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SMITHSONIAN CONTRIBUTIONS TO KNOWLEDGE.

NORTH AMERICAN

OÖLOGY;

BEING AN ACCOUNT OF THE HABITS AND GEOGRAPHICAL DISTRIBUTION OF THE BIRDS OF NORTH
AMERICA DURING THEIR BREEDING SEASON; WITH FIGURES AND
DESCRIPTIONS OF THEIR EGGS.

BY

THOMAS M. BREWER, M.D.

PART I.

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SMITHSONIAN CONTRIBUTIONS TO KNOWLEDGE.

NORTH AMERICAN

OÖLOGY.

BY

THOMAS M. BREWER, M. D.

PART I. — RAPTORES AND FISSIROSTRES.

[ACCEPTED FOR PUBLICATION, FEBRUARY, 1856.]

is at present aware, these include seventy-nine species inhabiting North America. Of these the eggs of no less than twenty are still entirely unknown to him, while of those of eleven others he has no present means of giving illustrations. Besides these deficiencies, it will be observed also that there is not that certainty which is desirable in regard to the illustrations of other eggs the parentage of which is rather probable than positive. To these deficiencies and uncertainties he invites the attention of all of kindred tastes, and solicits their aid and co-operation in supplying as many of these *desiderata* as may be practicable in future numbers, in order that the work may be made more nearly full and complete.

In all instances the illustrations are taken directly from the egg itself, and in none has any attempt been made to make use of drawings. It has been demonstrated by repeated trials, that no drawing of an egg, however skilful may be the draughtsman, can be obtained, in ordinary cases, which gives with sufficient accuracy of light and perspective the shape and markings of the object represented. It has been deemed advisable, therefore, to abandon entirely the original design of including among the illustrations copies of eggs of which access could not be had to the originals. This will materially reduce the writer's present means of illustration, but will render much more complete, uniform, and exact all that he may be enabled to give, while time and future opportunities can hardly fail to supply many of his present deficiencies.

In the following pages acknowledgments are made to the different co-laborers who have kindly contributed to aid him in his work, and to each in connection with the species they have assisted to illustrate. He has endeavored to give full justice to all whose co-operation has extended to those now given, and he trusts that none will find occasion to complain either of omission or of want of due appreciation of their several favors. There are those, however, whose services have been so valuable, whose assistance so constant, so unremitted, or so long continued, and from whose aid and sympathizing interest he has derived so much of encouragement and support, as to call for special mention here and elsewhere.

To John James Audubon, the gifted artist, the ardent and enthusiastic devotee alike of art and nature, the warm-hearted and kindly impulsive man, he must give credit for having been the first to warm into a permanent and enduring aim the earlier germs of interest in this subject. It is to his prompt and opportune sympathy, his generous contributions of materials and of many valuable specimens which would be irreplaceable if lost, that he is indebted for the foundation of his present knowledge, and many of the materials for his task. If, therefore, in the course of the present work, it may be found necessary to give, with that fidelity to exact truth which is the duty of every faithful servant of nature, certain statements and facts inconsistent or in conflict with those of his deceased friend, let it not be supposed that they are presented with any ungrateful lack of appreciation either of his distinguished services to science, or of his many acts of personal kindness. It is hardly possible even for the most exact and cautious to avoid falling into mistakes, and, well aware that he himself may not be found exempt from error, the writer has endeavored, where mention of them could not be avoided, to speak

of them without any imputation of censure, but with that charity for the mistakes of others which he hopes to have meted to himself when occasion shall arise.

To Dr. James Trudeau, hardly less than to Mr. Audubon, acknowledgments must be made for valuable co-operation and assistance. Many years since, almost coincident with his earliest investigations, the design was entertained of a joint work illustrative of American Oölogy. It has only been abandoned in consequence of the continued absence of Dr. Trudeau from the country, the want of knowledge of his present address, and, above all, the fact that no use could be made of the materials jointly collected for the illustrations. To Dr. Trudeau the writer is indebted for a large number of valuable and rare specimens, and for a much larger number of drawings, which are often referred to in the text, but which cannot be made use of in illustrating the present work.

During the past fourteen years, no one has evinced a more constant or more active interest in the subject of the writer's investigations, or contributed more valuable aid, than Professor Spencer F. Baird, of the Smithsonian Institution. The work itself will present, throughout its entire extent, constant evidences of the assistance and co-operation which have been received more or less directly from his zealous and successful endeavors to increase the means of its completeness.

To the venerable John Bachman, D. D., of Charleston, S. C., to John Cassin of Philadelphia, to Dr. A. L. Heermann, now of San Antonio, Texas, to Charles S. Paine of East Bethel, Vt., to Robert Kennicott of West Northfield, Illinois, to Thure Kumlien of Fort Atkinson, Wisconsin, to Samuel Jillson of Lynn, Mass., to John Wolley, Jr., of Beeston, England, to Henry F. Walter of London, besides many others referred to in these pages, the writer is under many and great obligations, without which his undertaking would have been both more onerous and less successful.

In mentioning those to whom special obligation should be acknowledged for important assistance, the author refers with pleasure to the services of Mr. L. H. Bradford, whose ingenious application of photography to the aid of lithography has given valuable results that could have been reached by no other means. The illustrations which are due to his intelligent skill are probably the most perfect representations of eggs that have ever yet been achieved. The credit of this is chiefly due to Mr. Bradford, who has thus greatly contributed to the completeness and value of the work by furnishing illustrations of unsurpassed excellence.

But above all, his acknowledgments are due to the Smithsonian Institution for the aid which it has afforded in the publication and illustration of this work. Without the assistance the author has received from this source, the memoir could not have seen the light, as its cost would have been greater than his own means would authorize, and beyond all probability of remuneration from sales.

It would be too soon, in the present condition of the science, to seek to determine how far Oölogy may ultimately be the means of determining ornithological classification. At present, our knowledge upon this subject is greatly restricted. Only in Europe have any illustrated works upon the local Oölogy been published, and those are chiefly confined to its more northern portions. We have no knowl-

edge of the eggs of more than one tenth of the species of birds ascertained to exist. Those of whole genera, and even families, are comparatively unknown. Yet it is not difficult to see that Oölogy promises to become an important auxiliary both in aiding to determine natural divisions, and to enable us to decide in regard to varieties the specific identity of which is in doubt. Let us take an instance. The Brown Thrush of North America (*Mimus rufus*) is usually classed in the same generic group with the Cat-Bird (*Mimus felivox*). The eggs of these birds are very unlike, and apparently demonstrate that they do not belong together. Without looking at all to the external structure of these birds, Oölogy would seem to indicate that the Cat-Bird, though closely allied to the true Mocking-Bird, is at least one step, and that the Brown Thrush is even farther, removed. If we ask where the former belongs, its eggs point out the Wood Thrush, the Hermit Thrush, and Wilson's Thrush as its nearer kith and kin, with whom it is not usually classed. With the Brown Thrush the case would be even plainer. It would require but a glance at the eggs of the birds of North America, supposing them spread out before us, to satisfy us that, if we accept this test, the Brown Thrush should be counted as a *Toxostoma*, and classed with the *T. curvirostris*, *T. longirostris*, &c., from whose eggs its own could hardly be distinguished.

In regard to the value of Oölogy in determining disputed points of identity of species, the case of *Buteo montanus* may be cited as a striking illustration. Much more might be said upon both these points, but, until more has been learned in regard to the eggs of the birds of all the other parts of the world, it is at least premature to consider how far Oölogy may be taken as a safe guide in classification. As to its value in determining questions of identity or diversity, this cannot well be disputed.

In presenting to the consideration of all interested in the natural sciences the results of his own investigations, largely aided by the co-operation of others, the hope is indulged that it will not be forgotten that the field has been one hitherto unexplored, that all has been new and untried, and that there has been but little in the writings of those who have gone before to lessen the need of his own investigations. Whatever deficiencies may be found in the present pages, and that there must be many is necessary and inevitable, may be remedied in future numbers, if they who may become aware of them will but point them out and supply the means of rectifying them. The co-operation of all interested in the science, throughout the Union, is invited. To those who may add anything to our common stock of knowledge, due credit will be promptly and gratefully rendered.

Boston, April, 1857.

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NORTH AMERICAN OÖLOGY;

BEING AN ACCOUNT OF

THE GEOGRAPHICAL DISTRIBUTION OF THE BIRDS OF NORTH AMERICA

DURING THEIR BREEDING SEASON,

WITH FIGURES AND DESCRIPTIONS OF THEIR EGGS.

PART I.

ORDER RAPTORES.

FAMILY VULTURIDÆ.

CATHARTES AURA.

Vultur aura, LINN. Syst. Nat. I, 1766, 122.

“ “ WILSON, Am. Orn. IX. 1814, pl. lxxv, fig. 1.

Cathartes aura, BONAPARTE, Synopsis, 1828, p. 22.

“ “ RICHARDSON & SWAINSON, Fauna Bor. Amer. II, 1831, 4

“ “ NUTTALL, Manual, I, 1832, 43.

“ “ AUDUBON, Ornithological Biography, II, 1835, 296; V, 339, pl. cli.

“ “ BONAP. Geog. and Comp. List, 1838, p. 1.

“ “ AUD. Synopsis, 1839, p. 3.

“ “ “ _ Birds of America, I, 1840, 15, pl. ii.

“ “ DE KAY, Nat. Hist. New York; Birds, 1841, p. 2, pl. v, fig. 12.

“ “ CASSIN, Synopsis N. A. Birds (Illust. of Birds of California, &c.), 1854, p. 57.

Cathartes septentrionalis, DE WIED, Reise, I, 1839, 162.

VULG. — *The Turkey Buzzard. The Turkey Vulture. John Crow Vulture* (GOSSE). *Carrion Crow* (SLOANE, Journ. II, 294). *Carrion Vulture* (LATHAM, Gen. Syn. I, 9). *Vautour du Bresil* (DE BUFF. Ois. I, 246).

Few birds are more widely distributed through the North American continent than this Vulture. On the Atlantic coast its highest northern migration has been supposed to be southern New Jersey, where it is said to be found throughout the year. A few well-authenticated instances exist of its having been seen on the eastern coast beyond this northern limit,¹ and vague but probably unfounded state-

¹ Catalogue of the Birds of Connecticut, by Rev. James H. Linsley, Silliman's Journal, XLIV, 1843, 250.

ments have been made by writers of its having been met with even in Nova Scotia. West of the Alleghanies it has a much less restricted distribution, from Central America almost to the Arctic regions. It is found more or less frequently in all the Middle, the Southern, Western, and Northwestern States, without probably an exception. It is met with in large numbers throughout the entire Pacific coast of North America, from Lower California to Washington Territory. And until the discovery that the species in South America, which has been regarded as identical with it, is really distinct (*Cathartes jota* of Molina), it was supposed to have an extended South American range. It is not known with certainty whether the *C. aura* is found in South America at all, or whether the species with which it has hitherto been confounded has exclusive possession of that field. Since attention has been drawn to the point, every specimen from that quarter which has been examined proves to be, not the northern, but a distinct and smaller species, of a more uniformly black color.¹ The doubt naturally arises whether the *C. aura* is at all South American, and, until it can be shown positively to be so, it should be excluded from the lists of that region.²

The Turkey Buzzard breeds along the entire Atlantic coast, from New Jersey to the Gulf of Mexico, and throughout North America, south of a line extending from the former State to the Pacific, this line reaching farther north as we proceed west. It nests in Cook County, Illinois, (latitude 42° north,) as I learn from the observations of my friend, Robert Kennicott, Esq.³ David Douglas, possibly not the most undoubted authority, in a letter to Mr. Swainson,⁴ mentions seeing "vast numbers of this species in Upper Canada, near Sandwich and Lake St. Clair, in 1823," and implies that they were breeding there at that time. According, also, to Dr. Richardson, its summer migrations are higher in the interior of the continent than on the Pacific coast. He speaks of finding it along the banks of the Saskatchewan, in latitude 55°, late in the month of June. This, however, is stated, not from his own personal observations, but on the strength of a specimen in the Museum of the Hudson's Bay Company, obtained in that neighborhood.⁵ Mr. Say observed this species as far to the north as latitude 49°, and

¹ Cassin's Illustrations of the Birds of California, Texas, Oregon, British and Russian America, pp. 57, 58.

² Since the above was in type, a few facts have been brought to my knowledge which to some extent seem to favor the impression that the *C. aura* is not a South American bird, or if so, only in occasional instances. It is not found in all the West India Islands. It exists in Cuba, Trinidad, and Jamaica, but is nowhere common, and is unknown in Hayti, as well as in all the intermediate islands of the Caribbean chain. Mr. Richard Hill, an observant naturalist of Spanish-town, Jamaica, in speaking of these facts, writes: "We are no doubt indebted for it to an accidental colony blown over to us from Cuba, and Cuba herself owes it to some stray visitants from the neighboring continent of Florida." Darwin, in the Zoölogy of the Voyage of H. M. S. Beagle (Part III, p. 8), while supposing the *C. aura* and the *jota* of Molina to be identical, notices certain peculiarities in the habits and markings of the South American birds differing from those of the northern species.

³ Transactions of the Illinois State Agricultural Society, I, 580.

⁴ Fauna Boreali-Americana, II, 4.

⁵ This is doubted by Mr. Douglas, who suggests that they confounded this species with *C. atratus*. Its correctness is, however, indirectly confirmed by Dr. Gambel, who, in his paper on the Birds of

Lewis and Clarke met them near the Falls of the Columbia River, in latitude 48°. The southern limits of the migrations of the Turkey Buzzard cannot be given with precision. It is impossible to determine how far this species has been mistaken for the *C. jota*, as already stated. It is given by Lembeye and Dr. Gundlach as a resident of Cuba, by Gosse as a bird of Jamaica; it was found by Dr. Cabot in Central America, though not so abundantly as the *C. atratus*; and Darwin, in the Zoölogy of the Beagle, mentions it as having been obtained as far to the south as latitude 55°, even the extreme points of Terra del Fuego, Western Patagonia, and the Falkland Islands. It is, however, probable that the bird of which Darwin speaks is not the *C. aura*, but its kindred species already referred to. How far this is the case with the birds met with by the others named, may admit of some doubt, though the probability is that all the authorities cited refer to the northern species.

The Turkey Buzzard invariably lays on the ground, for the most part in hollow trees, stumps, or decaying logs. It constructs no nest, but deposits the eggs with little or no preparatory pains for their shelter. Mr. Ord found them breeding as early as the month of May, in the deep recesses of the solitary swamps of New Jersey. He describes the nest as formed, without any painstaking, in a truncated hollow tree, and in excavated stumps or logs, and mentions the number of eggs as from two to four. Except in regard to the number of eggs, which is rarely, if ever, more than two, these observations substantially correspond with all the reliable accounts I have seen of their breeding. In Jamaica, Mr. Gosse writes that the situations usually selected by the Turkey Buzzard of that island, for laying and hatching its eggs, are hollows and ledges of rocks, in secluded places or inaccessible crags and cliffs. A little dry trash, he adds, or decaying leaves, are all the apology for a nest. Mr. Audubon mentions, that on the island of Galveston, where this Vulture is plentiful, he several times found its nest, as usual, on the ground, but in an unusual place; namely, on a level part of the salt marshes, either under the wide-spread branches of cactuses, or among tall grass growing beneath low bushes. The eggs which Mr. Audubon obtained at Galveston, and which he supposed to be those of the *C. aura*, have been ascertained unquestionably to belong to the *C. atratus*. It is, therefore, probable that the nests he has described also belonged to birds of the latter species.

