the peculiar utterance of the Brown Thrashers. They have a singular note, apparently half a hiss and half a whistle, which is given at sunrise and sunset, throughout the autumn and winter. Judging by the noise I should think there were twenty or more of these birds in the hammock; but they were shy, and took care not to show themselves. Indeed, I have always found them hard to approach anywhere in Florida, making it difficult to procure specimens, although they are quite abundant throughout the northern portions of the interior. They invariably inhabit the almost impenetrable underbrush while in the State.

They migrate northward about April 1st, arriving in New England the first of May, where they frequent the edges of woods and clumps of bushes which grow along the fence rows and waste places. The males begin to sing as soon as they arrive. They may be seen perched in elevated situations, every morning and evening, and sometimes through-

out the day, pouring forth their most delightful strains. The song consists of imitations of the notes of other species, which, although given with deliberation, are energetic, and generally quite accurately rendered. He contents himself with practising but a few lays, among which those of the Robin and the Bobolink are the best. These melodies are so ingeniously arranged with some fine ones of his own, and given with such spirit, that the whole forms a harmony which can scarcely be surpassed by any of our native species. The performer is very calm when he sings, only ruffling his feathers slightly, and occasionally fluttering his wings, forming a striking contrast in this respect with the nervous and restless manner of the Cat Bird.

There seems to be a preference existing among them for certain perches. I have seen quite a combat ensue before one which occupied a particular tree would yield his place to an opposer, who finally won, and, hopping about the disputed bough, sang triumphantly, while the disposed bird, without being in the least disconcerted by the affair, answered from a neighboring tree.

They continue to sing from their arrival until the conclusion of the season of incubation. These birds build among the low bushes, placing their nests upon the ground or near it, without the slightest attempt at concealment. They are very assiduous in defending their eggs and young, and are not at all shy at this time, especially the female, which will permit one to approach within a few feet of her, when she is setting. They have a loud alarm note, and if disturbed, when breeding, will sound it with such energy as to call many feathered friends to their assistance. The young are fully fledged by the first of July, and moult, with the adults, during the first of August. At this time the young follow their parents, and the party will return every night to roost near the spot where the nest was placed. About the middle of September they collect into larger flocks, and by the first of October nearly all have passed into the south; I have, however, met with stragglers in Massachusetts as late as the first of December.

The Brown Thrashers are in no way injurious to the husbandman, but on the contrary, do much good by devouring many noxious insects; therefore if we do not extend our protection to them on account of their fine songs, we must certainly acknowledge their general usefulness, and not allow them to be wantonly destroyed.

GENUS. TROGLODYTES. THE WRENS PROPER.

GEN. CH. Both mandibles of bill, more or less arched. Sternum, wide, but with the keel low, not being higher than one-half the width of the sternum. Coracoid bones, fully as long as the top of the keel. Wings, short. Tail moderate and considerably rounded. Feet, of moderate size. Tarsus, about equal in length to the middle toe and claw. Hind toe and claw, considerably shorter than the middle toe and claw. No white spots or streaks on the back.

The characters used by authors in separating the genera *Thriothorus* and *Troglodytes* are so slight, that it appears to me scarcely consistent to raise the species, usually placed in the former named to a generic rank. Therefore, I have included them in *Troglodytes*, for after carefully examining a large series of specimens, I find that there is no more difference between members of the two genera, than often exists among species in the same genus.

TROGLODYTES LUDOVICIANUS.

Great Carolina Wren.

Troglodytes ludovicianus Litch., Verzeichniss der Doubletten des Zoolog, 1932, 38.

DESCRIPTION.

SP. CN. Form, rather robust. Size, moderate. Tail, about the length of the wings. Bill, not very slender, and as long as the head, with the upper mandible a little curved and slightly notched. Sternum, quite stoutly built, with the keel very low. Tongue, thin and horny, long and linear, with the end divided or broken into irregular points.

COLOR. Adult. Above, dark reddish brown, brightest on the rump but becoming blackish on the head. Wings, brown, barred on the outer webs with the same color as the back, which becomes lighter on the first quills. Tail, like the back, barred with dusky. There are concealed white spots on the rump near the ends of the feathers. There are also some concealed spots of yellowish white on the middle and ends of the feathers of the back of the neck. A superciliary line of buff extends from the base of the bill along the sides of the neck, edged above with black. Beneath, yellowish rusty; darkest on the flanks. Throat, white. Under tail coverts, barred with dusky. There is also an indication of dusky bars on the flanks. Under surface of wings glaucous. Lower side of tail, like the back, but with a glaucous suffusion. Under wing coverts, yellowish, barred with dusky. There is a whitish patch on the lower side of the ear coverts, and a few dusky spots on the neck back of it. Young, similar, but with the upper wing coverts spotted with white. The dusky bars on the flanks are quite conspicuous, and sometimes extend along the sides. There are also more spots back of the ear coverts. Sexes, alike. Irides, brown. Bill, brown, lighter at the base of the lower mandible. Feet and tarsi brown. Nestlings, taken when scarcely fledged, exhibit very little difference in coloration. The under parts are perhaps a little more rufous.

OBSERVATIONS.

This species is readily distinguished from the *T. bewickii* by the rufous under parts. Habitat is throughout Eastern United States, from about latitude 41 degrees, south to the gulf, excepting Southern Florida. They winter in the more southern sections.

DIMENSIONS.

Length, from 5.10 to 5.40; stretch, 6.80 to 7.15; wing, 2.10 to 2.25; tail, 2.15 to 2.35; bill, .50 to .55; tarsus, .65 to .70.

DESCRIPTION OF NESTS AND EGGS.

NESTS, composed outwardly of the fibrous substance which grows at the base of palmetto fronds, leaves or sticks, lined with fine fibers. It is usually built in the form of a hollow ball, with a hole in the side. Dimensions: external diameter, 4 inches; internal, 2.50 inches. Eggs, usually six in number, rather oval in form, creamy white in color, spotted and blotched irregularly with reddish brown and lilac. These spots vary greatly in number even in the same nest. For instance, one of a set which I have in my collection is covered so thickly that the ground color is nearly obscured, and the longer end is so thickly blotched as to look like a washing of reddish brown and lilac, while there is another egg of the same lot, which is comparatively clear. The spots also show a tendency to cluster on some specimens and form rings around the larger ends. Dimensions, .74 by .56 to .80 by .60.

HABITS.

The Great Carolina Wrens are birds of retiring habits, in fact they may be called shy, for, upon the approach of man, they instantly hide themselves in the thick undergrowth of the hammocks which they frequent, but if one stands quietly near their place of con-

cealment for a few moments he will hear a series of low notes and presently a Wren will be seen peering cautiously out from among the leaves; then another will appear, for they are usually found in pairs. They will not venture into open view, however, but will hop quickly about with their upraised tails which they will occasionally jerk in a nervous manner; then, upon the slightest movement indicative of danger will plunge at once into the cover, uttering a querulous cry, which they continue as long as the supposed enemy keeps at a little distance but, upon his near approach, the birds will become quiet and endeavor to escape from the immediate neighborhood without showing themselves; this they generally accomplish with such skill that the observer wonders what has become of them. I have frequently seen these wrens in isolated bushes and, after seeing them vanish, have beat about the place where they disappeared, then through it without starting them, afterwards finding that the wily birds had escaped by running with great rapidity beneath the grass and weeds to the next thicket. Even while resting it is difficult to find them, for although the female is setting, she will generally manage to fly from the nest so quickly as not to be visible, for she takes care to place every available obstacle between herself and the object from which she wishes to escape. I have found several nests yet have never succeeded in surprising the birds near them; but although such has been my experience, one of my companions, Mr. C. A. Thurston, was enabled, by using extreme caution, to capture one on the nest which was built in the top of a stump but a few feet from the ground. I know of no birds which are more variable in selecting places in which to build their nests. The usual situations chosen by the wrens on Indian River were at the bottoms of the "boots" of the palmettoes. The "boot" is the base of the dead leaf stalks which adhere to the tree after the top has decayed and fallen off, they are quite broad, slightly concave, and extend upward in an oblique direction leaving a space between them and the trunk; the fronds in falling often cover the top with a fibrous debris which is impervious to water and the cavities beneath form a snug nesting place for the Carolina Wrens. Many more nests will be found in these situations than elsewhere, especially in the wilderness; but I once found one built between two palmetto leaves which had dropped over in such a position that their surfaces were horizontal and only three or four inches apart, forming a floor as well as a roof for the home of the Wrens. They had conveyed a large amount of suitable material into this place and formed a cozy domicile. The fronds were swayed by every passing breeze, yet in such a manner as not to injure the structure which was between them.

I have spoken of an instance of their building in a stump which appears to be a somewhat common practice; they will also breed in holes of trees; one nest which came under my notice was placed in the fork of an orange tree, but a few rods from an inhabited dwelling; they will also take up an abode in buildings, and Capt. Dummett assured me that two or three pairs inhabited his boat house, which was placed over the water, every season. I have known of the eggs being taken from the interior of a barn, the birds having found entrance through a knot hole.

This species begin to breed about the first of April and continue until June, rearing

two or three broods. They are exceedingly sensitive about being disturbed at this season and I have frequently found nests that were being completed but, upon visiting them again, would invariably find that the birds had abandoned them. It will be seen by the examples given that the Great Carolina Wrens possess sufficient reason to avail themselves of surrounding circumstances when they wish to build, even turning the habitations of man to account. But what particularly distinguishes these birds from many others is their loud and cheery song; perched on slightly elevated position they will pour forth such clear and thrilling lays that the most careless observer will pause to listen and admire their power. There are no birds which excel them in the frequency in which this melody is given; from early morning until late at night they may be heard singing. Seasons as well as time are utterly disregarded by them, for their harmonious strains are given with as much earnestness in December as during the breeding time. The remembrance of the melodies ever bring to my mind pleasant visions of dark green foliage and the rustling palm leaves which grow so luxuriantly in this land; for we were always greeted by these birds whenever we pitched our tents by the side of a hammock or thicket, and I think no one, who has heard them as often as I have, will hesitate to place the Great Carolina Wren among the finest song birds of Florida.

Troglodytes ludovicianus miamensis.

Florida Wren.

DESCRIPTION.

Sub Sp. Un. Size, slightly larger than that of the typical Carolina Wren and the bill and feet are larger with the color deeper, especially below, where it is of a rich, nearly uniform, brownish red.

OBSERVATIONS.

This interesting sub species, remarkable for its limited distribution, being confined to extreme Southern Florida, was described a few years ago by Mr. Ridgeway.

DIMENSIONS.

Length, from 5.30 to 5.80; stretch, 7.08 to 7.25; wing, 2.25 to 2.35; tail, 2.25 to 2.60; bill, .75 to .80; tarsus, .50 to .55.

HABITS.

I found the Florida Wren quite common on the Miami River and in its vicinity in the winter and spring of 1876. The song appears to differ somewhat from that of the more northern form. I find that I have recorded that I heard them uttering curious guttural notes, and that the regular song consisted of a continuous strain of rapidly repeated notes, yet no two wrens sing exactly alike. They were very inquisitive and would generally come out of the thick bushes, into what they plunge when approached, to peer at the passer by. But they show themselves for a moment only and again disappear. I have seen them scratch on the ground after the manner of the thrushes. They appear to prefer as a dwelling place the low places that are covered with a thick growth of vines, etc. Mr. H. W. Henshaw called my attention to a deserted nest of a Florida Wren which

was placed in a niche of a wall of the old stone barracks of Miami, and this was the only nest of the Florida Wren that I ever saw.

TROGLODYTES BEWICKII.

Bewick's Wren.

DESCRIPTION.

SP. CH. Size, medium. Form, rather slender. Tail, larger than the wings. COLOR. Adult. Above, dark reddish brown, paler on the rump and central tail feathers, and slightly tinged with gray, distinctly banded everywhere with dusky. Beneath, whitish, tinged with plumbeous, becoming brown on flanks, which are banded behind with dusky. Wings, and tail dark brown, the central feathers banded with dusky, the outer with grayish white at tip. Iris, brown, bill, black, bluish at base of under mandible. Feet, brown.

OBSERVATIONS.

Distinguished at once from all of our wrens by the white under parts but more particularly by the grayish white bandings, to the tips of the outer tail feathers. Breeds throughout Eastern United States north to New York, especially in the Atlantic States, but locally distributed more common in the interior. Winters in some of the Southern States but chiefly in the interior.

DIMENSIONS.

Length, from 5.10 to 5.40; stretch, 6.90 to 7.15; wing, 2.10 to 2.25; tail, 2.15 to 2.35; bill, .52 to .55; tarsus, .68 to .72.

DESCRIPTION OF NESTS AND EGGS.

NESTS, placed in deserted woodpeckers' holes, natural cavities in trees and roots, rocks and about buildings, composed of sticks, rootlets, grasses, etc., loosely arranged and lined with hair, downy feathers, and other soft substances. EGGS, from seven to nine in number, oval in form, white in color, speckled and dotted with reddish brown of varying shades, and purple, usually more thickly around the larger end. Dimensions .50 by .66 to .52 by .68.

HABITS.

Bewickii Wren is a rather rare inhabitant of the states along the Atlantic sea board, but is sometimes locally common in the interior. In some habits it more nearly resembles the House Wren than the Great Carolina Wren, but in song it agrees more nearly with the latter named species. It builds its nest in holes and cavities of all descriptions, and Mr. August Koch pointed out a nook in one of his buildings which had been occupied by the same pair or their descendants for many years. These wrens make their appearance in Williamsport, Pennsylvania, late in May and depart the last week in August.

TROGLODYTES AEDON.

House Wren.

Troglodytes aedon Vieillot, Orn. Am. Sept. II, 1807, 32.

Troglodytes americanus Audubon, Orn. Biog. II, 1834, 452.

DESCRIPTION.

SP. CH. Form, not slender. Size, quite small. Bill, tapering, slightly curved at the end, not notched, shorter than the head. Sternum not stentily built; proportionately narrower than in the preceding, but with the keel higher. Tongue, thin, horny and acuminate, with the end, in adult specimens, broken into irregu-

lar points or coarse cilia, in young birds, however, it is more regular in form, there being four points, two long ones in the middle and two shorter ones at each side, which commence farther down on the tongue than the others and terminate at their base, forming a rounded or graduated end.

COLOR. Adult. Above, dark reddish brown; lightest on the rump and darkest on the head where the feathers usually show darker centers. Wings, above, dark brown, band on the outer webs, with the same color as the back, which becomes lighter on the first quills. Tail, like the rump but barred with dusky. Beneath, dirty white, with the breast and flanks tinged with brownish which becomes quite rufous on the latter. The flanks, breast and sides are usually somewhat obscurely barred. Under tail coverts, white, barred with rufous and black. Under surface of wings, glaucous. Under wing coverts, pale buff. Under part of tail, paler than the upper, otherwise similar. Ear coverts, mixed with whitish. In autumn there is a more rufous suffusion beneath and the whole head is darker. Young, similar, but with the wing coverts spotted with white. In this stage there is sometimes a white superciliary stripe. Sexes, alike. Neck, brown. Bill, brown lighter at the basal portion of the under mandible. Tarsi and feet brown.

OBSERVATIONS.

This is an extremely variable species in shading and coloration. The middle of the back is frequently barred, but in a specimen from Florida, which I collected during winter, there are conspicuous dark traverse lines from the forehead to the end of the tail, while the feathers of the breast, sides, abdomen and flanks are crossed with fine wavy lines of dark brown. The throat is washed with reddish brown and the whole breast is very dark. I have specimens running from this through every gradation of shading and marking to a very pale specimen, also from Florida, where the bars on the body are so nearly obsolete as to be only just perceptible on the middle of the back and flanks. I have elsewhere (*Naturalists' Guide*, p. 95, 96, 97) proved conclusively that the americanus of Audobon was only a darker type of aedon. The House Wren differs from *T. hyemalis* in being larger, darker, and in having the sides of the neck unspotted. The flanks and abdomen of *hyemalis* are also more deeply barred with black. Habitat throughout the entire United States and probably through Mexico.

DIMENSIONS.

Average measurements of 50 specimens from Florida and New England. Length, 4.80; stretch, 6.25; wing, 2.08; tail, 1.62; bill, .49; tarsus, .60. Longest specimen, 5.65; greatest extent of wings, 7.00; longest wing, 2.90; tail, 2.40; bill, .60; tarsus, .75. Shortest specimen, 4.30; smallest extent of wings, 6.10; shortest wing, 1.70; tail, 1.30; bill, .40; tarsus, .50.

DESCRIPTION OF NESTS AND EGGS.

NESTS. built in holes of trees or in bird boxes. Composed of pieces of grape-vine bark, sticks and weeds which usually completely fill the cavity in which it is placed, leaving a hole in the center which is thickly lined with feathers or fine strips of bark. Dimensions. The external diameter varies with the space which contains the nest; one which I have before me, that was collected for me by Mr. Ruthven Dean, measures about four inches externally and two internally. Eggs, usually rather oval in form, pinkish white in color, thickly dotted with reddish brown. These minute spots sometimes become confluent and cover the entire surface with a deep washing of the same color. The larger ends of such specimens are very apt to be darker than the remainder of the egg. I am indebted to Messrs. Deane and Brewster for the privilege of examining the large series of eggs of this species which they have in their cabinets.

HABITS.

One can scarcely pass a thicket throughout the entire extent of Florida from Key West to the northern limits of the state, whether on the borders of the hammock or in the vast pine barrens, without exciting the ire of the irascible House Wrens. They will suddenly start up at the feet of the pedestrian and, alighting on a log or bush, scold him

angrily ; but if the birds think they are in danger, will quickly disappear, then it requires rapid and thorough beating to make them rise. There are many thickets on the mainland which are so impenetrable that birds are perfectly safe from intruders yet on the keys they are particularly favored in this respect, for there the various species of cacti form an excellent cover for them. These plants are armed with many long spines which present a formidable barrier against the invasion of man or any large animal. Thus in Florida we find this wren keeping apart from mankind and his ways, but in New England they usually pursue a different course. Here they associate with human beings, building their nests in boxes erected for them, and even if these tiny edifices are placed in close proximity to the busy thoroughfare the birds may be seen perched on their roofs, singing their unceasing melodies. The House Wrens will occasionally select a hole in a tree as a breeding place; even in the North I observed a pair several times about an old apple tree which stood in a remote place and, being aware that they had a nest there, made repeated search for it; but after vainly looking in every hole which I thought they could enter, gave up in despair. But on passing the place one day I saw the female emerge from a very small orifice in a high limb which was not larger around than my arm, and upon examining found the nest concealed in it. I found a nest in a huge buttonwood tree which stood on an island in the Susquehanna River near Williamsport built in a hole of a limb which was at least eighty feet from the ground. This was on the 19th of May, and a large flight of warblers and other migrating birds were constantly passing. These visitors were constantly alighting in the tree much to the annoyance of the little brown wrens which scolded each as it came most vehemently, and in some cases would actually attack the smaller species in their anxiety to hold sole possession of the tree. The House Wrens breed in New England about the first week in June, in Florida somewhat earlier. They are constant residents in the South but migrants at the North, arriving in the spring about the first of May and departing in early October.

TROGLODYTES HYEMALIS.

Winter Wren.

Troglodytes hyemalis Vieillot. *Nouv. Diet.* XXXIV, 1819, 514.

DESCRIPTION.

SP. CII. Form, not stout. Size, small. Bill, much shorter than the head, slender, and but slightly curved. Tail, short and rounded. Sternum, rather weakly built, with the keel very low in comparison to the breadth. Tongue, linear, with the end, in nestlings, rounded, slightly bifid and fringed with cilia. In older specimens it is divided into four points like that of the preceding species, only the space between the two central ones is not as deeply cleft. In adult birds the tip becomes broken into irregular points.

COLOR. Adult. Above, reddish brown; darkest on the head, lightest on the rump. Upper surface of wings, dark brown, barred on the outer webs with dusky. Tail above, similar to the back, transversely lined with dusky. Upper wing coverts and sides of neck spotted with white. The nape and rump have concealed spots of white. Beneath, yellowish, which is lightest on the throat, but becomes rufous on the sides, flanks and abdomen, which are crossed with black and white wavy lines. Under tail coverts, marked with rufous, black and white. There is a rather indistinct yellowish white superciliary line. The ear coverts are mixed

with dusky. Under portion of the tail, similar to the upper but a little paler. Under wing coverts, whitish, barred with dusky. Lower surface of wing, glaucous. Young, similar to the adult, but with a more rufous



Fig. 107. Head of adult Winter Wren.

suffusion beneath and with the feathers of the throat and breast tipped with dusky. The wing coverts are also more spotted. Nestling plumage, darker throughout than in the young, the throat being as dark as the flanks. There are no spots on the sides of the neck. The bars beneath are not as conspicuous and the feathers of the throat and breast show lighter centers. The young birds from which I have taken the above descriptions were kindly loaned me by Mr. Brewster and Mr. Harold Herriek. Those in the nestling plumage were taken in New Hampshire and at Grand Manan.

OBSERVATIONS.

Specimens vary somewhat in the amount of black on the lower portions of the body as well as in the shading above, although they are more uniform in this respect. Differs from *T. aedon* as described under that species. It cannot be confounded with the Marsh Wrens, for they are streaked with white on the back. Distributed during summer throughout the more northern sections of Eastern United States and northward; winters from New England to the Southern States, but is rare in Florida.

DIMENSIONS.

Average measurements of seven specimens from New England. Length, 4.10; stretch, 6.04; wing, 1.72; tail, 1.24; bill, .40; tarsus, .66. Longest specimen, 4.25; greatest extent of wings, 6.30; longest wing, 2.00; tail, 1.32; bill, .48; tarsus, .75. Shortest specimen, 3.75; smallest extent of wings, 5.50; shortest wing, 1.70; bill, .35; tarsus, .65.

DESCRIPTION OF NESTS AND EGGS.

The following descriptions were kindly forwarded to me by Mr. Ridgway. That of the nest was made from a specimen now in the Smithsonian collection, which was taken in Maine by Mr. W. F. Hall.

NESTS. A compact mass of green moss, strengthened by a few slender twigs of coniferous trees. It is in the form of a hollow ball with the cavity deep and the entrance narrow. Dimensions: 5 inches in length by 3.50 in diameter. EGGS, five in number (these described were taken at Fort Umpqua, Oregon, by Mr. E. P. Vallum), oval in form, pure white in color with a circle of thickly sprinkled reddish brown dots around the larger end. Dimensions, .68 by .48.

HABITS.

The Winter Wrens find their summer homes in the thick, evergreen woods of Northern New England; here they frequent the masses of fallen trees, that are piled in confused heaps by the tornadoes, which occasionally visit these vast forests. The birds are abundant in such situations, but if it were not for the peculiarly sweet warbling song of the males, which are frequently heard, one would be inclined to call them rare. All wrens are endowed with the faculty of concealing themselves, but in the Winter Wrens this instinct is developed to a remarkable degree; and even while they are singing remain hidden. I have stood within a few yards of their place of abode and endeavored to discover the invisible bird which was constantly repeating his delightful melody; but after the closest scrutiny was obliged to give up the search as unsuccessful. When approached too nearly these wrens glide through the intricate passages of their retreat like mice and it requires considerable exertion to drive them from a particular pile; when forced to leave they use every available means to escape unseen. I have seen one enter the knot hole of a hollow log, when closely pursued, and emerge at the open end which was in a

thicket. These birds must conceal their nests very carefully; for, although I am certain that I have many times been within a few yards of their homes, I have failed to discover any after the most thorough search. The Winter Wrens pass Massachusetts during the migrations in October and April; they are very rare in Florida and I have never met with them there, but Mr. Boardman informs me that he has seen them on two occasions.

GENUS. CISTOTHORUS. THE MARSH WRENS.

GEN. CH. Feet proportionately large, but the tarsus is shorter than the middle toe and claw. Back, conspicuously streaked with white. The species included in this genus are quite small birds, which inhabit the grasses or reeds of fresh water marshes.

CISTOTHORUS PALUSTRIS.

Long-billed Marsh Wren.

Cistothorus palustris Baird, Birds of North America, 1858, 364

DESCRIPTION.

SP. CH. Size, small. Form, slender. Bill, equal in length to the head, quite slender. Sternum, somewhat stoutly built. Tongue, thin, narrow and acuminate, ciliated for one-third of the terminal length. These cilia form a bifid tuft at the end, and two on each side about five-hundredths of an inch nearer the base. COLOR. Adult. Above, light reddish brown, with the middle of the back and sides of the top of the head, black, which is darkest on the back; this patch on the back is triangular in form being broadest between the shoulders; there is a white line in the center of many of the feathers. There is also a superciliary stripe of white which extends well down on the sides of the neck. The wings and tail are dark brown barred with a color similar to that of the back. Beneath, pure white with the sides and flanks, reddish brown. There is sometimes a buff suffusion on the breast. Lores and ear coverts dusky. The shoulders are streaked with white. Under wing coverts, white; under tail coverts white, barred with brown and rufous. The young, even in the nesting plumage, are scarcely different from the adult excepting that there are fewer streaks of white on the back. Sexes, similar. Neck, feet and bill, brown, the latter lighter at the base of the lower mandible.

OBSERVATIONS.

The Long-billed Marsh Wrens may be at once distinguished from the Short-billed by their larger size and longer bill. They are distributed throughout temperate Eastern North America during the breeding season, wintering in the Southern States.

DIMENSIONS.

Average measurements of ten specimens. Length, 5.64; stretch, 6.15; wing, 2.07; tail, 1.67; bill, .57; tarsus, .68. Longest specimen, 5.25; greatest extent of wings, 7.00; longest wing, 2.25; tail, 1.80; bill, .60; tarsus, .75. Shortest specimen, 4.12; smallest extent of wings, 5.00; shortest wing, 1.75; tail, 1.48; bill, .45; tarsus, .60.

DESCRIPTION OF NESTS AND EGGS.

NESTS, built in grass, reeds or rarely on bushes, and formed of coarse grass or of weeds which are bent and woven into the form of a hollow globe, with a hole for an entrance at the side. They are lined with fine grasses and the nests of spiders. Dimensions: external diameter, 7 inches; internal, 3 inches. Eggs, six to nine in number, usually five, however, oval in form, pale brown in color, spotted and blotched irregularly with darker brown; sometimes the spots are very minute forming a dark washing over the entire surface. On other eggs they become confluent and form rings around the larger ends. Dimensions, from .60 by .50 to .70 by .55.

HABITS.

The Long-billed Marsh Wren is locally distributed throughout Massachusetts but is very abundant in some sections, thus it was once numerous on the Fresh Pond marshes in Cambridge and is now to be found in considerable numbers on the Wayland marshes. In both of these places it formerly nested and still builds to some extent at Wayland. As far as my experience extends, this species will not nest in grass nor weeds unless their stems are surrounded by water and for this reason avoids marshes in which the herbage is not in this condition. Occasionally nests are placed in bushes which grow in the water, but I believe in no case unless they are surrounded by grass or weeds.

The well known singular habit which the Long-billed Marsh Wrens have of building several nests in a season, in one of which only the eggs are deposited, seems to never have been satisfactorily explained. I have made a careful study of the building grounds of this species and have seen hundreds of nests and am of the opinion that the extra nests are always built by the males. The nest occupied by the female, and possibly constructed by her, is, as a rule placed lower than the vacant nests made by the males, and is better concealed. The extra nests are also not always fully completed and it is not at all unusual to find mere shells composed of the grass and not over an inch in thickness, while but few if any are lined. They number all the way from two or three to eight and sometimes even more, depending somewhat on the date in the breeding season, for the male evidently continues building at least until the eggs are hatched. He always exhibits great solicitude whenever these false nests are disturbed scolding the intruder very violently, but the female slips so quietly out of her domicile that I have never been able to detect her when she was leaving it, thus the multiplicity of nests certainly favors her chances for escape and so becomes of benefit to the propagation of the species, but how such an unusual habit became evolved is more difficult to explain. The breeding season is rather late beginning the first week in June. On June 5th, 1880, I found many nests on the Wayland marshes which contained from one to six eggs, some of which contained embryos in an advanced stage of incubation.

The song of the Long-billed Marsh Wren is a rather feeble bubbling or sputtering kind of warble given usually when the birds are concealed in the thick grass, in which they pass most of their time. They emerge, however, when disturbed and as related scold the intruder vehemently raising their tails upward and over their backs so far as strongly to remind one of the blade of a pocket knife when nearly closed.

This species of wren departs for the South early in September, but I found a few on the west bank of Pamlico Sound in some marshes about the mouth of Yesocking Creek November 13th, 1876, and found them common at Juniper Bay a little to the southward on the 15th, but we did not find them that year between this place and the St. John's River, Florida. They were common at Rosewood Florida in rather dry fields and in the salt marshes of the Gulf coast in November and December, 1883. I do not think that the true *C. palustris* migrates much south of this point, and that below this we find the species next given. The Long-bills have been known to remain in the Fresh Pond swamps at Cambridge, Massachusetts all winter.

MARION'S MARSH WREN.

CISTOTHORUS MARIANAE.**Marion's Marsh Wren.**

Cistothorus marianae Scott. Auk, April, 1888 p 188.

DESCRIPTION.

SP. CH. Form and size similar to those of the Long-billed Marsh Wren, but nearly uniform black above without rufous and the under parts are pale buff, banded on sides of neck, back, flanks and upper and under tail coverts with dusky.

OBSERVATIONS.

In 1872, sixteen years before Mr. Scott published his description of this bird, I noticed the appearance of this form at Spruce Creek, Eastern Florida, and recorded it on page 42 of the "Birds of Florida," but did not name the species. Occurs as a constant resident throughout middle and Southern Florida, excepting about Miami and on the keys.

HABITS.

Spruce Creek, in Eastern Florida, rises in the interior near Lake Ashby. It is a remarkable stream, for this section, inasmuch as the banks are high and abrupt, rising in many places forty feet from the water; these highlands do not form both margins of the river in any one place, however, but enclose an expanse of marsh, which varies from a few hundred feet to a mile in width, through which the stream winds. This interval is thickly overgrown with a species of rush (*Juncus maritimus*), which grows to the height of five feet. The luxuriant growth formed a cover for hundreds of Marion's Marsh Wrens, and is the only place where I ever found them in any numbers in Florida. My attention was attracted to them by their notes which are merely weak sputtering attempts at song. This was in April, 1872, and they were evidently nesting, but as I was unable to make my way through the thick rushes, did not ascertain this for a certainty. I found them common on Indian River in February, 1886, and they began to sing on the 28th of this month and on April 16th I found a partly constructed nest in high grass on the salt marshes just north of Merritt's Island. It resembled those of the Long-billed.

CISTOTHORUS STELLARIS.**Short-billed Marsh Wren.**

Cistothorus stellaris Cabanis, Mus. Hern., 1851, 77.

DESCRIPTION.

SP. CH. Form, slender. Size, small. Bill, shorter than the head, quite stout and not very acuminate. Sternum, not strong, with the keel proportionately shorter and lower than in the preceding species. Tongue, slender, thin and horny, with the end, in adult specimens, bifid and divided into coarse cilia, which, in younger birds, extend along the sides, sometimes for one-fourth of the terminal length.

COLOR. Adult. Above, dark brown, becoming reddish on the rump, shaded on top of head with buff; there is a buffish collar, then the back is shaded with white and buff. There are also some white spots on the nape. Wings, upper tail coverts and tail, barred with pale yellowish white, brown and rufous. Beneath, white, with the breast, sides, flanks, under tail coverts, and under wing coverts, buff. The chin is also tinged with the same color and there is a yellowish superciliary stripe. Lores, and ear coverts, dusky. There are faint indications of white on the shoulders. Young differ from the above in having the top of the head streaked with white. There is also more white on the shoulders and the feathers of the rump are

striped with it. The buff of the lower parts is brighter. The nestlings do not differ from the plumage last described. Iris and bill, brown, the latter lighter on the basal three-fourths of the lower mandible. Feet, pale brown.



Fig. 108. Head and bill of Short-billed Marsh Wren.

OBSERVATIONS.

I can see no difference between specimens taken in Florida and those from the North. This species may be distinguished from the preceding as described under that head. Breeds in the United States and Southern Canada. Winters from the Carolinas, southward, but I did not see it in the everglades of Florida or among the keys.

DIMENSIONS.

Average measurements of ten specimens. Length, 4.37; stretch, 5.50; wing, 1.79; tail, 1.40; bill, .42; tarsus, .43. Longest specimen, 4.50; greatest extent of wings, 5.60; longest wing, 1.90; tail, 1.60; bill, .45; tarsus, .75. Shortest specimen, 4.00; smallest extent of wings, 5.24; shortest wing, 1.75; tail, 1.36; bill, .40; tarsus, .69.

DESCRIPTION OF NESTS AND EGGS.

Nests, built in the tops of meadow grass. Composed of green grass bent and woven into a hollow ball with a hole for an entrance at the side. They are usually lined with fine grasses. Dimensions; external diameter, 7 inches; internal, 4.75. Eggs, commonly six in number, oval in form, and pure white in color. Dimensions, from .60 by .50 to .75 by .55.

HABITS.