Dr. C. Kollock, of Cheraw, South Carolina, informs me that in his neighborhood both this species and the Black Vulture frequent places in the interior of swamps and thick woods, generally called Buzzards' roosts; that they congregate there through the year in large numbers, and usually breed in the immediate vicinity of these places. Mr. Audubon visited one of these roosts, near Charleston, S. C. It extended over two acres of ground, which were entirely destitute of vegetation.

The *eggs* of this species exhibit certain deviations in size, and, occasionally, in their markings, yet for the most part preserve specific characteristics. The

California (Journal of Philadelphia Academy, Second Series, Vol. I.), states that he found *C. aura* as common on the Pacific as on the Atlantic coast.

following are the proportions of four specimens, which will well represent their usual variations: $2\frac{1}{16}$ inches by $1\frac{1}{16}$; $2\frac{1}{16}$ by $1\frac{1}{16}$; $2\frac{1}{16}$ by $1\frac{1}{16}$; $2\frac{1}{16}$ by $1\frac{1}{16}$. These specimens were from New Jersey, South Carolina, Louisiana, and Tamaulipas (Mexico). The more common varieties have a ground of a light cream-color, marked with large confluent spots of reddish-brown or chocolate, chiefly predominating at the larger end, but also sparsely scattered over the entire egg. Intermixed with these are less frequent markings of a light purplish or lilac shade of drab. These are often so faint as only to be perceptible on a close examination. An egg taken some years since in New Jersey, by Alexander Wilson, and which perhaps is somewhat faded from its original colors, is marked over the entire shell with confluent spots of a dark greenish-brown, but with no perceptible shades of red or purple. Another variety from Cheraw, S. C. (fig. 2) has a ground of nearly pure white, is very nearly unspotted, and is only marked with a few small dots and lines of red and indistinct purple at the larger end.

CATHARTES ATRATUS.

- Vultur jota*, Gmel. Syst. Nat. I, 1788, 247.
 “ “ Wils. Amer. Orn. IX, 1814, pl. lxxv, fig. 2.
Vultur atratus, Bartram's Trav. 1791, p. 289.
Vultur urubu, Vieill. Ois. d'Am. Sept. 1807, p. 53, pl. ii.
Cathartes jota, Bonap. Syn. 1828, p. 23.
 “ “ Nuttall, Manual, I, 1832, 46.
 “ “ Aud. Orn. Biog. II, 1835, 33; V, 345, pl. cvi.
 “ “ Bonap. Geog. and Comp. List, 1838, p. 1.
Cathartes atratus, Rich. & Swains. Fauna Boreali-Americana, II, 1831, 6.
 “ “ Aud. Syn. 1839, p. 3.
 “ “ “ Birds of America, I, 1840, 17, pl. iii.
 “ “ Cassin, Syn. N. A. Birds (Illust. Birds of Cal.), 1854, p. 58.
 “ “ “ Birds of Gilliss's U. S. Nav. Ast. Ex. II, 1855, 173.
 VULG. — *The Carrion Crow. The Black Vulture. Jotecillo. Gallinazo.*

THE distribution of this species, though perhaps less extended in North America than that of the preceding, is yet over a wide extent of territory. Along the southern and southwestern coast of the United States, from North Carolina to Mexico, it is very common. West of the Rocky Mountains it is said to be abundant,¹ and to be found as far to the north as Oregon Territory. We have the authority of Mr. David Douglas² for its visiting the marshy islands of Columbia River, and the banks of Lewis and Clarke's River, latitude 45°–49° north. Mr. Audubon has

¹ Later investigations do not confirm its abundance on the Pacific; and it is a noticeable fact, that, in the numerous collections of birds made on the western coast of North America within the last few years, there are no specimens of *C. atratus*.

² Fauna Boreali-Americana, II, 4.

stated that it was found as far to the north, on the eastern coast, as Maryland. If so, its occurrence must be very rare, and I can find no satisfactory confirmation of the statement.¹ It is not often met with farther north than Wilmington, N. C. At Norfolk, Va., if occurring at all, it has not been distinguished from the Turkey Buzzard; for I was unable to find any one who had met with this Vulture there, to his knowledge, though familiar with the bird itself. Along the coast of all the Southern States, from North Carolina to Texas, it is much more abundant than its kindred species, even where, in the interior of the same State, it is far less frequent. Along the banks of the Mississippi and its tributaries, as far as Ohio to the east and Illinois to the north, it is found more or less abundantly, at certain seasons. Dr. Gambel met with it in great numbers on the Pacific coast of California,² and Dr. S. Cabot, Jr. found it the most prevalent species in Central America.

As to what its extreme southern limits may be, the same doubts arise as in regard to those of the preceding, because in South America it has been, until very recently, confounded with a smaller and quite distinct species,³ *Cathartes brasiliensis*. It is not as yet possible to determine to what extent this species occurs in that region, or how far writers, in speaking of the *C. atratus*, have had in view only that for which it has been mistaken. Mr. Cassin, however, informs me that he has seen a specimen of the real *C. atratus* from Peru, and specimens were also brought by Lieutenant Gilliss from Chile, obtained near Santiago, where it was not common, and only found in the mountainous regions of the interior. Darwin fixes its extreme southern limit in latitude 41° south, near the Rio Negro,⁴ and he did not meet with it in Chile or Patagonia.

In the Southern Atlantic cities, especially Charleston and Savannah, the Black Vulture, or Carrion Crow, as it is as frequently called, is a semi-domestic bird, and is very abundant. It is also to be found in the interior, but is neither so common nor so tame. It breeds on or near the ground, in the same manner as the Turkey Buzzard, in hollow logs, decayed trunks of trees, and stumps, and also without this protection, the bare earth only being made use of. It makes no nest.⁵ The eggs seldom if ever exceed two in number. These are greater, both in their length and capacity, than those of the Turkey Buzzard, although the measurements of the birds themselves would seem to show the latter to be apparently the larger of the two, its length being 32 inches, and that of *C. atratus* but 26. As, however, the average weight of the Carrion Crow is about one pound, or fifteen per cent, greater than that of the Buzzard, this superiority in the eggs of the *C. atratus* ceases to seem anomalous.⁶ Three eggs, from Charleston, Galveston, and the Rio Grande, furnish the

¹ An accidental specimen of the Black Vulture was obtained in Swampscot, Massachusetts, November, 1850, by Mr. S. Jillson, of Lynn, a diligent and reliable ornithologist.

² Journal of Philadelphia Academy, Second Series, I, 26.

³ Cassin's Birds of California, &c., p. 59.

⁴ Darwin's Zoölogy of the Beagle, Part III, p. 7.

⁵ The statement of Mr. Abbott of Georgia, that this Vulture breeds on trees, is not well founded. No well-authenticated instance is known.

⁶ The length of a bird cannot always be taken as a safe guide in determining the probable size of its egg. Much depends upon the shape and relative capacity of the pelvis, and much also upon the

following measurements: $3\frac{1}{16}$ inches by $1\frac{5}{16}$; 3 by $2\frac{1}{16}$; $3\frac{1}{16}$ by $1\frac{5}{16}$. The principal difference between the eggs of this and the preceding species is in regard to their size. Their ground color is the same, or nearly the same: a yellowish-white or cream-color, almost never a pure white, and if so, only in exceptional cases. The eggs are more elongate in their shape, and the blotches are usually larger. These are of a dark reddish-brown, confluent and chiefly distributed around the larger end. There are also markings or dashes, smaller and less frequent, of lilac and purplish drab, similar to those noticed in the eggs of the *C. aura*. An egg from the Rio Grande is marked with small spots of reddish-brown and faint lilac, equally distributed over the whole surface on a ground of cream-color. This is very peculiar, and probably not a common variation from the more usual markings of the eggs of this Vulture. The more common markings of this egg are well represented in fig. 3. The specimen was obtained by Audubon on Galveston Island, Texas. Fig. 4 represents a less common variety, obtained by Dr. Kollock in Cheraw, S. C.

CATHARTES CALIFORNIANUS.

Vultur californianus, SHAW, Nat. Misc. IX, 1797, 1, pl. cccci.

Vultur columbianus, ORD, Guthrie's Geog. II, 1815, 315.

Cathartes vulturinus, TEMM. Pl. Col. I, 1820, pl. xxxi.

Cathartes californianus, BONAP. Syn. 1828, p. 22.

“ “ NUTTALL, Manual, I, 1832, p. 39.

“ “ AUD. Orn. Biog. V, 1838, 240, pl. cccexi.

“ “ BONAP. Geog. and Comp. List, 1838, p. 1.

“ “ AUD. Syn. 1839, p. 2.

“ “ “ Birds of Am. (Svo.) I, 1840, 12, pl. i.

“ “ GRAY, Gen. of Birds, 1849, pl. ii.

“ “ CASSIN, Syn. N. A. Birds (Illust. Birds of Cal.), 1851, p. 58.

VULG. — *The Californian Vulture. The California Turkey-Buzzard.*

BUT one instance of the possession of a well-authenticated egg of this species by a naturalist has come to my knowledge. This was one laid in confinement by a female belonging to the Garden of Plants in Paris. An accurate drawing of this was taken by Dr. James Trudeau, and is now in my possession. There seems no reason to doubt that the egg thus laid does not essentially vary from those deposited in a wild state. It certainly is hardly possible that the variations between this and the natural egg can be so total and striking, as between it and the attributed

degree of development possessed by the young bird when first hatched. Birds whose young are hatched in an advanced stage of maturity, and can shift for themselves from the egg, like many species of shore-birds, the *Uria* and others, have invariably proportionately very large eggs, and *vice versa*, except only where the female deposits a large number, as in the case of the Wild Turkey, the Virginia Quail, the Ruffed Grouse, and many others.

shape and markings of the eggs of this species, if we credit the previous accounts which have been given of the eggs of the Californian Vulture. These descriptions are, however, all traceable to one source, so far as I am aware. David Douglas, in the *Zoölogical Journal*, speaks of the eggs of this Vulture as nearly spherical, *jet-black*, and about the size of those of a Goose. Following this authority, all writers who have referred to the eggs of the Californian Vulture have described them in a similar manner. That they should be spherical would be an exceptional case to the whole genus, and is therefore hardly probable, though by no means impossible. Markings of a jet-black color, even to the extent of blotches, spots, or lines, are of very rare occurrence, if not positively unknown. Nor am I aware that any of this family of Vultures ever construct nests. For these reasons, and until the statements of Mr. Douglas can be confirmed by other testimony, I am inclined to discredit his accounts of its nest, eggs, and habits, in every respect.¹ In this unbelief I am in part confirmed by the testimony of Mr. Townsend. He was informed, as he tells us, by the Indians of the Columbia River, that the Californian Vulture, like all others of its genus, breeds on the ground, fixing the place for a nest in swamps, under the pine forests, chiefly in the alpine country, — in this conforming with the habits of the family.

The egg in the Garden of Plants corresponds, in its generic characteristics, with the eggs of the *Cathartes aura*, the *C. atratus*, and also with those of the *jota* and *brasiliensis* of South America. It is also remarkably similar, except in size, to occasional marked varieties of the egg of the Condor (*Sarcoramphus gryphus*), which, however, is usually white and unspotted. I feel justified, therefore, in accepting the drawing as an authentic representation of those of this species.

This egg measured $3\frac{1}{8}$ inches in length by $2\frac{1}{8}$ in its greatest breadth. Its ground color is that of all the known eggs of this genus, a rich cream-color, or a yellowish-white. A ring of reddish-brown confluent blotches surrounds the larger end, leaving the residue nearly free from markings. A few blotches of a smaller size and lighter color are distributed over the whole surface. The faint purplish-drab markings noticeable in the eggs of the preceding species are not observable in this specimen.

The Californian Vulture is confined to the western slope of the Rocky Mountains. It is there found from the extreme southern portions of the Pacific coast of North America to Washington Territory and the British possessions, where it abounds in the summer season. It was met with by Mr. Townsend on the banks of the Columbia, upwards of five hundred miles above the mouth of that river, throughout the months of June, July, and August.

¹ "They build in the most secret and impenetrable parts of the pine forests, invariably selecting the loftiest trees that overhang the precipices on the deepest and least accessible parts of the mountain valleys. The nest is large, composed of strong thorny twigs and grass, in every way similar to the nests of the Eagle tribe, but more slovenly constructed. The same pair resort for several years to the same nest, bestowing little trouble or attention in repairing it. They lay two nearly jet-black eggs, about the size of those of a Goose. They hatch generally about the 1st of June, and the period of incubation is twenty-nine or thirty days." (David Douglas, *Zoölogical Journal*.)

FAMILY FALCONIDÆ.

FALCONINÆ.

FALCO ANATUM.

- Falco peregrinus*, WILS. Am. Orn. IX, 1814, 120, pl. lxxvi.
 “ “ BONAP. Syn. 1828, p. 27.
 “ “ RICH. & SWAIN. F. B. A. II, 1831, 23.
 “ “ NUTT. Man. I, 1832, 53.
 “ “ AUD. Orn. Biog. I, 1832, 85; V, 365, pl. xvi.
 “ “ “ Syn. 1839, p. 16.
 “ “ “ Birds of Am. I, 1840, 84, pl. xx.
 “ “ DE KAY, Nat. Hist. New York, I, 1844, 13, pl. iii, fig. 8.
 “ “ LEMBEEYE, Birds of Cuba, 1850, pl. i, fig. 2.
Falco anatum, BONAP. Geog. and Comp. List, 1838, p. 4.
 “ “ CASSIN, Syn. N. A. Birds (Illust. Birds of Cal.), 1854, p. 86.
 VULG.—*Great-footed Hawk. American Peregrine Falcon. Blue-backed Falcon. Spotted Falcon. Haggard Falcon. Duck Hawk.*

THE amount of exact information in our possession in regard to the distribution of this species during the breeding season, its geographical range generally, its manner of breeding, or the extent of the variations to which its eggs may be subject, is much more limited than could be wished. To some extent this is owing to this species having been so long confounded with the Western Peregrine (*Falco nigriceps*, Cassin) of California, but yet more so to its restriction, during the breeding season, to less frequented and high northern latitudes, where it has been rarely met with by naturalists. But one well-authenticated instance has come to my knowledge of its having been met with, during the breeding season, south of Newfoundland. At other seasons it has been found throughout the entire American continent, unless we are to suppose that its near relatives, the two Californian species, may have been mistaken for this bird in the instances referred to. It preys chiefly upon sea-ducks, and therefore is, for the most part, met with on the coast, is rarely found inland, and its migrations and wanderings are influenced by the flights of its favorite game. It has been found, at various seasons, throughout the entire eastern coast of North America, and possibly belongs to the western also; but this remains to be ascertained. Mr. Gosse obtained it in Jamaica, and Lembeye and Dr. Gundlach in Cuba. Sir William Jardine assigns it to Bermuda, and a species supposed, though perhaps erroneously, to be the same, has been observed in the Straits of Magellan. The last, however, may have been either the Californian, the Australian,¹ or an undescribed species.

¹ The Australian species, once confounded with the Peregrine Falcon of Europe, is now recognized as distinct. It is the *Falco melanogenys* of Gould's Birds of Australia. This bird, like all of its kindred

I was not, until very recently, aware that this species had ever been known to breed within the United States. Mr. Audubon inferred it from meeting with specimens near Niagara Falls, in the month of August; but their mere occurrence in that locality so late in the season as August is not conclusive evidence of their having been hatched in that neighborhood. Mr. Ord, in his addition to Wilson, stated that this Hawk breeds in the swamps of New Jersey; but though diligently sought for, their nests have never been found, and the statement is probably incorrect. Nor is there apparently any good foundation for the impression Mr. Ord seems to have been under, that they nest on trees. Certainly there is no satisfactory evidence of this fact, or nothing beyond vague and unsupported reports. Sir John Richardson, in his Arctic searching expedition, in 1845, while descending the Mackenzie River in latitude 65° north, noticed a Peregrine nest, supposed to be one belonging to a bird of this species, placed on the cliff of a sandstone rock. He also speaks of this Falcon as not rare on that river, where it preys on the Passenger Pigeons and smaller birds. Dr. Gambell speaks of its occurrence on the sea-coast of California, and of its there nesting on the cliffs, but he has probably mistaken for it the common species of that country.¹

and closely assimilated species, breeds on the rocky cliffs of the sea-coast of Australia. Its eggs are two in number; their ground color is buff, but this is scarcely perceptible from the predominance of the blotchings of deep reddish-chestnut with which it is marbled all over. They are two inches and one line long by one inch and seven and a half lines broad. It is highly probable that the South American bird referred to above will prove to be yet another distinct member of this interesting and closely connected group.

¹ Since writing this article, I have been informed by Professor S. F. Baird that this Hawk undoubtedly nested on a high cliff near the house of Professor S. S. Haldeman, near Columbia, Pennsylvania, as attested by the assurances of Professor Haldeman, who has on several occasions procured very young ones which had fallen from the nest. Specimens of these are in the Smithsonian Institution. Professor Haldeman, in answer to my inquiries, has kindly furnished me with the following interesting information in regard to the occurrence of this bird in Pennsylvania: "In the Proceedings of the Academy of Natural Sciences, Vol. I. p. 54, (1841,) I have noticed the occurrence of *Falco peregrinus (anatum)* on the Susquehanna. A pair had a nest for many years about a hundred yards from my house, on a high and almost vertical cliff; but as a railway now traverses its base, it is not probable that the species will return to the locality. I have not seen an individual for a number of years past. Without direct comparison, I regarded this as the European bird; and I suspect that, in giving it the name of *F. anatum*, Bonaparte was guided by the supposed difference in the habits. Had I known that any one had a doubt on the subject, I would have collected the material placed within my reach; and having failed to do so, I must now depend upon an uncertain recollection. This bird remained ten or eleven months in the year, disappearing only in the coldest weather, and returning with the first favorable change. The nest was difficult of access, and I never saw it; but it was once reached, and the young taken, by getting down from above. I have seen them at Harper's Ferry since the railway has been in use there, recognizing them by their flight and cry. I feel confident that they breed there, the cliffs being well adapted to their habits. Ranges of similar cliffs occur along the rivers of East Tennessee, but I did not meet with the bird when travelling there. On the Susquehanna they breed early in spring, the young (to the number of *not less* than three) leaving the nest perhaps in May; and there may possibly be a second brood. I used formerly to see this species about three miles farther up the Susquehanna, where it probably inhabits the cliffs on the western side. I will endeavor to discover whether they are still there, and if so, will set some inquiries on foot as to the probability of getting the eggs. I am under the impression that at my locality but a single pair remained, the young disappearing in the course of the season. In the wild region between Columbia and tide-water, there are many localities suited to the habits of this bird."

My knowledge of the markings of the eggs of the Great-footed Hawk is limited to two specimens, one of which is represented in the plate (fig. 11). The other is a drawing taken by Dr. Trudeau from an egg obtained in Labrador. It closely resembles a variety of the eggs of the European species, but seems to present differences sufficiently well marked to be regarded as specific. It measures two inches in length by $1\frac{2}{16}$ in breadth. The ground colors of both American and European are a reddish-yellow, and both are thickly covered with fine dottings of chocolate and ferruginous-brown, diffused over the whole egg, in nearly equal degree, and to such an extent as nearly to conceal the ground. The length of the American egg is slightly less, but it is of equal or greater capacity, and varies in its markings from all the European specimens that I have ever met with. These variations, though readily traceable by the eye, are not so easily described. The shades of coloring in both are closely alike; the variation consists more in the distribution of these markings. In the European specimens, the fine markings of chocolate are distributed with nearly exact uniformity. In the American, the secondary colorings are now more thickly and now more thinly diffused, here leaving the ground color nearly unchanged, there becoming confluent and blending into waving lines, blotches, and bold dashes. The egg, in consequence, presents a more variegated appearance. These markings are also in greater proportion around the larger end of the egg, and the blotches are of a deeper shade, so that there is a variation in the shadings between the smaller and larger extremities, not noticeable in any European eggs that I have met with.

Fig. 11 represents an egg to my mind undoubtedly of this species, but not certainly ascertained, because the difference of species between the American and European bird was not recognized by the donor. It is from Greenland, and was given me as that of *Falco peregrinus*, where, however, the *F. anatum* is supposed to replace the true Peregrine.

HIEROFALCO SACER.

- Falco sacer*, FORSTER, Phil. Trans. London, LXII, 1772, 423.
Falco fusca, FABRICIUS, Fauna Groenlandica, 1780, p. 56.
Falco cinereus, GMELIN, Syst. Nat. I, 1788, 267.
Falco islandicus, RICH. & SWAIN. F. B. A. II, 1831, 27.
 “ “ NUTTALL, Manual, I, 1832, 51.
 “ “ AUD. Orn. Biog. II, 1835, 552; IV, 476, pl. excvi.
 “ “ “ Syn. 1839, p. 15.
 “ “ “ Birds of Am. I, 1840, 81, pl. xiv.
Falco labradora, AUD. B. of A. 1834, pl. excvi.
Falco gyrfalco, BONAP. Geog. and Comp. List, 1838, p. 4.
Falco candicans, BONAP. Cons. Av.
Hierofalco sacer, CASSIN, Syn. N. A. Birds (Illust. Birds of Cal.), 1854, p. 89.
 VULG. — *American Gyrfalcon. The Greenland Falcon. American Jerfalcon. Iceland Falcon.*

VERY little is with certainty known in regard to the geographical distribution, nesting, and habits of this species. Like the preceding, it has, until very recently, been confounded with one closely allied, and even now we can only infer, rather than be said to know, all that is attributed to it. It is unquestionably specifically distinct, in my opinion, from the *H. islandicus*; and as no specimens of the latter are known to have been obtained nearer this continent than Greenland, and as *H. sacer* is not found in Europe, it is presumed, though possibly on insufficient grounds, that one bird is exclusively American, and the other as exclusively confined to Iceland and the old continent.¹ The extreme northern range of the two birds makes it by no means improbable that both are found throughout the entire Arctic circle, and are not restricted to either continent.

The *H. sacer* is rarely met with in the United States, and only in midwinter, but is not unfrequent in the more northern regions of North America, and throughout Greenland. Richardson speaks of it as a constant resident in the Hudson's Bay territories. He supposed its extreme southern latitude to be 52° north. It was observed by Captain Sabine on the west coast of Greenland, as far north as 74°. Sir John Richardson found a nest of this bird in June, 1821, built on a lofty precipice on the borders of Point Lake, in latitude 65½°. Mr. Audubon also speaks of finding a nest of the present species near Bras-d'or in Labrador, placed on high rocks, fifty feet from their summit, and more than one hundred from their base. It was composed of sticks, sea-weeds, and mosses, about two feet in diameter, and almost flat. I have in my possession the drawing of an egg from Labrador, which was taken by Dr. James Trudeau, and is, so far as I am aware, the only authentic representation of the egg of this species which has been obtained on our continent. It differs essentially from all the European specimens I have seen, but corresponds very closely

¹ Since the above was written, the publication of a paper read before the Philadelphia Academy in February, 1855, by Mr. Cassin, in part confirms my conjecture that these species are not restricted to either continent. Certainly *H. islandicus* is not. At the same time, this accurate ornithologist appears less confident of the distinctness of the two species, and is not without a suspicion of their identity.

with one from Greenland, in the collection of the Philadelphia Academy (fig. 12). If these variations are specific, as I presume they are, the eggs belonging to Mr. Yarrell, described by him as those of the European species (*H. islandicus*), are probably those of the American bird. The same were figured by Mr. Hewitson; and as neither of these naturalists recognizes the two Hawks as distinct species, they were not likely to be on their guard in reference to any specific variations in their eggs. In European collections, the eggs of both species have been confounded with each other, all passing as undoubted eggs of *H. islandicus*, precisely as those of the American Fish-hawk (*Pandion carolinensis*) are unwarrantably confounded with those of the European Osprey (*Pandion halietus*), and the two are even regarded as identical in Hewitson's Oölogy.

The egg of the *H. sacer* is slightly larger than that of the *H. islandicus*, and the predominant color of its markings is a deep reddish-brown, very generally and nearly equally diffused over its surface, concealing the ground color, which is lighter, and with a more yellowish shade. Its measurement is $2\frac{6}{16}$ inches in length by $1\frac{3}{16}$ inches in breadth.

Two specimens of the egg of *H. islandicus*, one from Norway and the other from Iceland, measure, the first $2\frac{7}{16}$ by $1\frac{3}{16}$, the latter $2\frac{6}{16}$ by $1\frac{3}{16}$ inches. In both, the ground color is a dirty yellowish-white. One is marked with spots, dottings, and confluent blotches of yellowish-brown, interspersed with a few dashes of dark brown in an increased proportion about the larger end. The other is marked in like manner with light yellowish-brown, but much more sparingly, and so slightly and uniformly, that, unless closely examined, it would seem to be of one uniform color, and that a light brown, shaded with yellow.

HYPOTRIORCHIS COLUMBARIUS.

- Falco columbarius*, LINN. Syst. Nat. I, 1766, 128.
 " " WILS. Am. Orn. II, 1810, pl. xv, fig. 3.
 " " BONAP. Syn. 1828, p. 38.
 " " RICH. & SWAINS. F. B. A. II, 1831, 35.
 " " NUTTALL, Manual, I, 1832, 60.
 " " AUD. Orn. Biog. I, 1832, 466; V, 368, pls. lxxv and xcii.
 " " BONAP. Geog. and Comp. List, 1838, p. 4.
 " " AUD. Syn. 1839, p. 16.
 " " " Birds of Am. I, 1840, 88, pl. xxi.
 " " DE KAY'S Nat. Hist. N. Y. I, 1844, 4, pl. iv, fig. 9.
Falco intermixtus, DAUDIN, Traité d'Orn. II, 1800, 141.
 ?? *Falco asalon*, RICH. & SWAINS. F. B. A. II, 1831, 37.
Falco temerarius, AUD. Orn. Biog. I, 1832, 381, pl. lxxv.
 VULG. — *The Pigeon-Hawk. Little Corporal Hawk. L'Epervier de la Caroline* (Briss.).

It was at first my intention to omit at present giving any plate representing the egg of this species, for the reason that I have been unable to decide with certainty

between two claimants to be so regarded. These are each with so very nearly equal pretensions, that at times I have been strongly inclined to give alternately the one or the other as genuine. Yet they are very distinct, and it is not possible they can be varieties belonging to the same species. One of these was obtained in the Two Islands, a group near Grand Menan, in the Bay of Fundy. This had been obtained a few days before it came into my possession. The remains of a bird, which I was told was the parent, were unmistakably those of this species. This egg measures $1\frac{1}{16}$ by $1\frac{7}{16}$ inches, and is nearly spherical. Its ground color is a not very clear white, and is marked by a few bold dashes of a light yellowish-brown, distributed irregularly, but chiefly about the smaller end. There were four eggs in the nest. The latter was coarsely constructed, as I was informed, of sticks and mosses, and resembled that of a crow. The size of this specimen seems disproportionately large for the bird. It corresponds, however, very closely with the description of the eggs of this Hawk given in Hutchins's Notes on the Birds of Hudson's Bay.¹ This egg is represented, Plate 10, fig. 35.

On the other hand, I have a copy of Mr. Audubon's drawing taken from the contents of a nest which he was confident was that of the *H. columbarius*. This is very different in size, shape, and markings. It measures $1\frac{1}{16}$ by $1\frac{3}{16}$ inches, its shape is an oblong oval, and it is so thickly covered with deep blotches of chocolate that its ground is entirely concealed. Mr. Audubon refers to the discrepancy between Mr. Hutchins's description and his own observations,² and appears to have been very positive that the eggs which he found in three different instances were those of this Hawk. As, however, I have known instances in which even Mr. Audubon has been mistaken, when apparently feeling equally confident, I have hesitated to adopt his drawing, until it can be verified, or the other egg ascertained to belong to a different species. My own supposition is that my egg from Grand Menan is genuine, and that Mr. Audubon's drawing may be that of an egg of the Sharp-shinned Hawk (*Accipiter fuscus*).

The Pigeon-hawk is distributed, in the breeding season, throughout the northern parts of North America. It breeds as far to the south as Maine on the Atlantic coast, and California on the Pacific. At other seasons it ranges over the entire continent, and extends its wanderings to Cuba, Jamaica, and the northern parts of South America. I have received a specimen from Wisconsin, where it possibly breeds.

¹ Mr. Hutchins, in his Notes on the Hudson's Bay Birds, informs us that this species "makes its nest on rocks and in hollow trees, of sticks and grass lined with feathers, laying from two to four white eggs, thinly marked with red spots." (Fauna Boreali-Americana, II, 36.) On the next page, Richardson, speaking of his *Falco asalon*, which, however, was really a variety of the *H. columbarius*, says: "In the oviduct there were several full-sized white eggs clouded at one end with a few bronze-colored spots,"—a description much more nearly corresponding with the egg from Grand Menan than with Mr. Audubon's drawing and description.

² "Mr. Hutchins's description of the eggs of this bird is greatly at variance with my own observations. The eggs, in three instances which occurred at Labrador, were five; they measured an inch and three quarters in length, an inch and a quarter in breadth, and were rather elongated; their ground color a dull yellowish-brown, thickly clouded with irregular blotches of dull dark reddish-brown." (Birds of America, Svo, I, 88, 89.)

Mr. Gosse speaks of it as a constant resident of Jamaica,¹ and Mr. Nuttall supposed it to nest in the Southern States.² Both are probably mistaken. In every instance where I have heard of the Pigeon-hawk as a summer resident, south of Maine, it has proved to be the Sharp-shinned Hawk (*Accipiter fuscus*). Dr. Gambel found it abundant on the coast of California, Sir John Richardson met with it in latitude 57° north, and again probably in 66°, and M. de Sagra, Lembeye, and Dr. Gundlach mention it as a visitant of Cuba.