The Short-billed Marsh Wrens inhabit the dryer marshes of Massachusetts nesting in the tussock grass. I found them building on June 12th, 1880, on the Wayland meadows. At this date their singular domed structures were fully completed but contained no eggs. The birds were constantly near the nests and would scold me when I approached them; they were tame and allowed me to go within a few feet of them before they disappeared in the grass. It was not until July 6th that the nests contained any eggs and then the birds had just begun to lay, but the full set was not deposited until about the middle of the month. Like their near relations the Long-bills, the males construct several nests in a season, but not as many as do those of the allied species. The nests are partly woven of the ends of the long grass which thus keeps green, so the singular domiciles are difficult to see, especially that of the female which is often placed very low, sometimes within five or six inches of the ground. Unless disturbed the Short-billed Wrens keep well in concealment, but when their breeding ground is approached they appear on the grass tops, and throwing their tails over their back, will scold the intruder, but their notes are not as harsh as are those of the Long-bills. The song is very peculiar and consists of two or three double notes which, when heard at a little distance, remind one somewhat of the sounds produced by striking with a small hammer upon an anvil. Singularly this song is given all night long during the breeding season.

Although the Short-billed Marsh Wrens do not arrive in Massachusetts very early in the spring they often remain until October. I found them in the middle of November, 1876, all along the dry marshes which skirt the western shore of Pamlico Sound and from this point southwest to middle Florida they were abundant in the dry marshes and high

grass of old fields. At all times this wren is difficult to start up from the grass, but this is especially true in Florida. Here, even with the aid of my dog, they concealed themselves so completely and ran so swiftly through the tall grass that although I could hear them scolding on all sides, not one in ten could be made to show itself.

FAMILY CERTHIIDAE. CREEPERS.

Primaries, ten, with the wings rounded, the first quills being less than one-half the length of the second, and this is about .40 shorter than the fourth, which is the longest. Tail, long and wedge shaped, with the feathers acute at tip and stiffened.

GENUS. CERTHIA. BROWN CREEPERS.

GEN. CH. Plumage, soft and close. Bill, very slender, as long as head, and curved. Nostrils, open. Sexes, similar. We have a single species within our limits.

CERTHIA AMERICANA.

Brown Creeper.

DESCRIPTION.

SP. CH. Size, small. Form, very slender. Hind toe longer than the anterior toes. COLOR. Above, dark brown, slightly tinged with rufous, but with the rump decidedly rust color, each feather streaked centrally with white. Wings, brown, with all but the three outer primaries tipped with white, crossed in the middle by a broad band of yellowish white, and edged terminally with the same color. Wing coverts also tipped with white. Tail, brown, edged with yellowish white. Beneath, silky white, tinged on flanks and under tail coverts with paler rusty. Young, similar, but with the streaks above more indistinct, and with the feathers tipped with dusky, and there are faint bars of dusky on the throat.

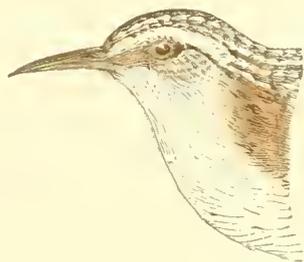


Fig. 108. Head of adult Brown Creeper.

OBSERVATIONS.

Distinguished at once by the slender, curved bill, acutely pointed and stiffened tail feathers and brown striped plumage. Occurs in the breeding season throughout temperate Eastern North America from Northern New England, northward. Winters from Massachusetts, southward to the Carolinas.

DIMENSIONS.

Length, 5.25 to 5.60; stretch, 7.50 to 7.90; wing, 2.40 to 2.60; tail, 2.30 to 2.45; bill, .55 to .58; tarsus, .60 to .68.

HABITS.

The sharp lisping cry of the Brown Creeper is a familiar sound in our Massachusetts woodlands in winter. The author of this somewhat feebly given note is not very easily seen, however, for he clings closely to the bark of the trees and his colors are quite similar to those of the tree trunks up which he makes his spiral ascent. By paying close attention to the trees from which the notes appear to come, one will be apt to see the little brown birds dart downward after they have reached the smaller branches and alight at the base of a neighboring tree. Besides this low lisping notes the creepers utter a louder

and more cackling sound and in spring they have a song, which although low, is so exceedingly sweet and silvery as to sound, when heard in the deep woodlands, like the tinkling of fairy bells.

For many years the breeding habits of the Brown Creeper were imperfectly known, but we owe the discovery of the nesting-site to the researches of Mr. Brewster who found them breeding in Northern Maine. The nest is usually placed behind a loosened strip of bark on some dead tree which stands either on the margin of the forest or in it.

FAMILY SITTIDAE. THE NUTHATCHES.

Sternum, narrow; not being wider than half the length of the top of the keel. Coracoid bones, shorter than in the two preceding families. The marginal indentations are also shallower; being only one-third as deep as the length of the top of the keel. Differs from Paridae in having a longer and more acuminate bill. The tongue is not only long and linear but is destitute of cilia on the end. Tail, very short; wings, long and pointed.

The tongues of the Nuthatches are peculiar; being long, thin, and of a horny appearance. They vary greatly in length among individuals of the same species, and the end has a jagged appearance as if worn away by constant use.

GENUS SITTA. THE NUTHATCHES PROPER.

GEN. CH. The same as are given for the family. There is but one genus of the Sittidae in the United States, upon which I have based the family characters as given above, and which will also answer for generic.

SITTA PUSILLA.

Brown-headed Nuthatch.

Sitta pusilla Lath., Index, Orn. I, 1790, 263.

Plate XL. Adult.

DESCRIPTION.

SP. CH. Form, rather stout. Size, small. Bill, not very long and somewhat acuminate. Tail, but slightly rounded. Sternum, not stoutly built. Keel, rather short, scarcely exceeding the length of the coracoid bones; but it is as high as one-half the width of the sternum. Tongue, quite long and narrow.

COLOR. Adult. Above, dull slaty-blue. Top of head and upper part of the sides of the neck, pale brown; with every feather tipped with whitish. There is a spot of silky-white on the nape. A line commencing at the base of the bill, running through the eye and crossing the ear coverts, dark brown. Upper surface of the tail, black; with the two central feathers like the back; all the feathers are tipped with brownish, which on the six outer is preceded by a bar of white. There is also a narrow line of white on the two middle feathers near the base. Wings above, brownish, edged with white on both webs. Beneath, dirty white; purest on the chin and sides of the neck, but tinged with buff on the breast and abdomen. The sides and flanks are like the back. Under portions of the wing and tail, glaucous. Axillaries and under wing coverts, pale bluish. Feathers at base of primaries and on the bend of the wing, white. Tibia, quite dusky. Young, similar, but with a deeper washing of buff beneath. The top of the head and the stripe through the eye are paler. The white of the tail does not extend over as many feathers, becoming obsolete on the central ones. Sexes, alike. Irides, brown. Bill, dark brown, bluish at the base of the upper and lower mandible. Feet and tarsi, brown.

OBSERVATIONS.

Known at once by the small size and brown head. This species has a distribution throughout the more southern sections of the United States, but I did not find it on the Florida Keys.

DIMENSIONS.

Average measurement of twenty-five specimens from Florida. Length, 4.21; stretch, 7.61; wing, 2.45; tail, 1.29; bill, .55; tarsus, .59. Longest specimen, 5.15; greatest extent of wings, 8.05; longest wing, 2.75; tail, 1.50; bill, .60; tarsus, .64. Shortest specimen, 4.00; smallest extent of wings, 7.30; shortest wing, 2.30; tail, 1.15; bill, .47; tarsus, .45.

DESCRIPTION OF NESTS AND EGGS.

Nests, in Florida, built in holes of trees and composed of the soft fibrous substances which grow about the base of the leaves of the saw palmetto. They are shallow and about two inches in diameter. Eggs, oval in form, white in color, spotted and dotted irregularly with reddish brown, but more thickly on the larger end. Dimensions, from .60 by .45 to .62 by .48.

HABITS.

The pine barrens of Florida are immense woodland plains, which are sometimes rolling, but generally level. The trees grow at rather wide intervals, and the spaces between them are usually covered with a sparse growth of dwarf palms. The effect of the early light upon this landscape is fine. The sun shines brightly on the straight, brown trunks of the pines, which rise on all sides, and glances from the shining leaves of the saw palmetto as they are waved by the morning breeze. Fantastic shadows are cast upon the ground by the huge fire-blackened stubs which wave their gigantic arms high overhead. Light, fleecy clouds move steadily across the blue sky, impelled by the rising wind, which sighs through the masses of dark green foliage, with a sound which reminds one of the roaring sea. Indeed, while wandering through these trackless wilds, with the trees apparently crowding together in the distance so as to shut out any very extended view, one seems as much alone as if upon the broad ocean. Many beautiful flowers are blooming in confusion around, yet they are seldom looked upon by any human being, and here where there is not a single trace of the hand of man, one thoroughly realizes that he is in a perfect wilderness which for ages has remained unchanged. The same pines which we now look upon stood where they stand to-day long before the Indians chased the deer upon these wide-spread pasture grounds, and it is extremely probable that centuries will come and go before any great change will have taken place.

Many bird notes greet the ear in this sunny woodland, but none are more in keeping with the prevailing loneliness than the somewhat harsh and solemnly given "cah cah cah" of the Brown-headed Nuthatch. There is something about this sound, for although it comes to the ear loudly and clearly, the tiny author of it is so high up among the tops of the tallest trees as to be invisible to the casual observer. They are lively little birds and have all the characteristic movements of their race, running along the under side of the limbs, or down the trunk head first, seeming to spend more than half of their time upside down. They are ever busy, never remaining long on one tree, but will flit quickly from place to place with a rapid undulating flight. They appear to lead a roving life and move

about in small flocks in company with warblers and woodpeckers, but by the latter part of February they pair and begin to build. They usually select a partly decayed stub and excavate a hole in it with their bills, after the manner of the woodpeckers, to a depth of some six or eight inches, placing the nest at the bottom, but are not particular regarding its height above the ground, for I have seen them in stumps not over ten feet high and in dead trees fifty feet in air.

While breeding they have a singular note which differs entirely from that which is ordinarily given, being a continuous low chatter. These birds are usually unsuspecting at this time and I have stood within a few yards of them while they were at work. Both sexes labor industriously, and like the Black-capped Titmouse, carry the chips which are made to some distance before dropping them. Although they pay very little attention to the presence of man, when undisturbed by him, they are assiduous in defending their nests from any real or fancied enemy and, if a Woodpecker chances to alight near the domicile, will attack him with fury, invariably forcing him to leave the locality. They are occupied some time in completing the nest but by the middle of March the eggs are deposited, and by the first or second week in April the young appear. They are fully fledged by the 15th of May and then follow their parents about. The Brown-headed Nuthatches avoid the deciduous woods, but I have found them in isolated patches of pines, to reach which they must have crossed swamps and hammocks. They doubtless move silently and quickly over such places for I have never seen nor heard them there.

SITTA CAROLINENSIS.

White-bellied Nuthatch.

Sitta europaea var. *y. carolinensis* Gmelin, I, 1788, 440, Baird, Birds of North America, 1858, 374.

DESCRIPTION.

SP. CII. Form, robust. Size, quite large. Bill, long and somewhat slender. Tail, not much rounded. Sternum, stoutly built. Keel, longer than the coracoid bones; but it is not higher than half the width of the sternum. Tongue, thin and horny, with the sides straight, the end broken into irregular points. COLOR. Adult male. Above, slaty blue. Top of head and neck to the shoulders, glossy black. Upper surface of wing and coverts, black: with the edges, tips, outer webs of upper tertiaries, and lines along the veins of the last, like the back; there is also a spot at the base of the primaries, and on the inner webs of the spurious quills, and elongated spots on the middle of the outer webs of the second, third and fourth quills, white. The two central tail feathers are like the back; remainder, black, with the six outer crossed diagonally by a broad subterminally bar of white, which extends up for a short distance on the outer web of the first two feathers, and reaches the tip of the third on the inner web. The black of the tips is preceded on the outer webs by a small patch of slaty. The remaining feathers are tipped with white, preceded by slaty. Lower parts, including sides of head, and space for some distance above the eye, white, tinged



Fig. 109. Head of adult White-bellied Nuthatch.

with buff, with the flanks washed with chestnut. Tibiae, crissum and ventral region, rich chestnut brown; the under tail coverts are also streaked with it. Wings and tail beneath, like the upper surface, but more glaucous. Axillaries, like the back. Under wing coverts, black. Adult female, similar to the male, but with the top of the head washed with slaty blue. Young, have the white of the tail feathers more restricted and a deeper suffusion of buff beneath. Webs, brown; feet, brown; bill, black, blue at the base of the under mandible, in both sexes and in all stages.

OBSERVATIONS.

This species may be readily distinguished from all other native Nuthatches by its larger size and white under parts. Occurs in summer in the more northern portions of the United States; winters from Massachusetts southward, excepting Florida.

DIMENSIONS.

Average measurements of six specimens from New England. Length, 5.76; stretch, 10.32; wing, 3.60; tail, 1.82; bill, .71; tarsus, .66. Largest specimen, 6.00; greatest extent of wings, 11.50; longest wing, 3.69; tail, 2.15; bill, .80; tarsus, .80. Shortest specimen, 5.00; smallest stretch of wings, 9.21; shortest wing, 2.69; tail, 1.85; bill, .67; tarsus, .60.

DESCRIPTION OF NESTS AND EGGS.

NESTS, built in the hole of a tree, and composed of fine grasses lined with hair or feathers. Eggs, usually six in number, occasionally seven and rarely eight or nine; creamy white in color, spotted and blotched irregularly with pale reddish brown and lilac, and the spots often form a ring around the larger end. Dimensions, from .70 by .57 to .83 by .60.

HABITS.

If there were ever harlequins among birds, they are the White-bellied Nuthatches; for while they are on the trees, searching for insects, they are constantly assuming all the positions imaginable. They will climb quickly up the trunk, after the manner of the Woodpeckers, peering right and left, then will suddenly commence a retrograde movement, which is checked abruptly as the birds seize upon some beetle, when, without an instant's pause, they will reverse themselves and back upwards, proceeding as agilely as if moving head foremost. In a few seconds they will stop, raise their heads, glance about while sounding their harsh notes, then launch into air, alighting upon the lower side of a limb, and will glide along it as nimbly as if upon the upper part. Thus they are ever in motion, and always changing their attitudes in an easy and graceful manner, but do not have the quick nervous movements of the Brown-headed and Red-bellied Nuthatches, but perform their evolutions more steadily.

These birds may be found in the orchard as well as in the woods, but, although by no means rare, it is not usual to meet with many in a single day. They appear to live in pairs, apart from their fellows, associating with the warblers or titmice; and I can recall but few instances where I have found more than two in one locality at the same time. Then the birds seemed to have met by accident and probably would not have remained together for any length of time.

The White-bellied Nuthatches, like the preceding species, are great wanderers during winter, but remain in one locality when the breeding season approaches. I think their eggs are laid by the last of April for I have seen fully fledged young by June 1st. The nest from which they came was built in the hole of an old stub, and was situated about

twenty feet above the ground. The tree had evidently been used as a nesting place for some time, for there were several other openings which had, in all probability, been occupied in previous years. The female is very unsuspecting while incubating, or her affections for her eggs overcome her fears, for she will permit herself to be handled at such times without attempting to escape. Mr. Brewster having discovered a nest in a partly decayed apple tree, enlarged the entrance, that he might introduce his hand, and remove the bird. She struggled vigorously to escape but, as soon as she was liberated, returned to her eggs. She was taken out several times but invariably entered her domicile the moment she gained her freedom. Even when thrown into the air she did not fly away, and when Mr. Brewster went away she was on the nest. This species usually construct their edifice in dead trees or stumps, but my friend, Mr. Harold Herrick, of New York, informed me that he knew of a pair which built their nest in the walls of an inhabited dwelling, having found an entrance through a knot hole in a clapboard, which was situated beneath the eaves. The White-bellied Nuthatches are constant residents in New England. Those which go south migrate quite early in the season, generally during the latter part of October. On the 30th of this month I was on a steamer bound for Savannah and when fifty miles off the coast of Virginia we were visited by a male of this species. He alighted on the deck at first apparently exhausted but, after resting a short time, recovered, when he commenced climbing about the rigging and running up and down the masts in search of food performing his gymnastic feats with as much agility as in his native woods; he remained on board until night but I could not find him the next morning. Their food consists principally of insects but they will sometimes eat acorns.

On September 25th., a White-bellied Nuthatch was brought to me, with an acorn shell attached to its beak, that had evidently been the cause of its death. The kernel

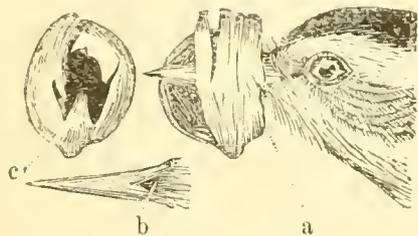


Fig. 110.

of the acorn had been removed, probably through the agency of a squirrel, and the shell had become quite dry, and consequently hard and horny. The rodent in manipulating the nut had gnawed a hole in both sides, and the orifice on one side chanced to be broken in a peculiar manner. Directly in the center of the upper portion of the acorn, and consequently in the center of the orifice, for this was about in the middle a spur of shell projected downward. (see Fig. 110)

where I have given a view of the acorn shell, top down, and the projection may be seen at c.

Now this simple shell lying on the ground or lodged on the limb of a tree, must have been an innocent looking object, yet it proved as fatal to this Nuthatch as would have been a charge of dust shot. It is probable that either some insect had found a lodging in the empty shell or that some bits of the kernel remained. It is most likely that the insect was there, at all events, something induced the bird to thrust its bill into the cavity. It must have gone further in than the Nuthatch intended, passing completely through so

that the spur, *ib.*, *c* slipped entirely over the lower mandible, and being somewhat elastic, pressed upward into the V-shaped depression at its base, (see *ib.*, *b* :) at the same time the broken edges above pressed firmly against the rather flat top of the base of the upper mandible, keeping the bill closed. So closely did the spur (seen in side view at *ib.*, *a*) hold the shell in place, that all efforts of the bird to dislodge it proved futile. Thus the nuthatch perished, not from hunger for there were remnants of food in the stomach, nor from suffocation for the nostrils were free, but from worry, just as some birds do when newly caged. The bird was picked up in Waltham, and the skin is now in the collection of Master Roy M. Baker to whom I am indebted for the privilege of illustrating the head.

Sitta Carolinensis Atkinsi.

Florida White-bellied Nuthatch.

Sitta Carolinensis atkinsi Scott, Auk, Vol. VII, 1890, p. 108.

DESCRIPTION.

SUB SP. CII. Size, a little smaller than the typical White-bellied. They are darker above with rather more chestnut below, but the chief difference lies in the fact that the females have a black crown as in the males, the only difference between the sexes being a less amount of black on the scapularies of the females.

OBSERVATIONS.

In November, 1893, I obtained typical specimens of this sub species at Rosewood, Florida, and noted the difference between them and the northern form, but neglected to describe the form.

HABITS.

I found the Florida Nuthatch rather common in the pine woods about Rosewood through November and December, 1893. Although sometimes occurring in company with the Brown-heads, they do not always accompany them nor other small birds but occurs in pairs. I frequently saw them carrying seeds about in their bills as if they were trying to hide them. The males utter a singular song which consists of a series of low notes which partly resemble those of the Carolina Wren and partly those of the Tufted Tit. The birds when giving this odd lay appear very restless, and fly from tree to tree without pausing anywhere. Judging from these habits it is probable that these nuthatches are constantly resident in the pine woods where I saw them and that they breed there.

SITTA CANADENSIS.

Red-bellied Nuthatch.

DESCRIPTION.

SP. CH. Size, small. COLOR. Adult male. Above, bluish slate of a shade or two darker than is the White-bellied. Top of head and line through eye, extending down on neck, black. Above and below this line are white lines extending its entire length, the one below meeting its fellow beneath on the chin. Wings, brown, with the two outer feathers banded near termination with white and ashy. Central tail feathers, ashy, and the others are tipped with it. Beneath, brownish red of a variable shade, becoming duller in summer. Adult female, similar, but the crown is like the back, and the stripe through the eye is dusky, not black. Beneath, often paler.

OBSERVATIONS.

Known at once by the reddish under parts. Occurs during the breeding season throughout northern temperate North America, Northern New England, northward, wintering in the middle districts.

DIMENSIONS.

Length, from 4.30 to 4.75; stretch, 8.40 to 8.50; wing, 2.55 to 2.75; tail, 1.35 to 1.50; bill, .54 to .60; tarsus, .60 to .75.

DESCRIPTION OF NESTS AND EGGS.

NESTS, placed in holes of trees excavated by the birds, composed of roots, strips of bark, etc. EGGS, usually five or six in number, rarely four, seven or eight, rounded oval in form, grayish white in color, spotted rather thickly with reddish, and the spots are inclined to become confluent on the larger end. Dimensions, .60 by .50 to .65 by .55.



Fig. 111. Head of adult Red-bellied Nuthatch.

HABITS.

The Red-bellied is rather more inclined to inhabit the woodlands than is the White-bellied, and like that species occurs in small flocks during the season of migration yet the two species rarely associate together. I found them common at Erroll, New Hampshire, in November, 1870, but they soon disappeared, departing southward. I think that the majority of the Red-bellied Nuthatches pass the winter in the middle States, certainly but few remain at that season in Massachusetts. In general the habit of this species resembles the White-bellied, but its note is perfectly distinguishable being rather sharper than that given by the allied species, but this garrulous utterance is changed during the breeding season for one which is more deliberately given. I have never seen a nest of this nuthatch, but the male is said to cover the the wood at the entrance of the nesting hole with soft pitch from pines, so thickly that the female looses some feathers every time she enters her domicile or leaves it.

FAMILY. PARIDAE. THE TITMICE.

Bill, short and conical, not notched nor curved at the tip. Tongue, short, terminating abruptly; with the end furnished with four distinct tufts of cilia. The webs of the feathers are somewhat scattering giving them a loose fluffy appearance.

The sternums of this family are scarcely different from those of the preceding. The tongues are the most remarkable of any which I have seen, on account of the singular terminations. The tufts are composed of several rather coarse cilia and situated at regular intervals with the three intermediate spaces entirely free from any projections; there are two in the center and one at each margin. Sexes, similar.

GENUS. PARUS. THE BLACK-HEADED TITMICE.

GEN. CH. Sternum, very broad; exceeding in breadth one-half of the length of the top of the keel. Head, not crested. All the members of this genus have dark heads and throats. They generally inhabit the woods, and build their nests in holes.

PARUS ATRICAPILLUS.

Chickadee.

Parus atricapillus Linn., Syst. Nat. 1, 1766, 341.

DESCRIPTION.

SP. CH. Form, rather stout. Bill, small. Tail, rounded. Tongue, but slightly narrower terminally than in the middle. The two central tufts of cilia are but slightly longer than the outer ones. Sternum,

not very stoutly built. COLOR. Adult. Above, ashy, becoming slightly rufous on the rump. Wings and tail, brown with the feathers edged with white. Entire top of head, nape, chin, throat and upper part of breast, black. Stripe from the base of the upper mandible running below the eye, widening out over the sides of the head (including ear coverts) and neck and extending over the shoulders, white. Beneath, dirty white, becoming rufous on the sides, flanks and under tail coverts. Axillaries and under wing coverts, white. In autumn the under portions are more strongly tinged with rufous; this color also pervades the entire back. Young, like the autumnal adult, but with a deeper suffusion of rufous. Young, in the nestling plumage, similar, but with less rufous; being in fact more like the adult in spring. Irides, brown; bill, black; tarsi and feet, slaty blue, in all stages of plumage.

OBSERVATIONS.

Distinguished from the Carolina Chickadee by the larger size and greater extension of the black on throat and nape, and from the Hudsonian Chickadee by the black head. Distributed as a constant resident throughout Eastern North America, south to latitude 40 degrees.

DIMENSIONS.

Length, from 5.40 to 5.75; stretch, 7.71 to 8.60; wing, 2.54 to 2.62; tail, 2.10 to 2.70; bill, .30 to .55; tarsus .50 to .75.

DESCRIPTION OF NESTS AND EGGS.

NESTS, built in holes of trees, composed of soft mosses, and lined with the hair of various animals. Dimensions. External diameter, 3.50 inches; internal, 2 inches; external depth, 1.50 inches; internal, 1 inch. EGGS, usually six in number, oval in form, white in color, spotted and dotted throughout, but more thickly on the larger end, with reddish brown. Dimensions, from .60 by .45 to .65 by .50.

HABITS.

One can scarcely enter the evergreen woods of Southern New England during winter, without hearing the cheery song of the Chickadees, which come trooping around him as if glad of his company and will venture quite near in order to scan him carefully. They do this in such a sly manner that one would hardly suppose that he was noticed, for they are apparently always busy searching for insects on the bushes around, hanging head downward or balancing themselves on the tip of a twig but ever keeping an eye on the object of their curiosity. But they never remain long in one spot and after completing their investigations, are off; then we can occasionally hear them tapping on the limbs like the Woodpeckers. At this time they are constantly repeating the strain from which the name is derived, which sounds exactly like "chick-a-dee-dee" or sometimes "de'dee" is added. During the bright days of early spring, when they leave the woods, where the coldest weather is spent, and enter the farm-yards or orchards they have a peculiar long-drawn song which is like the syllable "cee dee" with the last prolonged and plaintively given. In the spring they give a beautiful warbling song which is also sometimes given in the autumn but in a much lower tone.

These birds wander about in small flocks all winter, but by the middle of April, and by the first of May settle down to nest building. They usually select a partly decayed birch in a swampy place for this purpose, and drill a hole through the bark with their bills. They then easily remove the softened wood, carrying each piece to some distance before dropping it. In this great sagacity is exhibited, for if a pile of chips were allowed

to accumulate at the foot of the tree it would be apt to attract attention to the nest above. They excavate a space six inches or more in depth and nearly four in diameter, laboring industriously from daylight until dark without any cessation, that the task may be completed. They are often obliged to abandon a nearly finished domicile on account of dampness which is caused by the water that is absorbed by the punky wood, during wet weather. They are not discouraged at this occurrence but immediately select a drier quarter and zealously commence anew. The Chickadees are not always obliged to dig for themselves for they sometimes find a suitable place in the knot hole of a tree. I once found a nest built in a cleft of an oak, the entrance of which was nearly grown over. The birds had enlarged the opening and constructed their nest at the bottom. The female begins to incubate as soon as the first egg is deposited, so that the time the last is laid the embryo in the first is considerably advanced and consequently the eggs hatch at intervals. This facilitates bringing out the brood and is rendered easy by the fact that the male constantly furnishes the female and young with food. Indeed, from the moment she begins to sit, she is dependent upon him for everything she eats, and will sometimes emerge from her abode to follow him about, fluttering her wings and begging for a morsel in a low monotonous tone.

When the young leave the nest, about the first week in June, they have a similar note and follow their parents through the woods, seeming to subsist entirely upon what is caught for them. The family continues to live together until after the moult, which takes place in August, then collect in small flocks, and by October commence a partial migration. Those which live in Massachusetts pass further south, and the summer residents of Northern New England take their places.

PARUS CAROLINENSIS.

Carolina Chickadee.

Parus carolinensis Aud. Orn. Biog., 1834, 341.

DESCRIPTION.

SP. CH. Size, smaller than that of the Chickadee with the tail proportionately shorter, and the color is similar in all stages of plumage, excepting that the black of the head and throat is rather less extended, and there is less white on the wings and tail, while the white beneath is rather more rufous.



Fig. 112. Head of adult Carolina Chickadee.

OBSERVATIONS.

Occurs as a constant resident in the South Atlantic and Gulf States, as far north as Washington and Southern Illinois.

NESTS and EGGS similar to those of the Chickadee but the eggs are a little smaller.

DIMENSIONS.

Length, 4.25 to 4.52; stretch, 7.00 to 7.25; wing, 2.40 to 2.50; tail 2.00 to 2.25; bill, .25 to .27; tarsus, .50 to .55.

HABITS.

I have always found the Carolina Chickadee common whenever I have been in the Southern States from the Carolinas south to Northern Florida on the east side, and as far as Tampa on the west coast. In general habit they are almost exactly like the Chickadee, going about in small flocks in a nervous, active manner, but the note is at once distinguishable. It is weaker than that of the chickadee with a decided husky intonation. In spring the Carolina Chickadee gives a warbling song much like that of its northern relative. The breeding habits are also similar.

PARUS HUDSONICUS.

Hudsonian Chickadee.

Plate XXXIX. Adult.

DESCRIPTION.

SP. CH. Size, medium. Form, robust. COLOR. Adult. Above, reddish slate becoming slightly more rufous on the rump. Wings and tail, brown edged with slaty. Sides of neck, ashy. Chin and throat, black. Cheek and lower parts, soiled white with the sides and flanks dull chestnut. Iris, brown, bill, black, feet, bluish.

OBSERVATIONS.

Known at once by the absence of the black on the top of the head and dull chestnut on the sides and flanks. Occurs as a constant resident throughout Northern New England and British America, migrating somewhat southward in winter.

DIMENSIONS.

Length, from 5.50 to 5.75; stretch, from 8.50 to 9.00; wing, from 2.50 to 2.75; tail, 2.25 to 2.50; bill, .30 to .35; tarsus, .50 to .55.

DESCRIPTION OF NESTS AND EGGS.

NESTS, placed in holes of trees composed of hair, feathers etc. EGGS, from six to ten in number, varying from oval to spherical in form, white in color, spotted and dotted with reddish brown. Dimensions from .60 by .50 to .66 by .55.

HABITS.

I found the Hudsonian Chickadee quite common and associating in flocks with the common chickadee in the heavily wooded mountain valleys of Erroll, New Hampshire, during the latter part of October, 1868. The habits are not all dissimilar to those of the Common Chickadee but the notes are decidedly harsher and are rather more quickly given.

During winter there is a migration southward and of late years the birds have not been of unfrequent occurrence in Massachusetts, while some have been taken as far south as Southern Connecticut.

GENUS. LOPHOPIANES. THE CRESTED TITMICE.

GEN. CH. Sternum, not broad, being narrower than one-half of the length of the top of the keel. The marginal indentations are also proportionately shallower than in *Parus*. Head, crested. Members of this genus may be readily distinguished by the prominent crest and narrow sternum.

LOPHOPHANES BICOLOR.**Crested Titmouse.**

Lophophanes bicolor Bon., List Birds Europe, 1842.

DESCRIPTION.

SP. CH. Form, robust. Bill, short. Tail, slightly rounded. Sternum, stoutly built. Crest, of varying lengths. COLOR. Adult. Above, ashy; darkest on the head and with an olivaceous wash over the back, which is more perceptible on the rump. Forehead, black, with a narrow line next the crown tipped with rufous. The feathers of the crest show darker centers. Upper portions of wings and tail, dark brown with the feathers edged with the same as the back. Beneath, dirty white with the flanks chestnut. Wings and tail below, glaucous. Under tail coverts, pale buff. Axillaries and lower wing coverts, white, tinged with pale buff. Young, similar but with a rufous wash over the rump and back. There is also less chestnut on the sides, and the reddish edging of the forehead is better defined. Sexes, alike. Irides, brown; bill, black; feet, lead color in all stages of plumage.

OBSERVATIONS.

The birds from which I have made the above description, were all taken in Florida. They have a distribution throughout the Middle and Southern States, but I have never met with them on the coast of Florida, among the keys, or in the southern sections of the state, they being rare about Salt Lake and scarcely to be found below that point.

DIMENSIONS.

Average measurements of eleven specimens from Florida. Length, 6.16; stretch, 9.77; wing, 2.66; tail, 2.72; bill, .53; tarsus, .77. Longest specimen, 6.50; greatest extent of wings, 10.00; longest wing, 3.25; tail, 3.00; bill, .70; tarsus, .95. Shortest specimen, 5.75; smallest extent of wings, 9.25; shortest wing, 3.00; tail, 2.50; bill, .45; tarsus, .65.

DESCRIPTION OF NESTS AND EGGS.

NESTS, placed in holes, composed of leaves and moss, lined with hemp-like fibers from plants and hair. EGGS, usually six in number, oval in form, white in color, spotted and blotched with light reddish brown and lilac. The spots are accumulated more thickly on the larger end.

HABITS.

The pleasantest part of the city of Jacksonville, Florida, is built in a fine live-oak grove; as shade is quite essential in this climate, all of the trees which did not grow in the streets in such a manner as to impede the progress of vehicles were allowed to stand. The sidewalks, therefore, are overhung with thick evergreen foliage, which form a resort for numerous birds, especially when they are migrating; and I have counted seven or eight species in a single tree. One day I was passing beneath these branches, in company with my friend, Mr. Fred A. Ober, when we heard a note which sounded something like that of the common Chickadee, only it was much harsher. I knew at once that it could be produced by no other than the Crested Titmouse, and by advancing a few paces we perceived that I was correct, for there was a large flock of them among the trees. They were busily engaged in searching for insects; turning upside down, clinging to the under sides of the limbs, in fact behaving almost exactly like overgrown Black-caps, but were not quite as agile as that species, and when they raised their crests, which they did frequently, resembled miniature Blue Jays. They were not as inquisitive as our common bird, but very

unsuspicious, and would alight in the gardens within a few paces of pedestrians. They were restless, and we had not watched them long before they moved onward, flying with a heavy undulating motion.

I have always found them in small flocks during the colder season, moving about the country apparently without purpose. They are never seen in the pine woods, but usually frequent the hammocks, and I have heard their loud notes in the thick cypress swamps along the rivers. When moving they are very noisy, sounding the short grating "chick-a-dee" almost constantly. This is all the song which I ever heard them utter, but when alarmed they emit a querulous sound. When one is wounded and caught, it will cry for assistance so loudly that all of its companions, within hearing, will gather closely around scolding most vociferously, at the same time raising their crests, jerking their tails, ruffling their feathers; thus showing, by every motion, as much rage as any bird of their size is capable of exhibiting. Nor is this all ostentation; they are truly solicitous for the safety of their unfortunate friend, and will remain in the immediate vicinity until many are killed. About the first of March these companies break up into pairs and may be found with migrating warblers. I have never seen a nest, and do not think they breed in Florida for I did not meet with a single specimen while on the St. John's in May.