HYPOTRIORCHIS FEMORALIS.

Falco femoralis, TEMM. Pl. Col. I, 1827, Livraison 58, pl. cxxi (males); pl. cccxliii (adult male).

“ “ DARWIN, Zoölogy of the Beagle, 1838, Part III, p. 28.

Harpagus bidentatus, GAY, Fauna Chilena, 1847, Aves, p. 230.

Hypotriorchis femoralis, CASSIN, Birds of Gilliss's U. S. Nav. Ast. Ex. II, 1855, 177.

VULG.—*Alcou* or *Halcou*.

THIS handsome species rests its claims to be regarded as a North American, as well as a South American bird, at present, upon a single specimen, obtained in New Mexico by Dr. A. L. Heermann. This was a fine adult bird, in regard to the identity of which there can be no question. It was at first supposed by its discoverer to be a new and undescribed species, and its identity with Temmink's *F. femoralis* was closely scrutinized. No other specimens, that I am aware of, have been obtained in North America.

Mr. Darwin, in his Zoölogy of the Voyage of the Beagle, mentions obtaining one specimen in a small valley on the plains of Patagonia, at Port Desire, in latitude 47° 44' south. This would seem to exhibit for this Hawk the unusually extended geographical range of at least eighty degrees of latitude. M. D'Orbigny supposed that latitude 34° was the extreme southern limit of this species. In this he was clearly very much in error. Besides the instance just mentioned, I am assured by Mr. N. H. Bishop that he found this bird very abundant throughout the Pampas of southern South America, in about latitude 38° south, and Lieutenant Gilliss also brought specimens from Chile.

According to Mr. Darwin, the *H. femoralis* builds its nest in low bushes. This corresponds with the observations of Mr. Bishop. Mr. Darwin also states that he found the female sitting on her eggs in the beginning of January. He describes the eggs he found as “one eighth of an inch in longer diameter, and one fourth of an inch in shorter; surface rough with white projecting points; color nearly uniform dirty wood-brown, thickly freckled with rather a darker tint; general appearance as if it had been rubbed in brown mud.” This description is not exact, and does not convey a very correct idea of the specimens in my possession.

¹ The Birds of Jamaica, p. 19.

² Nuttall's Manual, I, 60.

M. D'Orbigny states that the *femoralis* prefers a dry, open country with scattered bushes, which Mr. Darwin confirms. Mr. Bishop also informs me that he met with this Hawk in the greatest abundance upon those vast plains of South America known as the Pampas, in which no trees except the ombû are found, and that it there nests exclusively on the tops of low bushes hardly more than a foot or two from the ground. The bird is not at all shy, like most Hawks, but is easily approached so nearly as to be readily recognized.

Mr. Bridges states, in the Proceedings of the London Zoölogical Society (1843, p. 109), that the *H. femoralis* is trained in some parts of South America for the pursuit of smaller gallinaceous birds, and that it is highly esteemed by the Chilian falconers. It very soon becomes quite docile, and will even follow its master within a few weeks of its capture.

I am indebted to my esteemed friend, Mr. Nathaniel H. Bishop, of Medford, Massachusetts, — a young and enthusiastic naturalist, whose zeal in the study of natural history prompted him, alone, unaided, and at the risk of his life, to explore the arid plains of South America, while yet a mere lad in years and stature, though his observations there exhibit the close and careful study of maturer years, — for two fine specimens of the eggs of this Hawk. They were obtained by him in the midst of the Pampas. The nest contained but these two, and was built on the top of a low bush or stunted tree, hardly two feet from the ground. It was constructed, with some pains and elaboration, of withered grasses and dry leaves.

The eggs in my possession measure, one $1\frac{1}{6}$ inches in length by $1\frac{1}{3}$ inches in breadth, the other $1\frac{2}{3}$ inches by $1\frac{3}{8}$. This does not materially vary from the measurement given by Darwin. The ground color of the egg is white. This, however, is so thickly and so generally studded with fine brown markings, that the white ground to the eye has a rusty appearance, and its real hue is hardly distinguishable. Over the entire surface of the egg is distributed an infinite number of fine dottings, of a color most nearly approaching a raw terra-sienna brown. Over this again are larger blotches, lines, and splashes of a handsome shade of Vandyke-brown. In the egg represented in the plate (Plate 3, fig. 22), these larger markings are much more frequent than in the other specimen, and produce quite a fine effect. The latter specimen is chiefly marked with the finer rusty dottings, but with only a few blotches of Vandyke-brown. It has, in consequence, a more dingy and less pleasing effect.

TINNUNCULUS SPARVERIUS.

- Falco sparverius*, LINN. Syst. Nat. I, 1766, 128.
 “ “ WILS. Am. Orn. II, 1810, pl. xvi, fig. 1, and IV, pl. xxxii, fig. 2.
 “ “ BONAP. Syn. 1828, p. 27.
 “ “ RICH. & SWAINS. F. B. A. II, 1831, 31.
 “ “ NUTTALL, Manual, I, 1832, 58.
 “ “ AUD. Orn. Biog. II, 1835, 246; V, 370, pl. cxlii.
 “ “ “ Syn. 1839, p. 17.
 “ “ “ Birds of Am. I, 1810, 90, pl. xxii.
 “ “ DE KAY, Nat. Hist. New York, I, 1844, 16, pl. vii, fig. 16.
Falco dominicensis, GM. Syst. Nat. I, 1788, 285.
Cerchneis sparverius, BONAP. Geog. and Comp. List, 1838, p. 5.
Falco gracilis, SW. Cab. Cyc. 1838, p. 281.
Falco cinnamominus, SW. Cab. Cyc. 1838, p. 281.
Falco isabellinus, “ “ “ “ “
Tinnunculus sparverius, CASSIN. Syn. N. A. Birds (Illust. Birds of Cal.), 1854, p. 92.
 “ “ “ Zoölogy of U. S. Naval Astronomical Expedition, II, 1855, 176.
 VULG. — *The Sparrow-Hawk. Little Rusty-Crowned Falcon. Little Falcon. Emerillon de St. Domingue. Little Hawk. Emerillon de Cayenne.*

This species is one of the most widely distributed of North American birds, having been met with from latitude 50° north to the most extreme southern point of South America. Captain King found it at Point Famine in the Straits of Magellan. Sir John Richardson speaks of it as abundant on the banks of the Saskatchewan, in the neighborhood of the Carlton House. Darwin obtained it in Patagonia and Peru. Macleay, Lembeye, De Sagra, and Gundlach give it as a Cuban bird, the last of whom informs me that it breeds there. Mr. Pease obtained it in Mexico, Lieutenant Gilliss in Chile; Dr. Gambel found it abundant throughout California, as also did Mr. Audubon on the Yellowstone, in the Northwest Territory (now Nebraska). This Hawk probably breeds throughout North America, from Hudson's Bay to Mexico, and from Maine to California, though it is rare in the New England States. It constructs no nest, but makes use of hollow trees, the deserted hole of a woodpecker, or even an old crow's-nest. Its eggs are usually as many as five in number, and Mr. Audubon once even met with seven in a single nest. The ground of the eggs is usually a dark cream-color or a light buff. In their markings they vary considerably. Five from a nest in Maryland were covered throughout the entire surface with small blotches and dottings of a light brown, at times confluent, and, except in a single instance, not more frequent at the larger end than the smaller. Others, the contents of a nest obtained by Mr. Audubon in the Northwest Territory, had a ground color of a light buff, nearly unspotted, except at the larger end, with only a few large blotches and splashes of a deep chocolate. In others, interspersed with the light-brown markings are a few of a much deeper shade. In some, the eggs are covered with fine markings of buff, nearly uniform in size and color; and others again are marked with lines and bolder dashes of brown, of a distinctly reddish shade, over their entire surface, and often so thickly as nearly to con-

ceal the ground. The eggs are nearly spherical. Their average length is $1\frac{5}{8}$ inches by a breadth of $1\frac{2}{8}$. They are not subject to much variation either in size or shape.

Since the preceding pages were printed, I have received from an attentive correspondent, Mr. Archibald Hopkins, the son of President Hopkins of Williams College, the egg represented in Plate II, fig. 15 *a*. It was obtained in the neighborhood of Williamstown, Mass., and is interesting, both as showing that this Hawk, though rare in Massachusetts, does breed in certain parts of that State, and also on account of its well-defined markings, and the unusual depth and distinctness of their colors.

ACCIPITRINÆ.

ASTUR ATRICAPILLUS.

- Falco atricapillus*, WILSON, Am. Orn. VI, 1812, 80, pl. lii, fig. 3.
 “ “ NUTFALL, Manual, I, 1832, 85.
Astur atricapillus, JARDINE & SELBY, Illust. Orn. 1825, pl. cxxi.
 “ “ BONAP. Geog. and Comp. List, 1838, p. 5.
 “ “ CASSIN, Syn. N. A. Birds (Illust. Birds of Cal.), 1854, p. 93.
Falco regalis, TEMM. Pl. Col. 1827, tab. 495.
Falco palumbarius, BONAP. Syn. 1828, p. 28.
 “ “ AUD. Orn. Biog. II, 1835, 241, pls. cxli and xxxvi.
Accipiter palumbarius, RICH. & SWAINS. F. B. A. II, 1831, 39.
Dædalion pictum, LESS. Traité d'Orn. I, 1831, 67.
Astur palumbarius, AUD. Syn. 1839, p. 18.
 “ “ “ Birds of Am. I, 1840, 95, pl. xxiii.
 VULG. — *The Goshawk. American Goshawk. Ash-colored Hawk. Black-cap Hawk. A-tour Royal.*

IN regard to the distribution of the American Goshawk, much remains to be learned. It has nowhere been ascertained to be at any time common, and is only known to breed in the extreme northern parts of the United States. Dr. Gambel did not meet with it in California. The only known instance, at the time of my writing, of its occurrence near the Pacific coast, is that of a specimen in Dr. Suckley's collection, from the Columbia River,¹ and another from Steilacoom, Puget's Sound. It is chiefly found in the United States in winter. Sir John Richardson obtained a few specimens in the fur regions, and it appears to be not uncommon in New Brunswick, Nova Scotia,² Maine, Northern New York, Ohio, and even Pennsyl-

¹ Since the above was in type, I have learned from my friend, Mr. Cassin, that six specimens of the *Astur atricapillus* have been brought in the Government collections made by the Pacific Railroad Survey parties. These were collected by Dr. Suckley, in Washington Territory, or by Dr. J. G. Cooper, at Shoalwater Bay.

² While these sheets are passing through the press, Professor Baird has favored me with a list of the

vania. Our only knowledge of its nest is derived from Mr. Audubon, who observed these Hawks in the Great Pine Forest of Pennsylvania, and on the banks of the Niagara River, near the Falls.¹ He describes it as placed on the branches of a tree, and near the trunk. This nest was one of great size, and resembled that of a Crow in the manner of its construction, but was much flatter. It was made of withered twigs and coarse grass, with a lining of fibrous strips of plants resembling hemp. Another, found by Mr. Audubon, in the month of April, contained three eggs ready to be hatched. In another, the number was four. The only specimen of this egg that I have ever seen was one from Northern Ohio, near Cleveland. Its measurements are $2\frac{5}{16}$ by $1\frac{1}{16}$ inches. In its shape, it is nearly spherical; its surface is rough and granulated; its ground color is a soiled white with a hardly perceptible shade of bluish. It is marked irregularly with large but quite faint blotches of drab and yellowish-brown.

ACCIPITER FUSCUS.

- Falco fuscus*, GMELIN, Syst. Nat. I, 1788, 280.
 “ “ BONAP. Syn. App. 1838, p. 433.
 “ “ AUD. Orn. Biog. IV, 1838, 522, pl. cccxxiv.
Falco dubius, GMELIN, Syst. Nat. I, 1788, 281.
Accipiter striatus, VIEILL. Ois. Am. Sept. 1, 1807, 42.
Falco vclor, WILS. Am. Orn. V, 1812, 116.
 “ “ NUTTALL, Manual, I, 1832, 87.
 “ “ BONAP. Syn. 1838, p. 29.
Falco pennsylvanicus, WILS. Am. Orn. VI, 1812, 13.
Sparvius lineatus, VIEILL. Encyc. Meth. III, 1823, 1266.
Accipiter fringilloides, VIG. Zoöl. Jour. III, 1827, 434.
Accipiter pennsylvanicus, RICH. & SWAIN. F. B. A. II, 1831, 74.
Nisus mafini, LESS. Traité, I, 1831, 58.
Accipiter fuscus, BONAP. Geog. and Comp. List, 1838, p. 5.
 “ “ CASSIN, Syn. N. A. Birds (Illust. Birds of Cal.), 1854, p. 95.
Astur fuscus, AUD. Syn. 1839, p. 18.
 “ “ “ Birds of Am. I, 1840, 100, pl. xxv.
 “ “ LEMBEYE, Av. de la Isla de Cuba, 1850, p. 16.
 VULG. — *Sharp-skinned Hawk. Slate-colored Hawk. American Brown Hawk. Chicken Hawk. Autour à Bec Sineuse. Cernicalo Morado* (Cuba).

This species is one of the most common Hawks of North America, and its geographical range covers the entire continent, from Hudson's Bay to Mexico. Sir John Richardson mentions its having been met with as far to the north as latitude 51°.

birds of Nova Scotia, prepared by Lieutenant Bland of the Royal Engineers and Mr. John R. Willis of Halifax. In this catalogue, the *Astur atricapillus* is given as a bird of that Province, migratory and tolerably common.

¹ Birds of America, (Svo.) I, 97.

Drs. Gambel and Heermann both speak of it as abundant in California. Audubon found it very plentiful as far north as the southern shore of the Gulf of St. Lawrence. It has been obtained in New Mexico by Mr. McCall, in Mexico by Mr. Pease, and in Washington Territory by Dr. Cooper and Dr. Suckley. Both Dr. Gundlach and Lembeye give it as a Cuban species. It was not discovered in Jamaica by Mr. Gosse, nor am I aware that it has ever been detected south of Mexico. It has been ascertained, from my own observations as well as those of others, to breed in Massachusetts, New Jersey, Wisconsin, California, and Pennsylvania, and it probably does so in the intervening States and Territories, and indeed in all, except perhaps the most southern.