FAMILY. SYLVIIDAE. THE WARBLERS.

Marginal indentations of sternum, proportionately deeper than in the preceding family. Coracoid bones equal in length to the top of the keel. All the members of this family found within the United States are very small in size.

GENUS. REGULUS. THE KINGLETS.

GEN. CH. Sternum, exceeding in breadth twice the height of the keel. Marginal indentations, very deep. Nostrils, partially covered with projecting feathers. Top of head, in adult specimens, crowned with bright colors. Tarsi, booted.

REGULUS SATRAPA.

Golden-crowned Kinglet.

Regulus satrapa Leichtenstein, Verzeich, Doubl., 1823, No. 410.

DESCRIPTION.

SP. CH. Form, quite stout. Size, small. Bill, slender and much shorter than the head. Marginal indentations of sternum, as deep as one-half the length of the top of the keel. Tongue, linear, terminating abruptly, with the end fringed with coarse cilia, three hundredths of an inch in length. The form of the tongue of this species closely resembles that of *Seiurus noveboracensis*.

COLOR. Adult male. Above, olivaceous green, brightest on the rump, but becoming ashy on the back and shoulders. Top of head, black, enclosing a stripe of bright orange, which is preceded and edged with yellow. Forehead, and lines extending over the eyes, ashy white. Upper surfaces of the tail and wings, brownish, with the outer edges of the feathers greenish. The two rows of greater coverts are tipped with white, forming bars across the wings. There is also a dusky band across the secondaries, which extends over two or three of the primaries. The tertiaries and secondaries are tipped with whitish. Under parts, dirty white, with an ashy tinge across the breast. Under wing coverts and axillaries, purer. The under surfaces of the wings and tail are glaucous, with the feathers of the former edged with white. Loral region

and space below the eyes, ashy white. Ear coverts, dusky. In autumn there is a greenish wash over the breast and flanks. The upper portion of the body is also more olivaceous. Adult female, similar to the male, but having the central stripe composed entirely of yellow. Young, with the central stripe paler. The upper surface, breast and flanks are clouded with greenish brown. Nestlings, lack the yellow of the crown. In both sexes, and in all stages of plumage, the irides are brown; the bill dark brown, lighter at the base of the lower mandible; the tarsi and feet dark brown, with the soles of the latter, yellow.

OBSERVATIONS.

This little species may at once be distinguished from all other American kinglets by the bright orange of the crown. They breed from Northern New England north to the barren grounds. They winter from Massachusetts to Northern Florida.

DIMENSIONS.

Length, from 3.15 to 4.00; stretch, 5.00 to 6.00; wing, 1.10 to 2.25; tail, 1.05 to 1.86; bill, .30 to .50; tarsus, .50 to .67.

DESCRIPTION OF NESTS AND EGGS.

NESTS, placed in trees, composed of soft moss, arranged in a globular form, with the entrance on the top, lined with feathers. EGGS, eight to ten in number, oval in form, creamy white in color, minutely and somewhat obscurely dotted with slaty and brown. Dimensions, .47 by .80 to .52 by .41.

HABITS.

While visiting the region about Lake Umbagog, in Maine, during the first week in June, 1871, in company with Messrs. Deane and Brewster, I was very much surprised to find this little species very common. It inhabits the thick woods, and although the birds were generally invisible, we could hear their peculiar song which consists of a series of low sharp chirps terminated by a lisping warble. They were probably singing for the benefit of their mates which evidently had nests near. Indeed, we shot two or three females that bore unmistakable marks of incubating and saw others which exhibited considerable solicitude whenever we approached certain trees, hopping distractedly about, sounding their querulous alarm notes; in fact, betraying by every movement that their eggs were near. Although we did not succeed in finding the nests at that time many have since been taken from evergreen trees. In summer the birds remain in pairs, or in small parties after the young are fledged; but in autumn they gather in flocks, associating with the warblers and other small species. About the middle of October they begin to migrate southward, and arrive in Massachusetts during the latter part of the above named month. Many pass on further south, but some remain all winter. These may be found everywhere upon their arrival, but as it becomes colder, they retire to the woods and cedar groves, where they spend the extreme cold weather, apparently as contented when the thermometer stands at zero as in summer. One can scarcely conceive how such little morsels of flesh and blood can avoid freezing to death during some of the intensely cold nights of midwinter, when many of the larger species perish; or how they maintain themselves through protracted snow storms. A large number must die, and the only wonder is that any attempt to withstand a climate so rigorous. In mild days they emerge from their wooded fastnesses to visit the orchards or farm-yards. They are always lively little birds and as they hop nimbly from twig to twig, in search of the eggs and larvae of insects, which form almost their

only food at this season, amuse themselves by frequently uttering a short lisping song. Although they winter in large numbers in most of the Southern States, I have met with them but once in Florida. This was in December, 1868, when I took two specimens in a hammock; they were accompanying a large flock of warblers, titanice, etc. About the middle of April they migrate northward, and by the 10th of May they have all passed Massachusetts.

REGULUS CALENDULA.

Ruby-crowned Kinglet.

Regulus calendula Licht. Verzeich, 1832, Nos. 408-9

DESCRIPTION.

SP. CH. Form, rather stout. Size, somewhat larger than the preceding. Bill, rather broad at base, acuminate and slightly curved at the tip of the upper mandible. Wings and tail as in *R. satrapa*. Marginal indentations, shallower. Tongue, broad, with the edges nearly straight to the tip, which is rounded, bifid, with the forked portions and sides coarsely ciliated for one-third of its terminal length.

COLOR. Adult in spring. Above, olivaceous green, brightest on the rump, but becoming ashy on the neck and the top of the head, which has a concealed spot of bright ruby. Wings and tail, dark brown, edged with greenish. Tertiaries, quite broadly margined with whitish. The secondaries and quill feathers are also narrowly edged with it terminally. The two rows of greater wing coverts are tipped with yellowish-white forming bars. There is also a dusky band across the secondaries, extending over two or three primaries. Space in front of the eye and a spot behind it, ashy-white. Sides of head, lores and ear coverts, ashy; the latter more dusky. Sides of neck, throat and breast, also ashy, but of a lighter shade; this color becomes yellowish on the abdomen, flanks and under tail coverts. Axillaries and under wing coverts, white. Under portions of the tail and wings, glaucous; the feathers of the latter edged with white. In autumn there is a more yellowish suffusion beneath; the olivaceous of the back is more uniform, and extends over the top of the head; the feathers of the ruby crown are also slightly tipped with dusky.

Young, similar to the adult in autumn, but lacks the ruby crown. Both sexes are alike in all stages, excepting that the female lacks the ruby crown but the male sometimes has a feather or two of it the first year. Irides, brown. Bill, dark brown, lighter at the base of the lower mandible. Tarsi and feet brown, with the soles of the latter yellow.

OBSERVATIONS.

This species is larger than *R. satrapa*, and the males have the ruby crown in place of the yellow. There is no black on the top of the head in any stage of plumage. Although they breed much further north than the preceding, they winter much further south; being very abundant in Florida, and none being found in Massachusetts. When north, during summer, they are distributed from the Atlantic to the Pacific.

DIMENSIONS.

Average measurements of nineteen specimens. Length, 4.33; stretch, 6.91; wing, 2.26; tail, 1.82; bill, .34; tarsus, .72. Longest specimen, 4.56; greatest extent of wings, 7.30; greatest stretch of wing, 2.35; of tail, 1.86; of bill, .38; of tarsus, .76. Shortest specimen, 4.00; smallest extent of wings, 6.75; smallest length of wing, 2.17; of tail, 1.72; of bill, .32; of tarsus, .38.

DESCRIPTION OF NESTS AND EGGS.

NESTS, placed in trees; they are semi-sensile and purse-shaped, composed of bark and green moss, lined with feathers and hair. EGGS, from four to six in number, rounded oval in form, faintly spotted with pale brown, but rather more thickly on the larger end. Dimensions, from .54 by .42 to .58 by .43.

HABITS.

The Ruby-crowned Kinglets are the most common birds of Florida during winter, arriving from the North about the first of December, scattering through the hammocks all over the state, even as far south as Key West, and they may occasionally be found in company with other birds, but are generally independent; indeed, I think they seldom pay any attention to the movements of even their own companions: each pursues a course agreeable to itself. They can therefore hardly be called gregarious at this season, being equally numerous in every wooded locality, unless we choose to consider all which are in Florida as constituting one vast flock. They move about among the luxuriant growth of trees and shrubs in a manner which plainly indicates that they are at home. They seem to be always busily engaged in searching for insects upon the branches, yet will pause to gaze inquisitively at a stranger. They are not noisy at such times, and although very abundant, one who is not a naturalist would scarcely notice them, for they come without bustle, remain in the seclusion offered by the hammocks, quietly pursuing their avocations, then, by the middle of March, retire northward as silently as they came.

When passing Massachusetts in early April they behave far differently, for they are then full of activity, and if any one chances to enter the wood through which they are migrating they will scold at him most vociferously. The males are also full of melody, and their musical efforts most certainly do them credit, for their song consists of a full, clear warble, which excels that of many of our native species. They linger here, frequenting the groves and thickets, until the latter part of the month, when they have all passed to the north.

The breeding place of this species was for a long time unknown, but now we know that they breed in similar places as the Golden-crowned. I found the birds very abundant at Bethel, Maine, on the 12th of October, 1868, but by the 22d they had all disappeared. They enter Massachusetts in autumn, about the first week of the above named month, but have left for the south by the 30th.

GENUS. POLIOPTILA. THE GNATCATCHERS.

GEN. CH. Sternum much narrower and proportionately longer than in the preceding genus: the marginal indentations are also shallower. The frontal feathers do not cover the nostrils. The tarsi are scutellate. The tail is rounded, whereas in *Regulus* it is square and emarginate. All the species in this genus are of small size, with delicate blue colors above and silvery white below.

POLIOPTILA CAERULEA.

Blue-gray Gnatcatcher.

Polioptila caerulea Selater, Proceedings Zool. Soc. 1855, 11.

DESCRIPTION.

SP. CH. Form, slender. Size, small. Bill, rather broad at base, acuminate; and with the upper mandible a little curved at the tip, where it is slightly notched. Sternum, rather stoutly built. Tongue, linear, with the end rounded and finely ciliated: there are also some minute cilia on the sides for one-third of the terminal length. COLOR. Adult male. Above, uniform slaty blue; brightest on the head, and lightest on

the rump, where the concealed portions of the feathers are silky white. Wings above, brown; with the upper coverts and edges like the back. Tertiaries, margined with white. Tail, black, with three-fourths of the outer feathers, two thirds of the second, and the tips of the third and sometimes of the fourth, white; with the veins black. Upper tail coverts, black but glossed with the same color as the back. There is also a narrow but distinct black line over the eye. Beneath, silvery white, with a bluish cast throughout, which is brightest on the sides. Under portions of the wings, glaucous with the edges of the feathers and under coverts, white. Under portions of the tail, similar to the back, but with the black more glaucous. Ring around the eye, white. Adult female, similar to the male, but with the upper parts paler. The white of the tail is not as much extended. There is no black stripe over the eye. Young male, similar to the adult female, but with the under parts paler. Young female, with a reddish wash over the upper surface, especially on the head. In all stages of plumage and in both sexes the irides are brown; bill, black, with the base of the lower mandible bluish; the feet and tarsi, black.

OBSERVATIONS.

Known at once by the silvery blue color and rounded, white marked tail. This species is distributed, during the breeding season, throughout the United States, north to Southern New England, and occasionally to Massachusetts.

DIMENSIONS.

Average measurements of forty-eight specimens from Florida. Length, 4.50; stretch, 6.15; wing, 1.95; tail, 1.95; bill, .47; tarsus, .67. Longest specimen, 5.00; greatest extent of wings, 6.75; longest wing, 2.19; tail, 2.22; bill, .56; tarsus, .77. Shortest specimen, 4.05; shortest stretch of wing, 5.80; shortest wing, 1.75; tail, 1.75; bill, .33; tarsus, .55.

DESCRIPTION OF NESTS AND EGGS.

NESTS, composed of the fine stalks of some delicate plants which are mixed with thistle down and woven together with cobwebs. The whole is formed into a neat structure and smoothly covered with gray lichens, which are also kept in place with the fine silk of the spider-webs, after the manner of the Wood Pewee or the Humming Birds. They are lined with thistle down, lichens and feathers. The interior is somewhat purse-shaped, for the mouth is contracted. The nest strikingly reminds one of that of the Humming Bird, only it is much larger, being, in fact, very large for the species to which it belongs, yet its beautiful finish does credit to its delicate architect. Dimensions. External diameter, 2.50 inches; internal, in the middle, 2.00 inches; at the mouth, 1.50 inches; external depth, 2.75 inches; internal, 1.50 inches. EGGS, from four to six in number, short oval in form, bluish white in color, spotted and blotched irregularly with reddish brown, umber and lilac. Dimensions, from .43 by .56 to .46 by .60.

HABITS.

The little Blue-gray Gnatcatcher is the personification of graceful activity. We see it skipping about among the underbrush on the edges of a hammock with half spread wings and expanded tail. Then it disappears as if by magic, and we hear its lisping note high over head, as it poises itself for an instant on the topmost bough of a tall live oak before launching into air to snap up some passing fly, or hangs head downward that it may peer into the crevices of the rough bark; but in the next second will be hovering before the large white blossoms of the magnolia grandiflora, while it lightly removes a tiny beetle from the creamy petals. Thus it flits constantly from place to place ever busied in searching for insects and the most casual observer will pause to admire its rapid but elegant movements.

During winter they may be found in scattering flocks and I have seen hundreds of them in a single day at Key West. But singularly nine-tenths of those which I took there

were females. I think that this may be accounted for by the fact that Key West is the southern limit for this species, during winter, in the eastern section of the Union. The adult males of all species of birds are apt to wander more than the young males or the females; therefore the more venturesome males crossed into Cuba leaving their mates behind, to await their return in the spring. Many Gnatcatchers, however, remain in the more northern portions of Florida, but here we find that the majority are adult males as they are hardier and better able to withstand the colder climates. In March they pair and move about independent of their fellows, although they sometimes associate with the warblers or titmice.

In early winter I have never heard them utter aught more than the soft lispings "see see," and was not aware that they had any other song until February 4th, 1871. I was walking in a narrow path through a hammock, which lies back of the old fort at Miami, and had paused to observe a female of this species, when I heard a low warbling which sounded like the distant song of some bird that I had never heard before. I listened attentively but could make nothing of it, and advanced a few paces, when I heard it more plainly. This time it appeared to come from above me; looking upward I saw a male Gnatcatcher hopping nimbly from limb to limb on some small trees which skirted the woods. Although he was but a short distance away, I was obliged to watch the motions of his little throat before I became convinced that this music came from him. It was even so, and nothing could be more appropriate to the delicate marking and size of the tiny fairy-like bird than this silvery warble which filled the air with sweet, continuous melody. I was completely surprised for I never imagined that any bird was capable of producing notes so soft and low; yet each one given with such distinctness that the ear could catch every part of the wondrous and complicated song. I watched him for some time but he never ceased singing, save when he sprang into air to catch some insect. The female which was near seemed to enjoy the musical efforts that were executed for her benefit for she drew gradually nearer, until she alighted on the same little tree with her mate. At this moment she took alarm and flew a short distance followed by the male. As I walked away I could hear the murmur of the love song until it became indistinguishable from the gentle rustling of the leaves around.

I have heard them sing but a few times since then and only once as finely. This was a year later; we had pushed our boat far up the Wekiva Creek when a pair flew over, and alighted on a tree near. The male commenced his lovely warble and continued it while we were within hearing. The birds were not often seen in such a singular place, for we were in the midst of an immense cypress swamp which extended for miles around, and we heard but few sounds save the hoarse bellowing of the alligators, or the harsh cry of some lonely heron; thus this tinkling melody sounded particularly sweet after listening to such uncouth sounds in such a gloomy spot.

Mr. Roland Thaxter found a nest containing half-grown young, in May, at Ladies Island, South Carolina. It was placed in the fork of a small water oak at some distance from the ground. The Blue-gray Gnatcatcher rarely occurs as far north as Massachusetts.

FAMILY. TURDIDAE. THE THRUSHES.

Marginal indentations of sternum exceeding in depth the height of the keel. Width of sternum not more than half the length of the keel. Hind claws less than twice the length of the anterior claws. Generally birds of plain colors, but what they lack in this respect is made up in vocal powers, for among them are some of the finest singers in the world. The stomach is quite muscular. The proventriculus is not large and is provided with simple glands which are arranged in a zonular band. The pancreas is quite large and the spleen is a cylindrical body, usually curved. The coeca are present but very small.

GENUS. TURDUS. THE THRUSHES PROPER.

GEN. CH. Bill, shorter than the head, conical, with the tip slightly curved and notched, either yellow in color or brown, lighter at the base of the lower mandible. Anterior face of tarsus, in adult specimens, fused into a continuous plate. Members of this genus are spotted below, at least in some stages of plumage, but a few species exhibit this character only when very young. Sexes, similar.

TURDUS MUSTELINUS.

Wood Thrush.

DESCRIPTION.

SP. CH. Size, large. Form, robust. COLOR Adult. Above, including wings, reddish brown, brightest on the head and becoming slightly olivaceous on the tail. Beneath, white, slightly tinged with reddish, marked everywhere excepting on chin, abdomen and under tail coverts, with large rounded spots of dark brown. Sides of head mottled with dark brown and white. Iris, bill and feet, brown. Young, similar to the adult. Nestlings are spotted and streaked above with whitish, and there are drop shaped marks on the wing coverts forming bars, and the spots beneath are less sharply defined, otherwise, similar to the young.



Fig. 113. Head of adult Wood Thrush.

OBSERVATIONS.

This species is at once distinguishable by the large size, comparatively deeply colored top of the head and large numerous spots beneath. Occurs during the breeding season throughout Eastern United States, north to Massachusetts, Ontario, Wisconsin and Eastern Dakota, west to the Great Plains, south to Georgia on the east coast. Winters in Guatemala, and occasionally in Cuba.

DIMENSIONS.

Length, 8.00 to 8.55; stretch, 13.50 to 14.00; wing, 3.35 to 4.50; tail, 2.85 to 3.00; bill, .65 to .75; tarsus, 1.10 to 1.25.

DESCRIPTION OF NESTS AND EGGS.

NESTS, placed in large trees or bushes, composed of an outer layer of leaves, roots and mud, lined with fine roots and leaves. Eggs, four or five in number, oval in form, bluish green in color, usually unspotted.

HABITS.

The Wood Thrushes make their appearance in Massachusetts in May, in the middle States a little earlier. When the males arrive they are in full song and their clear bell-

like notes may be heard echoing through the wooded glens which was at one time their only place of resort. Now, however, they frequent small groves in the vicinity of houses, and on account of protection thus afforded them are rather increasing in numbers. The nest is built the last of May and I have found newly hatched young as early as June 4th. As a rule the Wood Thrush makes no attempt at concealing its nest placing it in the fork of a bush or low tree in open sight. The birds sing more frequently in the morning and evening and when so engaged is often perched in some elevated situation. In the autumn of 1867 the Wood Thrushes remained in Massachusetts as late as October 10th, but I think that they usually migrate somewhat earlier than this.

TURDUS SWAINSONII.

Olive-backed Thrush.

Turdus swainsonii Cab, in Tschudi, F. Peruana, 1844-46, 188.

DESCRIPTION.

Sp. Cu. Form, not very robust. Bill, rather short and stout. Tongue, narrowing towards the terminal half; bifid and fringed for about one-third its length. Breadth of sternum generally exceeding the depth of the marginal indentations. COLOR. Adult. Above, uniform olivaceous brown, varying somewhat in intensity. Under parts, white, with the chin, throat, upper part of breast, ring around eye, sides of head, and a stripe in front of eye, decidedly tinged with rufous. The throat and breast are also spotted with dark brown and olivaceous. These spots, which vary in number and size, are darker on the upper, and lighter on the lower part of the breast. Flanks, olivaceous. Under tail coverts, pure white, with the edges occasionally tinged with olivaceous. Under side of tail and of wings, olivaceous, with a pale buff bar starting from the inner edges of the latter and extending across them. Iris and feet brown. Bill, dark brown, with the base of the lower mandible pale yellow. Young, with two bars on the wings formed by the yellowish tips of the coverts. Lesser wing coverts with light central stripes to the feathers. The extreme ends of the wing and tail feathers are sometimes narrowly tipped with white. The bars on the under sides of the wings are more extended and better defined than in the adult. Nestling plumage. The following description is taken from a young bird in this plumage, kindly loaned me by my friend, William Brewster, and it is the only one I ever saw in this stage. General colors above and below, similar to the adult. The center of each feather on the entire upper portion, however, has a stripe of rufous, which widens at the extremity. The triangular spots on the wing coverts are much more prominent in this stage than in the last. The spots on the breast are somewhat broader, on account of the webs of the feathers not being as closely blended as in the adult. The bar beneath the wing is perhaps wider, the colors being more diffused. The bill and feet are paler.

OBSERVATIONS.

This species may be distinguished from all others, excepting *T. aliciae*, for which see description, by the uniform olivaceous color of the back and tail. *T. fuscescens* is uniform on the upper parts, but the color is reddish. *T. swainsonii* differs from *T. pallasii*, another closely allied species, in having the back and tail uniform; the tail of *T. pallasii* being much more rufous than the back. The Olive-backed Thrush is distributed, during the breeding season, throughout that section of North America that lies between latitude 44 degrees and the Arctic circle. A few winter in Florida, but the greater part pass into South America.

DIMENSIONS.

Average of twenty-eight specimens. Length, 6.54 to 7.76; stretch, 10.50 to 13.00; wing, 3.00 to 4.40; tail, 3.00 to 4.00; bill, .47 to .55; tarsus, 1.14 to 1.50.

DESCRIPTION OF NESTS AND EGGS.

NESTS, composed of weeds, grasses, mosses and hemlock twigs woven together, forming a neat, rather compact, well proportioned structure, which is lined with fine roots and soft mosses. Dimensions. External diameter, 4.50 inches; internal, 3 inches; external depth, 2.50 inches; internal, 1.75 inches. Eggs, usually four in number, blue in color, of varying shades, spotted and blotched throughout with pale violet and brown. Dimensions, .90 by .61 to .95 by .65.

HABITS.

While migrating, this thrush is very generally found in swampy localities, where it is extremely shy, keeping in the densest thickets. Here it maintains perfect silence, except an occasional soft chirp of alarm. It also spends the greater part of its time upon the ground scratching among the leaves in search of its insect food. It is extremely difficult to procure a specimen, as upon the approach of the intruder it instantly hides or flits rapidly through the bushes, pausing but an instant here and there to glance at its enemy. If driven into a thicket it will persistently remain concealed until approached quite nearly, and then rapidly move to another place but a few rods away. If too closely pursued it rises suddenly to the tops of the bushes, and darting through the woods, with nearly the speed of light, disappears in the distance. This species passes through our midst in great numbers; yet, on account of its retiring habits, only the experienced collector will consider it at all common. Those who have never seen it on its breeding grounds, and who can judge of its habits only during the migrations, will consider it a silent and mysterious bird.

But let such an one visit its northern home, when the mild breezes of June sigh quietly through those vast primeval forests that everywhere cover the land. Let him wander beneath the dark shadows of the huge hemlocks and spruces, the large limbs of which form immense arches high overhead. The air is filled with the balmy odor of their leaves, mingled with the spicy fragrance of the snowy flowered moosewood. The ground is covered with a soft carpet of green moss, and all the plants that grow in these shady retreats are now in bloom, while the gentle murmur of some mountain stream is heard, harmonizing pleasantly with the warbling of the birds. Preeminent among these the echoing song of the Olive-backed Thrush rings through the wooded valleys, enchanting the ear with its scarcely surpassed melody. The song differs entirely from that of the Hermit Thrush, being more continuous but not quite as loud. It is, however, remarkably fine, and one can hardly believe that the silent bird he has been accustomed to see farther south is capable of producing such delightful notes. Not only in the newly acquired vocal powers does the bird in summer differ from the same species in spring and autumn, but its habits are different. It does not now skulk in the bushes, but perches upon the branches of its favorite evergreen trees, many feet from the ground, and at this elevation sings its song. It has, however, the same low soft chirp of alarm, but it uses it oftener, boldly standing in plain sight while it thus remonstrates with the invader, as if conscious of a prior right to the soil. While in this position it usually moves its tail slowly, and tips its head slightly while it gazes, with its full round eye, upon the movements of the invader. Sometimes, however, it will sit without noise or motion, after the manner of the Robin, until one has passed quite under it. At such times it is difficult to detect the birds, so closely do its colors blend with those of the trunks and branches of the trees. These

thrushes do not spend their entire time on the trees, but are occasionally seen on the ground.

Just before the season of incubation, the male may be seen chasing the female playfully through the branches or among the bushes, flitting from place to place so swiftly that the eye can with difficulty follow their movements. About the last week in May they begin to build. The locality selected is generally a thick clump of low fir trees. The nest is almost always placed in the top of one of these trees, at a height of from five to six feet above the ground. I have seen several uncompleted, but never saw the bird building or near them. Indeed, it is rather careless about guarding its nest, for although it may contain eggs, it is difficult to find the bird near. Upon the approach of man she instantly leaves and conceals herself. Even when the eggs are removed, neither of the birds appear or make the least remonstrance. I doubt if they would make an effort to defend even their young from the depredations of man. As I have found several nests containing broken shells of fresh eggs, I also conclude that jays and squirrels meet with very little opposition when they feel inclined to make a meal of freshly laid thrushes' eggs. The birds seem aware of their deficiencies in this respect, for the nest is usually placed in such a position that it is entirely concealed from view, especially from directly above and below, points from which it would be likely to be discovered by the pilfering jays or squirrels. It is a singular fact that those birds which carefully conceal their nests, display cowardice when their eggs or young are molested. On the other hand, birds like the jays, crows, hawks, robins, etc., that build in conspicuous places, all make loud outcries whenever their breeding places are approached, and defend them bravely. It is also observable that many species that place their nests upon the ground, trusting to the protective color of their plumage and eggs, invariably endeavor to draw away their enemies' attention by feigning lameness, as practised by the Ruffed Grouse, Bay-winged Bunting, the various species of Plover, etc.

The young Olive-backs are fully fledged by the last of July, and by the 20th of September both young and old commence their southward flight. The majority leave before the middle of October, but I have met with stragglers who seemed loath to leave their summer homes, although the cold winds of November had begun to blow, and the autumn leaves were fast falling to the ground. The food of this species consists principally of insects, but an occasional dinner of ripe berries does not go amiss if it comes in their way.

I give this thrush as a bird of Florida upon the authority of Mr. George Boardman, who has taken two in the state in February, one at St. Augustine, and one at Green Cove Springs.

TURDUS ALICIAE.

Gray-cheeked Thrush.

DESCRIPTION.

SP. CH. Size, form and general coloration, similar to those of the Olive-backed Thrush, the only difference being that the cheeks and ring around the eye are paler, being nearly white, while the throat and breast are buffy white and not reddish, and the upper parts are usually, but not always, gray.

OBSERVATIONS.

Occurs during the breeding season in Northern North America west of the Rocky Mountains from Labrador westward to Southern Alaska. Winters south of the United States. Rare on the Bahamas during migration.

DIMENSIONS.

Length, from 7.30 to 7.60; stretch, 12.30 to 12.60; wing, 4.00 to 4.15; tail, 3.00 to 3.15; bill, .53 to .55; tarsus, 1.18 to 1.20.

DESCRIPTION OF NESTS AND EGGS.

NESTS, usually placed in trees but occasionally on the ground, composed of grass, leaves, strips of bark, and occasionally of moss, with sometimes a mud base. EGGS, four in number, oval in form, greenish blue in color, spotted and blotched with reddish and yellowish brown. Dimensions, from .88 by .62 to .92 by .64.



Fig. 114. Head of adult Gray-checked Thrush.

HABITS.

The Gray-checked Thrushes are a late spring and early autumnal migrant through the middle and New England States, thus I found them common on May 18th, 1876, at Williamsport, Pennsylvania, the Olive-backs having migrated in great numbers during the week previous. While with us this bird is shy and retiring in habit and is silent excepting for the low warbling note of alarm. On its breeding ground in Alaska, however, it is said to utter a low sweet song. I shot a single specimen out of a small flock of presumably the same species, on one of the smaller of the Grassy Keys, Bahamas, on May 6th, 1884, just at night fall. I visited the key the next morning by daybreak but all of the birds had departed.

Turdus aliciae bicknelli.**Bicknell's Thrush.**

DESCRIPTION.

SUB SP. CH. Differs from typical specimens of *T. aliciae* only in being smaller. Length, from 6.25 to 7.25; wing, 3.40 to 3.80; tail, 5.60 to 2.70; bill, .50 to .52; tarsus, 1.10 to 1.15.

OBSERVATIONS.

The nests do not differ from those of the Olive-back but the eggs are greener and more finely spotted. This sub species occurs in summer on the White Mountains of New Hampshire, Vermont and on the Catskills, New York, also on some small islands off the south-western end of Nova Scotia, also on the summit of Mount Graylock, Western Massachusetts.

HABITS.

Bicknell's Thrush is a regular migrant through Massachusetts in spring and autumn coming about the time in which the typical Gray-checks make their appearance. Mr. Brewster says that the song is like that of the Wilson's Thrush and that some of its call notes resemble those of the Wilson's, and that others call those of the Olive-back, while it emits a low cluck much like that of the Hermit.

TURDUS PALLASII.

Hermit Thrush.

Turdus pallasii Cabanis, Wiegmann's Archiv, 1847, I, p. 205.

DESCRIPTION.

Sp. CII. Form, not robust. Bill, not long but rather slender. Tongue, bifid, and fringed for about one-fourth its length. Breadth of sternum, not greatly exceeding the depth of the marginal indentations.

COLOR. Adult. Above, dark reddish brown, which becomes bright rufous on the rump and tail; the latter sometimes has a decided purplish tinge. Beneath, white, with numerous triangular spots of brown on the throat and breast. These spots vary in shade, number and size, being larger and darker on the middle of the breast, and lighter on the lower part of it. Those on the sides of the throat near the base of the bill show a tendency to cluster and form maxillary stripes. A ring around the eye, and the under tail coverts, pale buff. A spot in front of the eye, white, intermingled with dark feathers. The feathers of the crown have also darker centers. Sides of the head, neck and flanks, of the same color as the back but some shades paler. Feathers of the ear coverts, olivaceous, with narrow central lines of pale yellow. There is a broad band of buff beneath the wings, commencing on the inner sides, and, spreading as it advances, reaches



Fig. 115. Head of adult Hermit Thrush.

nearly to the outer quill feathers, extending over nearly three-fourths of the inner marginal length of the primaries. Iris and bill, dark brown, with the lower mandible of the latter, yellow. Feet, pale brown. Young, similar, but darker on the back, with a tinge of rufous over the chin, throat and breast. The two rows of coverts are also tipped with yellowish, forming bars across the wings. The bands on the under side of the wings are deeper in color. The outer sides of the wings are decidedly rufous, very nearly as dark as that of the upper portions of the tail. Feathers of the wings and tail, slightly tipped with yellowish white.

OBSERVATIONS.

This species may be distinguished from *T. swainsonii* and *aliciae* by the foxy tail and buff under tail coverts. It differs from *T. fuscescens* in the darker and larger spots on the breast, besides which *T. fuscescens* is more uniform in color on the upper parts. I have never met with this species in the nestling plumage, but judge that it differs from the adult much as in the preceding species. The Hermit Thrush has a distribution somewhat similar to the Olive-backed, but is, if anything, more Southern during the breeding season. It winters in great numbers in Florida, and the other extreme southern states.

DIMENSIONS.

Length, from 6.60 to 7.60; stretch, 10.77 to 12.83; wing, 3.27 to 3.64; tail, 2.40 to 3.17; bill, .40 to .75; tarsus, 1.00 to 1.25.

DESCRIPTION OF NESTS AND EGGS.

NESTS, composed outwardly of dried grasses, twigs, leaves and mosses; rather smoothly lined with finer grasses, mosses, and fibrous roots. It is well proportioned to the size of the bird. Dimensions. External diameter, 5.00 inches; internal, 2.50 inches. External depth, 3.00 inches; internal, 2.00 inches. Eggs, rather elongated in form, pale green in color, generally unspotted. Dimensions, from .88 by .60 to .92 by .65.

HABITS.

The Hermit Thrush makes its appearance in Florida about the first of November and soon scatters over the mainland of the state. It frequents the dense undergrowth of

the hammocks, where it may be seen scratching among the decaying leaves and other debris in search of insects. It is very unsuspecting while in these southern wilds; sometimes an individual would come into our camp, when we chanced to pitch our tents near a thicket, and perching on a box or barrel, gaze at us inquisitively, occasionally raising and then lowering its tail, while it gave vent to its astonishment by a low chirp. They are very numerous; every hammock and thicket has its share; they even inhabit the bushy edges of the thick palmetto swamps, the dark and dismal recesses of which are seldom visited by any birds, excepting the nocturnal species. All winter they flit silently among the luxuriant vegetation of Florida, revelling throughout the season amid flowers. But when the cool, refreshing north winds cease to blow, and the burning heat of the semi-tropics comes over the land, the Hermit prompted by instinct, commences its steady march northward. The old males go first, followed by the young males and females, so that by the middle of April not one is to be found within the limits of the state.

The earliest migrants arrive in Massachusetts the first week in April; others continue to come until the first of May, when, with the exception of a few individuals, they have all passed to the great breeding grounds in the woods of the North. While migrating in the spring this thrush is somewhat shy and retiring, generally keeping in the swamps. At this season it has no song, excepting the low note of alarm, but in its home among the hemlocks and spruces it is far different in this respect; there it sings finely.

I well remember that I first heard its song at Hyannis, in south-eastern Massachusetts, during the last week in June, when in company with my friends, Messrs. Wm. Brewster and F. P. Atkinson. We were walking in a field, near one of those woods, composed of low scrubby trees, which cover a large portion of this section of the state, when Mr. Brewster exclaimed, "Hear that Hermit Thrush!" We listened for a moment for a repetition of the song, which his quick ear had detected, and soon heard the clear, bell-like notes, coming from the far depths of the wood, through the still morning air. The scene was peculiar, and the song thus became associated with it, and will not soon be forgotten. The bird sung well, but the song lacked the accompanying loud, ringing echo heard to perfection in the deep, heavily wooded valleys of Northern New England.

Although it breeds sparsely at Hyannis and in some other sections of Massachusetts, its true home is farther north. Here, in the dense shade of the evergreens, amid the giant trunks which stand around like sentinels, it builds its nest upon the ground by the side of some moss-grown log. The situations chosen are generally upon some gently sloping hillside, and the nest is placed in such a position as to be hidden, especially if the brown-backed mother bird be upon it. She sits very closely, as if aware of this fact; generally not starting until the intruder is about to tread upon her, when she will flit silently to the cover of some thicket, and remain concealed — for this species, like the Olive-backed, is not very assiduous in defending its nest, even when it contains young. They exercise great judgment in selecting material with which to cover the outside of the nest, so that it may not readily be discovered. One which I found built on the upper side of a prostrate mossy log, was sunk into the decaying wood so that the top was on a level with the

surface, and was smoothly covered with green moss, similar to that growing around it. So neatly was this done, that, although I noticed the log as it lay in my path, I never should have observed the nest if the bird had not flown from it as I came up.

The eggs are generally laid the first week in June, but in the instance spoken of above, although it was found as early as June 5th, the nest contained newly hatched young. Mr. Allen and myself found the young fully fledged, and flying about, at Hyannis, on July 3d, 1869. A nest was taken at North Beverly, June 14th, by Mr. E. P. Emerton, and another was taken at Concord, the first week of the same month, by Mr. Brewster. These instances go to prove that it does not breed any earlier in Massachusetts than in Northern Maine.

The male is very attentive to the female, not only before the time of nesting, when he follows her everywhere, but during the time of incubation he sits on a branch above her, and sings his incomparable song. During the northern migrations they associate, and even while moving south they may be seen in pairs.

They enter Massachusetts on their southern flight about the first of October, and although some remain in Maine and New Hampshire as late as the first week in November, the mass have left the north by the 20th of the former-named month. They linger in Massachusetts in great numbers through October, frequenting the woods and thickets everywhere. They are not at all shy, even being so familiar as to enter the villages, and flit through the gardens. Most of them disappear by the first of November, but a few remain somewhat later. Thus the Hermit comes to us in the fading glories of autumn, becomes associated with the falling leaves and ripening nuts, then leaves us with the first icy blasts of winter.

TURDUS FUSCESCENS.

Wilson's Thrush.

Turdus fuscescens Stephens. Shaw's Zoology. Birds, X, I, 1817, 182.

DESCRIPTION.

SP. CUL. Form, slender. Bill, not long and rather broad at base. Tongue, acuminate, bifid, and rather coarsely fringed for one-third of the terminal length. It is bright yellow in color. Sternum, of about the same proportions as that of *T. swainsonii*; indeed, the sternums of *T. swainsonii*, *pallasii* and *fuscescens*, which I have in my collection, are so nearly alike, in general proportions and size, that it is impossible to determine from what species any particular one came, without referring to the label. On an average, however, those from *T. fuscescens* are stoutest and broadest, those from *T. pallasii* are the slenderest, while those from *T. swainsonii* are intermediate; but those from *M. migratorius* are not only larger, but have deeper marginal indentations in proportion to the width. COLOR. Adult. Above, light reddish brown, becoming slightly yellowish on the rump. Beneath, pure white, with a pale buff tinge across the throat and fore part of the breast; the throat and breast are also covered with pale triangular spots, which on the fore part of the breast are



Fig. 116. Head of adult Wilson's Thrush.

brown, but more olivaceous on the lower part, where they become nearly obsolete. On the sides of the throat they exhibit a tendency to cluster and form maxillary lines. Flanks and tibiae, pale olivaceous. A broad band beneath the wing, which is not well defined, is of a pale buff. Under wing coverts, white, with an olivaceous tinge. Axillaries, white, tinged with pale buff. Ring around the eye, and stripes on the feathers of ear coverts, pale buff. Lores, ashy. Iris, brown. Bill, dark brown; the basal half of lower mandible, pale yellow. Sexes, similar in all stages of plumage.

OBSERVATIONS.

This bird is easily distinguished from all the other smaller thrushes by the paler tints of the spots on the throat and breast, which are also more restricted. The colors of the back are very uniform throughout, with the exception of a slight ochrey tinge upon the upper tail coverts and lower part of the rump. This tint also occasionally appears on the crown. This species is perhaps less variable in color than any other of the thrushes. It is found during the breeding season from latitude 42 degrees, northward, perhaps to the far countries. Although a few are found in Florida and Cuba the greater part winter in Central and South America.

DIMENSIONS.

Length, 7.00 to 7.75; stretch, 11.25 to 12.50; wing, 3.70 to 4.20; tail, 2.60 to 3.55; bill, .55 to .60; tarsus, 1.08 to 1.20.

DESCRIPTION OF NESTS AND EGGS.

NESTS, composed of grape-vine bark, leaves and weeds, lined with fine grasses, leaves and fibrous roots. It is deeply hollowed, but well proportioned to the size of the bird. Dimensions. External diameter, 5 inches; internal, 2.50 inches. External depth, 3 inches; internal, 2 inches. EGGS, rather pointed in form, generally dark green in color. Dimensions, from .90 by .60 to .95 by .70.

HABITS.

While wandering through the thickly wooded valleys of Massachusetts, after the first of May, the ears of the pedestrian will be saluted with a series of continuous life-like notes, coming in two or three waves, and ending in a prolonged sound. This melody will attract his attention, if he is not at all inclined to notice such things, for it is very singular, and he will naturally wish to see the author of it. Therefore, he makes his way cautiously towards the spot where the songster seems to be, but as he draws near the song ceases to be given, and in its place he hears a suppressed whistle. This note is uttered at irregular intervals, sometimes loud, sometimes soft, and ever changing in the direction from which it comes. If the observer is wary, he will perhaps catch a glimpse of a brown-backed bird flitting quickly through the thick bushes. But unless he is acquainted with the habits of Wilson's Thrush, for this is the species which he is endeavoring to discover, this is all he will see; for if it is too closely pursued, it will cease giving its alarm-note, and, rising suddenly to the tops of the trees, will dart over them, alighting a long distance from the disturber of its peace.

If surprised in the open woods, which it sometimes visits, it usually behaves in an entirely different manner. When any one comes suddenly upon it, as it sits upon the branch of a tree it will remain perfectly quiet and keep silent, as if conscious that its sober colors are a natural protection. In this habit it resembles the robin and other small thrushes, and one may pass quite near it without its flying. But if the intruder pauses for a time to observe it quietly, the bird will appear puzzled, and, after keeping its statue-

like position for a few moments, will walk slowly along the limb on which it is perched, uttering a low whistle, but always attentively examining the object of its dread. Then, if a single step is made towards it, the thrush is off like a flash, as if just aware that it is discovered. Although it usually flies very rapidly, it slackens its speed when crossing an open field and moves with a steady flight.

Before the season of incubation, the male is constant in his attentions to the female. In this he resembles the Hermit; like that species he may be seen pursuing her through the woods, and while she is setting he is never far away. They generally build their nests during the last week in May; nearly always in the thick woods. It is usually placed upon the ground by the side of a prostrate tree or log, or else at the foot of a clump of bushes. The situation chosen is almost always upon a sloping hillside, near a swamp, where the trees grow thick and the shade is dense. But a short time since, however, (June 21, 1870) I was surprised by seeing a nest built on an apple tree in the orchard of the well known apiarist, Mr. H. Alley at Wenham. The nest was placed on the tops of some twigs and limbs after the manner of the Cuckoos, and at a height of ten feet from the ground. It was constructed of much the same material as usual, and contained four eggs in an advanced stage of incubation. This is the first, out of many instances, where I have found the nest of this bird in any other situation than on the ground. As it feeds principally upon insects, it may be possible that the large number of bees kept in the orchard, attracted the birds to the spot, and, as there was no locality near, where they could place their nest upon the ground and remain undisturbed, they chose this singular situation.

Like the other small thrushes, already described, it is very timid, and seldom attempts to drive the spoiler from its nest; indeed, it usually conceals itself at such times. On June 20th of the present season, I found a nest in a small, thickly wooded island on the salt marsh, which contained newly hatched young. The female was setting at the time, but she instantly darted away into the thicket. I went in search of the bird, but only succeeded in catching a glimpse of her as she was flitting through the bushes more than a hundred yards from the nest. She made very little noise, only occasionally giving a low whistle. The male did not make his appearance.

In the latter part of July, this species moults, and for this purpose retires to the alder swamps, which border streams and other bodies of fresh water. The male never sings then, and they seem to have deserted the woods, so completely do they remain concealed. They do not begin to migrate south until the latter part of September, after which but few are to be found. As the voice of the Tawny Thrush is only heard in early summer, this singular, half mysterious song becomes inseparably connected with the dark green foliage, seen in the softened light of the deep, deciduous woods, and with the peculiar odors which greet the senses in these pleasant retreats, when the breezes murmur through the tree tops and one feels a delicious quietude only experienced on those bright days which appear perfect only in New England.

I give this species as a bird of Florida on the authority of Mr. Boardman, who took two specimens at Green Cove Springs on February 20th and 22d.

GENUS. MERULA. LARGE THRUSHES.

GEN. CH. Marginal indentations of sternum deeper than in the preceding genus. Size, large. Tail, not as long as the wing. Sexes not always similar.

MERULA MIGRATORIA

Robin.

Turdus migratorius Linn., Syst. Nat. 12 ed., 1766, 292.

DESCRIPTION.

SP. CH. Form, robust. Size, large. Wings, rather long and pointed. Tail, slightly rounded. Marginal indentations, equal in depth to the width of the sternum. Tongue, not very wide, slightly cleft at the extremity, and delicately fringed with cilia for about one-half of the terminal length. Color. Adult male in spring. Back, rump, outer edges of primaries, secondaries and tertiaries, ashy gray; other portions of wings above, dark brown. Top and sides of head, upper portions of throat and tail, black; the latter, streaked with white. Interseapular region, ashy, spotted with black. Spots above and below the eye and just in front of the upper portion of it, chin, throat, abdomen and under tail coverts, pure white, the latter streaked with black. Under parts of wings and tail, glaucous, with the primaries tinged with pale buff. Remainder of lower portion, including under wing coverts, rich golden brown. Bill, yellow. Adult female in spring. Similar to the above but generally paler, which is especially noticeable in the colors below which are inclined to be yellowish rufous. Adult in winter. The plumage differs from that in spring in having the feathers of the under portion of the body, as well as the secondaries and tertiaries, tipped with white.



Fig. 117. Head of adult male Robin.

The upper surface is tinged with brown. This is especially noticeable in Robins taken in Southern Florida during January. Young. Similar to the winter male, but has two white bars on the wings composed of drop-shaped marks on the tips of the two rows of wing coverts. During winter, birds in this stage are strongly tinged with brown, both on the under and upper surfaces of the body. The bill is also browner. Nestlings. Pale yellow beneath, barred and spotted throughout with black. The feathers of the upper surface are darker and tipped with drop-shaped marks of white. The upper row of lesser wing coverts is streaked with brownish yellow. Throat and chin, pure white, with a brown maxillary line. Iris and feet, brown in all stages.

OBSERVATIONS.

The above description will serve to distinguish this species from all others. As will be seen by dimensions given below, specimens taken in Southern Florida, average a very little smaller in size, than those from New England, but the tail and bill are longer in proportion to the size of the bird. The difference is too slight, however, to warrant sub-specific separation. It is a widely distributed bird, being found throughout the entire extent of Eastern North America, west to the Rocky Mountains.

DIMENSIONS.

Length, from 9.15 to 10.75; stretch, 14.80 to 16.50; wing, 4.10 to 5.40; tail, 4.10 to 4.20; bill, .50 to 1.00; tarsus, 1.00 to 1.30. From Florida: length, 9.69; wing, 4.86; tail; 3.90; bill, .71; tarsus, 1.06.

DESCRIPTION OF NESTS AND EGGS.

NESTS, generally placed in trees or bushes, composed of mud mixed with grass, and the compound when dried forms a kind of cement. They are almost always smoothly lined with fine, dead grasses, and are placed

on a foundation of coarse grass. The nests are regular in form and well proportioned to the size of the bird. Nests built in damp localities contain less mud than those found in drier places. Dimensions, external diameter, 6.00, internal, 4.50. External depth, 4.50, internal, 3.00. Eggs, four or five in number, oval in form, greenish blue in color, of varying shades but generally very dark, and unspotted. Dimensions, from 1.05 by .80 to 1.26 by .85.

HABITS.

Although the robins are shy in autumn and winter, they become tamer during the breeding season, and may be seen hopping about the greens of our villages with the utmost concern; indeed they even visit the public parks of the great cities and alight on the grass plats and gardens within a few feet of pedestrians. They build their nests in all sorts of localities and in the most peculiar situations. Sometimes a pine in the deep woods is selected, or a cedar on a breezy hill-top; again, a pair will build in the apple tree that overhangs the farmhouse, and the worthy husbandman will tell you that the same birds have bred in the same locality for years.

They seem to have a fondness for the same place, and will often use the decaying nest of the previous season as a foundation for their new structure. I knew a pair to build for several successive years on a bracket over a window of a dwellinghouse; here they piled mixed mud and grass, summer after summer, until they had accumulated a heap of rubbish a foot in height. Another couple had strangely taken a fancy to the window bracket of a house which stood but a few rods away, and which was built exactly like the first.

The birds seem to possess a liking for building about houses, and I have seen several nests in similar situations to that described above. I once found one built on the top of a slatted hen pen, in a situation exposed to wind and rain. Nor do they always choose the outside of buildings, but often more sensibly enter deserted edifices and there construct nests. Upon visiting an ancient house at Hog Island, Mass., in which Rufous Choate was born, I found no less than four placed inside on the broad window sills, the birds having found entrance through some broken panes of glass.

Individuals of this species sometimes find a natural shelter. I found a nest containing four eggs in a hole in an old apple tree; the aperture was about six inches deep and four in diameter, and the nest was neatly placed in the bottom, after the manner of the Bluebird.

Probably no bird is more assiduous in guarding its nest than this species. Upon the slightest appearance of danger it sounds its querulous, loud alarm-note, calling the attention not only of its feathered friends, but of man (for nearly every one has a liking for the robin), and in this way it procures the assistance of powerful allies. It is ever on the alert, and woe betide the unfortunate urchin who has been bitten with the mania for egg collecting, if in his meanderings over forbidden ground in search of rare nests, he chances to be seen by a robin who has a nest in the vicinity. No matter if robins' eggs are not what he wants, it is all the same to the anxious bird, and her cries ring out just as loudly as if his pilfering hand was on her own blue eggs. This, of course, attracts the attention of the owner of the forbidden land, who is on the lookout for amateur oologists, and the disappointed youngster is forced to take to his heels or pay the penalty of the law.

The food of these birds consists in a great measure of insects, especially during that part of the year when they are rearing their young. As much has been said upon this subject, expressing contrary opinions, I offer the result of my observations. Out of seven robins dissected in April, the stomachs of but three contained vegetable food to the exclusion of insects; all the others were filled with grubs, beetles, other insects and earthworms. The stomachs of the three of which I have spoken contained dried barberries. These birds were shot in early April, when the ground was partly frozen. The stomachs of the birds shot in June all contained wire worms or beetles; and only in one instance was there any addition to this food, then I found a few currants. In July I found the same food, excepting the currants, and with the addition of grasshoppers. In August and September their stomachs exhibited about an equal proportion of insects, cherries and berries. In but two instances out of seven did I find that the latter articles of diet were taken to the exclusion of the insect food. October and November finds them feeding upon worthless berries. What few remain in New England during winter subsist upon the berries of the mountain ash, the savin and the cedar.

The robins breed in New England from April 15th to July 15th, commonly raising two and even three broods in a season. I have never found them breeding in Florida, but have been informed that they remain through the summer in some localities. This species is subject to albinism, and it is not uncommon to see a pied or white specimen. This is owing to a diseased condition of the feathers or to extreme old age, when the bird seems to lose the power of moulting; then the feathers become nearly white; I have taken a specimen in this condition that was nesting. They live to a good old age; a specimen taken when young and kept in confinement by my friend, Mr. L. L. Thaxter, lived over ten years. Early in life it lost an eye by an attack from a cat, yet it appeared lively and happy until its death, which resulted from age.

The song of the robin consists of several loud notes given with energy; it can hardly be called fine, yet it is lively and agreeable. Perched on the topmost bough of some apple tree, in the rosy twilight, after a sunny day in early spring, he pours out his song. Thus his simple lay becomes associated with the balmy odor of the pine woods, the budding trees, and growing grass in the meadows, all pleasant reminders of the early summer. The robin appears in Florida in some winters, arriving usually in November.

GENUS. SAXICOLA. STONE CHATS.

Bill not as long as head, short and slender. Tail, shorter than wing, square and emarginate. A large and widely distributed Old World genus. Sexes not similar.

SAXICOLA OENANTHE.

Stone Chat.

DESCRIPTION.

SP. CH. Size, medium. Form, slender. COLOR. Adult male. Ashy gray, with the forehead, superciliary line, upper tail coverts and lower parts, white. Wings and tail, black, the latter with most of the

feathers white for more than half their length. Broad lines on sides of head, black. Female and young more grayish, with markings less distinct.

OBSERVATIONS.

Known by the gray back, white under parts and black wing and tail. An Old World species, occurring also in Greenland and Labrador.

DIMENSIONS.

Length, from 6.65 to 6.75; stretch, 11.50 to 12.50; wing, 3.65 to 3.75; bill, .50 to .60; tarsus, .95 to 1.00.

DESCRIPTION OF NESTS AND EGGS.

NESTS, placed in holes in the ground or in rocks, composed of weeds, grass, etc. EGGS, four, five and seven in number, rounded oval in form, grayish blue in color, without spots. Dimensions, .55 by .80 to .60 by .85.

FAMILY SAXICOLIDAE. THE BLUE BIRDS ETC.

Marginal indentations of sternum exceeding in depth the height of the keel, but the width of the sternum is more than half the length of the keel. This family differs from that of Turdidae in having the sternum wider in proportion to its length. The tail is also square and emarginate, while in Turdidae it is always rounded.

GENUS. SIALIA. THE BLUE BIRDS.

GEN. CH. Primaries, ten. Wings, pointed. Tail, shorter than the wing, square and somewhat emarginate. Predominating color above, blue. Sexes not similar.

SIALIA SIALIS.

Blue Bird.

Sialia sialis Baird, Birds of North America, 1858, 222.

DESCRIPTION.

SP. CH. Form, somewhat robust. Bill, not very slender; gently curved at the tip, and slightly notched. Tongue, acuminate, bifid, and fringed with rather coarse cilia at the end. Sternum, quite strongly built. COLOR. Adult male in spring. Above, uniform dark blue, with the tips of the primaries, secondaries, and inner edges of the tertiaries, dark brown. The ends of the tertiaries, secondaries, primaries and tail, are narrowly edged with white. Lores and ear coverts dusky. Chin and sides of the throat, blue; this color sometimes extends over the entire throat, and, in some specimens, even reaches the upper part of the breast. Breast, sides and flanks, rich chestnut brown, with the abdomen dirty white. The under tail coverts are pale blue. Tibiae, dusky. Under wing coverts, axillaries, and under portion of the tail, blue, of a lighter shade than the upper parts. The remainder of under side of wings, glaucous. In autumn there is a reddish suffusion over the upper surface, and less dusky about the sides of the head. Adult female in spring. Above, pale blue, becoming brighter on the wings and upper side of the tail. There is a reddish wash over the middle of the back, and on the shoulders. The ends of the wings are colored as in the male. Sides of the head, dusky. Chin, throat, abdomen and under tail coverts, dirty white; remainder of under portions of the body, chestnut, as in the male, but paler. Axillaries and under wing coverts, bluish white. Tibiae, dusky. In autumn the chin and throat are like the breast: the white of the abdomen and under tail coverts is purer. Young male, differs from the adult in having a whitish wash over the breast. There is also a more rufous suffusion above. The tertiaries are edged with reddish and white, and the entire colors are paler. Young female, darker above than the adult, with the tertiaries edged with rufous and white. A reddish wash extends over the head and back. The chin and throat are like the breast. The white of the

abdomen is purer, while the under tail coverts are strongly tinged with buff. Nestling plumage of male. Tail and wings like the young in autumn. The remainder of upper surface dull reddish brown, streaked with whitish; two rows of coverts are also tipped with it, forming bars across the wings. Under portions, whitish, with the feathers of the throat, breast and flanks edged with brownish red. Tibiæ, white. Female in nestling plumage, similar to the male, but with colors paler. Irides, brown. Bill and feet, black in both sexes, and in all stages of plumage.

OBSERVATIONS.

There are two western representatives of this species (*mexicana* and *arctica*), but it may be distinguished from them by its uniformly blue back, combined with the red breast and throat; although I have seen specimens of *sialis* having a blue throat, which closely approached some specimens of *mexicana*. Females of *mexicana* are paler than of *sialis*. Specimens found breeding in Florida are not only smaller in size, but darker in color throughout, than those from New England. This species has a wide distribution, extending from latitude 46 degrees, south to the extreme limits of the main land of Florida, and west to about longitude 102 degrees. They winter in the Southern States and occasionally in Cuba.

DIMENSIONS.

Length, 6.31 to 7.70; stretch, 11.40 to 13.25; wing, 3.85 to 4.20; tail, 2.85 to 3.15; bill, .50 to .55; tarsus, .70 to .82.

DESCRIPTION OF NESTS AND EGGS.

Nests, built usually in holes of trees or stumps, and composed of dried grasses, smoothly arranged. They are rather shallow. External diameter, 4 inches; internal, 2.50 inches. External depth, 2 inches; internal, 1 inch. Eggs, usually five in number, oval in form, pale blue in color, varying somewhat in shade even in the same nest. Dimensions, from .68 by .80 to .62 by .75. There is no perceptible difference in size or color between those taken in Florida and in New England.

HABITS.

The first whistle of the Blue Birds is heard in Massachusetts in early March, when the snows of winter still linger in the valleys; but when we hear their mellow notes we know that warm weather is approaching, for the instincts of these harbingers of spring are rarely at fault. They are seen in small flocks upon their arrival, and frequent orchards, fields, and meadows, where they catch a large number of insects, alighting on the ground for this purpose, but when one is captured they fly to the top of a stake or fence to eat it. These birds are very useful in destroying injurious insects; subsisting almost exclusively upon them. Out of forty-seven specimens, which I have dissected, the stomachs of thirty-eight contained insectivorous food alone; five taken when the ground was partly frozen, in early spring, had eaten dried barberries and insects, while the remaining three had taken berries only.

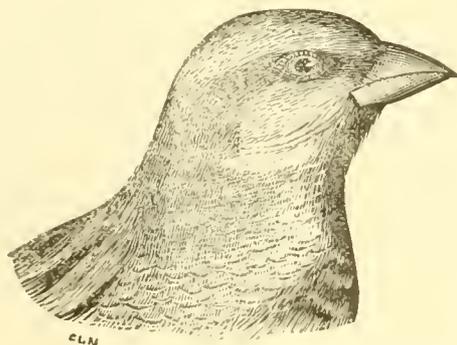
They continue in flocks until the first of April, when they pair, and by the middle of the month begin to breed. A hole in an old apple tree, or the deserted nest of a Woodpecker, is usually selected for an abode; but sometimes they will make their homes in Martin-boxes. If a box chances to be occupied by some White-bellied Swallows or House Wrens, and a pair of Blue Birds take a fancy to it, they coolly expel the owners, in spite of their noisy remonstrances, and appropriate the nest within to their own use. Sometimes they will select an aperture in a building as a breeding place, or a knot hole in a hollow fence post, and if undisturbed will return to such places season after season. I once

knew of a pair, or their successors, which nested for many years in an old pump, the spout of which formed a convenient entrance. This stood in a yard, near a dwelling, where people were constantly passing, yet the birds never manifested any alarm, but occupied the place until the pump was removed.

The male pays close attention to the female previous to depositing her eggs, and during the season of incubation. They are very affectionate, and if one is shot, the survivor will alight near it, or flutter over it, sounding the alarm note in such a plaintive manner that all the Blue Birds in hearing will gather closely around. If the victim is only wounded, and taken in the hand, it will scream loudly for assistance; then its half-distracted companion will dash at the enemy's head with fury, often snapping its bill within a foot of his face. The others, which have been attracted by these cries, display great concern as well as boldness, and if one is so disposed he may shoot them one by one without any leaving the spot, provided some of the maimed are allowed to remain in sight.

Two broods are commonly reared during the summer, in Massachusetts, but I think only one is brought out in Florida. The time of nesting there is not much earlier than at the North. I discovered a nest at Miami, on March 28th, in a stub, which stood in the pine barrens. It was built in a hole about twelve feet from the ground, and at that time there were only a few straws deposited in the bottom, but upon visiting it again on April 12th I found four fresh eggs. Another nest was taken at Dunn's Lake, by Mr. Burton, during the first part of April, which also contained only four eggs; so I judge this to be the number commonly laid in this section. It is a singular fact that many species which breed both north and south lay a smaller number of eggs in the latter place.

About the first of September the Blue Birds of New England collect into large flocks, then, as the season advances, commence their southern march, and by the first of November they have nearly all disappeared. They continue in small flocks all winter in Florida, frequenting the pine woods.



Head of adult male English Sparrow.

APPENDIX.

The following species and sub-species of birds have been omitted from the body of the work for one reason or another. Herein will also be found some notes and corrections and a descriptive list of hypothetical and extinct species.

Graculus floridanus.

Florida Cormorant.

DESCRIPTION.

SP. CH. Size, rather small. Like the Double-crested Cormorant of which a general description is given on page 56, but smaller. The smallest dimensions there will apply to this species.

OBSERVATIONS.

In stating that I considered the Florida Cormorant and the Double-crested were one and the same species I consider now that I was mistaken. I also think authors, who consider that one is a sub species of the other, are also mistaken. We cannot for a moment doubt that with the retreating ice sheet which covered the country during the glacial period that form, which is now the Double-crested Cormorant, spread northward and became gradually modified by the changed environments into a stronger, larger species, which acquired the migratory instinct; it is also equally true that, while at one time there may have been a connected chain of breeding places, extending from the Gulf of St. Lawrence to Florida, and consequently connecting intergrades between the northern and southern forms of cormorants, this condition of affairs no longer exists. Therefore, as more than a thousand miles intervene between the breeding grounds of one and the other, there can be no intermingling of one species with the other, for if they come together at all they meet in the winter, and no one can believe that migrant birds which breed at a different season, will mate with a resident species which breed at another. Hence it is that if we separate the birds at all we must separate them as species not as sub-species. I may be thought inconsistent in considering these two forms of cormorants specific and yet give the American Herring Gull as a sub-species only. but I think it highly probable that the European Herring Gull is a straggler to this coast, and that it may interbreed with our form.

BERNICLA NIGRICANS.**Black Brant.**

DESCRIPTION.

SP. CH. Size and form of the common Brant but differs in having the black of the throat extending over most of the under parts fading gradually behind without any line of demarkation. The white neck patches are usually larger and meet in front.

OBSERVATIONS.

Breeds over the same region as the Brant but is common only on the Pacific coast, and rare on the Atlantic. NESTS and EGGS similar to those of the Brant.

Cupidona cupido.**Heath Hen.**

DESCRIPTION.

SP. CH. Size and general coloration of the Prairie Hen, but differs in having broader bandings and in the feathers of the winglets on the side of the neck being lanced shaped and cut abruptly rounded, (See Fig. 118 for outlines of the feathers of the two species.)



Fig. 118. A, feather from neck tuft of Heath Hen. B, same from Prairie Hen.

OBSERVATIONS.

As Mr. Brewster has shown in the *Auk*, for 1885, p. 82, the Grouse found on Martha's Vineyard, Massachusetts, differs from the Prairie Hen as given above. As Linnaeus' description of the original *Cupidona cupido* was based upon Catesby's description and figure, which is most unmistakably that of the Eastern Heath Hen, the newly described form will have to retain the old name while to the Prairie Hen the name of *C. americana* has been given. The eggs of this species do not differ greatly from many of the Prairie Hen, excepting that they are paler than the average of those of the western species.

HABITS.

The Heath Hen appears to inhabit the low scrub lands of the Vineyards where they are at this date, 1895, not very uncommon. They are protected by law but it is highly probable that a number are killed every year, hence the species is in great danger of becoming exterminated. It is not necessary for me to say that such an event would be deplored by naturalists throughout the world. I would once more urge that the matter of the probable extermination of some of our birds, through the agency of man, be brought before the General Government, and stringent measures be taken to protect them.

GENUS. PEDIOCAETES. SHARP-TAILED GROUSE.

GEN. CH. Tail short and graduated, with two feathers of the upper tail coverts projecting considerably beyond. Elongated feathers on neck absent. Tarsus, feathered to the toes.

PEDIOCAETES PHASIANELLUS CAMPESTRIS.

PRAIRIE SHARP-TAILED GROUSE.

DESCRIPTION.

SUB SP. CH. Pale, with the general color buffy grayish or light brown. These shades predominate over the darker markings. White of wings not conspicuously contrasted with the general color. The type

P. campestris is shaded above with irregular spottings and barrings of black and brownish. Wing coverts, with large round white spots, and the scapulars are streaked with white. White beneath, with numerous V-shaped marks of dusky. The Prairie Sharp-tailed Grouse is a well-marked, paler form of this, which occurs on the plains and prairies east of the Rocky Mountains, east to Wisconsin, north to Manitoba and south to New Mexico.

DIMENSIONS.

Length, 17.50 to 18.50; stretch, 26.50 to 28.50. Wing, 8.00 to 8.50; tail, 4.75 to 5.25; bill, .80 to .87; tarsus, 1.70 to 1.72.

DESCRIPTION OF NESTS AND EGGS.

NESTS, placed on the ground, composed of a little grass. Eggs, from six to thirteen in number, pointed oval in form, varying from clay to greenish brown in color, sometimes unmarked, but usually speckled with fine spottings of dark brown.

Bonasa umbellus togata.**Canadian Ruffed Grouse.**

DESCRIPTION.

SUB SP. CH. Form, similar to that of the Common Ruffed Grouse but the size is larger and the colors darker, being rather more gray than reddish. Occurs in the wooded section of Northern New England northward. The Ruffed Grouse is found on Cape Cod and the islands along the south shore, are typical, *B. umbellus*, being quite red in coloration, but those from other portions of Eastern Massachusetts are often (in fact are usually) intermediate in plumage between this and the northern form, yet I see no reason why the constantly gray form of the north should not be recognized sub-specifically.

Lagopus albus alleni.**Allen's Ptarmigan.**

DESCRIPTION.

SUB SP. CH. Size, form and general coloration similar to those of the White Ptarmigan, but differs in having not only the white spots of both primaries and secondaries black, but this color also extends to a greater or less extent to the web of the primaries, sometimes forming black patches on the terminations of the feathers.

OBSERVATIONS.

Possibly on account of its isolated range on Newfoundland, this well marked form of Ptarmigan ought to be considered as a species, but as it has been affirmed that the White Ptarmigan, in its wandering migrations, crosses the Straits of Belle Isle, it becomes questionable whether some do not remain and breed there, thus still producing hybrids between the two forms.

LAGOPUS REINHARDTI.**REINHARDT'S PTARMIGAN.**

DESCRIPTION.

SP. CH. Form, size and general coloration similar to the Rock Ptarmigan, but in summer is less regularly and more coarsely banded above, where the black predominates, varied with pale grayish buff. Occurs as a resident in Greenland.

LAGOPUS WELCHI.**WELCH'S PTARMIGAN.**

DESCRIPTION.

SP. CH. Similar in form, size and general coloration to Reinhardt's ptarmigan but differs in summer in being grayer above, which color is marked with fine vermicalations of black. From the Rock Ptarmigan

it differs in the presence of gray instead of reddish bands above, which alternate with the black. This form has rightly been considered Mr. Brewster's, by whom it has recently been described, as a distinct species on account of its isolated range, it being confined to Newfoundland.

MELEAGRIS GALLOPAVO OSCEOLA.

FLORIDA WILD TURKEY.

DESCRIPTION.

SUB SP. CH. Form and size similar to that of the Wild Turkey but darker, with the white on the wings more restricted, the black predominating, the white being present only as detached, narrow, broken bars, not reaching the shaft of the feather. The above form, which occurs in Florida, has been separated by Mr. W. E. D. Scott in the Auk, Vol. VII, 1890, p. 376.

BUTEO BOREALIS KRIDERII.

KRIDER'S HAWK.

DESCRIPTION.