Neither Mr. Wilson nor Mr. Nuttall was so fortunate as ever to find the nest of this bird. Mr. Audubon speaks of having met with three, and all in different situations. One was in a hole in a rock, on the banks of the Ohio River; another was in the hollow of a broken branch, near Louisville, Ky., and the third in the forks of a low oak, near Henderson, Ky. In the first case, the nest was slight and simply constructed of a few sticks and some grasses, carelessly interwoven, and about two feet from the entrance of the hole. In the second instance there was no nest whatever; but in the third, the birds were engaged in the construction of an elaborate nest. The number of the eggs was four in one instance, and five in another. He describes them as almost equally rounded at both ends, though *somewhat elongated*, their ground color white, with a livid tinge, but scarcely discernible amid the numerous markings and blotches of reddish-chocolate with which they were irregularly covered. In a nest, which was large and elaborately constructed of sticks, and contained five eggs, found by Dr. H. R. Storer in Concord, Mass., there was a single egg which nearly corresponds with this description. It is, however, the only one among fifteen specimens which I have seen that at all agrees with it. This specimen is a little more than usually elongate, and its ground color, which is a purplish white, is nearly concealed by its blotches of various shades of sepia-brown. This egg is represented on Plate V, fig. 54. In every other instance, the egg is very nearly spherical, the ground color white, and beautifully marked with large confluent blotches of sepia, varying in depth from a quite light to a very dark shade. In one, these confluent markings form a broad belt around the centre of the egg. In others, they are chiefly distributed about one end. The contrast between the white ground and the dark confluent dashes of brown is very beautiful, and, except in size, the eggs of this bird bear a marked resemblance to those of the Sparrow-hawk of Europe. In a few instances, the brown markings have a purplish and reddish intermixture.

In a majority of the instances in which I have known of the existence of the nest of this Hawk, it has been constructed in trees. It is usually large in proportion to the size of the bird, and its materials are somewhat elaborately put together; it is composed chiefly of large sticks and twigs, and the whole platform is covered with a thin lining of dry leaves, mosses, grass, &c. Mr. John Krider of Philadelphia met with a nest in New Jersey, in the vicinity of that city, which was built on the edge of a high rock. Where such opportunities are afforded, this Hawk is often known to frequent similar situations; but its nest is more usually found in trees.

The eggs represented on Plate III, figs. 23 and 24, are the more common varieties. Figs. 23 and 54 (Plate V) were from the same nest, and obtained by Dr. H. R. Storer in Concord, Mass. The egg copied in fig. 24 was obtained in New Jersey by Mr. John Krider, of Philadelphia.

ACCIPITER COOPERII.

- Falco cooperii*, BONAP. Syn. 1828, App. p. 433.
 “ “ “ Am. Orn. II, 1828, p. 1.
Astur cooperii, BONAP. Geog. and Comp. List, 1838, p. 5.
 “ “ AUD. Syn. 1839, p. 18.
 “ “ “ Birds of Am. I, 1840, 98, pl. xxiv.
 “ “ LEMBAYE, Av. de la Isla de Cuba, 1850, p. 17.
Falco stanleyii, AUD. Orn. Biog. I, 1834, 186, pl. xxxvi.
 “ “ “ “ “ II, 1835, 245, pl. cxli.
Accipiter cooperii, CASSIN, Syn. N. A. Birds (Illust. Birds of Cal.), 1854, p. 96.
 VULG. — *Cooper's Hawk. Stanley Hawk. Hen-Hawk. Azor Americano* (Cuba).

COOPER'S Hawk is quite common throughout the United States, but probably does not extend its migrations much, if at all, beyond the limits of the Union. It is especially abundant in the Middle States, and particularly so along the banks of the Potomac River. I have received reliable information of its breeding in Vermont, Massachusetts, Ohio, Maryland, Virginia, and South Carolina. It undoubtedly nests in all the intervening States. Lembeye and Dr. Gundlach give it as a resident of Cuba, and although it has not yet been ascertained to rear its young in that island, such is probably the case. Mr. Gosse did not meet with the Cooper's Hawk in Jamaica. Drs. Gambel and Heermann found it very abundant throughout California. Lieutenant Trowbridge obtained several near San Francisco, and Dr. Cooper others in Washington Territory.¹

My specimens of its eggs from South Carolina were obtained by Messrs. A. D.² and M. A. Curtis, Jr., the sons of Rev. M. A. Curtis, of Society Hill, in that State. Mr. Curtis, Sen. has kindly furnished me with the following description of its nest: — “The nest of the Cooper's Hawk was built in the triple fork of a tall black gum (*Nyssa multiflora*), near the top of the tree, which stood in a swamp. The nest was formed of a layer of small sticks, $\frac{1}{3}$ to $\frac{1}{2}$ inch in diameter. Its external diameter varied from $1\frac{1}{2}$ to 2 feet. This layer was $\frac{7}{8}$ inch in thickness, with only

¹ More recent investigations show this Hawk to be abundant in Texas and New Mexico. The Government Survey parties have obtained numerous specimens in both regions.

² Since the above was prepared for the press, Mr. A. D. Curtis, to whose kindness I am chiefly indebted for a certain identification of the egg of this Hawk, has been taken from the field in which he had already given so much promise of future distinction, by an early death. The writer cannot omit the occasion to pay the passing tribute of his regard for that which Mr. Curtis had, thus young, contributed to the cause of scientific research, and of his regret for the loss of the rich promise the future seemed to hold out, from his interest, zeal, and intelligent investigation in natural science.

a slight depression in the centre, hardly enough to keep the eggs from rolling out. A few thin pieces of pine bark formed the bed for the eggs."

Another nest, obtained in Randolph, Vt. by Charles S. Paine, Esq., is thus described by him in a letter:—"The nest was built of hemlock twigs, and lined with small, thin pieces of hemlock bark, such as hang loosely on the tree. The Hawk, when the nest was approached, did not whistle, as some others of that family do, but uttered a cry of Ge! ge! ge! ge! This was repeated several times with great rapidity, by both male and female."

The average size of the eggs of this bird is $1\frac{1}{16}$ by $1\frac{5}{16}$ inches. The color is usually a uniform dull white, but occasionally tinged with a slight bluish shade. They are nearly spherical, though less so than the eggs of several species, and are equal at either end. Their surface is slightly granulated. The number of the eggs varies from three to four, though occasionally there are five in a nest. The egg figured is from South Carolina, and from the nest above mentioned.

BUTEONINÆ.

BUTEO BOREALIS.

- Falco borealis*, GMELIN, Syst. Nat. I, 1788, p. 266.
 " " WILS. Am. Orn. VI, 1808, pl. lii, fig. 1.
 " " RICH. & SWAINS. F. B. A. II, 1831, 50.
 " " AUD. Orn. Biog. I, 1832, 265; V, 378, pl. li.
 " " NUTTALL, Manual, I, 1832, 102.
Falco leverianus, GMELIN, Syst. Nat. I, 1788, 266.
 " " WILS. Am. Orn. Biog. VI, 1812, 78, pl. lii, fig. 2.
Falco jamaicensis, GMELIN, Syst. Nat. I, 1788, 266.
Falco aquilinus, BARTRAM, Trav. 1791, p. 290.
Buteo ferruginicaudus, VIEILL. Ois. d'Am. Sept. I, 1807, 32.
Accipiter ruficaudus, " " " " " 47.
Buteo fulvus, VIEILL. Nouv. Dict. 1816, IV, 472.
Buteo americanus, VIEILL. Nouv. Dict. 1816, IV, 477.
Buteo borealis, BONAP. Geog. and Comp. List, 1838, p. 3.
 " " AUD. Syn. 1839, p. 6.
 " " " Birds of Am. I, 1840, 32, pl. vii.
 " " GOSSE, Birds of Jamaica, 1847, p. 11.
 " " LEMBEYE, Av. de la Isla de Cuba, 1850, p. 18.
 " " CASSIN, Syn. N. A. Birds (Illust. Birds of Cal.), 1854, p. 97.
 VULG.—*The Red-tailed Hawk. Red-tailed Buzzard. American Buzzard. White-breasted Hawk. Great Eagle Hawk. The Hen-Hawk. Gavilan Coli-rojo* (Cuba).

THE Red-tailed Hawk of the Atlantic States is another of the Raptorial family that appears to be very widely distributed throughout the North American continent. According to Richardson, it is rather common in the fur countries, which it

visits in summer, and where also it occasionally breeds. Mr. Gosse states that it is the most common bird of this family in Jamaica, of which island it is a resident, and where, though he never met with its nest himself, he was assured by others that it does breed.¹ Mr. Lembeye and Dr. Gundlach both include it in their lists of the birds of Cuba, and the latter also marks it as breeding in that island. It has been observed in Florida, Mississippi, Ohio, and Wisconsin, and is not uncommon in all the New England States, where it is resident throughout the year. In the Southern States it is most abundant in the winter months.

Some doubts have prevailed whether this, or a distinct but closely identical species, is found on the Pacific coast, and it now seems quite probable that the *Buteo borealis* is not found there.² A species quite abundant in California has, until recently, been supposed to be the *Buteo swainsoni*. Mr. Cassin, Dr. Heermann, Dr. Gambel, Dr. Trudeau, and others, have taken this Western variety to be that species. The examination of three undoubted specimens of the veritable *B. swainsoni* first induced Mr. Cassin to revise his views in respect to the Western varieties, and for a while to regard them as exhibiting no differences but such as are consistent with a specific identity with the *borealis*. To this opinion I was not quite able to subscribe. The eggs of the Western birds had been described to me as exhibiting such constant and well-marked variations from those of the common Red-tail, that I could not believe them to belong to the same bird.

Soon after the publication of Mr. Cassin's valuable paper upon the Falconidæ of North America,³ I expressed to him, in view of the constant difference between the eggs of the Eastern and Western varieties, a belief that, if the eggs from the West were those of a Red-tailed Hawk, the latter would be found to be a distinct, however closely allied, species, and not our Eastern Red-tailed Hawk. These anticipations have been fully confirmed. Mr. Cassin has since satisfactorily ascertained the existence of a constancy of different characters,⁴ which readily distinguish the Western bird from the well-known species of the Atlantic coast, besides the peculiarities of their voice and the difference of their eggs, all of which appear to be sufficiently well marked to establish the two varieties as specifically distinct. These differences were first noticed by Messrs. Nuttall and Townsend, the former of whom described the Western bird as a distinct species.⁵

¹ "A young friend informs me that he lately knew of the nest of this Hawk, a large mass near the top of an immense cotton-tree, into which he observed the old birds frequently go. It was at Content, in the parish of St. Elizabeth. The gigantic dimensions of the tree rendered its summit perfectly inaccessible, and prevented particular examination." (Gosse's Birds of Jamaica, p. 14.)

² As it now appears to be a well-ascertained fact that the common variety of California is a different bird from the Red-tailed Hawk of the Atlantic States, it becomes a matter of much interest to define the limits of the two species, and to ascertain to what extent, if any, they frequent common grounds. There is at present no reason for doubting the identity of the West-Indian bird with that of the Atlantic States.

³ Proceedings of Philadelphia Academy, February, 1855, p. 279. Cassin's Notes on North American Falconidæ.

⁴ Proceedings of Philadelphia Academy, February, 1856, p. 39.

⁵ Nuttall's Manual, I, 1840, 112.

The *Buteo borealis* constructs a large nest, composed externally of coarse sticks and twigs, and lined with dried grasses, moss, and leaves, built for the most part in the fork of a lofty tree. The eggs are usually four in number.

The egg represented in Plate II, fig. 16, was obtained near Salem, Mass. It was fully identified, the parent bird having been shot from her nest. It varies somewhat in its shape from any of the eggs of this Hawk that I have yet met with, being pyriform, and one end much more pointed than the other. It measures $2\frac{2}{16}$ inches in length by $1\frac{11}{16}$ in breadth. Its ground color is a yellowish white, which is partially intermixed with, rather than covered by, a large number of purplish spots and blotches. These faint purplish markings are found in all of the eggs of this Hawk that I have seen, but in this one are more than usually frequent. Over these prevail irregular collections of blotches and markings, of unequal size, of a light shade of Dutch umber. This egg was presented me, several years since, by the Salem Natural History Society, now known as the Essex Institute.

That given in Plate II, fig. 17, is a larger egg, measuring $2\frac{4}{16}$ inches in length by $1\frac{3}{8}$ in breadth. It also varies in the color of its secondary markings from any Red-tailed Hawk's egg that I have seen. Its ground color is a yellowish white, intermixed here and there, but sparingly, with obscure markings of a dull purplish. Over the entire surface of the egg is diffused a light tone of brown, most nearly approaching a burnt umber. If examined with a powerful magnifying-glass, this color appears to be distributed in small granulations, prevailing over the whole egg, but predominating at the smaller end, and only there assuming anything of the character of blotches or confluent spots. This egg is almost an exact ovoid, and one end is only slightly smaller than the other. It was taken in Bethel, Vermont, from a nest which contained three young birds. When received in Boston, the chick was alive in the egg, and upon an opening being made in the shell, several days after it was taken, the young Hawk was quite lively, made repeatedly an audible noise, and lived half an hour after its premature and unnatural delivery.

An egg obtained in Danvers, Mass., by Augustus Fowler, Esq.,¹ an accurate and observing ornithologist, is represented in Plate II, fig. 17 *a*. It is almost spheroidal in its shape, and neither end is perceptibly smaller than the other. It measures

¹ The following observations in regard to the habits of this Hawk, as noticed by Mr. Fowler, are extracted from a letter by that gentleman, dated Danvers-Port, December 25, 1856:—

“This species of Hawk (*Buteo borealis*) usually begin to build their nests about the first of April. They select some tall tree near the middle of the woods, the branches of which form a crotch near its trunk. To this chosen spot the female carries a sufficient quantity of sticks for its outside, (the male taking no very active part in the matter,) and for its inside she uses the bark from the dead branches of the chestnut, which she beats and peeks to pieces with her bill, making it soft and pliable, or gathers the fallen leaves of the pine, or some other soft material, which she finds conveniently, as a lining, which is about one inch in thickness; it is 13 inches in diameter from outside to outside, and 7 inches in diameter on the inside, while its depth is $2\frac{1}{2}$ inches. The female usually lays five eggs, which are spherical, of a dirty-white color, and marked with large blotches of brown; on some they cover almost the whole egg, while others are marked mostly on the large end, and some even of the same litter are so faintly marked as to appear almost wholly white. They are $2\frac{1}{8}$ inches in length, and $1\frac{3}{4}$ inches in diameter.”

$2\frac{2}{16}$ inches in length by $1\frac{2}{16}$ in breadth. Its ground color is a dull white, intermixed with which are frequent small markings of dull purplish. Over these are numerous large confluent blotches of a brown, of a light tone, and almost exactly conforming with the tint known as Dutch umber. These are chiefly diffused around one end of the egg, covering about one half of it with a large ring of close and confluent markings. Over the rest of the egg these markings are distributed in smaller spots and dottings, of the same shade of color.

Another egg from the same nest corresponds exactly in size and shape with the preceding, but varies greatly in its general appearance, in consequence of the almost total absence of the Dutch-umber markings. These are few and small, and are nearly all confined to a small portion of one end of the egg. The ground color is also a dull white, and the markings of dull purplish which are intermixed with it are larger, more frequent, and, in consequence of the absence of the brown, much more conspicuous and noticeable.

Another egg of this Hawk, obtained in Danvers by Mr. S. P. Fowler, a brother of the gentleman just referred to, again varies perceptibly in its markings. It measures $2\frac{1}{16}$ inches in length by $1\frac{1}{16}$ in breadth. Its ground color is a dirty white, very closely intermixed with frequent minute markings of a dull purplish, which give a dingy effect to the ground. It is blotched and marked, chiefly at the larger end, with bold, distinct, and not confluent spots, of a greenish umber, intermixed with darker spots of Vandyke-brown. One end of the egg is slightly larger than the other.