SUB SP. CH. Size and general form similar to that of the Red-tail, but differs in being pure white beneath, without any rufous tinge, with the spots across abdomen being indistinct or lacking. Above, lighter, with the white predominating. Upper tail coverts, pure white, and the tail is pale reddish, with the terminal band either represented by a few spots, or wanting. Young, differ in being snowy white beneath, lighter above, and whitish on the tail. Occurs on the Great Plains from Minnesota to Southern Texas, casually to Illinois and Iowa.

BUTEO BOREALIS CALURUS.

WESTERN RED-TAIL.

DESCRIPTION.

SUB SP. CH. Darker than the common Red-tail excepting tail and upper coverts, but some specimens occur which are lighter and which are scarcely to be distinguished from *B. borealis*. Young, more heavily spotted beneath than those of the Red-tail, sometimes wholly dusky excepting the tail. Tail of adult olivaceous, with a black sub-terminal band and frequently with more or less complete bars. Occurs in Western North America occasionally as far east as Illinois.

GENUS BREWSTERIA. WIDE-MOUTHED HAWKS.

Tarsus, feathered to the toes as in *Archibuteo*, but proportionately longer, exceeding the length of the middle toe and claw, not being about equal to it as in *Archibuteo*. The bill is much stouter and wider at the base, 1.70 to 1.90 measured from corner to corner (*A. lagopus* measures from 1.35 to 1.45) and the gape extends to a point about midway under the eye (in *A. lagopus* it reaches but a little beyond the corner of the eye.) The sterno-trachealis is remarkably stout and thick, not slender and weak as in *Archibuteo*. The proventriculus is not large and is provided with simple oval glands arranged in a zonular band about 1.25 wide. These glands are not elevated into ridges as in *Archibuteo*. Type, *B. ferrugineus* from a specimen in the collection of Mr. Wm. Brewster.

I have above briefly indicated some of the chief differences between these two genera, but there are other characters which I shall give more at length later elsewhere. The most remarkable external difference between these two genera will be found in the wide gape and elongated tarsus. Internally the large thick sterno-trachealis would indicate that the Squirrel Hawk has a louder voice than the Rough Leg, but a more remarkable difference, and one which any one familiar with the anatomy of our Birds of Prey, will consider at least of great generic importance, is the fact that in *Archibuteo* we find the glands of the proventriculus elevated into five longitudinal ridges which are absent in *Brewsteria*. This elevation of the glands into ridges occurs in two other genera of North American Birds of Prey which I have examined, namely, in *Pandion* and *Haliaeetus*, both fish eaters. As we also find this character is same of the Herons, Gannets, and many of

the other Totipalmates, we should naturally infer that it accompanies fish eating habits. I have named this genus for Mr. Wm. Brewster of Cambridge, whose life long studies of ornithology have been of great and lasting benefit to students throughout the world, and who first called my attention to the external differences between the Rough-legs and the Squirrel Hawk.

BREWSTERIA FERRUGINEUS.

SQUIRREL HAWK.

DESCRIPTION.

SP. CH. Size, large. Form, robust. Adult. Usual plumage. Upper parts, generally dark reddish brown shaded with dusky. Tibiae, also dark brown, barred with dusky. Wings, plumbeous. Tail, white, tinged with ashy, partly shaded or stained with rusty red, sometimes with an indistinct band of dusky. Lower parts, white, occasionally shaded with dusky. Young, grayish brown above, with the feathers margined with dusky. Basal half of tail, white, remainder grayish brown, more or less banded with dusky. Legs and lower parts, white. Black phase, adult. Blackish brown throughout, more or less varied by reddish spottings and edgings, to the feathers, either tint prevailing. Tail, as in the normal phase.

OBSERVATIONS.

Distinguished from the Rough-leg by the larger size, wide mouth and white tail, and from other Hawks by the feathered tarsi. Occurs as a resident or partial migrant, throughout Western North America, north to the Saskatchewan, south into Mexico, east to Iowa and casually to Illinois.

DIMENSIONS.

Length, from 22.25 to 23.50; stretch, 53.25 to 55.00; wing, 16.30 to 17.25; tail, 9.50 to 10.00; bill, 1.00 to 1.10; tarsus, 3.10 to 3.20.

DESCRIPTION OF NESTS AND EGGS.

NESTS, usually placed on trees, but occasionally on rocky cliffs, composed of sticks, weeds, etc., lined with grass. EGGS, three or four in number, spherical or rounded oval in form, creamy white in color, irregularly spotted and blotched with varying shades of brown. Dimensions, from 2.75 by 1.95 to 2.50 by 2.00.

BUTEO BRACHYURUS.

SHORT-TAILED HAWK.

DESCRIPTION.

SP. CH. Size, small. Three outer primaries are decidedly emarginate, the next slightly so as in the Broad-winged. Normal color, dark umber brown above, but barred on the under wing and tail coverts with white, with the feathers on the back of head and nape white at base. Tail, with six or eight bands of grayish. Face, and most of the lower parts, white. Adult phase of plumage is nearly uniformly dark brown throughout. Dimensions. Length, 16.00; wing, 13.00; tail, 7.00; tarsus, 2.00. Occurs regularly in Florida and southward.

GENUS ASTURINA. STAR HAWKS.

GEN. CH. Proportions of Buteo, with the coloration of Astur. Wings, short; tail, about three-fourths as large as the wing and not emarginate nor graduated. Feet, stout. Sexes, similar.

ASTURINA PLAGIATA.

MEXICAN GOSHAWK.

DESCRIPTION.

SP. CH. Size, medium. COLOR. Above, light plumbeous, with dark, short lines to the feathers, and faint, light wavy bandings. Upper tail coverts, partly white. Tail, black, white tipped and banded sometimes irregularly, with white. Wings darker than the back. Beneath, including tibiae, white, closely and finely banded, excepting on throat, with dark ash. Dimensions. Wing, from 10.00 to 11.00; tail, 7.50 to 8.00; tarsus, 2.75 to 3.00. Readily distinguished from the Goshawk, which it somewhat resembles in general coloration by the white and dark bands to the tail. Occurs in South-western United States, south to Central America, and north occasionally to Illinois.

FALCO MEXICANUS.

PRAIRIE FALCON.

DESCRIPTION.

SP. CH. About the size and form of the Duck Hawk but generally paler. Top of head, grayish brown streaked with dusky, outer webs of tail feathers without distinct spots, and the primaries are without a trace of spots. Under parts and collar on back of neck, pure white, with the flanks heavily spotted with dusky, and the under tail coverts are more sparingly spotted with the same. Young, grayish brown, with the feathers margined with pale rusty. Pale buff below.

OBSERVATIONS.

Distinguished at once by the pale colors above and white or whitish lower parts. Resident in Western North America, straggling east to Illinois.

DIMENSIONS.

Length, 17.00 to 18.50; stretch, 39.50 to 43.00; wing, 12.00 to 13.50; tail, 7.25 to 8.20; bill, .70 to .85; tarsus, 2.00 to 2.10.

DESCRIPTION OF NESTS AND EGGS.

NESTS, usually placed on rocky cliffs or occasionally in trees, composed of stalks lined with grasses. EGGS, four or five in number, spherical or rounded oval in form, grayish white in color, profusely spotted and blotched with reddish brown. Dimensions 2.05 by 1.70 to 2.12 by 1.80.

FALCO RICHARDSONII.

RICHARDSON'S MERLIN.

DESCRIPTION.

SP. CH. Size, form and general coloration of the Pigeon Hawk but differs in having six light bands (not four or less) on the middle tail feathers, and in the outer webs of primaries being spotted very distinctly with grayish in the male, and buffy in the female, and the general plumage is paler. Occurs from the Mississippi River to the Pacific. Eggs scarcely distinguished from those of the Pigeon Hawk.

SYRNUM NEBULOSUM ALLENI.

FLORIDA BARRED OWL.

DESCRIPTION.

SUB. SP. CH. General color and form quite similar to that of the Northern Barred Owl but smaller and darker with wider markings and a general reddish tingeing. The chief difference is that the toes of the Florida bird are nearly naked, being occasionally, however, slightly feathered. The average size is a little smaller. An abundant Florida form is occurring all over this state.

BUBO VIRGINIANUS ARCTICUS.

ARCTIC HORNED OWL.

DESCRIPTION.

SP. CH. Size and form of the Great Horned Owl but creamy; often nearly white throughout. This beautiful form occurs in the far north, migrating southward in winter, probably to Massachusetts.

BUBO VIRGINIANUS SATURATUS.

DUSKY HORNED OWL.

DESCRIPTION.

SUB SP. CH. Form and size of the Great Horned Owl, but much darker, all the dark markings becoming widened and in many cases fused together. Occurs on the northern sea board of both American coasts, on the east from Labrador northward, migrating southward quite to Massachusetts or south of this point. A specimen was brought to me in November, 1844, which was killed in Waltham, Massachusetts. Mr.

Brewster has suggested to me that both the dark and light forms of the Great Horned Owls which occasionally occur in Massachusetts, are birds which have been raised there. If this is so we must consider them as specimens that have reverted toward the original stock which once occupied this section in common when both *B. v. arcticus* and *B. v. saturatus* followed up the retreating ice sheet of the glacial period.

SCOPS ASIO FLORIDANUS.

FLORIDA MOTTLED OWL.

DESCRIPTION.

SUB SP. CH. Form, plumage, and general color similar to those of the Mottled Owl but darker and smaller. The smallest dimensions given on page 326 are of this sub species. Both gray and red phases of plumage occur, also an intermediate form, and all are equally common as in northern birds. Occurs in Florida.

SPEOTYTO FLORIDANA.

FLORIDA BURROWING OWL.

DESCRIPTION.

SP. CH. Form, similar to the Burrowing Owl, but a little smaller and darker, with the tarsus rather more sparsely feathered and the spottings beneath are rather more numerous and confused. Wing, 6.00 to 6.50. Occurs in Western Florida and possibly on the Bahamas. I procured a small Burrowing Owl at Nassau in the spring of 1884, which appeared quite similar to this form.

GENUS. MILVULUS. FORK-TAILED FLYCATCHERS.

GEN. CH. Bill, shorter than the head but about equal to the tarsus. Tail, nearly twice as long as the wing. First primary (sometimes three) abruptly narrowed at tip. Head, with a concealed bright colored spot.

MILVULUS FORFICATUS.

SCISSOR-TAILED FLYCATCHER.

DESCRIPTION.

SP. CH. First primary, narrowed at tip. COLOR. Adult. Above, pale ashy, gradually darkening behind until the upper tail coverts are nearly black. Wings, dark brown, margined with lighter. Tail, dark brown with all but the tips of the greatly elongated two outer, and basal half of the third, rosy white. Beneath, white, becoming orange on the hind parts, lining of wing orange with the axillaries and crown patch, bright vermillion. Dimensions. Length, 11.50; stretch, 15.50; wing, 5.00; tail, 9.25; bill, .70; tarsus, .70. Eggs, quite similar to those of the Kingbird. Occurs regularly throughout Eastern Mexico, north to Indian Territory, Southern Kansas and South-western Missouri, south to Costa Rica. Accidental at Key West, Florida, Norfolk, Virginia, New Jersey, New England, Manitoba and at York Factory, Hudson Bay Territory.

MILVULUS TYRANNUS.

FORK-TAILED FLYCATCHER.

DESCRIPTION.

SP. CH. Outer three primaries, emarginate. Above, clear ash. White below. Top and sides of head, black. Crown patch, yellow. Tail, black, the outer feather white for about one-half its length. Size, of the last species. Tail, sometimes 12.00 long. Occurs in tropical America; accidental in Louisiana, Kentucky and New Jersey.

TYRANNUS VERTICALIS.

ARKANSAS KINGBIRD

DESCRIPTION.

SP. CH. Size and general form, similar to that of the Kingbird but there are four, and not two or three only, of the outer primaries greatly narrowed at the tips. The tail is slightly forked. Above, ashy,

becoming greenish on the back and bluish on the rump. Concealed spots on crown vermillion in the center yellow before and behind. Wings brown, with the feathers whitish edged. Tail nearly black above, brownish beneath, with the outer webs of outer feathers yellowish white, throat and upper parts ashy, remainder of lower parts yellow, brightest on the abdomen and olivaceous on the back. Dimensions. Length, 9.00; stretch, 15.50; wing, 5.00; tail, 3.65; bill, .65; tarsus, .70. Eggs, similar to those of the Kingbird. Occurs throughout Western United States, east to Missouri and Western Minnesota, occasionally straggling eastward, even to New England.

SAYORNIS SAYA.

SAY'S PHOEBE.

DESCRIPTION.

Form, quite similar to that of the Phoebe but somewhat larger. In color, paler and more bleached above, with the head scarcely darker than the back, but with the tail very dark brown. Beneath, ashy red, lightest anteriorly, especially on the throat. Bill and feet, wholly black. Length, 7.25; stretch, 12.60; wing, 4.20; tail, 3.70; bill, .60; tarsus, .90. Occurs in Western United States, north to the Saskatchewan east to Dakota, south through middle Kansas into Mexico, straggling eastward even to Massachusetts, a specimen having been taken at North Truro, September 30th, 1889, by Mr. G. S. Miller, Jr.

CHORDELIES VIRGINIANUS CHAPMANI.

FLORIDA NIGHTHAWK.

DESCRIPTION.

SUB SP. CII. Form and general coloration, of the Nighthawk but darker and with rather less suffusion of color. Smaller, with the bill proportionately larger. Length, (average) 8.96; stretch, 22.20; wing 17.66; tail, 4.10; bill, .25; tarsus, .56. Eggs, smaller, from .75 by 1.10 to .80 by 1.15. Occurs in summer from the Carolinas, southward, migrating southward in winter.

HABITS.

I found the Florida Nighthawk abundant on Merritt's Island and breeding the first week in May. The eggs were deposited on clayey spots, destitute of vegetation. The birds are not shy, and the females would sit upon the eggs until I was within a few feet of them. No material whatever was used in the nest, the eggs being deposited in a slight depression in the soil.

PICUS VILLOSUS AUDUBONII.

SOUTHERN HAIRY WOODPECKER.

DESCRIPTION.

SP. CII. Smaller than the Hairy Woodpecker, with the white areas above more restricted. Dimensions. Length, from 8.00 to 8.75; stretch, 13.00 to 14.00; wing, 4.50 to 5.00; tail, 2.75 to 3.20; bill, 1.00 to 1.15; tarsus, .60 to .75. Occurs from the Carolinas southward.

PICUS VILLOSUS LEUCOMELAS.

NORTHERN HAIRY WOODPECKER.

DESCRIPTION.

SUB SP. CH. General coloration similar to that of the Hairy Woodpecker, but with the white areas above more extended and the size is larger. Dimensions. Length, 10.50 to 11.00; stretch, 16.00 to 17.00; wing, 5.00 to 5.70; tail, 3.10 to 3.90; bill, 1.25 to 1.50; tarsus, 1.10 to 1.30. Occurs from Northern New England northward, migrating somewhat southward in winter.

FAMILY ALAUDIDAE. LARKS.

Tarsus, not sharpened behind, but covered with two series of scales, which meet on the inside, where there is a groove, (See Fig. 119, A.) Hind claws lengthened, (ib B.) Nostrils, usually concealed by a tuft of feathers.

GENUS. OTOCORIS. HORNED LARKS.

Primaries, nine, with the first three about equal in length. Head pointed with elongated tufts of feathers on sides of the crown.

OTOCORIS ALPESTRIS.

HORNED LARK.

DESCRIPTION.

Size, medium. Form robust. COLOR. Adult. Above and on sides, pinkish brown, brightest on nape and rump, streaked with dark brown. Wings and tail, brown, edged with pinkish and tipped with white.

Forehead, line over the eye, sides of head and throat, sulphury yellow. Crescent on crown, line from base of bill to ear coverts and broad shield on breast, black. Remainder of under parts, white. Iris, bill and feet, brown. In winter and young. Similar, but the colors are obscured and the breast is frequently tinged, more or less, with dusky. Easily distinguished by the yellowish and black markings, and tuft on head. Dimensions: Length, 7.55; stretch, 13.35; wing, 4.31; tail, 2.00; bill, .50; tarsus, .90.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground, composed of grass and moss. Eggs, four or five in number, oval in form, ashy in color, thickly spotted with yellowish brown and bluish. Dimensions, from .65 by .82 to .70 by .85.

HABITS.

The Horned Larks are very common along our coast in November, remaining all winter, but depart northward to their breeding grounds north of New England. These birds are highly gregarious and often accompany the Snow Buntings and Longspurs. They are not shy, but have the habit of squatting behind stones or tufts of grass when they perceive an intruder; then, if approached, will rise with a loud, shrill cry.

OTOCORIS ALPESTRIS PRATICOLA.

PRAIRIE HORNED LARK.

DESCRIPTION.

SUB SP. CH. Smaller than *O. alpestris*, duller colored and with less yellow on the head. That is, the forehead and line over the eye is soiled white, and the yellow of the throat is either quite wanting or is very pale and often confined to the chin. Occurs when breeding south and west of the Great Lake, eastward to Western Massachusetts and to Vermont and New Hampshire. Visits the coast of Southern New England in spring and autumn.

GENUS PICA. MAGPIES.

Tail rather longer than the head and body, with the feathers graduated. First primary sword-like, curved, and narrowed. A patch of naked skin around and behind the eye.



Fig. 119. Head of adult Horned Lark; A, inside of tarsus, B, hind toe of same.

PICA HUDSONICA.

AMERICAN MAGPIE.

DESCRIPTION.

Sp. CII. Size, large. General color, black, with the abdomen, scapularies, and inner webs of secondaries white, tail glossed with green, purple, and violet, the wings with green, the secondaries and tertiaries with blue. Young, similar to the adult, but with the throat spotted with white. Length, 20.00; stretch, 25.30; wing, 8.00; tail, 11.00; bill, 1.25; tarsus, 1.85. Occurs as a constant resident in Western North America (excepting California) north to Alaska; east to the edge of the plains, straggling in winter to Northern Illinois and Michigan.

DESCRIPTION OF NESTS AND EGGS.

NESTS, placed in trees and bushes, composed of stalks and twigs with the inside plastered with mud formed into a dome-like structure, and lined with grasses and feathers. The entrance hole is on one side. EGGS, six to nine in number, oval in form, pale green in color, thickly spotted with grayish and purplish brown. Dimensions, 1.25 by .90 to 1.30 by .95.

CYANURUS CRISTATA FLORINCOLA

FLORIDA BLUE JAY.

SUB SP. CII. Similar to the Blue Jay but smaller, with the bill proportionately larger. The crest is smaller and the white areas less. Occurs as a resident in Florida. Nests and eggs similar to those of the Blue Jay.

PERISOREUS CANADENSIS NIGRICAPILLUS.

LABRADOR JAY.

DESCRIPTION.

SUB SP. CII. Size and general coloration of the Canada Jay, but darker on crown, blacker and darker on sides of the head with the white of the forehead less extended. Labrador.

NOTES ON THE FLORIDA JAY. Habits. In the winter of 1886, I found this species common in the scrub lands between Bannana River and Mosquito Lagoon, Florida. They were breeding there, and I found a number of nests containing eggs the last week in April. The nests were placed in bushes generally about as high as my head, and the birds when setting were exceedingly tame. But all the Jays of this region were remarkably unsuspecting. Mr. Sacket, who had an orange grove on the river, had succeeded in taming three Florida Jays, and they soon became familiar with me, alighting on my out-stretched hand to take food, coming readily when called. I also found a nest of this Jay at Enterprise the first week in May which contained nearly fresh eggs.

CORVUS CARNIVORUS PRINCIPALIS.

NORTHERN RAVEN.

DESCRIPTION.

SUB SP. CII. This is a name given by Mr. Ridgway in his Manual to the northern form of Raven, described in the body of this book (See page 451).

CORVUS AMERICANUS FLORIDANUS.

FLORIDA CROW.

DESCRIPTION.

SUB SP. CII. Under this name it may be well to recognize the crow of Florida, which is smaller than northern birds but with a particularly large bill.

GENUS. STURNUS. STARLINGS.

GEN. CH. Bill, somewhat similar to that of *Sturnella*, but wider and flatter, and somewhat more elevated at base between nostrils.

STURNUS VULGARIS.

STARLING.

DESCRIPTION.

SP. CH. Size, large. General plumage black, glossed with green, purplish and blue, variegated throughout with yellowish or ochraceous tips to the feathers. Bill, yellowish, feet reddish. Length, 8.50; wing, 5.00; tail, 2.75; bill, 1.00; tarsus, 1.00. Europe; entirely accidental in Greenland.

AGELAIUS PHOENICEUS FLORIDANUS *Novo.*

FLORIDA RED-WING.

DESCRIPTION.

SUB SP. CH. Form and general coloration similar to that of the Red-wing but smaller, with the plumage more velvety black, and the buff edging to the scarlet shoulder, deeper. The bill is a little longer and much more slender. This difference is best seen in the cut, (Fig. 120) where I give life sized heads of three

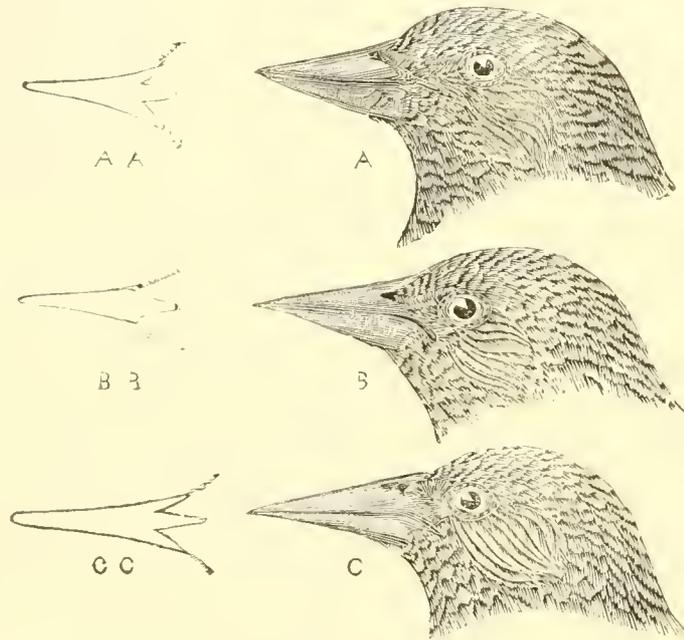


Fig. 120. A. Head of male Red-wing from Massachusetts, A A, upper mandible of same; B, type of Florida Red-wing, B B, upper mandible of same; C, Bahama Red-wing, C C, upper mandible of same.

forms; A, the Red-wing from Massachusetts, B, the Florida Red-wing, C, the Bahama Red-wing, (A. bryanti Ridgway). In the latter species the bill is equally lengthened but, singularly, is considerably widened at the tip, and the plumage is even more velvety black than in the Florida Red-wing. The female of the latter named is much paler than northern birds, with the streakings less conspicuous, and with the bill more

slender. This sub-species which I have described occurs through southern and middle Florida, north on the west coast to Cedar Keys, and on the east to Mosquito Lagoon. The types are specimens which I collected on Key West in November and December, 1876, and they belong to the museum of Comparative Zoology, where, through the courtesy of Messrs. Brewster and Faxon, I have been permitted to examine them. Mr. Ridgway has kindly forwarded to me a specimen of the Blackbird upon which he has based his opinion that the Bahama Red-wing occurs in Florida, and I find that it is of this sub-species and not *A. bryanti* as he at first thought, being in fact one of the very specimens which I collected with the type. The dimensions of the Florida Red-wing will be found on page 433, and the habits which relate to the Red-wing in Florida should now be applied to this sub-species.

QUISCALUS AENEUS.

BRONZED GRACKLE.

DESCRIPTION.

SUB SP. CII. Size and form of the Purple Grackle, but with the violaceous blue of the head and neck ending abruptly all around, and not intermingling with the bronze of the body as in *Q. versicolor*. Occurs in New England and westward. *Q. versicolor* is also found in New England, but more rarely, but is abundant in the middle districts.

QUISCALUS AGLAEUS.

FLORIDA GRACKLE.

DESCRIPTION.

SP. CH. Smaller than the Purple Grackle. (See page 448 the smallest dimensions of the Florida specimens are of this species). Beautifully variegated on wings, back, sides and rump with bronze, violet, and blue. Occurs in Florida. The eggs are rather darker than those of the other two Grackles, and are more sparingly spotted. I found them breeding on Indian River in April, 1886, placing their nests at the base of the fronds of the palmetto.

NOTES ON THE BLACK AND WHITE SHORE FINCH. The Latin name of this species should be *Ammodromus nigrescens* Ridgway. HABITS. I have now no doubt but what this species is a constant resident on the salt marshes of Indian River. I found them common on both sides of Banana River in February, 1886, and they did not appear to increase in number as spring advanced. Here they frequented the tall grass in company with both species of Marsh Wrens. Although there was every indication that they were breeding in April, yet I did not succeed in finding a single nest and up to date (December 1895) the eggs remain unknown. In fact, I cannot find that any one, excepting myself or my assistants who have accompanied me, has ever taken a specimen of this interesting species.

AMMODROMI'S PENINSULAE.

SCOTI'S SEASIDE SPARROW.

DESCRIPTION.

SP. CH. Size, form and general coloration of the Black and White Seaside Sparrow, but lighter in color, with the dark areas more restricted, being in fact, about intermediate between *A. nigrescens* and *A. maritimus*. I see no reason why this form should not be considered as good a species as *A. nigrescens*. They breed much earlier than do either of the others, nesting probably in February, and the song is quite different as described on page 702, where I speak of the Seaside Sparrow of Cedar Keys.

AMMODROMUS CAUDICUTUS NELSONI

NELSON'S SPARROW.

DESCRIPTION.

SP. CH. Similar to the Sharp-tailed Finch, but differs in being smaller with a shorter more slender bill with the colors brighter, the buff of the head and other parts deeper. The light edges of the back feathers whiter and the stripes on the lower parts finer and less numerous. Occurs in the interior of North America, migrating eastward to the Atlantic coast in autumn, as far north at least as Massachusetts.

AMMODROMUS CAUDICUTUS SUBVIRGATUS.

ACADIAN SHARP-TAILED SPARROW.

DESCRIPTION.

SUB SP. CH. Intermediate in size, between *A. caudicutus* and *A. nelsoni*, but paler and grayer than in the former above, sparingly streaked beneath as in *A. nelsoni*, but the markings are broader and greenish gray, not dusky. Occurs in summer on the coast and islands of New Brunswick and Nova Scotia, migrating south in winter.

ZONOTRACHIA LEUCOPHRYS.

WHITE-CROWNED SPARROW.

DESCRIPTION.

SP. CH. Form, size and general coloration, similar to those of the White-throated Sparrow, but lacks the yellow on head and edge of wing, while the throat and entire plumage is more ashy, and the young have the crown overwashed with reddish. Dimensions. Length, 7.08; stretch, 10.50; wing, 3.25; tail, 2.85; bill, .46; tarsus, .82. Nests and eggs, similar to those of the White-throated Sparrow. Occurs throughout North America, breeding in Labrador and westward.

HABITS.

This species occurs as a rather uncommon migrant in New England but is quite common in Pennsylvania and westward when migrating. In general habit they resemble the White-throated but the songs are quite different.

CYANOSPIZA CYANEA.

INDIGO BIRD.

DESCRIPTION.

SP. CH. Form, slender. Size, small. COLOR. Adult male. Greenish-blue throughout, darkest anteriorly. Wings and tail, brownish. Female, reddish-brown, lightest beneath, and more or less tinged with blue. In autumn and young, similar to last but dark throughout, and old males are strongly tinged with blue. Known by the nearly uniform blue or brownish colors. Occurs in summer from Pennsylvania, north to Canada, wintering south of our limits. Length, 5.75; stretch, 8.50; tail, 2.10; bill, .75; tarsus, .65. Nests, placed in bushes, composed of grass, leaves, etc. Eggs, four or five in number, oval in form, pale bluish-green in color, very rarely dotted with reddish-brown. Dimensions from .50 by .70 to .60 by .80.

HABITS.

The song of the Indigo Bird in Massachusetts, is a hisping warble, ending so abruptly as to appear half finished, but in Pennsylvania, this lay is so much clearer and longer, that I did not, at first recognize the author. These birds are fond of thorny thickets that border on fields grown up to bushes, and the males may be seen perched on the top-most limb of some tree, giving the peculiar song. The nests are placed low, often only a few inches from the ground, and the eggs are deposited early in June.

AMMODROMUS MARITIMUS.

Gray Shore Finch.

Ammodromus maritimus Sw. Zool. Jour., III, 1827, 328.

DESCRIPTION.

Sp. Ch. Form, rather robust. Size, medium. Tongue, long, thin, and horny, provided with a terminal tuft of hair-like fibers. Sternum, rather stout, with the keel a little higher than that of the preceding species and with the coracoids somewhat shorter.

Color. *Adult.* Above, greenish-gray, broadly streaked with dusky. Wings and tail, dark-brown, with the outer webs edged with reddish-brown. Beneath, ashy-white, purest on the throat but very much darker on the sides and flanks. Sides of head and streakings below, dusky. There is a decided maxillary line of dusky below one of white, and a slightly defined median line of ashy extends from the bill to the occiput. Line from base of upper mandible to point over the eye, and edge of wing, yellow, and there is a greenish suffusion back of the eye. Bill, black, bluish at base of lower mandible. Feet, brown.

Young. Similar, but browner above, with the median line better defined. The greenish gloss back of the eye is not very perceptible, and there are traces of yellowish-rufous across the breast.

Young of the year. Are very brown above, where the dark streakings are nearly obscured. They are also very much whiter below, where there are but few streakings. The median ashy line is considerably broader and much more clearly defined. Sexes, similar in all stages.

OBSERVATIONS.

There is a general uniformity of coloration in specimens of the same age. The streakings below are never well defined, but occasionally encroach upon the throat which is usually immaculate. Readily distinguished from *melanoleucus* by the uniform grayish tint throughout which is so conspicuous, even in the young, that this species need not be confounded with any other. A constant resident along the coast from the Carolinas to Middle Florida and on the Northern portion of the Gulf of Mexico. Found as far north as Connecticut in summer but does not occur in the interior.

DIMENSIONS.

Average measurements of twenty specimens. Length, 5.50; stretch, 8.25; wing, 2.50; tail, 2.10; bill, .60; tarsus, .80. Longest specimen, 5.75; greatest extent of wing, 8.40; longest wing, 2.60; tail, 2.25; bill, .65; tarsus, .95. Shortest specimen, 5.25; smallest extent of wing, 8.15; shortest wing, 2.40; tail, 2.00; bill, .55; tarsus, .75.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground, or near it. They are either gourd-shaped, with a contracted entrance on top, partly covered, having the entrance on the side, or open. They are composed of coarse grass lined with finer and occasionally with rootlets. Dimension: external diameter, 4.00, internal, 2.50. External depth, 4.75, internal, 1.75.

Eggs, four, five, or even six in number, rather elliptical in form, dull-white in color, spotted and dotted quite finely with reddish-brown and sepia. Dimensions from .80 x .58 to .82 x .62.

HABITS.

The coast of South Carolina and Georgia is peculiar being made up of various islands. These are separated by deep sounds which form the mouths of the numerous rivers that flow through this section of the country. The islands are not much elevated but are above high water mark, while the land back of them is very low being, in fact, overflowed by the tide. These salt marshes are quite wide extending for some hundreds of miles along the shore, and are intersected by numerous creeks some of which are very deep. As those that empty into one sound connect with those that have outlets in sounds on either hand, there is a continuous chain of canals which admit the passage of vessels of considerable size. In my last trip south on the yacht *Nina* I availed myself of this circumstance, and after leaving Bull Bay in South Carolina, kept inside as far as Jacksonville, Florida. As we were frequently obliged to remain in one spot for some time, I had a fine opportunity of observing the birds which inhabited the vast marshes through we were sailing, and the Gray Shore Finches were among those which claimed my constant attention.

Here these birds found a home in the tall grass which grew very thickly and formed a complete protection for them. Thus they are perfectly safe, having few if any enemies; therefore they have increased to a surprising degree; in short they fairly swarm in countless numbers. Every square acre held its thousands, and every mile its hundreds of thousands if not millions, of these little gray birds. At first I was not aware that there were so many, for we entered the marshes during a low course of tides, but when the water rose so high as to cover all but isolated patches of tall grass, forcing the birds to congregate in them in large flocks, I saw how numerous they were. Usually they live concealed, but at such times they retreat before the advancing flood, until they are obliged to perch on the tops of the swaying grass where they crouch, patiently awaiting the subsiding of the waters, when they seek their fastnesses and run about on the mud in search of small shells and aquatic insects which form the principal part of their food.

During the cold season they are quiet only occasionally uttering a chirp of alarm, but when we arrived in Florida, in January, I heard them singing for the first time that season. This lay was very familiar to me as I had frequently heard it at Cedar Keys, where I found the Gray Shore Finch very common and about to breed as early as February. Then the males would give their performance morning and evening, and throughout the day if the weather were stormy. The song consisted of four notes, the first two were given abruptly with a distinct articulation, while the last were more connected; the former being low and quick, the latter prolonged and accented, and both together much resembled the carol of the Red-winged Blackbird; in fact I at first thought the sound was produced by this bird as the Finches were almost always concealed at the time. While giving this singular song the bird becomes greatly excited, ruffling his feathers, spreading his tail, and drooping his wings, while the head is bowed forward when the last syllable is uttered as if it cost him a very great effort. This somewhat rude lay is evidently quite attractive to the female for she is always near the spot, and the male often pauses in order to pursue her through the grass.

Besides the notes I have described the Gray Shore Finch utters a low twittering song while hovering in air a few feet above the grass. It is a singular fact that these birds were about to lay so early in the season at Cedar Keys, for they do not nest in the Carolinas until the first of June which is but a little earlier than the breeding time in Connecticut. The nest is placed either on the ground or fastened to grass stalks or stems of low bushes. They arrive on the marshes of the more northern sections during the last of April and leave before the ground freezes, but they are constantly resident at least as far north as North Carolina.

AMMODROMUS CAUDACUTUS.

Sharp-tailed Finch.

Ammodromus caudacutus Sw., Birds II, 1837, 289.

DESCRIPTION.

Sp. CII. Form, slender. Size, small. Tongue, thin and horny, provided with a tuft of long, coarse, terminal, hair-like filers. Sternum, stout, with the keel somewhat higher than one third the length of the coracoids, which are shorter than the top of the keel.

Color. *Adult in spring.* Above, including the outer edges of the tail feathers, and ear coverts, yellowish-rufous, with the remainder of the wings and tail, and top of head streaked with dark brown. Superciliary and maxillary lines, space back of ear coverts, and bend across breast, buff. Median line, extending from bill to occiput, ashy. Beneath, white, finely streaked on the breast, sides, and flanks with dark-brown, while there is a buffy tinge on the two latter and on the under tail coverts; there are also a few dusky streakings below the maxillary lines. Edge of wing, yellow. Bill, brown, lighter at base of lower mandible. Feet, brown.

Adult in winter. Has a greenish tinge to the plumage above, the ashy median line is clearer, the buffy markings on the head are yellower and the tinging on the sides and flanks, stronger. The ear coverts are ashy, the feathers of the scapulars are edged with white and the dark mark markings below are broader.

Young. Similar to the above, but with a brownish hue on the top of the head which completely obscures the streakings. The dark markings above are not as prominent but the white edgings are broader. The buffy tinging beneath is more extended and the streakings are not as clear.

Young of the year. Very much tinged with greenish above where the feathers show ashy edgings. The streakings below are nearly obscured, while the buffy tinge is extended over the throat and ear coverts.

Nestlings. Birds in this stage present quite a singular appearance being buffy above and below, broadly streaked on the upper parts with dark-brown and more finely below in a similar manner as the adult. The tail feathers are not nearly as acuminate.

OBSERVATIONS.

The breadth of the streakings below vary with individuals as do also those above, and one specimen has a yellow line from base of upper mandible to point over the eye, as in the preceding species. This bird presents a singular variety of markings, from the first to the final plumage. As will be seen, the streakings above and below are at first prominent then become nearly obsolete, only to come out broad and clear after the next moult, when they gradually narrow down to the adult stage. The buff, however, which at first tinged the entire bird, grows gradually less until it only covers restricted areas. Readily distinguished from all others by the buff markings as described. Found in summer along the coast from Maryland to New Hampshire, and in some of the large marshes of the interior. Winters from the Carolinas to Middle Florida and on the Northern portion of the Gulf of Mexico.

DIMENSIONS.

Average measurements of twenty-five specimens. Length, 5.50; stretch, 7.70; wing, 2.45; tail, 1.77; bill, .47; tarsus, .77. Longest specimen, 5.85; greatest extent of wing, 8.10; longest wing, 2.76; tail, 2.10; bill, .55; tarsus, .85. Shortest specimen, 5.15; smallest extent of wing, 7.31; shortest wing, 2.15; tail, 1.45; bill, .40; tarsus, .70.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground. They are loosely constructed, being composed of grass lined with finer. Dimensions; external diameter, 4.00, internal, 3.00. External depth, 2.50, internal, 1.50.

Eggs, four or five in number, rather elliptical in form, pale-blue in color, spotted and dotted quite finely with rufous. Dimensions from .75 x .55 to .80 x .60.

HABITS.

The salt marshes which border the coast of Massachusetts are usually comparatively solid or at least firm enough to bear the weight of a man, but some spots are very peculiar being composed of soft mud overlaid with soil. Thus these slough, as they are termed, are very deceptive, as the surface which looks solid to the eye proves very yielding to the feet and the unwary pedestrian finds himself submerged to the armpits in soft slimy ooze, the odor of which is only exceeded by its pertinacity in adhering to the clothing. These singular places are doubtless the remains of lagoons or small bays, that have been surrounded by the slowly forming marshes which have gradually encroached upon the space occupied by the water. Indeed this transformation of water into earth may be plainly seen in progress, for some portions are not even covered with vegetation, others merely support the soil; while small peninsulas have made out which are firm enough to walk upon. These are covered with a species of short, wiry grass that grows very thickly and, as it is never cut, the dead growth of previous seasons accumulates, forming a mat. The insecurity of the footing prevents cattle or other mammals from wandering on such places

thus the localities are comparatively lonely and just suited for the home of some retiring species of bird. The Sharp-tailed Finches are aware of this fact for here they find excellent breeding grounds, as they are almost entirely free from invasion. The thick matting of dead grass is admirably adapted to nest building and their neat domiciles are almost always placed in it, while the overhanging grass serves to hide them. I know of but few birds which take so much pains to conceal their eggs as the Sharp-tailed Finches. They will frequently form a path for nearly a yard under the grass, by which they enter the nest that is placed in a thicket at the end. The female when setting is extremely difficult to start, and then I have nearly placed my foot on her before she would fly. As will readily be perceived by the foregoing description, the nests are not easy to discover, and it is only by carefully examining every foot of the ground that I ever found one. They breed in communities in the localities which I have described, and I have taken as many as eight nests from a space not larger than a half acre.

The Sharp-tailed Finches breed late, from the last week in June to the middle of July, and the young accompany their parents in August. During nesting time the males utter what is certainly the faintest approach to a song that I ever heard any of the family attempt. This is given when the bird is hovering in air, a few feet over the surface of the ground, and is so low that I have listened in vain for any sound when the wind was blowing, even if the bird was only twenty yards distant. On still days, however, a sputtering hasty warble may be distinguished which continues only for a moment when the would be musician drops as suddenly as if shot into the grass. At this season they spend the greater portion of their time in the low grass, only occasionally appearing for a moment on the top of some pile of debris, left by the high spring tides; but later they may be found in the tall sedge which grows along the creeks. Here they may be seen early in September in large flocks, when they have quite different habits than when nesting. At all times, however, they run about on the mud in search of small shells or other aquatic animals left by the receding water, but when the tide is high they perch on the top of the grass, enjoying the bright sunshine of those lovely autumnal days peculiar to the sea-coast of New England.

All of the Fringilline birds are more or less agile, but none among them move more quickly on the ground than the members of this genus. The species under consideration is particularly noticeable in this respect as they are perfect acrobats when among the tall sedge, now clinging to a slender swaying top which will scarcely bear their weight, then hanging head downward in order to reach some insect, after which they will drop to the ground and make their way with surprising rapidity to some other point. When surprised they will rise to a short distance above the grass, fly for a few yards, and then dart into a place of concealment. Then it is difficult to make them rise a second time, for they will scamper nimbly among the grass stems for a long distance. When wounded they are very difficult to capture, for if their legs be uninjured they will make good use of them and enter some hole and remain quiet, or will run through the grass until certain that a safe distance intervenes between themselves and their pursuers. The Sharp-tailed Finches leave

the north about the middle of October and enter the marshes of the Carolinas and Georgia where they are exceedingly abundant. They are also common in the marshy country just north of the St. Johns River, Florida, but are not to be found in any numbers south of this point on the east coast. In fact I never saw a single specimen below Mosquito Inlet. There were a few, however, about Cedar Keys in company with the Gray Shore Finch, but I saw no indications whatever of their breeding, as was the case with the preceding species, and I think, beyond a doubt, that they all leave Florida by the middle of April. They linger somewhat while on the migration, for they do not reach their breeding grounds until late in spring; in fact they are one of the very last among the Sparrows to make their appearance.

GENUS XVII. PEUCÆA. THE GRASS FINCHES.

GEN. CH. *Bill, slender, but not thick nor swollen at base. Upper mandible, considerably curved. Wings, shorter than the tail which is much graduated, and with the feathers narrow but not acuminate. Sternum, stout, with the coracoids about equal in length to the top of the keel. Keel, exceeding in height one third the length of the coracoids. Feet, small.*

All the species are streaked above but have only a few markings below. The toes are quite short and the feet small. The edge of the wing is yellow.

PEUCÆA ÆSTIVALIS.

Pine Wood Finch.

Peucaea æstivalis CABINIS, Mus. Hein., 1850, 132.

DESCRIPTION.

SP. CH. Form, rather slender. Size, medium. Tongue, thin and horny, provided with a bifid tuft of long, terminal, hair-like fibers. Sternum, as given above.

COLOR. *Adult.* Above, including the outer edges of the wings and tail feathers, dark-chestnut, with the feathers edged with ashy. The back and upper tail coverts are streaked with dark-brown. There is a median line of ashy extending from the bill to the occiput. Wings and tail, brown. Under parts, superciliary line, and ring around eye, brownish-yellow, clearest on the belly and abdomen, darkest on the breast. Edge of wing, yellow. Bill, brown, very much lighter at base of lower mandible. Feet, pale-brown.

Young. Similar to the adult, but more reddish above where there is less ashy. There are indications of maxillary lines of dusky and there are some narrow streakings across the breast where the brownish-yellow tinging is somewhat darker. Sexes, similar in all stages.

OBSERVATIONS.

Specimens vary greatly in the amount of ashy edging to the feathers above. The females, although quite similar to the males, are inclined to be redder above and to have streakings below. Readily distinguished from all others by the chestnut markings above combined with the graduated tail and yellow edge of wing. Found in summer through the dry piney woods along the coast, from Middle Florida to the Carolinas, and in the interior as far north as Southern Indiana. Winters in Florida.

DIMENSIONS.

Average measurements of twenty-five specimens. Length, 5.70; stretch, 7.87; wing, 2.37; tail, 2.44; bill, .50; tarsus, .69. Longest specimen, 6.20; greatest extent of wing, 8.20; longest wing, 2.56; tail, 2.60; bill, .55; tarsus, .76. Shortest specimen, 5.60; smallest extent of wing, 7.75; shortest wing, 2.25; tail, 2.35; bill, .45; tarsus, .62.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground. They are loosely constructed, being composed of rather coarse grass lined with finer. Dimensions; external diameter, 4.00, internal, 3.00. External depth, 2.50, internal, 1.50.

Eggs, four or five in number, rather oval in form, pure, brilliant white in color. They are, I believe, never spotted. Dimensions: from .80 x .60 to .81 x .63.

HABITS.

The piney woods in the immediate vicinity of Lake Harney, Florida, are among the finest that I ever saw in the state. A narrow strip of marsh or hummock borders the water, but back of this the vast plains stretch away in the distance with the large brown tree trunks rising at intervals, while high over head wave the branches covered with evergreen leaves. There are but few of the lofty limbs and therefore they cast but little shadow, thus the ground is covered with green grass in profusion and is sprinkled with wild flowers of varied hue. Some ten years ago I visited this lovely region for the first time. Then everything was in its primitive state, for there was but one settler on the east side of the lake and, as he cultivated but a very small portion of the soil, the country was a wilderness, there not being another house or cabin within twenty-five miles. Then the deer roamed in herds and it was not an uncommon occurrence to meet with a dozen in one morning's walk. They found ample pasturage in the luxuriant growth of short grass which covered the earth with a soft carpet.

This grass formed a place of concealment for many birds, and it was here that I first became acquainted with the Pine Wood Finch. I was walking through the woods one morning, when a little bird started from nearly under my feet, flew a short distance, then dropped and disappeared. Anxious to obtain it, I endeavored in vain to start it a second time, but shortly after I took a specimen and recognized it as the species under consideration. This was in winter when they are difficult to find but later, by the last of March or first of April, they are more abundant and much easier to obtain. Then the males make themselves more prominent for they are in full song. Early in the morning, when the delicate sun-dews and rare orchids are sparkling with dew-drops, when all is silent save the distant cry of the Sandhill Crane or the low murmur of the gentle breeze in the tree tops, the melodious strains of the Pine Wood Finch are heard to the best advantage. There are few among the many brilliant songsters of this family which surpass our little friends. Seated on a branch of some fallen tree or a low limb of a pine, they pour forth the sweetest warbling carol that I ever heard in Florida. When I first listened to the bird I could not believe that it was a sparrow, for there is a kind of ventriloquism about the sound, causing it to so completely fill the air that it is not easy to distinguish the exact spot from which it comes. After giving his performance for some time the male flies down into the grass to join his mate.

At first the song is only given morning and evening, but a little later the birds sing at intervals all day continuing until long after sunset. They breed about the middle of April placing the nest on the ground, concealing it in the higher patches of grass. The young are able to fly by the first of June. The Pine Wood Finch is very abundant throughout Northern and Middle Florida in summer but I looked for it without success in suitable localities at Miami. I found a few about Cedar Keys in winter and, as above stated, at Lake Harney, but I do not think that very many pass the winter in the state. I was surprised to find them breeding at Wilmington, North Carolina, in June, but I did not find them there in winter a few years later.

GENUS XVIII. COTURNICULUS. THE YELLOW-SHOULDERED SPARROWS.

GEN. CH. *Bill, short and thick, considerably swollen at base. Upper mandible, but little curved. Wings, much longer than the tail which is a little rounded, and with the feathers a uninate. Sternum, stout, with the coracoids much shorter in length than the top of the keel which is not low, nearly equaling in height one half the length of the coracoids. Size, quite small.*

All the species are streaked above, and some have narrow lines below where there is more or less buff. The edge of the wing is yellow. The feet are quite small. I do not include Leconte's Bunting under this head, for I think that it should be placed in a separate genus, for which I propose the name, *Passerherbulus*; for generic characters of which see the forthcoming appendix.

COTURNICULUS PASSERINUS.

Yellow-winged Sparrow.

Coturniculus passerina Bon., List, 1839.

DESCRIPTION.

SP. CH. *Form, robust. Size, small. Tongue, short, rather fleshy, provided with a tuft of terminal, hair-like fibers. Sternum, as given above.*

COLOR. Adult. Above, including the wings and tail, dark-brown, with the feathers edged with yellowish-ash, and tipped and edged with dark-chestnut, especially on the neck and back. There is a median line of yellowish-ash extending from the bill to the occiput, and a superciliary line, the anterior portion of which is orange and the remainder buff. Under parts, yellowish-white, with a strong buffy tinge on the breast, throat, sides of head, sides, flanks, and under tail coverts. Edge of wing and shoulder, yellow. Bill, brown, very much lighter at base of lower mandible. Feet, pale-brown.

Young. Similar to the adult, but more reddish above, and the tail feathers, which in the adult are usually edged with nearly a straight line of yellowish-ash, show indications of dark brown bars. There are also dusky streakings on the sides of the breast. The anterior portion of the superciliary line is not as yellow.

Nestings. Show no traces of chestnut above, where the feathers are edged with buff and yellowish-white. There are indications of whitish wing bars, and the shoulders show no traces of yellow and the edge of the wing is only tinged with it. There is but little buff below, but the throat, breast, sides, and flanks are streaked with dark-brown. There is no superciliary line. Sexes, similar in all stages.

OBSERVATIONS.

Specimens which I procured at Key West vary greatly from birds of Massachusetts in being much darker below, especially across the breast, where there are narrow brownish streakings. There is very little ashy above, where the chestnut is very much more prominent, occupying fully one half of the surface. The median line is decidedly buffy and the superciliary line is deep orange. Birds from Miami are nearly as dark as the above, while those from the more northern section of Florida are not as dusky and those from Pennsylvania are nearly as light as those from Nantucket. Skins from any given locality do not differ greatly, as is exhibited in a large series now before me, the principal variation being due to the wearing of the edges of the feathers. Known in the adult stage from *Henslowi* by the absence of streakings below, and from all others by the chestnut and ashy above, combined with the yellow and buff superciliary line and short, acuminate tail. Found in summer throughout the United States, east of the Rocky Mountains, south of latitude 43°. Winters in the more Southern sections. Resident in Florida and on the Keys.

DIMENSIONS.

Average measurements of fifteen specimens. Length, 5.15; stretch, 8.00; wing, 2.50; tail, 1.70; bill, .45; tarsus, .72. Longest specimen, 5.35; greatest extent of wing, 8.45; longest wing, 2.60; tail, 1.75; bill, .55; tarsus, .75. Shortest specimen, 5.00; smallest extent of wing, 7.60; shortest wing, 2.40; tail, 1.65; bill, .35; tarsus, .70.

DESCRIPTION OF NESTS AND EGGS.

Nests, placed on the ground. They are loosely constructed, being composed of dried grass lined with finer. Dimensions; external diameter, 1.00, internal, 2.50. External depth, 2.00, internal, 1.00.

Eggs, four or five in number, rather oval in form, ashy-white in color, spotted and blotched with reddish-brown and lilac, more thickly on the larger end.

HABITS.

A greater portion of the Island of Nantucket is destitute of trees, being composed of rolling, sandy plains which are covered with short, wiry grass or other herbage, while at

intervals grow clumps of low wax myrtle shrubs. During the warm summer weather there is but little variety of animal life to be found on these commons, as they are termed, for the soil being dry the heat is great, and the vegetation withers affording but little shelter even for birds. There are some, however, of this latter named class which appear to prefer that of kind country. These are the Yellow-winged Sparrows, and it will be difficult to find in any given area, a greater number of individuals of any one species of Fringilline birds than are found there, for they fairly swarm. When one is walking across the plains they will start up everywhere, and often a half dozen males may be heard singing at one time. I say singing, but hasten to correct myself, for, although the birds are perched on the highest elevations that they can find on their domains (which, however, seldom exceed a foot in height), while the ruffled feathers, bowed head, and wide-spread tail indicate that they are doing the best in their power to bring forth a melodious carol, the feeble sound produced by all these vigorous efforts is so low that it is quite inaudible at a few rods distance, and more nearly resembles the stridulation of a locust than the song of a bird. This unsuccessful attempt is rendered only the more ludicrous by the important air which the bird assumes at the time, and this sputtering chant appears to please them greatly for they often utter it. Indeed they are seldom quiet, being engaged in their melodious efforts constantly during the cool of the day, and even performing when the noon time heat is so great as to be nearly suffocating, especially on the sandy wastes where they live. In addition to this uncouth song they give a series of chattering, scolding notes when greatly annoyed. These sounds are more often uttered when any one approaches the vicinity of the nests.

The Yellow-winged Sparrows breed early in June, as I found the young newly fledged by the first of July, but they lay a second litter, and I took a nest containing five newly laid eggs on the third of this month. The female ran from the nest, as I approached the spot, without uttering a cry, feigning lameness, but almost instantly hid herself in a neighboring bush. The nest was placed in a depression of the soil, and was so completely concealed by the overhanging grass that, had the bird remained on it I should not have observed it, although I was passing within a few feet and carefully scanning the ground as I walked.

Although abundant on Nantucket, these birds are not very common elsewhere in eastern Massachusetts, but are more numerous further west, and in Pennsylvania where they are found in considerable numbers. They also occur in the pine woods of Florida, and I even found them on a grassy mound near an abandoned, half completed fort at Key West. I never heard them sing in Florida, but judge that they are constant residents there. They are migratory in other sections, arriving in the north about the first of May, and leaving early in November, proceeding leisurely on their southern migration. This species is seldom if ever found in flocks, nor do they accompany other Sparrows. At this season they are very shy, keeping in the grass, through which they run nimbly, and from which it is very difficult to make them rise; then when on the wing, they will plunge into the nearest place of concealment.

SPIZELLA MONTICOLA.

TREE SPARROW.

DESCRIPTION.

SP. CH. Form, robust. Size, medium. Color. Adult. Ashy brown above, becoming darker on the wings and tail. Crown, maxillary spot, middle back, which is streaked with whitish, wing coverts, and edge of tertiaries, bright rufous. Beneath, ashy white, tinged, especially on sides, with yellowish, with a single brown spot on breast. Young, similar but darker. Known by the rufous crown and bright spot on breast. Breeds from Northern New England, northward, wintering from Massachusetts to the Carolinas. Dimensions. Length, 6.50; stretch, 9.50; wing, 3.00; tail, 2.60; bill, .45; tarsus, .85. Nests, placed in bushes, composed of mud, grass, and hair. Eggs, four or five in number, oval in form, greenish ash in color, spotted with reddish brown. Dimensions from .55 by .70 to .56 by .74.

HABITS.

The Tree Sparrow is among the most abundant of our spring and autumn migrants, and during some winters, is very common in Eastern Massachusetts, but usually the greater portion go south of us.

SPIZELLA BREWERII.

BREWER'S SPARROW.

DESCRIPTION.

SP. CH. Size, form, and general coloration of the Chipping Sparrow, but differs in being paler, with all the markings indistinct, and in having no chestnut crown, this being permanently streaked all over with narrow lines of dusky. South-western United States, accidental in Massachusetts.

SPIZELLA PALLIDA.

CLAY-COLORED SPARROW.

DESCRIPTION.

SP. CH. Differs from Brewer's Sparrow in being more distinctly streaked, but the lines of the back are distinctly separated from those on the crown by a collar of ashy. There is a dusky line of ashy on the crown, a dark line behind eye, and another on the lower jaw. Interior of North America, casual in Wisconsin.

JUNCO CAROLINENSIS.

CAROLINA JUNCO.

DESCRIPTION.

SP. CH. Form and general coloration of the common Snow Bird but larger, and with the dark of the head tinged with pinkish or reddish. Breeds in the Southern Alleghanies, wintering somewhat north of this point.

JUNCO HYEMALIS OREGONUS.

OREGON JUNCO.

DESCRIPTION.

SUB SP. CH. Similar in form, size and general coloration to the common Snow Bird but darker on head and breast, with a square patch of reddish brown on the back and tinged with pinkish on sides and breast. Pacific coast of North America, straggling eastward even as far as Massachusetts.

MELOSPIZA LINCOLNI.

LINCOLN'S SPARROW.

DESCRIPTION.

SP. CH. Form, slender. Size, small. Color. Adult. Above and on sides, yellowish, ash, becoming buff in a band across breast and on under wing and tail coverts. Two bands on crown, rufous, streaked

with dark brown. Remainder of under parts, white. Young, similar, but with the color below, darker. Length, 8.59; stretch, 8.75; wing, 2.65; tail, 2.00; bill, .45; tarsus, .75. Recognized by the band across breast. Breeds chiefly north of the United States or on mountain ranges further south, migrating southward to Panama. Nests, placed on the ground, composed of leaves, grasses, etc. Eggs, four in number, oval in form, pale green in color, spotted and thickly dotted with reddish brown. Size, from .76 by .57 to .81 by .58.

HABITS.

Lincoln's Sparrow is not a common New England migrant but occurs regularly in certain locations; thus, they are not uncommon near the Fresh Pond marshes, Cambridge, and at Concord, Massachusetts. I also found them common in autumn at Watsontown, Pennsylvania, where they frequent the thick grass and bushes along streams, and in general habit resemble Swamp Sparrows.

PEUCAEA AESTIVALIS BACHMANII.

BACHMAN'S SPARROW.

DESCRIPTION.

SUB SP. CH. Similar in size, form and general coloration to the Pine Wood Finch, but differs in having a larger bill, and with brown streaks above these being confined to the middle of the back, while the breast and sides are more buffy. This is the more northern form, occurring from the Carolinas to Illinois.

PETROCHELIDON FULVA.

WEST INDIAN CLIFF SWALLOW.

DESCRIPTION.

SP. CU. Slightly smaller than the Cliff Swallow but very similar in coloration but lacks the dark patch on the throat; the chestnut of the throat is paler and the black of the head nearly surrounds the eye. Length, 4.70; wing, 4.00; tail, 1.85; bill, .27; tarsus, .40. Occurs on the Antilles, but two specimens were taken on the Tortugas, Florida, March 22, 1890. I found this species breeding at Kingston, Jamaica, the second week in February. The nests were placed inside the railroad station, one end of which was open and the young birds flew in and out undisturbed by the coming and going of the trains.

MINUS CAROLINENSIS GRISIFRONS *Novo*.

KEY WEST CAT BIRD.

DESCRIPTION.

SUB SP. CH. Similar to the Cat Bird but differs in being smaller in size with a more slender bill, generally darker in color, but with the forehead distinctly grayish, and with the primaries narrowly tipped with ashy. Length, 8.60; stretch, 11.30; wing, 3.55; tail, 3.93; bill, .85; tarsus, 1.05. I have above designated a form of Cat Bird, of which I obtained a number of specimens, twenty or more, on Key West, in November and December, 1870. The type (original number 4281) is in the Museum of Comparative Zoology where I have been permitted to examine it and other specimens, through the courtesy of Messrs. Brewster,

and Faxon I have no doubt but what the Florida Cat Bird was a constant resident on Key West at the time when I obtained the type. Specimens obtained at Miami and on the Bahamas appear to be so much like our northern birds as to be indistinguishable.

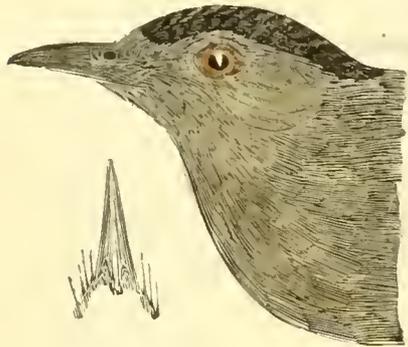


Fig. 121. Head and upper mandible of adult Key West Cat Bird.



Fig. 122. Head of adult Cat Bird.

MERULA NAEVIA.

VARIED THRUSH.

DESCRIPTION.

SP. CII. Differs from the common Robin, which in general form and coloration it resembles, in having a broad black collar on neck which extends along the sides of the head to the bill, in having a chestnut line back of eye, and two bands of a similar color on the wings. Female, duller. Size of the Robin. Eggs, smaller but spotted with dark brown. Occurs on the Pacific coast, accidental in New Jersey, Long Island, and Massachusetts.

TURDUS ILIACUS.

RED-WINGED THRUSH.

DESCRIPTION.

SP. CII. About the size of the Robin. Greenish brown above, darkest on the head, palest on the rump. Wings, dark brown, with the coverts and inner secondaries tipped with whitish. The eyelids and a superciliary stripe are whitish. Tail, dark brown, the outer feathers white tipped. Grayish white below, becoming yellowish on throat which is streaked with dark brown. Sides and under wing coverts, pale red. A European species occurring in Greenland.

EXTINCT SPECIES.

The following species have been described by authors, as inhabiting our section, but have not been taken recently anywhere.

Regulus Cuvieri. Cuvier's Kinglet. Similar to the Golden-crown, but has two black bands on crown. A single specimen was obtained by Audubon, in June, 1812, in Penn., which has been lost.

Dendroeca montana. Blue Mountain Warbler. Greenish above and yellow beneath, streaked on breast and sides with dusky. Tail and wings, black. One specimen obtained by Wilson in the Blue Mountains, Vir., years ago.

Myiiodioides minutus. Small-headed Flycatcher. Greenish above, and pale yellow beneath, with wings banded, and outer tail feathers patched, with white. Found by Audubon and others, in the Middle States. There are no specimens of either this or the above now in existence.

Euspiza Townsendi. Townsend's Bunting. Similar to the Black-throated, but with throat white. One specimen obtained, May 11, 1833, near New Garden, Penn. None have been seen since.

Tringa Cooperi. Cooper's Sandpiper. Bill, straight. Ashy above, and white beneath. Upper tail coverts, white with V-shaped marks of black. Length, 9.50; wing, 5.75; bill, 1.23. A single specimen obtained by Wm. Cooper, at Raynor South, L. I., May 24, 1833.

Alca impennis. Great Auk. Form of Razor-bill. Above, black, with large spot in front of eye, and beneath, white. Length, 30.00; wing, 5.50. Formerly abundant on our coast, but last seen thirty-eight years ago.

DOUBTFUL SPECIES.

Myiiodioides Bonaparti. Bonaparte's Flycatcher. Probably the young of *M. Canadensis*

Dendroeca carbonata. Carbonated Warbler. Probably a form of plumage of the Cape May.

Linota Brewsteri. Brewster's Linnæ. Form and size of Red Poll, but lacks the crimson crown. Only a single specimen has been obtained, by Mr. Brewster at Concord, Mass., a few years ago.

Helminthophaga Cincinnatiensis. Cincinnati Warbler. Greenish above; yellow beneath, patch before eye and on ear and line on sides of crown, black. Length, 4.75; wing, 2.50; tail, 1.85. A single specimen obtained by its describer, F. W. Langdon, at Madisonville, Ohio, May, 1, 1850.

Haliaeetus Washingtoni. Washington Eagle, of Audubon. Probably a large specimen of an immature White-head.

Lagopus Americanus. This is, doubtless, a plumage of one of our Ptarmigans.

Cedemia bimaculata. Huron Scoter. A Duck described by Frank Forester, as occurring in numbers on Lake Huron, during fall and winter, which has a bill like that of the Surf Duck, but is black. The plumage is also black with spot in front of eye, and patch on wing, white. It is a matter of question, as to what this species is, for no one appears to have taken it since.

Larus chalcopterus. Gray-winged Gull. Undoubtedly the young of the White-wing.

Larus cucullatus. Hooded Gull—is the young of Franklin's Gull.

Pagophila brachytarsi. Short-legged Gull. This is, without doubt, an Ivory Gull with shorter tarsi than usual.

Larus Hutchinsi. Hutchins' Gull. White, no pearly mantle, but mottled with pale yellowish-brown on neck, back, and under tail coverts, and more faintly on tail; tinged beneath with a darker shade of the same, while the bill is pinkish, tipped with dusky. Length, 26.00; wing, 17.60. Since writing my article on the Glaucous Gull, a Gull, shot in Boston, April 1, 1851, answering to the above description, has come into my possession, and I should unhesitatingly pronounce it, as remarked by Mr. Howard Saunders in his incomparable Work on the *Lorinae*, "An immature *L. glaucus* in the stage where the mottled brown of the immature stage has passed away and the pearly gray mantle has not begun to show", were it not for the fact that it is moulting, and the new feathers indicate that had the bird lived a short time longer, it would have been pale yellowish-brown banded and mottled with darker, excepting on wings and tail which not being moulted in the spring, would have remained pure white. This presents a change of plumage quite unique among members of this Family, where none are described as passing from a pale winter dress to a darker one in summer, and if it does not re-open the question of the validity of *Hutchinsi*, certainly shows a new phase of plumage for *glaucus*. My bird is a female, and a careful examination of the ovaries shows that it has never deposited an egg, for I counted upward of one hundred ova and could detect no ruptured capsules.

Puffinus fuliginosus. Sooty Shearwater. Size of Greater, but sooty-brown throughout, lighter beneath. Although considered by nearly all writers, as a species, it may prove to be the young of the Greater Shearwater.

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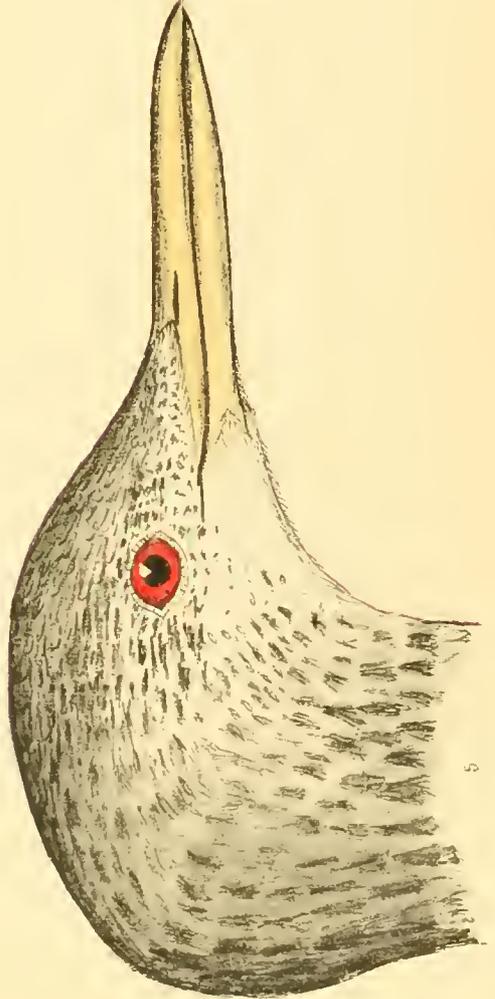
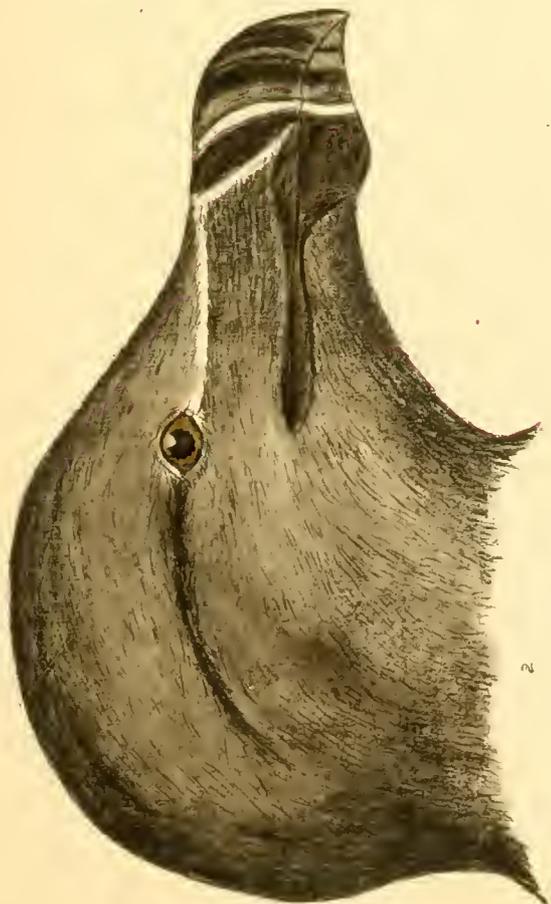
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 Connecticut 615
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 Lawrence's 577
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 Zone-throated Sparrows 482

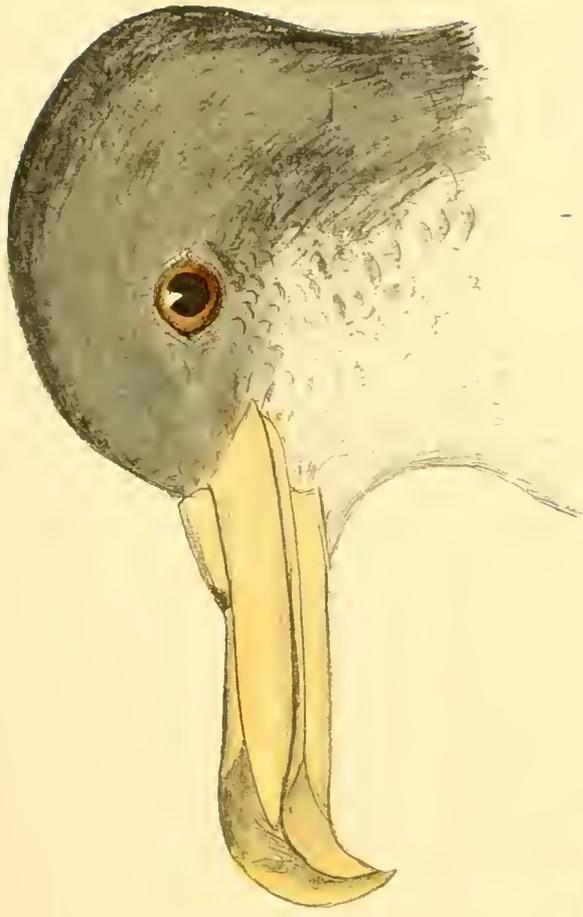
EXPLANATION OF FIGURES ON PLATE I.