Another egg, of which I have only a drawing, is very nearly spherical. Its measurements are $2\frac{2}{16}$ by $1\frac{2}{16}$ inches, and its markings are numerous confluent blotches of dark slaty-brown and light umber, upon a clay-colored ground.

BUTEO SWAINSONI.

Buteo vulgaris, RICH. & SWAIN. F. B. A. II, 1831, 47.

Buteo swainsoni, BONAP. Geog. and Comp. List, 1838, p. 3.

“ “ CASSIN, Syn. N. A. Birds (Illust. Birds of Cal.), 1854, p. 98.

“ “ “ Proceedings Phil. Acad. Feb. 1855, p. 280.

Falco buteo? AUD. Orn. Biog. IV, 1838, 508, pl. cccclxxii.

Buteo vulgaris? AUD. Syn. 1839, p. 5.

“ “ “ Birds of Am. I, 1840, 30, pl. vi.

VULG. — *Swainson's Buzzard*. *The Western Buzzard*. *The Common Buzzard*. *The Northern Buzzard*.

AN egg, of which I possess only a copy, and which I am unable to represent in the plate, was obtained in the northern part of California, by Dr. Heermann. It was kindly lent me for inspection. At the time it was obtained, it was supposed to be well identified as the egg of this Buzzard, and but for the confusion which has since

been found to have prevailed among our ornithologists in regard to the lines of separation between this and two other North American Hawks, elsewhere referred to more at length, there would be no doubt, in my mind, that this paternity was unquestionable. As it is, I am of the opinion that it is probably rightly named. I take only the precaution of stating that it is barely possible Dr. Heermann may have mistaken a different hawk for a *B. swainsoni*, and that it may be found to belong to another bird. This egg differs materially from those of *B. montanus*, is more pointed at the smaller end, and is of a somewhat less capacity. The ground color is a bluish-white, and the egg is marked at one end with blotches and spottings of a light sepia-brown. Its measurements are $2\frac{3}{16}$ inches in length, by $1\frac{1}{16}$ in breadth. According to Sir John Richardson (*Fauna Boreali Americana*, II, 4), the *B. swainsoni* arrives in the fur countries in the middle of April, and soon afterwards begins to build its nest on a tree, of short sticks, lining it sparingly with deer's hair. The eggs, from three to five in number, are equal in size to those of the domestic fowl, and have a greenish-white color, with a few large dark-brown blotches at the thick end. The one described above was spotted at the smaller end, an accidental but by no means uncommon occurrence in the eggs of many species.

The geographical distribution of this Hawk can as yet hardly be regarded as having been well determined. Thus far the only specimens brought home by recent collectors have been from the region between the Yellowstone River and the Great Salt Lake, and southward, along the eastern slope of the Rocky Mountains, to the Staked Plains of Texas. None have been found thus far on the Pacific coast, or east of the Mississippi River. Dr. Heermann's specimen, if really the present species, will extend this range to the westward.

The egg represented in the plate was taken by Dr. James Trudeau near Saline, Arkansas, who assured me that he identified it with its parent. It differs from Dr. Heermann's specimen in size, and in the absence of distinct spottings. It varies also from the descriptions given of the egg by Richardson and Swainson.

I have also a drawing of an egg taken by Dr. Trudeau in Western Louisiana, and supposed by him to be an egg of this Hawk. They present no unusual variations, the principal being in the depth of the secondary coloring. They are each of an extremely well marked oval shape, approaching a spheroidal. The Arkansas egg measures $2\frac{3}{16}$ inches in length by $1\frac{1}{16}$ inches in breadth. The measurement of that from Louisiana is $2\frac{1}{16}$ inches by $1\frac{3}{16}$, being a little more oblong and less spheroidal. The ground color of both is white, and each is sparingly spotted and blotched with markings of light umber-brown and a purplish-slate. In the specimen from Saline, these markings are fainter, and the shades of color less distinctly traced.

Since the above was prepared for publication, I have received from Mr. Krider of Philadelphia an egg of the *B. swainsoni*, which I have substituted in the plate for the egg given me by Dr. Trudeau, and mentioned above. It was obtained by Dr. Heermann, in California, and by his permission was forwarded at the last moment in which it could be made available for the present work. Its size is almost exactly that of the one from Saline; its shape and general appearance are the same, except that it is more distinctly marked with secondary colors. This egg may be

described as $2\frac{1}{8}$ inches in length by $1\frac{3}{8}$ in breadth; its ground is a yellowish-white or cream-color; sub-markings of a purplish-gray occur; over the entire egg, in scattered, irregular patches, are spots and blotches of a very light tone of umber-brown, but these are nowhere confluent or frequent in number. Traces of these markings exist in the Arkansas specimen, but so faintly, that they would, unless looked for carefully, be mistaken for accidental discolorations. In regard to its exact locality, or the circumstances attending its discovery, I am unable at present to add anything.

BUTEO MONTANUS.

Falco buteo, AUD. Orn. Biog. IV, 1838, 508, pl. cccclxxii.

Buteo vulgaris! AUD. Syn. 1839, p. 5.

“ “ “ Birds of America, I, 1840, 30, pl. vi?

Buteo montana, NUTTALL, Mammal, I, 1840, 112.

Buteo swainsoni, CASSIN, Syn. N. A. Birds (Illust. Birds of Cal.), 1854, p. 98.

Buteo borealis, CASSIN, Notes on N. A. Falconidæ, — Proc. Phil. Acad. Feb. 1855, p. 279.

Buteo montanus, CASSIN, Proc. Phil. Acad. Feb. 1856, p. 39.

VULG. — *The Western Buzzard. The Western Red-tailed Hawk. White-throated Buzzard.*

THREE separate species of North American Hawks, having a more or less close resemblance, have been confounded one with the other. At least their specific distinctness has not until very recently been well ascertained. These, as has been already stated, are the common Red-tailed Hawk (*Buteo borealis*) of the Atlantic States, Swainson's Buzzard (*Buteo swainsoni*, Bonap.), and the Western Red-tailed Hawk (*Buteo montanus*). The last named has only recently had its claims to be received as a distinct species duly recognized. The obscurity which has rested over these claims of the Western Red-tail to be regarded as specifically distinct, has at last yielded to the results of Mr. Cassin's diligent investigations; and the uncertainties which have hitherto prevailed may now be considered as having been entirely removed by the satisfactory paper of that naturalist. A brief review of the history of these gradual steps towards our present knowledge may not be inappropriate in this connection.

The common Red-tailed Hawk of the Atlantic States was known to the earliest American naturalists. Its distinguishing characters have always been regarded as well defined, and the species has been well known to all American ornithologists. The bird now received as a good species, under the name of Swainson's Buzzard, was first described in Richardson and Swainson's *Fauna Boreali-Americana*, as identical with the Common Buzzard (*Buteo vulgaris*) of Europe.¹ It is there spoken of as quite a common bird in the fur countries. This species was first claimed

¹ In the same work, Mr. Swainson described, as the female of this species, a bird which is not identical with it, but is probably a female *B. montanus* in an immature plumage.

as new, and a distinct one from the *B. vulgaris*, by Bonaparte (Geog. and Comp. List, p. 3), who named it *Buteo swainsoni*, in honor of Mr. Swainson, who was the first to describe it. The third species, *Buteo montanus*, or Western Red-tail, was first given as a distinct bird by Mr. Nuttall; but its claims to this distinction have remained unrecognized until very recently. Mr. Audubon, in each of his several works, has regarded Swainson's Buzzard as identical with the European, and has even added to the prevailing confusion, by figuring, in his representation of it, the young of a different species, probably *B. montanus*. Subsequently, Mr. Cassin, in the carefully prepared Synopsis accompanying his Illustrations of the Birds of California and Texas, classed both the Western varieties under the single name of *Buteo swainsoni*. Afterwards, in his paper on the *Falconidæ* of North America, published in the Proceedings of the Philadelphia Academy of Natural Sciences, February, 1855, Mr. Cassin recognized *B. swainsoni* by its true specific characters, having then for the first time seen three undoubted specimens of that bird in the collection made by Mr. Kreutzfeldt, of Lieutenant Beckwith's party. Referring to *Buteo borealis*, in the same paper, he did not regard it as specifically distinct from the Western variety. He says: —

“In the comparison of numerous specimens of adults and young, from various localities in Western North America, with others obtained in the vicinity of Philadelphia, I have failed to detect any differences not consistent with specific identity. There is in some specimens a greater extent of the brown color on the breast, and a deeper shade of rufous on the abdomen and tibiæ, than are usual in Eastern specimens; but I have found no character in the Western bird that I have not seen at some time in the other.”

Mr. Cassin's attention having been called to the fact that the eggs of the Eastern and Western species present constant and well-marked differences, in another paper, published in the Proceedings of the Philadelphia Academy of Natural Sciences, February, 1856, he referred the Western variety to Mr. Nuttall's *Buteo montanus*, as given in the 1840 edition of his Manual of the Ornithology of the United States. In this last paper he says: —

“On examination of not less than twenty specimens of this bird, from various localities in the Western countries of North America, I have found the characters constantly present which distinguish it from the *Buteo borealis*, as pointed out in my Birds of California and Texas, p. 98. The voice of this species is represented by several of the late naturalists who have visited California as quite peculiar, and I am assured by my friend, Dr. Thomas M. Brewer, of Boston, that the egg is entirely different from that of *B. borealis*. Though nearly related to that species, it is very probably entitled to be regarded as distinct, for which purpose Mr. Nuttall's name, as above given, is proper.”

In regard to the range of the bird, we have yet to learn with certainty the extent of its general distribution. It appears to be of very common occurrence in and about California, being brought in nearly every collection from that part of the country. It also occurs among the birds obtained by Drs. Suckley and Cooper in Washington Territory. Dr. Townsend procured several specimens in the Rocky Mountains.

It is probable that it is distributed throughout the greater part of North America west of the Mississippi, and we may yet hear of stray individuals on the eastern side of that river.

Two eggs belonging to a bird of this species were obtained by Mr. Samuels near Petaluma, California, in 1856, one of which is represented in Plate I. fig. 6. This egg measures $2\frac{5}{16}$ inches in length, by $1\frac{1}{16}$ inches in its greatest breadth. The shape of the egg is an almost exact ovoid, slightly tending to a spheroid, one end being hardly perceptibly larger than the other. Its ground color is a very light buff, the spottings and markings giving to it the effect of a yellowish-white. The egg is marked over the entire surface with blotches, dashes, and lines of a light tint of a brown tending to Vandyke. These are mixed with markings of a lighter purplish-brown. The markings, of both shades, are chiefly oblong in shape, and run with the length of the egg. They bear no resemblance to any eggs of the *B. borealis* that I have ever seen, and are also quite unlike those of any other Hawk, so far as I am aware.

The nest was discovered by Mr. Samuels, not far from Petaluma, California, close to the Mission House, near Petaluma Flat. It was built on the top of a large ever-green oak, at least seventy feet from the ground, and was constructed entirely of large, coarse sticks, lined with a few stray feathers. The eggs were two in number, and had been set upon a short time. The male bird was shot as it flew from the nest, which was so hidden by the thick branches that it would have escaped detection.

BUTEO LINEATUS.

Falco lineatus, GMELIN, Syst. Nat. I, 1788, 268.

“ “ WILS. Am. Orn. VI, 1812, 86, pl. liii, fig. 3.

“ “ AUD. Orn. Biog. I, 1832, 296; V, 380, pls. lvi and lxxi.

“ “ DE KAY, Nat. Hist. New York, 1814, pl. vi, fig. 13.

Falco hyemalis, GMELIN, Syst. Nat. I, 1788, 268.

“ “ WILS. Am. Orn. IV, 1812, 73.

“ “ BONAP. Syn. 1828, p. 33.

“ “ NUTTALL, Manual, I, 1832, 106.

“ “ AUD. Orn. Biog. I, 1832, 364.

Falco buteoides, NUTTALL, Manual, I, 1832, 100.

Buteo hyemalis, BONAP. Geog. and Comp. List, 1838, p. 3.

Buteo lineatus, AUD. Syn. 1839, p. 7.

“ “ “ Birds of America, I, 1840, 40, pl. ix.

“ “ CASSIN, Syn. N. A. Birds (Illust. Birds of Cal.), 1854, p. 99.

VULG. — *The Red-shouldered Hawk. The Winter Hawk. Winter Falcon. Hen-Hawk. Chicken-Hawk.*

THE northern limits of this common species have not been well ascertained. In some cases they have been incorrectly stated.¹ Mr. Nuttall supposed it to be re-

¹ Mr. Audubon was, in his first issues, disposed to make two distinct species, based upon the mature

stricted to the Middle States, and says that it is never found in Massachusetts. This is quite a mistake. It is not only not uncommon in that State, but has been ascertained to breed there, and is also found abundantly throughout the year. It also undoubtedly breeds still farther to the north, as young birds visit the vicinity of Boston at certain seasons, evidently from a more northern quarter. According to the late Rev. Zadock Thompson, of Burlington, whose authority is unquestionable, it breeds throughout Vermont. It is therefore quite probable that this Hawk may be found in every part of the United States,¹ except where it is replaced by the Western variety, *Buteo elegans*. It has been observed in Oregon. Dr. Gambel speaks of it as "common," and Dr. Heermann as "abundant," in California; but it is quite probable they referred to a bird now considered a distinct species. It breeds abundantly throughout South Carolina, where, I am assured by Rev. Dr. Bachman, of Charleston, it is much the most common Hawk, and it is equally frequent throughout Florida. It is not given by Dr. Gundlach as a bird of Cuba, nor by Mr. Gosse as a bird of Jamaica. It was not met with by Sir John Richardson in the Arctic regions. Vermont and Oregon, or about latitude 45°, appear to be the most northern limits to which it has been positively traced.²

This Hawk constructs a large nest, resembling that of the Crow, in the forked branches of a high tree. It is composed externally of sticks, and is lined with moss and soft leaves. The eggs are four in number, occasionally three or two. When the nest is approached, the bird utters loud, frequent, and peculiar cries of alarm and resentment, not unlike Keé-oó! rapidly repeated, but makes no attempt at resistance. They will return year after year to the same nest, even when it has been robbed the previous season.

The eggs of this bird vary remarkably in size and ground color, and also in the frequency of the secondary markings. In the shape of the eggs and the color of the markings there is no essential variation that I am aware of. Their difference in length is sometimes as great as one fifth of an inch, and in breadth one sixth of an inch. I have in my possession the copy of a drawing by Mr. Audubon, of what must be a not very common variety; at least I have never met with the light blue of the ground there represented, and which is also spoken of by Mr. Thompson, in his

and the immature plumage of this bird. He even went so far as to assign to these supposed distinct species very different habits, cries, and geographical distribution. The mature bird (*lineatus*) is represented as a Southern species, stopped by the Middle States; the immature (*hyemalis*), as a Northern bird, visiting the United States only in winter. Even in his later work, in which he recognizes their identity, he persists in still assigning them certain imaginary diversities. Sir William Jardine, in some notes to his edition of Wilson's Ornithology, goes a step farther in error, and makes these imaginary differences of habit not only specific, but generic, allying the *hyemalis* with the Harriers (*Circi*), and the *lineatus* with the *Astur*!