1. PUFFIN, MORMON ARCTICA; head of adult male in summer plumage, from Bird Rock, Gulf of St. Lawrence.
2. RAZOR-BILLED AUK, ALCA TORDA; head of adult male in summer plumage, from Bird Rock, Gulf of St. Lawrence.
3. LITTLE AUK, MERGULUS ALLE; head of young male in autumnal plumage, from the coast of Massachusetts.
4. HORNED GREBE, PODICEPS CORNUTUS; head of adult male in spring plumage, from Pennsylvania.
5. RED-THROATED DIVER, COLYMBUS SEPTENTRIONALIS; head of young in autumnal plumage, from the coast of Massachusetts.



EXPLANATION OF FIGURES ON PLATE II.

1. CORY'S SHEARWATER, *PUFFINUS BOREALIS*; head of adult male in autumnal plumage, from the coast of Massachusetts.
2. AUDUBON'S SHEARWATER; *PUFFINUS AUDUBONI*; head of adult male in summer plumage, from the Bahamas.
3. SOOTY TERN, *STERNA FULIGINOSA*; head of adult male in summer plumage, from the Bahamas.
4. NODDY TERN, *ANOUS STOLIDUS*; head of adult male in summer plumage, from the Bahamas.
5. BRIDLED TERN, *STERNA ANÆSTHETA*; head of adult male in summer plumage, from the Bahamas.



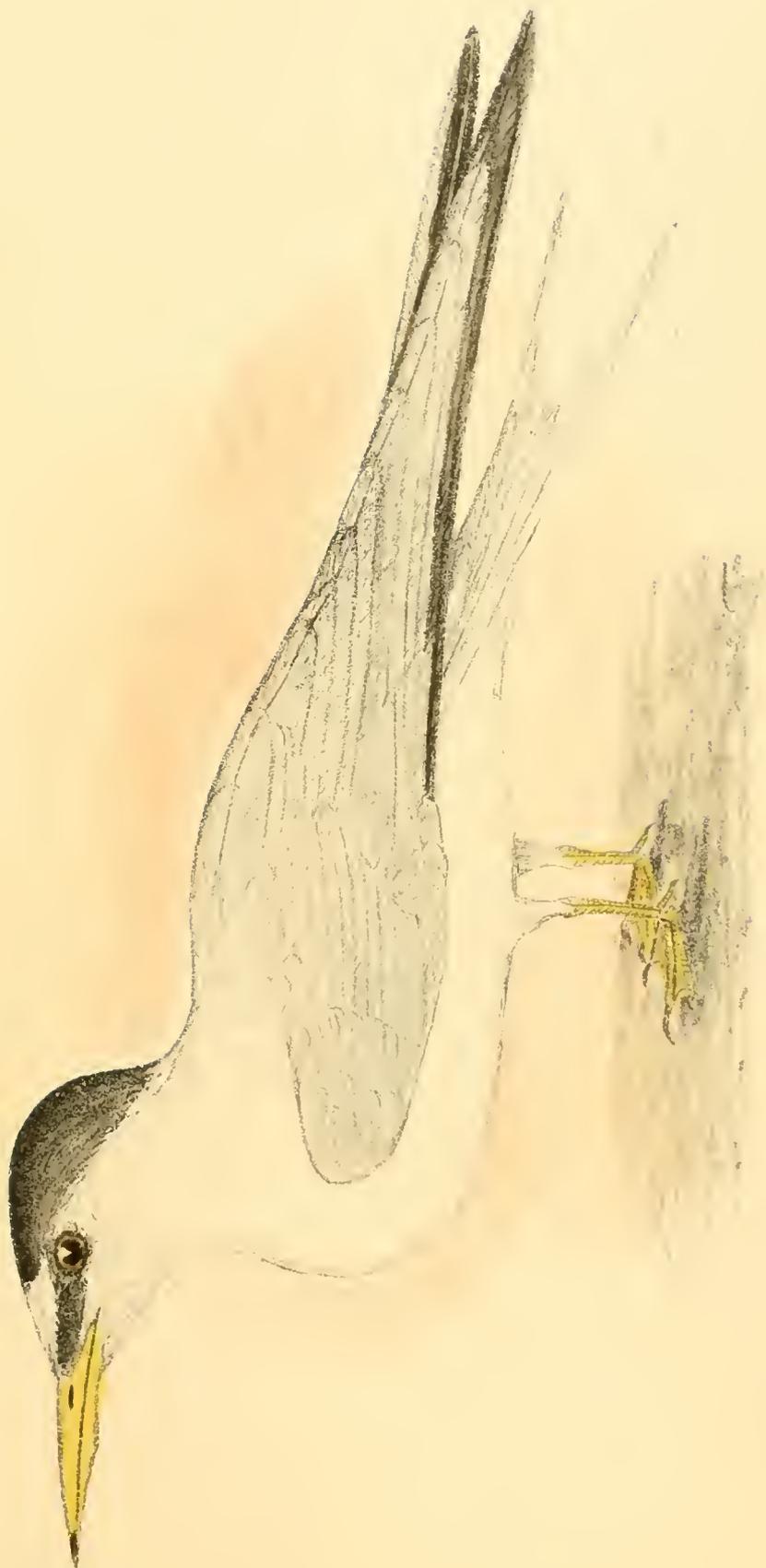


C.J.M.

LEACH'S PETREL, *THALASSEUS LEUCURUS*
Adult male, spring plumage.

PLATE XVII.

KIRTLAND'S WARBLER. Adult female. Ann Arbor, Michigan.



LEAST TERN, STERNA ANTILLARUM.

Adult male, spring plumage.

C. J. M.

PLATE V.

SANDERLING. Adult in winter.

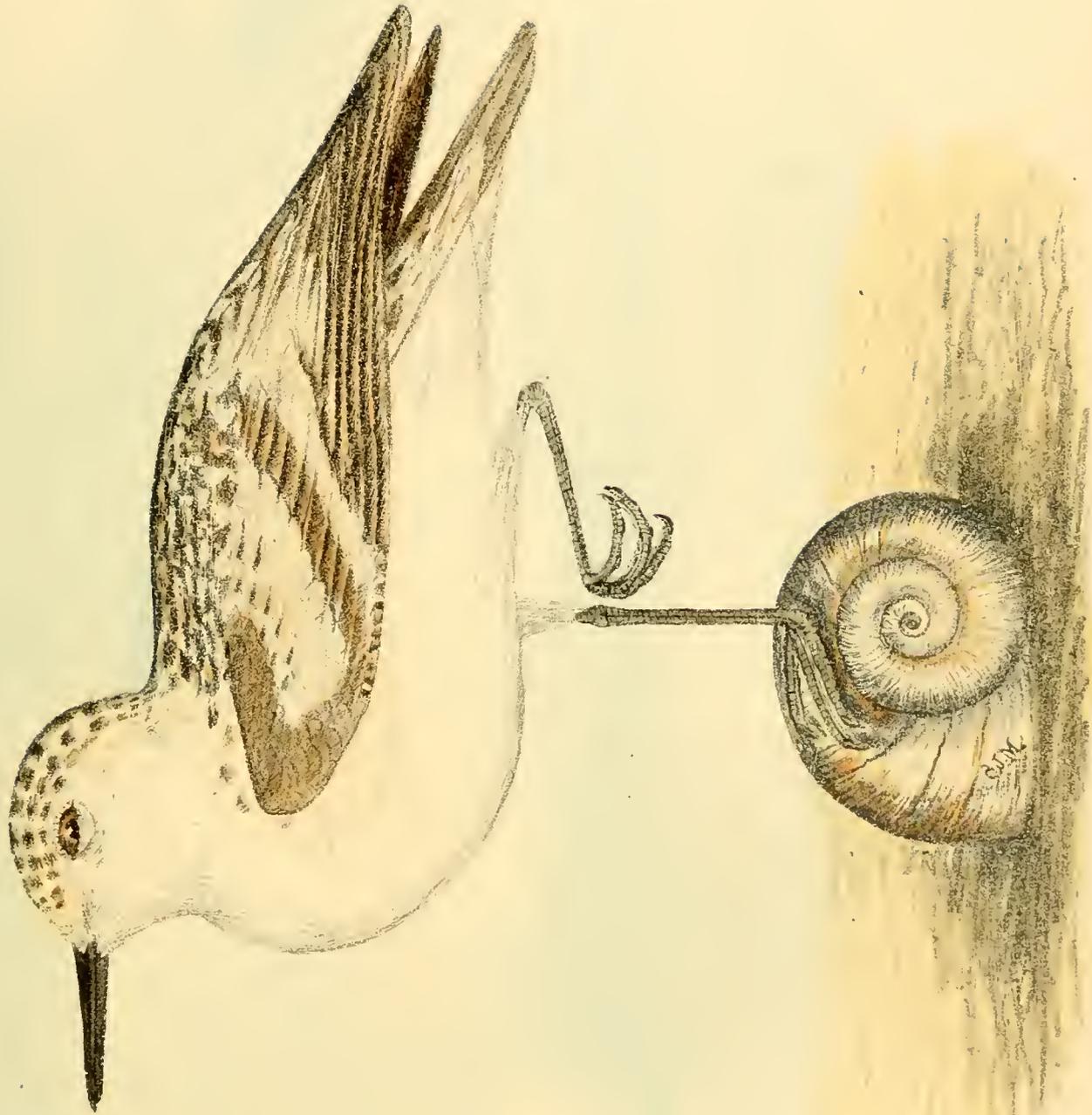
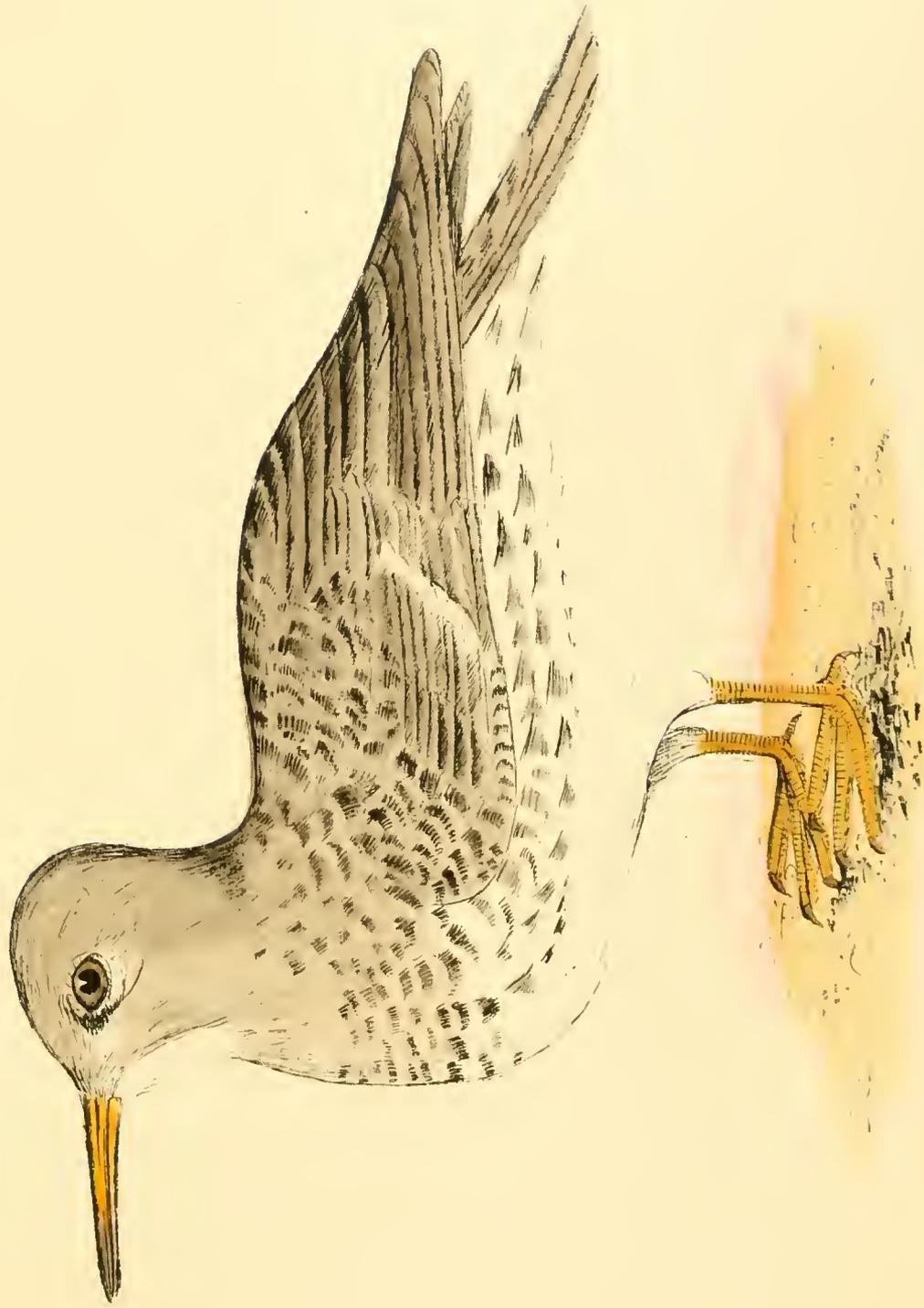


PLATE V.

PLATE VI.

PURPLE SANDPIPER. ADULT IN WINTER.



Purple-backed Petrel, *Pterodroma externa*.
Adult in winter.

PLATE VII.

AEGIALITIS MELODUS. Piping Plover. Adult male, in spring.



PLATE VIII.

Yellow-throated Warbler. Adult Male and Female.



EXPLANATION OF PLATE 9.

BLUE BIRD, *SIALIA SIALIS*: 1, tail; 2, upper mandible; 3, head.

BLUE-GRAY GNATCATCHER, *POLIOPTILA CAERULEA*: 4, foot; 5, tail; 6, head; 7, upper mandible; 8, sternum.

RUBY-CROWNED WREN, *REGULUS CALENDULUS*: 9, tail.

CHICKADEE, *PARUS ATRICAPILLUS*: 10, sternum; 11, upper mandible; 12, head.

GREAT CAROLINA WREN, *TROGLODYTES LUDOVICIANA*: 13, head; 14, upper mandible; 15, tail; 18, foot.

WORM-EATING WARBLER, *HELMITHERUS VERMIVORUS*: 16, upper mandible; 17, head; 25, foot; 26, sternum.

CRESTED TITMOUSE, *LOPHOPHANES BICOLOR*: 20, sternum; 19, tongue (twice life size); 21, upper mandible; 22, head.

WHITE-BELLIED NUTHATCH, *SITTA CAROLINENSIS*: 23, sternum; 24, tongue (twice life size).

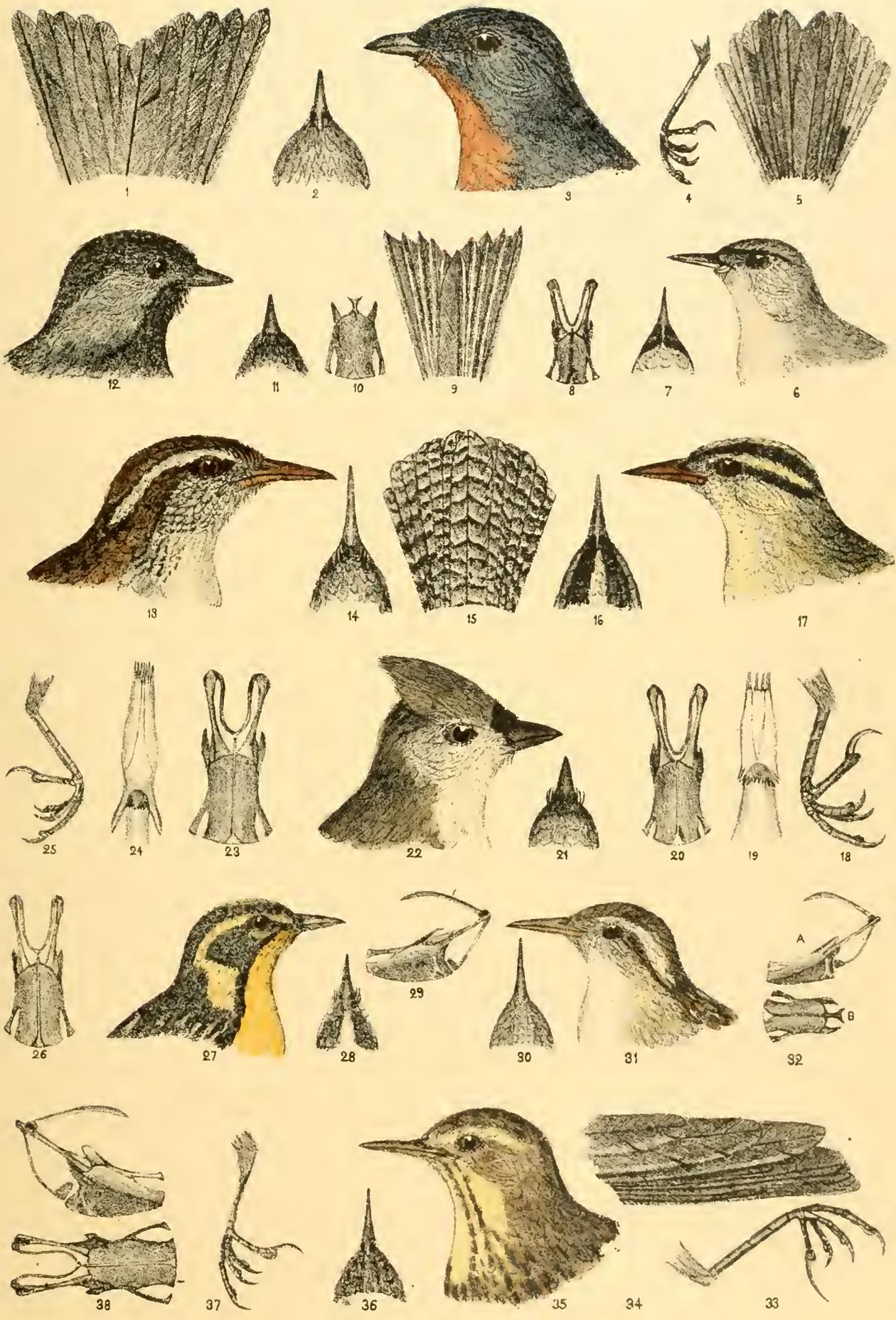
BLACKBURNIAN WARBLER, *DENDROECA BLACKBURNIAE*: 27, head; 28, upper mandible.

YELLOW-RUMPED WARBLER, *DENDROECA CORONATA*: 29, sternum.

LONG-BILLED MARSH WREN, *CISTOTHORUS PALUSTRIS*: 30, upper mandible; 31, head; 37, foot.

HOUSE WREN, *TROGLODYTES AEDON*: 32, sternum (A, side, B, front view).

TIT-LARK, *ANTHUS LUDOVICANUS*: 33, foot; 34, wing; 35, head; 36, upper mandible; 38, sternum (side and front view).



EXPLANATION OF PLATE 10.

- BAY-WINGED SPARROW, *POGOCETES GRAMINEUS* : 1, head ; 5, sternum.
LARK FINCH, *CHONDESTES GRAMMACA* : 2, head ; 7, sternum.
FOX-COLORED SPARROW, *PASSERELLA ILIACA* : 3, head ; 11, sternum.
SONG SPARROW, *MELOSPIZA MELODIA* : 4, head ; 6, sternum.
CARDINAL GROSBKAK, *CARDINALIS VIRGINIANUS* : 9, head ; 22, sternum.
SWAMP SPARROW, *MELOSPIZA PALUSTRIS* : 8, sternum.
PURPLE FINCH, *CARPODACUS PURPUREUS* : 14, head ; 10, sternum.
WHITE-EYED TOWHEE, *PIPILO ALLENI* : 12, sternum.
BLACK AND WHITE SHORE FINCH, *AMMODROMUS NIGRA* : 13, sternum.
BOBOLINK, *DOLICHONYX ORYZIVORUS* : 15, head ; 16, upper mandible ; 21, sternum.
COW BUNTING, *MOLOTHRUS PECORIS* : 17, head ; 27, sternum.
YELLOW-WINGED SPARROW, *COTURNICULUS PASSERINUS* : 18, head.
RED-WINGED BLACKBIRD, *AGELAUS PHOENICEUS* : 19, head ; 20, sternum.
YELLOW-HEADED BLACKBIRD, *XANTHOCEPHALUS ICTEROCEPHALUS* : 23, head ; 28, sternum.
MEADOW LARK, *STURNELLA MAGNA* : 24, sternum ; 25, upper mandible ; 26, head.

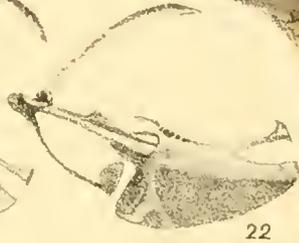
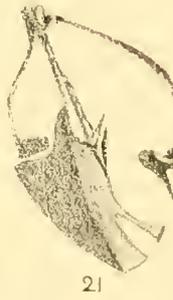
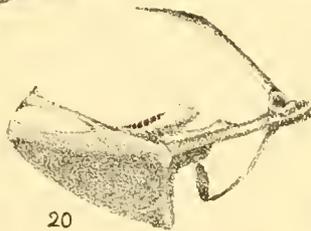
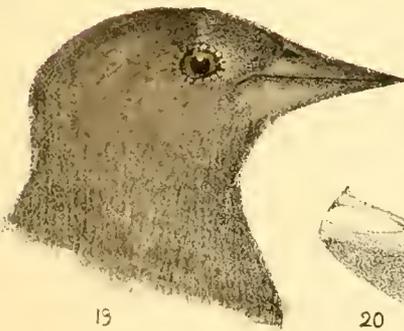
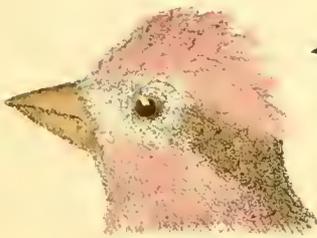
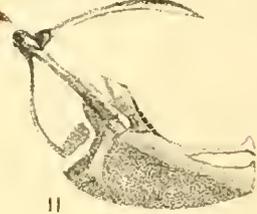
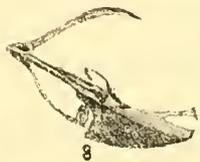
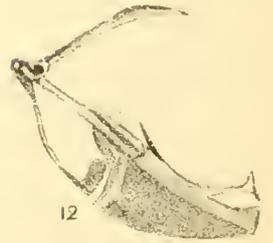
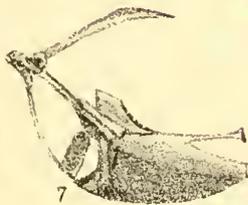
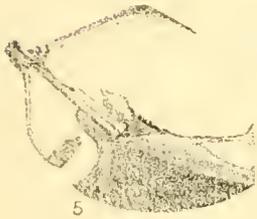


PLATE XI.

VIREO PHILADELPHICUS. Philadelphia Vireo. Adult in Spring. Vine, the Southern Jessamine.



PLATE XII

1, Head ; 4, Sternum of Florida Jay. 2, Head ; 7, Sternum of Orchard Oriole. 3, Head ; 6, Sternum of Rusty Grackle. 5, Sternum of Purple Grackle. 4, Head ; 8, Sternum of Blue Jay. 9, Head of Fish Crow. 10, 11, Sternum of Crow. 12, Head of Boat-tailed Grackle. 13, Sternum of Canada Jay.



PLATE XIII.

YELLOW-RUMPED CREEPER. Adult, Bahamas.

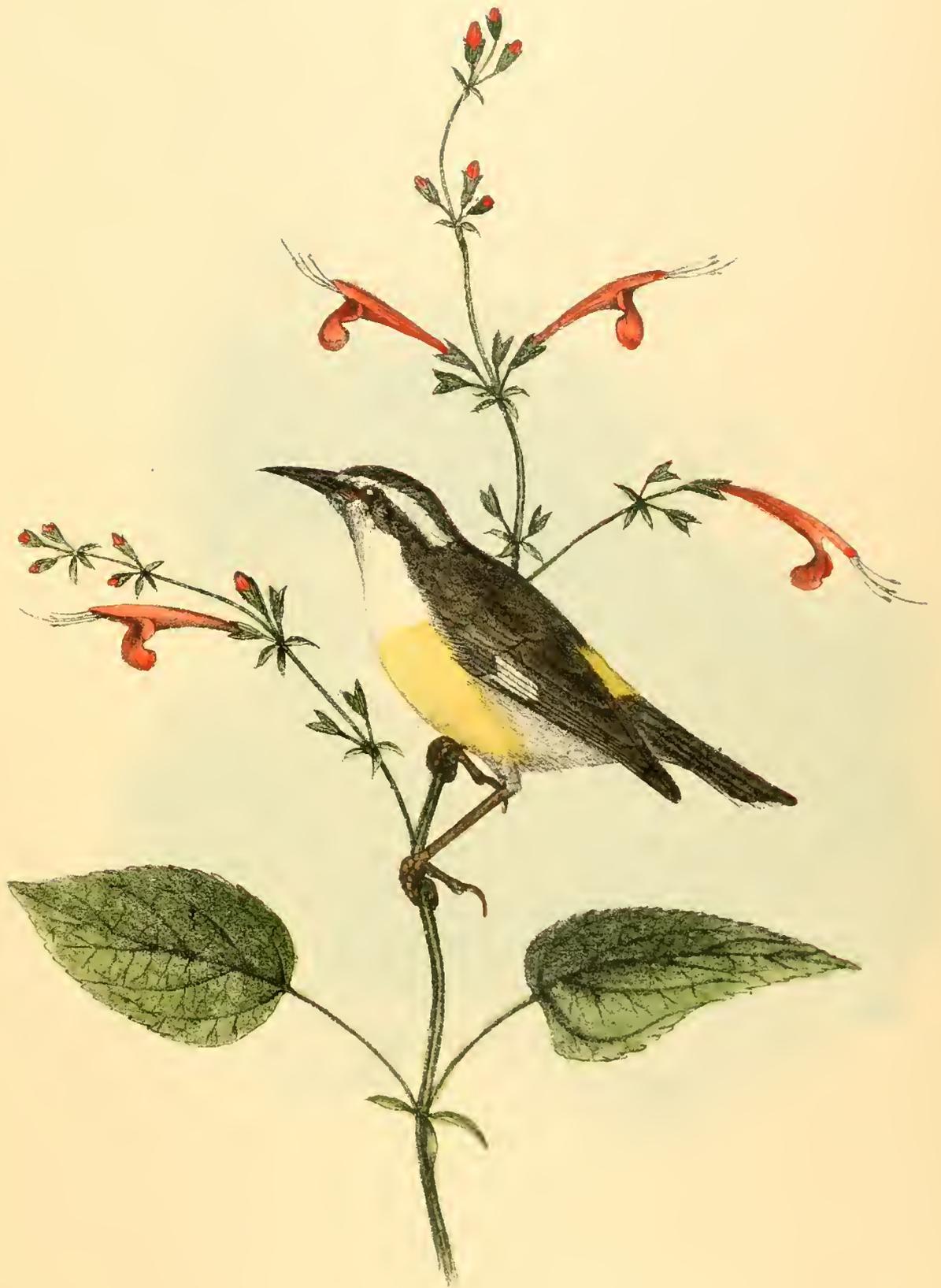


PLATE XIV.

1. Larynx of King Bird, (enlarged) O. Oesophagus: St. Sterno-trachealis, (elevated); Ba. Broncho-trachealis anticus; B B. Bronchialis; B, Bronchial Tube. 2. Head of Canada Jay. 3. Coracoid. 4. Upper Mandible. 6. Head of Great Crested Flycatcher. 7. Sternum of Acadian Flycatcher. 8. Head 10. Upper Mandible of Gray Kingbird 9. Head, 11, 12, Sternum of Belted Kingfisher. 13. Upper Mandible, 14. Head of Yellow-bellied Flycatcher. 15, 16, Sternum, 29. Upper Mandible. 30. Head of Night Hawk. 17. Head. 18. Sternum. 23. Upper Mandible of Bridge Pewee. 19. Sternum. 20. Head. 21. Upper Mandible of Wood Pewee 22. Pectinated middle toe nail. 24. Head. 25. Upper Mandible, 26. 27. Sternum, 28. Scapula of Whippoorwill.

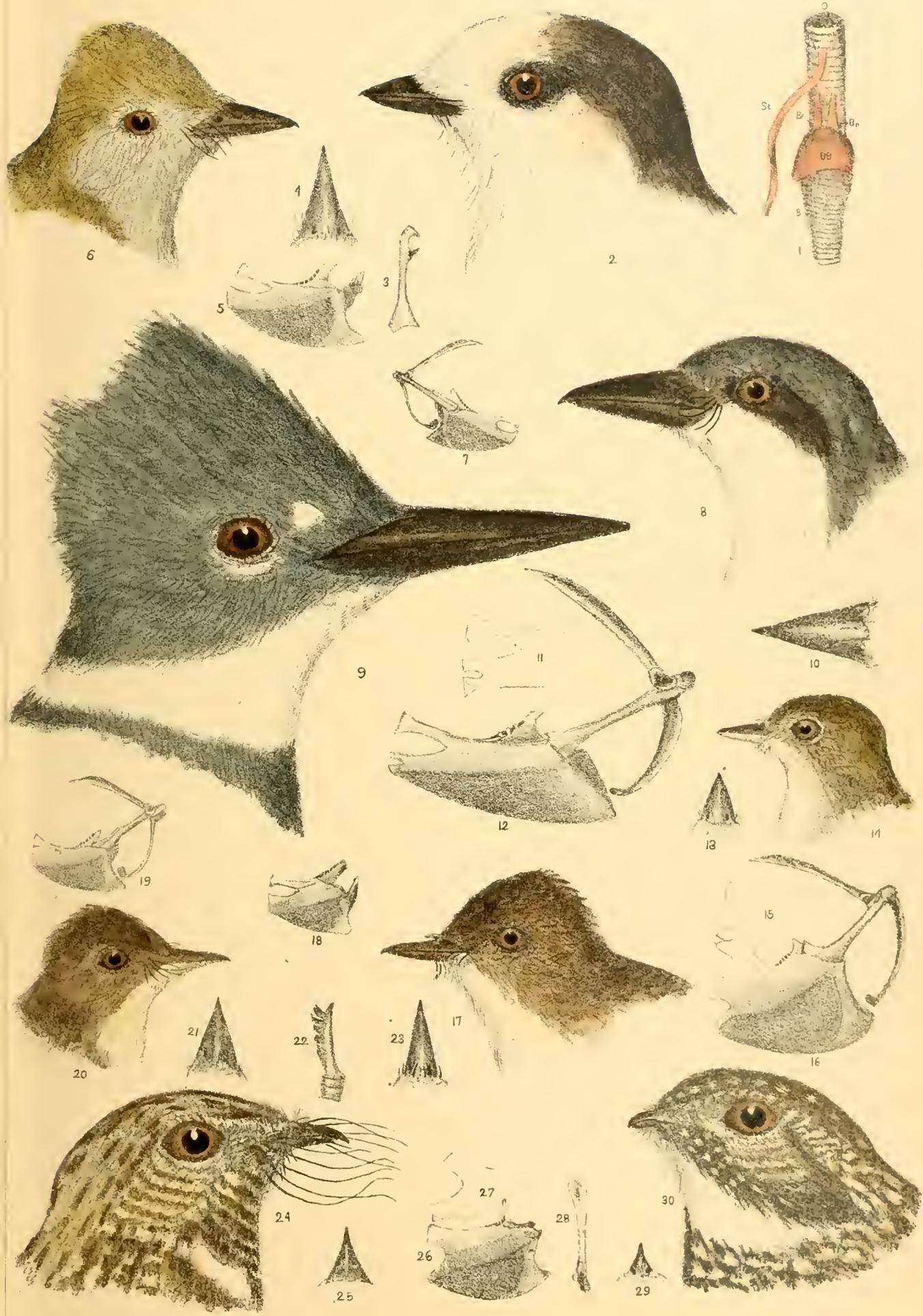


PLATE XXV.

EUTHEIA BICOLOR. Grassquit. Adults; upper fig., male; lower, female. Plant, Wild Lantana.



AEGIALITIS VOCIFERUS.

Killdeer. (Young.)

AEGIALITIS MONTANUS.

Mountain Plover.

J. A. Audubon, Del.

PLATE XVI.

1, Salivary Glands, (6, one enlarged) and Tongue, 2, Stomach, 3, Flayed body, 4, Back of Wing muscles, 5, Intestines, 7, Front, 8, Side view of Tongue, 9, 10, same (enlarged) 11, Egg, 12, Tail Feathers, 13, Head, 14, Upper mandible, 15, 16, Sternum of Chimney Swift. 17, 18, Sternum, 19, Egg, 20, Larynx, 21, Tongue, (enlarged) of Ruby-throated Humming Bird. 22, Foot, 23, Upper Mandible, 24, Head of Mangrove Cuckoo, 25, 26, Sternum, 27, Egg, of Black-billed Cuckoo.

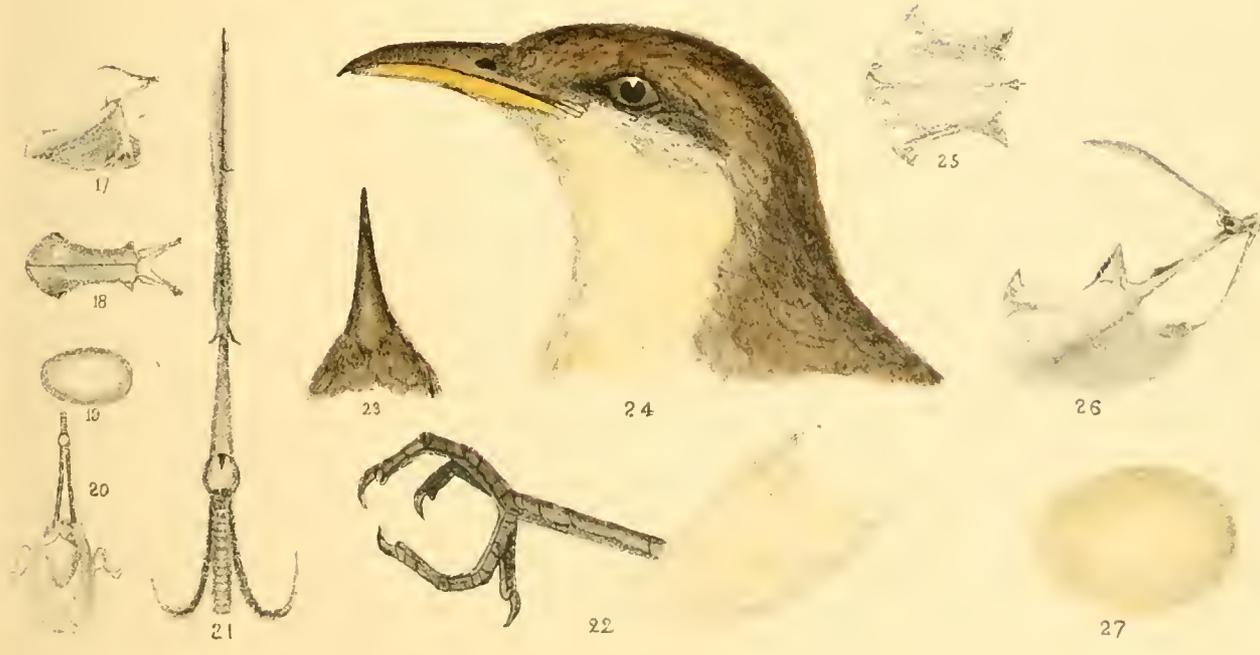
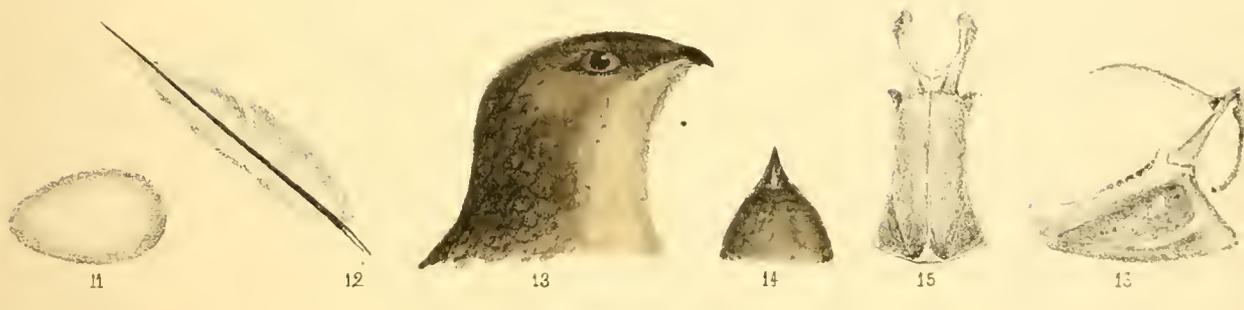
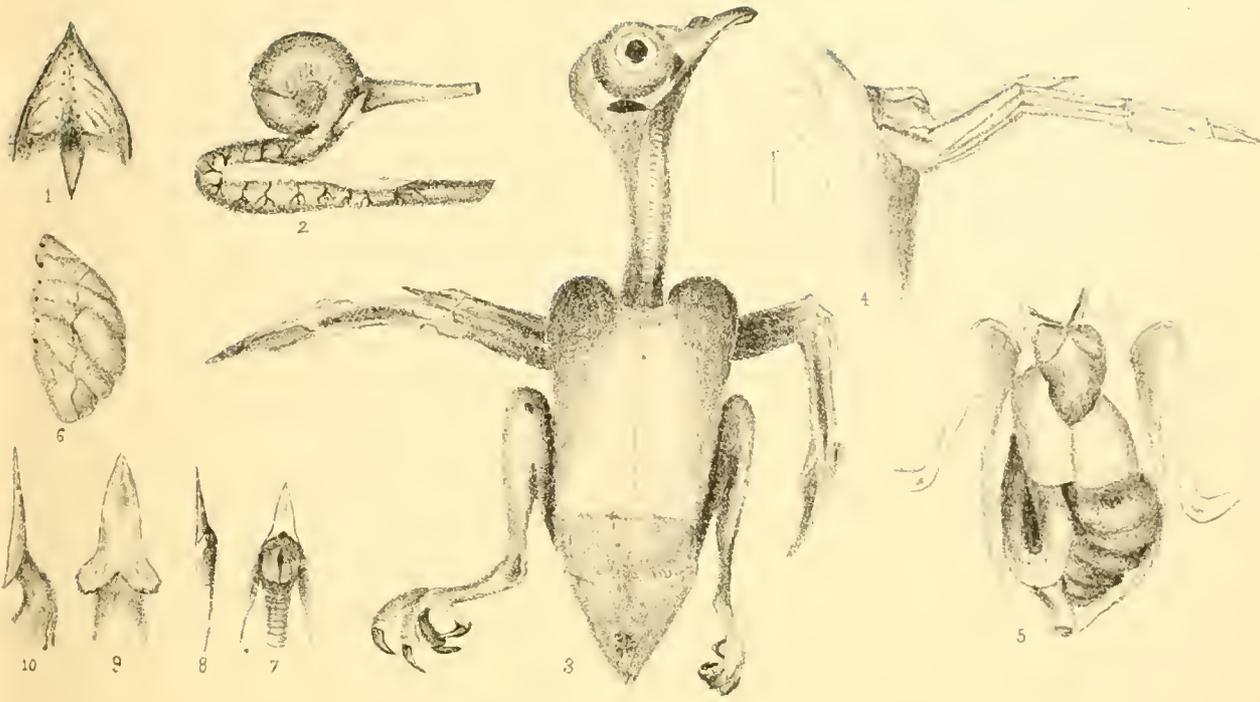


PLATE XVIII

1, 2, Sternum, 3, Tongue, 4, same enlarged, 5, Top of head, 6, Head of Yellow-bellied Woodpecker. 7, Tail feather, 8, 9, Sternum, 13, Head, 18, Tongue, 19, same (enlarged), 20, Stomach of Red-bellied Woodpecker. 10, Head, 11, 12, Sternum, 14, Section of Stomach, 15, Stomach, 16, Tongue, 17, same (enlarged) of Red-headed Woodpecker. 21, Stomach, 22, Proventriculus gland (enlarged), 23, Proventriculus, opened, 4, Head, 25, Salivary gland, 26, 27, Sternum of Golden-winged Woodpecker.

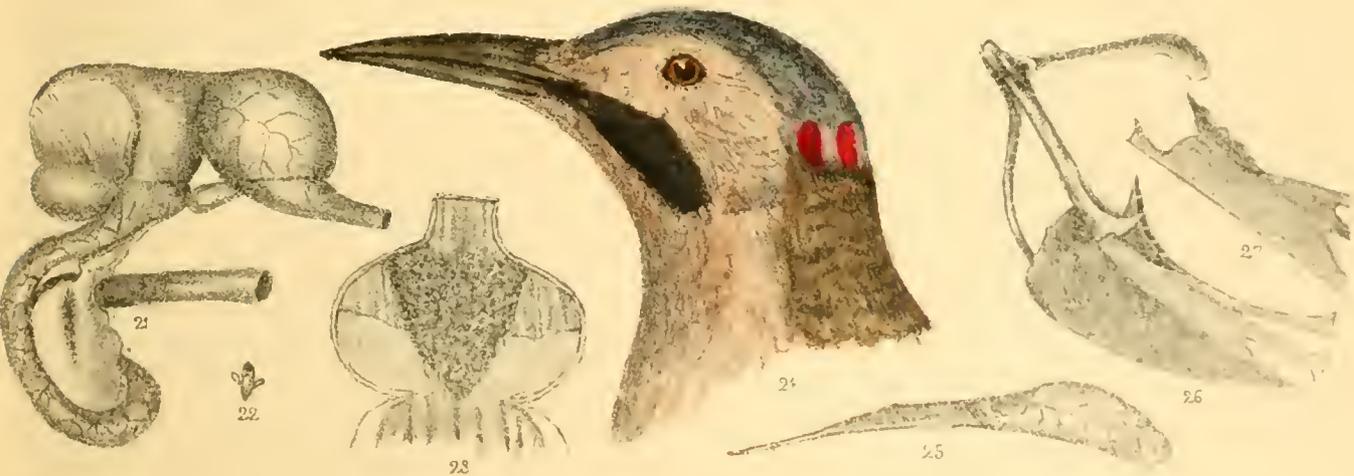
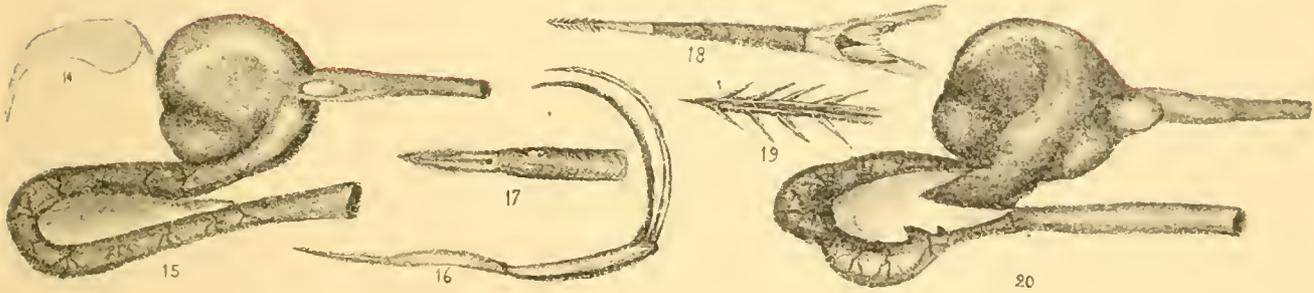
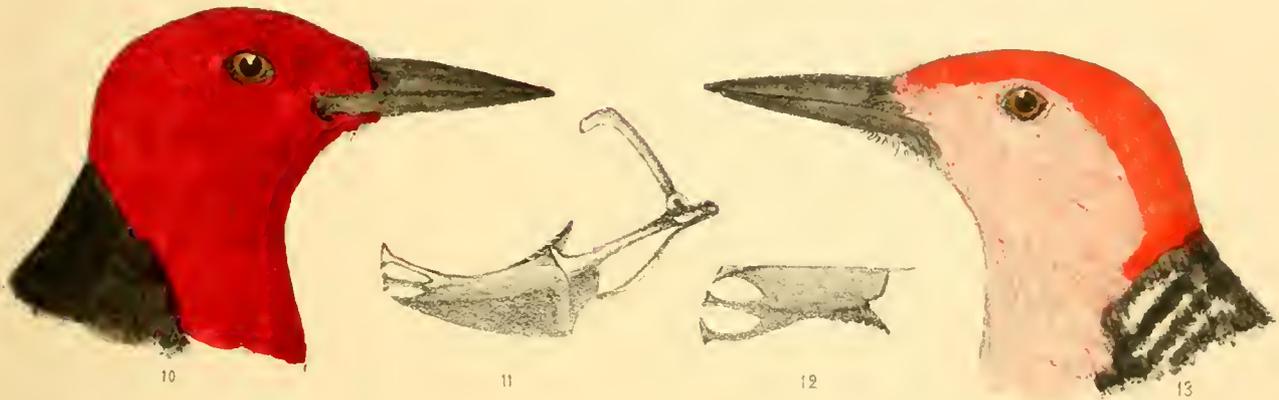


PLATE XIX.

1, 2, Sternum, 3, Head, 4, Upper Mandible of Pileated Woodpecker. 5, Upper Mandible, 6, 8, Sternum
7, Head of Ivory-billed Woodpecker. 9, 10, Sternum of Hairy Woodpecker. 11, Foot, 12, Head of Black-
backed three-toed Woodpecker. 13, Head of Cockaded Woodpecker.

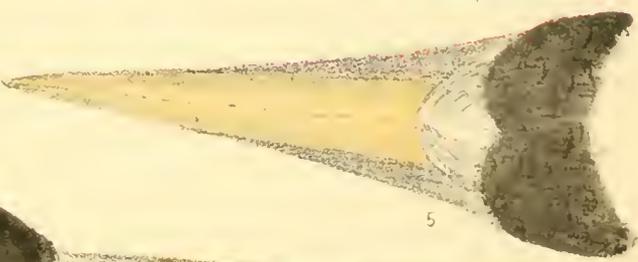


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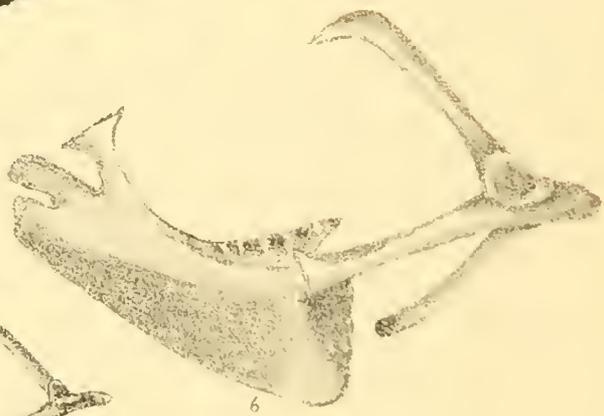
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8



9



6



10



2



PLATE XXI.

KIRTLAND'S WARBLER. Adult, Male. Bahamas.





PLATE XXII.

Upper fig. *HELMINTHOPHAGA LEUCOBRONCHIALIS*. White-throated Warbler. Lower fig., *Helminthophaga Lawrenci*. Lawrence's Warbler. Adult, males. Plant, Spray of White Birch.

















PLATE X XIX

DENDROECA TIGRINA. Cape May Warbler. Adult Male.



PLATE XXX

EMPIDONAX ACADACUS. Acadian Fly-catcher Adult. Twig of White Maple.



PLATE XXXI.

DENDROECA. CASTANEA. Bay-breasted Warbler Adult, male.



PLATE XXXII

1, Head, 3, 4, Sternum of Sandhill Crane. 2, Foot, 5, Head of Tropic Bird.

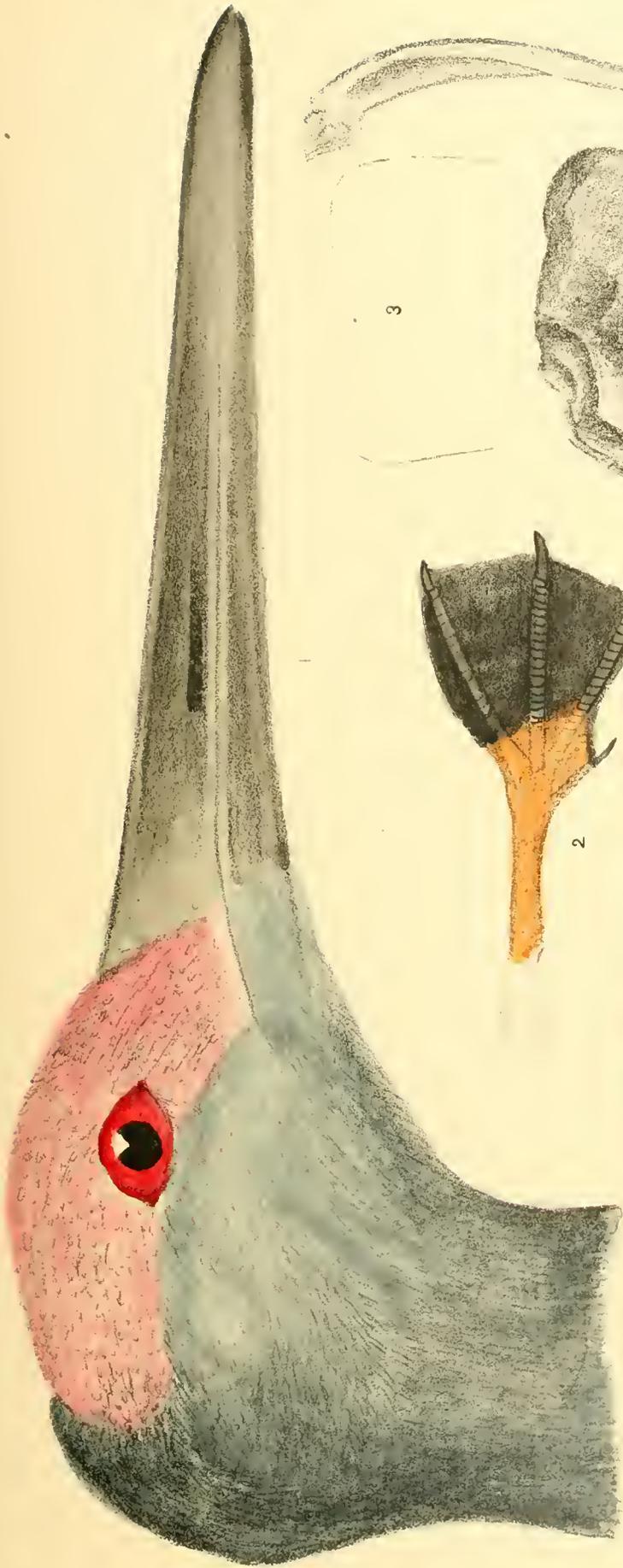


PLATE XXXIII.

Figs. 1, 2, 3, 4, Inferior larynx of a Crow. See page 426 for further explanations. 5, Sternum, 7, Foot, of Robin. 8, Head. 9, Upper mandible, of Olive-backed Thrush. 10, Head. 11, Upper mandible of Water Thrush. 12, 13, Sternum. 16, Head. 17, Upper mandible, of Mocking Bird. 14, Head. 15 C, Foot. B, Sternum. A, Upper mandible of Golden-crowned Kinglet. 18, 19, Sternum, Blue Bird. 20, Sternum. 21, Upper mandible. 22, Head. 23, Tarsus, of Brown Thrasher.

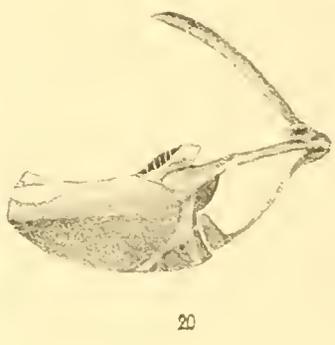
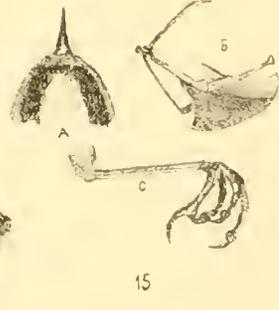
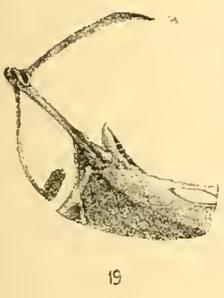
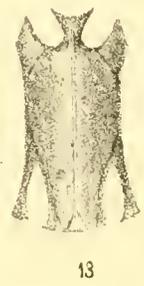
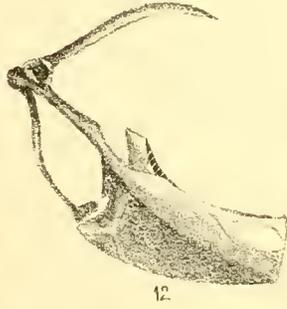
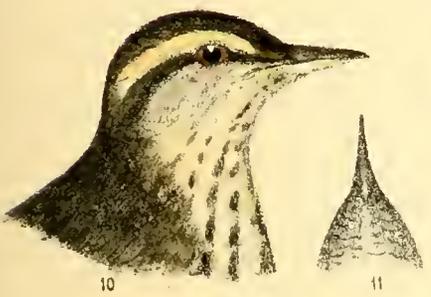
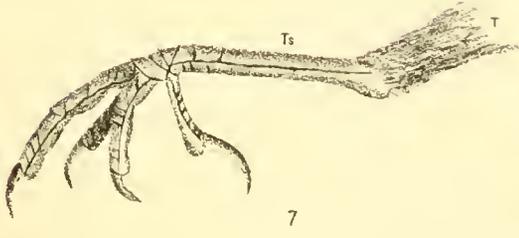
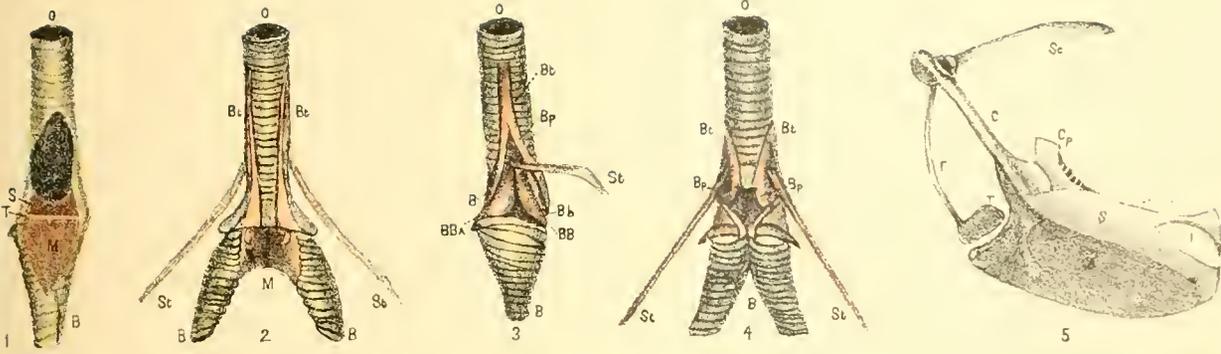


PLATE XXXIV.

Fig. 1. Sternum of Orange-crowned Warbler. 2, Head, 3, Upper Mandible, 4, Sternum and Foot of Blue Yellow-backed Warbler. 5, Upper Mandible, 6, Head, 7, Sternum, 10, Foot, of Maryland Yellow-throat. 8, Head, 9, Upper Mandible, 11, Foot, 24, Sternum, of Redstart. 12, Head 13, Upper Mandible 14, Foot, 27, Sternum, of Rough-winged Swallow. 15, Foot, 16, Upper Mandible, 17, Head, 25 and 26, Sternum, of Black and White Creeper. 18, Sternum, 29, Head. 30, Upper Mandible of Logger-head Shrike 19, Sternum of Scarlet Tanager. 20, Sternum of Warbling Vireo. 21, Upper Mandible, 22, Head, 23, Tip of secondary, 28, Sternum of Cedar Bird, 31, Head, 35, Upper Mandible, 43, Sternum of Indigo Bird. 36 Head, 37, Upper Mandible of Field Sparrow, 38, Upper Mandible, 39, Head of Snow Bird. 40, Upper Mandible, 41, Head of Goldfinch. 42, Sternum of Grassquit. 44, Sternum of Yellow-winged Sparrow, 45 Sternum of Tree Sparrow. 48, Sternum of Palid Sparrow.



PLATE XXXV.

PASSERCULUS PRINEPS. Pallid Sparrow. Adult in spring. View, Northern sea-coast. Plants
Common Cinque-foil and Field Sorrel.



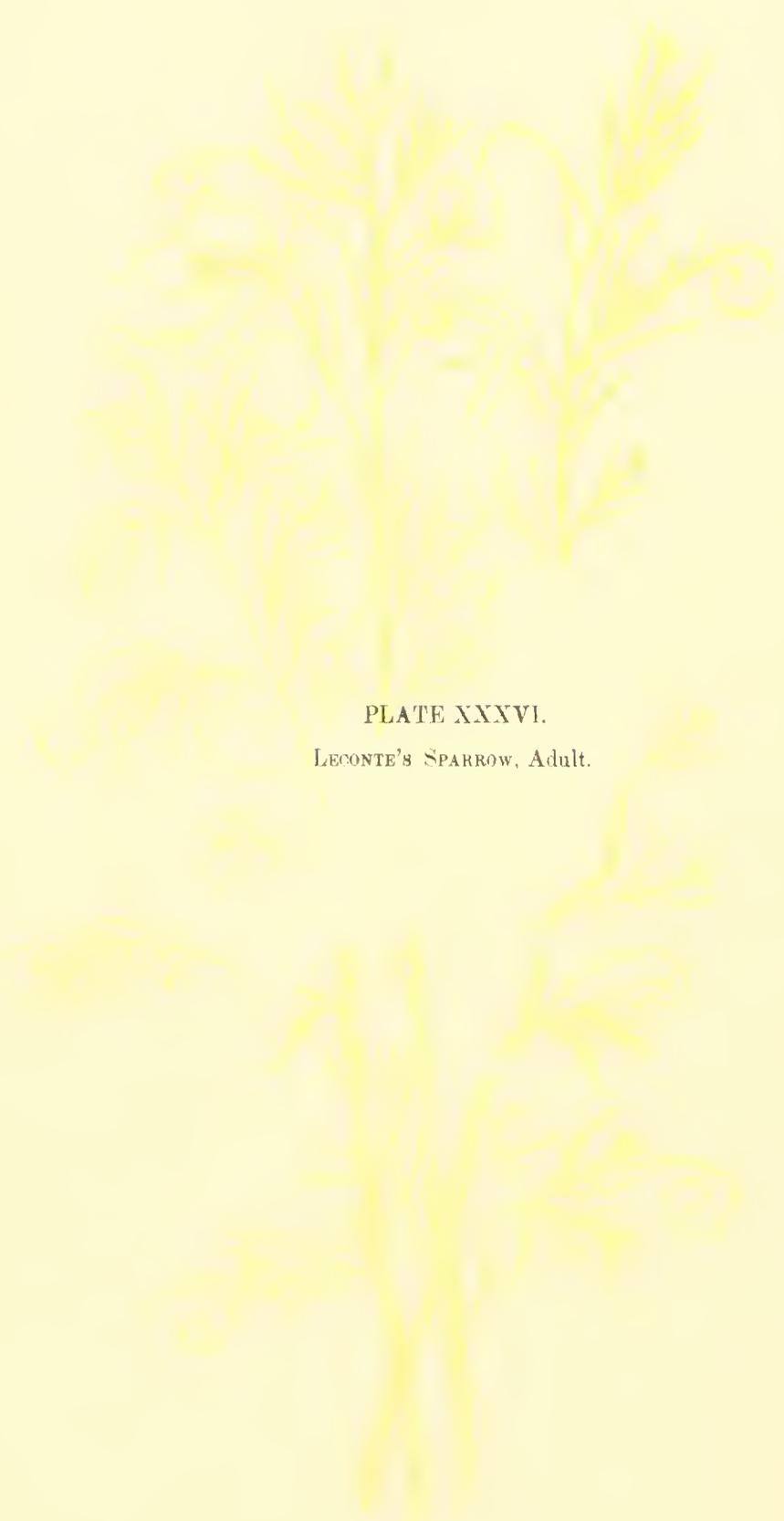


PLATE XXXVI.

LECONTE'S SPARROW, Adult.



PLATE XXXVII.

SOUTHERN YELLOW-WINGED SPARROW. Adult, Key West.

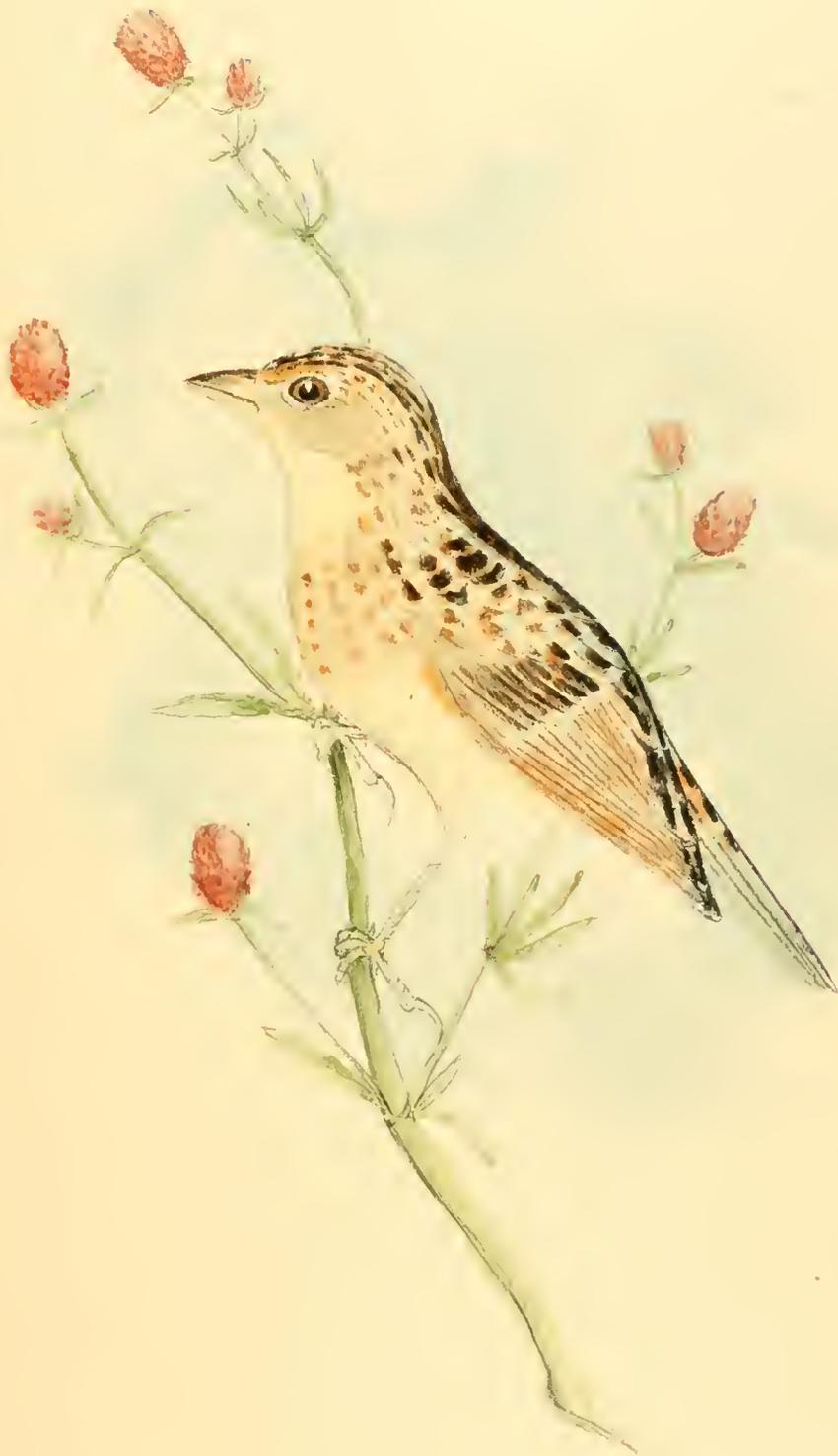


PLATE XXVIII.

BLACK-WHISKERED VIREO. Adult, Bahamas.



PLATE XXXIX.
HUDSONIAN CHICKADEE. Adult.



PLATE XL

BROWN-HEADED NUTHATCH. Adult.



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