¹ Mr. Cassin (Proceedings of Philadelphia Academy, Feb. 1855, p. 281) describes as a distinct species *B. elegans*, the variety which has probably been taken, on the Western coast, for the Red-shouldered Hawk of the Eastern States.

² Since the above was written, I have seen a list of the birds of Nova Scotia, prepared by Lieutenant Bland (Royal Engineers), in which I am not surprised to find *Buteo lineatus* marked as a common and migratory species in that Province.

descriptions of the birds of Vermont.¹ Two eggs from New Jersey, measuring $2\frac{1}{16}$ inches in length, by $1\frac{1}{16}$ in breadth, have a brownish-white ground, marked with large blotches of yellowish umber, chiefly around the larger end, where they form a confluent ring. One of these is represented in Plate III, fig. 25. Two others, from a nest in Massachusetts, exhibit the following measurements: $2\frac{3}{16}$ by $1\frac{1}{16}$, and $2\frac{2}{16}$ by $1\frac{1}{16}$ inches. One of these has a dirty-white ground, with large, irregular blotches of umber and sienna brown, mingled confusedly together, of different shades, and nearly covering the whole surface. The other is nearly unspotted, has the lighter brown markings of the preceding, which are not well defined, and are diffused over about one half of its surface. The ground color is more distinctly white, but with no bluish shade. Two others belonging to this species, obtained in Milton, Mass. by Mr. E. Samuels, and identified by securing the parent bird, may be thus described. One measures $2\frac{1}{16}$ by $1\frac{1}{16}$ inches; the ground color is a dirty white, and is marked with large blotches, lines, and dottings of umber-brown, of various shades, from quite dark to light. The other is 2 inches by $1\frac{1}{16}$, has a bluish-white ground, and is only marked by a number of very faint blotches of yellowish-brown and a slate-drab. Except in their shape, which is an oval spheroid, slightly pointed at one end, these bear but very slight resemblance to each other, though taken at the same time from one nest. Two more from Cheraw, S. C., also found in one nest, vary even more than these. One is 2 by $1\frac{9}{16}$ inches; the ground color is a dull, soiled white, marked chiefly at the larger end with bold, distinct blotches of deep umber-brown. The other measures $2\frac{1}{16}$ by $1\frac{9}{16}$ inches; the ground color is a light slate-drab, with hardly any markings, except some ill-defined blotches of the same color as the ground, but of a deeper shade. There is also a slight variation in their shape, the latter being more oblong.

¹ History of Vermont, Natural, Civil, and Statistical, by Zadock Thompson, (Burlington (Vt.), 1842,) p. 60.

BUTEO PENNSYLVANICUS.

- Falco latissimus*, WILS. Am. Orn. VI, 1812, 92.
Falco pennsylvanicus, WILS. Am. Orn. VI, 1812, 92, earlier copies.
 “ “ BONAP. Syn. 1828, p. 29.
 “ “ NUTTALL, Manual, I, 1832, 105.
 “ “ AUD. Orn. Biog. I, 1832, 461; V, 377, pl. xci.
 “ “ DE KAY, Nat. Hist. New York, 1844, pl. v, fig. 2.
Sparrius platypterus, VIEILL. Encyc. Meth. III, 1823, 1273.
Falco wilsonii, BONAP. Jour. Acad. Phila. III, 1824, 348.
Buteo pennsylvanicus, BONAP. Geog. and Comp. List, 1838, p. 3.
 “ “ AUD. Synopsis, 1839, p. 6.
 “ “ “ Birds of Am. I, 1840, 43, pl. x.
 “ “ CASSIN, Syn. N. A. Birds (Illust. Birds of Cal.), 1854, p. 100.
Buteo latissimus, LEMBEGE, Av. de la Isla de Cuba, 1850, p. 19.
 VULG. — *The Broad-winged Hawk. Falcon de Monte* (Cuba).

THIS bird appears to be nowhere a very common species, with perhaps the exception of the peninsula of Florida, and not to have a very extended range. It has not been found in the fur regions, nor, so far as I am aware, upon any portion of the Pacific coast, nor yet in New Mexico, Texas, or Mexico. In Cuba, Dr. Gundlach informs me, it is a resident species, and breeds in the island, which Mr. Lembeye also confirms. Yet Mr. Gosse did not observe it in Jamaica, nor do I know that it has been obtained either in Central or South America. It is occasionally found in Massachusetts, where it undoubtedly breeds.¹ The late Professor Adams of Amherst met with it nesting near Middlebury, Vermont, some years since. It therefore probably occurs throughout New England, and, it is quite possible, in all the Atlantic States also. Dr. Hay mentions it as common in Wisconsin, but this does not correspond with the information I have from other naturalists in that State. Mr. Audubon speaks of this Hawk as rare in Louisiana, and as only occasionally found in that State in severe winters; but as by no means rare in Virginia, Maryland, and the States eastward. Nests of this species have been observed in Vermont, New Jersey, Pennsylvania, and Florida. Beyond these data I have no certain information in regard to its distribution.

The nest found by Mr. Audubon was about the size of that of the Crow, and was placed in the larger branches of a tree, near the trunk. It was composed externally of dry sticks and briars; internally, of small roots, and lined with numerous large feathers. The nest found by Professor Adams, now in the museum of Middlebury College, Vermont, was quite large, when we consider the size of the Hawk, and was coarsely constructed of sticks, and lined only with fibrous roots and fine grass. In this instance the eggs were three. This, I am inclined to believe, is the more usual number; Mr. Audubon, however, gives it as four or five.

¹ Since the above was in type, I have seen an egg belonging to Mr. Archibald Hopkins, and obtained in Williamstown, Mass., which is undoubtedly one of this species.



Three eggs in my cabinet, from Pennsylvania, Vermont, and New Jersey, exhibit the following measurements: $2\frac{1}{16}$ by $1\frac{0}{16}$; $1\frac{5}{16}$ by $1\frac{8}{16}$; and $1\frac{4}{16}$ by $1\frac{8}{16}$ inches. In the first of these, the ground color is a grayish or dirty white, with a slightly silvery shade, and is nearly covered by large and irregular markings of faint purplish-brown, and dull shadings of a lighter brown. The specimen described was given me by Dr. James Trudeau as undoubted. In both the others, the ground color is distinctly white, and they are marked over the entire surface with irregular clusters of blotches of a light reddish-brown, intermixed with a few dottings and lines of a deeper shade of brown, which at times almost deepen into a black.

The eggs represented in the plate are from New Jersey, Pennsylvania, and Florida. For the first of these (Plate I, fig. 8) I am indebted to Mr. John Krider, of Philadelphia, who has several times met with nests of this Hawk in New Jersey, not far from Philadelphia. The second (Plate I, fig. 9) was given me by Dr. Trudeau, who obtained it in Pennsylvania. The third (Plate I, fig. 10) was obtained by one of the recent Government expeditions in Florida, where this bird seems to be more common than in any other part of the United States.

BUTEO CALURUS.

Buteo calurus, CASSIN, Proc. Phil. Acad. Feb. 1855, p. 277.

VULG. — *Black Hawk*. *Black Red-tail*.

THE egg represented (Plate I, fig. 7) was obtained in California, by Mr. Emanuel Samuels, while engaged in making collections in natural history for the Boston Society of Natural History and the Smithsonian Institution. It was fortunately well identified with its parent, the male bird having been shot on its nest.

This Hawk is comparatively a new species, having been met with for the first time by T. Charlton Henry, M.D., U. S. Army, in the vicinity of Fort Webster, New Mexico, and described by Mr. Cassin in the Proceedings of the Academy of Natural Sciences, Philadelphia, February, 1855, p. 277. The specimen obtained by Mr. Samuels, with the egg, is the second that has been discovered at the present time, so far as I am aware. In regard to its habits and specific peculiarities but little is known, and its geographical distribution can only be conjectured from the two points, about a thousand miles apart, where the two representatives of this species were obtained, — Fort Webster and Petaluma.

The nest was found by Mr. Samuels on a hill north of Petaluma, California. It was built near the top of an evergreen oak, at the height of about sixty feet from the ground. The nest contained two eggs at the time it was discovered, which were just on the point of hatching. It was constructed of sticks, and was lined with moss. Both birds were about the spot. The male bird, manifesting much more

courage than his mate in resistance to the intruders, was shot. The female was wounded, but escaped.

The egg of the *B. calurus* measures $2\frac{4}{16}$ inches in length by $1\frac{3}{16}$ in breadth. Its capacity is considerably less than that of the *B. montanus*; its shape is a much more oblong oval; one end is evidently more pointed than the other. Its ground color is a dirty cream-white. It is covered, chiefly at the larger end, with blotches and smaller markings of a dark shade of a brown almost exactly corresponding with that known as Vandyke-brown, with smaller markings and spottings of a lighter shade of the same. The latter are distributed at intervals over its entire surface.

BUTEO INSIGNATUS.

Buteo insignatus, CASSIN, SYN. N. A. Birds (Illust. Birds of Cal.), 1854, p. 102.

“ “ “ Illust. Birds of Cal. 1854, p. 198.

VULG. — *The Canada Buzzard. The Brown Buzzard.*

IN the collection of eggs obtained in California by Mr. Emanuel Samuels were two eggs of a Hawk which he had no doubt belonged to a bird of this species. The parent was shot on the nest, but escaped into a deep ravine below, and was not obtained. As the egg is different from that of any other Hawk that I am aware of, it has been included among the illustrations, and assigned to this bird, on the strength of Mr. Samuels's impressions. It should be added, however, that his view of the bird was necessarily imperfect, and he may have been mistaken in regard to it. It is possibly the egg of *Buteo bairdii*, perhaps a variety of *B. swainsoni*, or it may belong to the *B. elegans*, all of which bear sufficient resemblance to the *B. insignatus* to be confounded with it, without an opportunity of closer inspection than he possessed. The nest was on a large white-oak, over a deep ravine, on St. Antonio Creek, near Petaluma. It was very large, was constructed of coarse sticks, and was at least sixty feet from the ground.

In regard to the habits and the geographical distribution of this Hawk, but little is known to naturalists. It was first described from a specimen belonging to the Natural History Society of Montreal, and obtained in that vicinity. Specimens have since been met with in California; but to what extent it is distributed through the intervening country remains to be ascertained. It is not improbable that it is a more common species on the Pacific coast, and that it is of rare and accidental occurrence in the eastern part of the continent. Dr. Heermann has ascertained that this Hawk rears its young in California, where he met with both adult and young specimens of this species.

The egg represented in the plate (Plate III, fig. 27), and which is supposed to be that of this Hawk, measures $2\frac{4}{16}$ inches in length by $1\frac{4}{16}$ in breadth. Its shape is an oblong oval, and neither end is perceptibly larger than the other. The ground

us to speak of the results of our observations and inquiries as establishing their specific habits. Indeed, the European *lagopus*, supposed to be identical with our bird, is said to breed on trees as frequently as on cliffs.

The marks of distinction between immature birds of this species and the Rough-legged Falcon have not been so well defined as to make it possible to speak with certainty of the habits of each, as given by authors. We cannot always be sure which species these descriptions are meant to designate.

The egg of the *sancti-johannis* of which I have the drawing measures $2\frac{1}{6}$ inches in length by $1\frac{1}{6}$ in breadth; it is larger than any of the *lagopus*, American or European, that I have seen, and is differently marked. The ground color is a clear cream-white, and is marked, chiefly about the larger end, with dashes and blotches of a light umber, and by other markings, of a deeper shade, of olive-brown. These spots are each distinct, separate, and well defined, and are intermingled with each other in noticeable contrast.

Since the above was prepared, I have been favored by Mr. John Krider, an experienced and well-informed ornithologist of Philadelphia, with the loan of an egg obtained in New Jersey, which there seems to be no good reason to doubt is the egg of this Hawk. The person who obtained it did not secure the parent bird, but claimed to have had a close inspection of it, and described it as a black Hawk, with other points of resemblance such as to leave no doubt with Mr. Krider that it is the egg of the *sancti-johannis*. The nest was in a tree, and contained two eggs. They varied slightly from each other in the number and depth of color of their markings. The one not figured was marked more at the larger end, with darker blotches, and less generally distributed. The one represented in the plate (Plate III, fig. 28) measures $2\frac{1}{6}$ inches in length by $1\frac{1}{6}$ in breadth. Both have many points of resemblance to the drawing, yet vary considerably, most particularly in their smaller size and more ovoid shape. Their ground color is a brownish or yellowish shade of white. Intermixed with the ground are faint markings and blotches of a brownish-purple. Over these are diffused a large number of confluent blotches of russet-brown. These form a ring around the smaller end, which is undoubtedly an exceptional peculiarity. The russet-brown color may be obtained by an equal mixture of burnt-umber and terra-sienna. This egg approximates very closely in its size, color of its markings, and general appearance, to the egg of the *A. lagopus* from Switzerland referred to on page 37.

ARCHIBUTEO LAGOPUS.

- Falco lagopus*, Gmelin, Syst. Nat. 1, 1788, 260.
 “ “ Wils. Am. Orn. IV, 1812, 59, pl. xxxiii, fig. 1.
 “ “ Bonap. Syn. 1828, p. 32.
 “ “ Rich. & Swains. F. B. A. II, 1831, 52.
 “ “ Aud. Orn. Biog. II, 1835, 377, pl. clxvi.
Archibuteo lagopus, Gould, Birds of Europe, 1, pl. xv.
 “ “ Cassin, Syn. N. A. Birds (Illust. Birds of Cal.), 1854, p. 104.
 VULG. — *The Rough-legged Hawk. Rough-legged Falcon.*

As no specific differences are observable between this and the European species, I see no good reason for not regarding them as identical, though it has been usual to consider our *lagopus* as the immature bird of the preceding.¹ The observations of my nephews, Dr. H. R. Storer and Mr. F. H. Storer, in Labrador, satisfied them that these species are not mature and immature birds of the same species, but quite distinct birds in their character, habits, and general appearance. The Black Hawk is a bold, spirited bird, easy and swift in its motions, preying upon other birds. The Rough-leg is comparatively sluggish, inoffensive, and tamable, feeding upon mice, rats, frogs, and other inferior game. With their views I am disposed to accord.

To the supposition that it is the young or immature bird of the preceding species, I object, that the egg of the *sancti-johannis* is manifestly different from that of the *lagopus*, and that, so far as it is known, the mode of nesting of the two birds is also unlike. The American representative of this species breeds on rocky cliffs near the sea; the European is said to nest in trees.

The only egg of the *lagopus* that has been obtained in this country, so far as I am aware, was taken by my nephew from a nest on the cliffs, near the harbor of Bras-d'Or, on the coast of Labrador. The nest contained at the time three young birds, besides one egg unhatched. The young Hawks were just ready to fly, and forsook the nest when approached. As they flew, they rolled out an unhatched egg to the bottom of the cliff, but fortunately without destroying it. The nest was rudely constructed of sticks, and was on a high rock, over the water. Below it the cliff was steep and inaccessible, but was easily approached from above. In the nest at the time were four or five of the large rats peculiar to Labrador, procured by the old birds for their young. In this case, the parent birds were ascertained to be in the plumage of the *lagopus*. At the same time, a young bird, taken alive by one of the sailors of the party, and evidently a *sancti-johannis*, was quite black, even in its immature plumage, and was fierce, untamable, and in all its characteristics very different from the Rough-legged.

In the breeding season this Hawk is found only in the more northern parts of the continent. In the winter, however, it is to be met with nearly throughout the

¹ Mr. Cassin, in his Synopsis of the Falconidæ, gives the *lagopus* as a distinct bird, at the same time remarking that it is usually regarded by naturalists as the young of the *sancti-johannis*, and adds that his only reason for giving it thus is, that, after careful comparison and examination of numerous specimens, he finds it absolutely impossible to distinguish it by any character whatever from the European bird.

United States. Its southern limits in the breeding season have not been determined.¹ Its abundance in California, as observed by Dr. Gambel, leads to the inference that it is an inhabitant of that State throughout the year, as it is also of Washington and Oregon Territories. It was obtained by Dr. Kennedy on the Zuni River in New Mexico. From this we may very safely infer that it is to be found very nearly throughout North America.

The egg of the Rough-legged Hawk from Labrador measures $2\frac{1}{16}$ inches in length by $1\frac{1}{16}$ in breadth, and is nearly spherical. The ground color is a soiled white or a light drab, and is marked with a few faint, ill-defined spots of light-umber, distributed at intervals over the entire surface.

Of four European specimens in my collection, two are so nearly like the American, that the same description would answer for both. They are a trifle larger, but their color and markings are exactly the same. These eggs vary from $2\frac{1}{16}$ to $2\frac{2}{16}$ inches in length, and the breadth of each is $1\frac{1}{16}$ inches.

In one of the other specimens the ground color is of a deeper shade of dingy white, with larger blotches, and its purplish-slate markings intermingled with those of umber. It measures $2\frac{3}{16}$ by $1\frac{1}{16}$ inches.

The fourth is from Switzerland, and varies from all others of the species I have seen. It is marked over a cream-colored ground with very numerous and quite large blotches of different shades of umber and sepia-brown. It measures $2\frac{1}{16}$ by $1\frac{1}{16}$ inches.

ARCHIBUTEO FERRUGINEUS.

Buteo ferrugineus, LICHTENSTEIN, Trans. Berlin Acad. 1838, p. 428.

Archibuteo regalis, GRAY, Gen. of Birds, 1849, pl. vi.

Archibuteo ferrugineus, CASSIN, Illust. Birds of Cal. 1854, p. 159, pl. xxvi.

“ “ “ Syn. N. A. Birds (Illust. Birds of Cal.), 1854, p. 104.

“ “ “ Proc. Phil. Acad. 1855, p. 277.

VULG.—*The Western Rough-legged Buzzard.*

I AM unable at present to give any illustration of the egg of this recent addition to our North American Fauna. Mr. E. M. Kern was the first to bring home specimens of this Hawk, and to establish its existence within our limits. Since then, Dr. Heermann has obtained specimens in California of old and young birds, and also of the eggs.

This species was first described by Lichtenstein, in the Transactions of the Berlin Academy, in 1838. It appears to be common throughout California, but of its geographical distribution beyond, nothing is known. The only description of the nest and eggs I have seen is furnished by Dr. A. L. Heermann. He describes the nest as placed in the topmost branches of an oak, composed externally of large twigs, and

¹ In Lieutenant Bland's Catalogue of the Birds of Nova Scotia, it is given as “migratory,” and “not common.”

lined with coarse grasses and moss. The eggs were two in number; the ground color was white, which was marked with faint brown dashes. Dr. Heermann adds, that the eggs of this species are quite different from those of the European *A. lagopus*.

Since the above was in type, and just as these pages are passing through the press, I have been favored, through the kindness of Dr. Heermann and the attention of Mr. Krider, with the loan of an egg of this Hawk obtained by the former in California. It is represented in Plate III, fig. 26. Its measurements are, length $2\frac{3}{32}$ inches; breadth, $1\frac{1}{6}$. The ground color of the egg is a yellowish-white. This is marked with large blotches of a light, but very distinct, purplish-gray. Interspersed with these are a few light spots and lines of umber-brown.

MILVINÆ.

NAUCLERUS FURCATUS.

Falco furcatus, LINN. Syst. Nat. I, 1766, 129.

“ “ WILS. Am. Orn. VI, 1812, 70, pl. li, fig. 3.

“ “ NUTTALL, Manual, I, 1832, 95.

“ “ AUD. Orn. Biog. I, 1840, 368; V, 371, pl. lxxii.

“ “ DE KAY, Nat. Hist. N. Y., Birds, 1841, pl. vii, fig. 15.

Elanus furcatus, BONAP. Syn. 1828, p. 31.

Nauclerus furcatus, BONAP. Geog. and Comp. List, 1838, p. 4.

“ “ AUD. Syn. 1839, p. 14.

“ “ VIGORS, Zool. Jour. VII, 387.

“ “ AUD. Birds of Am. I, 1840, 78, pl. xviii.

“ “ GOULD, Birds of Europe, I, pl. xxx.

“ “ CASSIN, Syn. N. A. Birds (Illust. Birds of Cal.), 1854, p. 105.

VULG. — *The Swallow-tailed Hawk. The Fish-tail Hawk. Le Milan de Caroline* (Cuvier, Regn. Anim. I, 322).

THIS species has a wide distribution, but except in the Southwestern States does not appear to be anywhere abundant.¹ Its most northern limit on the Atlantic is Pennsylvania and New Jersey, where, however, it is probably of only accidental occurrence. Farther west it is much more frequent, and is found on the tributaries of the Ohio and Mississippi, as far to the north as the State of Wisconsin and the Territory of Minnesota.² It is not uncommon in the Atlantic States, from North Carolina south, frequenting the banks of rivers, but not the seaboard. It nests in South Carolina and Georgia, and in all the States which border on the Gulf of Mexico. It also occasionally breeds as far to the northwest as Wisconsin, as I am

¹ Wilson speaks of this Hawk as very abundant in South Carolina and Georgia; but this is contrary to my information. It is found in those States not unfrequently, but rather occasionally than abundantly.

² According to Mr. Nuttall, individuals have been seen along the Mississippi as far north as the Falls of St. Anthony, in lat. 44°.

informed, by letter, by Mr. Thure Kumlien, of Fort Atkinson, an intelligent and reliable naturalist. A pair of these Hawks were observed by him in that vicinity, in the summer of 1854. They were evidently breeding, although he was not able to discover their nest.

Mr. Gosse mentions this Hawk as a visitant of Jamaica, on the authority of Mr. Hill, and Dr. Gundlach gives it as a bird of Cuba,¹ although it is not stated that it breeds in either island. It is not clearly ascertained to be a bird of South America, and probably is not found there, except accidentally, unless the species known as *Elanoides yetapa*, which is very similar, proves to be identical.² Dr. Woodhouse, in his report upon the birds observed in the expedition down the Zuni and Colorado Rivers, speaks of this Hawk as common in Texas, and also in the country of the Creek and Cherokee nations. He confirms the accounts which have been received of its fondness for the neighborhood of streams, and adds, that along the Arkansas and its tributaries it was very abundant. It does not appear to have been observed in California by either Dr. Gambel or Dr. Heermann. It is a great wanderer, and instances are on record of its occurrence even in Europe, where, however, its appearance is only an accident, and does not justify its being classed as a European bird.³

This Hawk constructs its nest on tall trees, usually overhanging or near running water. The nest is like that of the Crow in its general appearance. It is constructed externally of dry twigs and sticks, intermixed with which are great quantities of the long Spanish moss peculiar to the Southern States. The nest is lined with dry grasses, leaves, and feathers.

The eggs are described by Mr. Audubon as from four to six in number, of a greenish-white color, with a few irregular blotches of dark brown at the larger end. I have in my possession the drawing of an egg obtained by Dr. Trudeau in Louisiana, and which was made by that gentleman. It is very nearly spheroidal, and its measurements are, length $1\frac{1}{6}$ inches, breadth $1\frac{9}{16}$ inches. It corresponds with Mr. Audubon's description of the egg of this Hawk.

I am greatly disappointed in being compelled to dismiss this species for the present without the illustration of a single egg. It breeds, with more or less frequency, on the banks of the rivers of nearly all the Southern States. My friend, Dr. Kollock, of Cheraw, S. C., has made repeated efforts to obtain the egg of this Hawk, but thus far has been too late for them. In May, 1855, he succeeded in finding a nest, and ascended to it; but, to his great disappointment, it was found to contain only young. This fact, however, is not without its value, as it fixes the period at which their incubation commenced at about the 1st of April, which is very nearly as soon as they are usually observed to make their appearance in that part of the country. The nest was on a large tree, not near the trunk, but on one of its projecting branches, and somewhat difficult of approach.

¹ It is not given as a Cuban bird by Lembeye, in his *Aves de la Isla de Cuba*.

² According to Vieillot, it is found in Peru, and even as far south as Buenos Ayres. This may refer to the present species, or, as is supposed, to a very similar but distinct one.

³ Two specimens are said to have been captured in Europe. One of these was in Argyleshire, Scotland, in 1772. The other in Yorkshire, England, in 1805.

ELANUS LEUCURUS.

- Falco dispar*, TEMM. Pl. Col. I, 1820, Div. 54.
 “ “ BONAP. Syn. App. 1828, p. 435.
 “ “ NUTTALL, Manual, I, 1832, 93.
 “ “ AUD. Orn. Biog. IV, 1835, 397, pl. ccclii.
Elanus leucurus, BONAP. Geog. and Comp. List, 1838, p. 4.
 “ “ CASSIN, Syn. N. A. Birds (Illust. Birds of Cal.), 1854, p. 106.
 “ “ “ Birds, Gilliss's U. S. Nav. Astr. Exp. II, 1835, 175.
Milvus leucurus, VIEILL. Nouv. Dict. XX, 1818, 563.
Elanus dispar, AUD. Syn. 1839, p. 13.
 “ “ “ Birds of Am. I, 1840, 70, pl. xvi.
 “ “ GAY, Fauna Chilena, Aves, 1854, p. 33, pl. ii.
Falco melanopterus, BONAP. Jour. Acad. Phila. V, 28.
 “ “ “ Syn. 1828, p. 31.
 “ “ “ Am. Orn. II, pl. xi, fig. 1.
 VULG. — *Black-shouldered Hawk. Black-winged Hawk. White-tailed Hawk. Bailairin*
 (Chile).

ALTHOUGH this species is quite abundant in the Southern States, from South Carolina south and west, and equally common in California, I am not able to illustrate its eggs, nor am I aware that any naturalist has discovered or described them, with the exception of Lieutenant Gilliss, who met with them in his recent naval astronomical expedition to Chile. Mr. Audubon, quoting Mr. Ward, states that the nests of this Hawk are placed on low trees, near the margins of rivers, and resemble those of the Crow, but with none of the substantial lining of that bird's nest. He says nothing of their eggs.

Mr. Nuttall, who incorrectly states that they are only seen in the United States in Florida, and then only occasionally, adds, that they build in the forks of trees a broad and shallow nest, lined internally with moss and feathers, and lay four or five eggs, but gives no description of them.

This species has been met with in South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, and Texas, and probably also in Mexico and New Mexico. Dr. Gambel describes them as very abundant in California, where I am informed they are familiar in their habits, and breed in clumps of oaks, in the immediate vicinity of habitations. Dr. Heermann speaks of them as common in that State. But neither of these naturalists appears to have met with their nests or eggs. It is not mentioned either as a bird of Cuba or Jamaica by Mr. Lembeze, Dr. Gundlach, or Mr. Gosse.

Mr. Gilliss obtained specimens of this bird in Chile, and Mr. Cassin, in his report upon the birds obtained in that expedition, infers from this that the species “has an extensive range of locality, embracing the southern portion of the United States, Mexico, Central America, and the countries of Western South America.

The only knowledge we have of its eggs is derived from the notes of Lieutenant

Gilliss,¹ from which we learn that the nest is composed of small sticks, and that the female lays from four to six eggs, of a dirty white, with brownish spots.

ICTINIA MISSISSIPPIENSIS.

- Falco mississippiensis*, WILS. Am. Orn. III, 1812, 80.
Falco plumbeus, BONAP. Syn. 1828, p. 90.
 “ “ NUTTALL, Manual, I, 1832, 92.
 “ “ AUD. Orn. Biog. II, 1835, 108; V, 374, pl. cxvii.
Ictinia plumbea, BONAP. Geog. and Comp. List, 1838, p. 4.
 “ “ AUD. Synopsis, 1839, p. 90.
 “ “ “ Birds of Am. I, 1840, 73, pl. xvii.
Ictinia mississippiensis, CASSIN, Syn. N. A. Birds (Illust. Birds of Cal.), 1851, p. 106.
Falco ophiophagus, VIEILL. Nouv. Dict. XI, 1817, 103.
 VULG. — *The Mississippi Kite*.

THE extent of the localities visited by this species is not well ascertained. The *Ictinia plumbea* of South America, with which it has been confounded, has been ascertained to be quite a distinct species. This leaves us without any present means of ascertaining how far its distribution may extend beyond Central America. It is found in the Southern States, from South Carolina south and west, but is most abundant about the Mississippi River. It was first discovered by Wilson, near Natchez, where he found it quite abundant. Mr. Say afterwards observed it far up the Mississippi, at one of Major Long's cantonments. In Captain Sitgreave's expedition to the Zuñi and Colorado Rivers, it was found exceedingly abundant in Eastern Texas, as well as in the Indian Territory, more particularly on the Arkansas River and its tributaries.

According to Mr. Audubon, the nest of this species is always placed in the upper branches of the tallest trees. It resembles a dilapidated Crow's nest, and is constructed of sticks slightly put together, Spanish moss, strips of pine bark, and dry leaves. The eggs are three in number, nearly globular, and are described by Mr. Audubon as of a light greenish tint, blotched thickly over with deep chocolate-brown and black.

The same writer mentions that a pair of these Hawks, whose nest was visited by a negro sailor, manifested the greatest displeasure, and continued flying with remarkable velocity close to the man's head, screaming and displaying the utmost rage.

Having only a drawing, and without access to any authenticated specimen, I cannot

¹ The eggs of this Hawk remain desiderata, and for the present our knowledge of their peculiarities is limited to the above very brief description. My friend Lieutenant Gilliss has, however, very kindly exerted himself to procure me specimens from Chile, while other friends in California hold out similar hopes. I trust that I may be able, in a supplementary number, to illustrate not only the eggs of this species, but also those of several others of this family, in regard to which nothing is now positively known.

illustrate the egg of this Hawk. The specimen represented in my drawing was taken in Louisiana by Dr. James Trudeau, to whom I am indebted for the copy. It measures, length, $1\frac{2}{16}$ inches; breadth, $1\frac{1}{4}$ inches. Its ground color is a greenish-white, and the egg is thickly marked over its entire surface by irregular blotches of olive-brown, dark slate-green, and purplish-drab colors.

CIRCUS HUDSONICUS.

- Falco hudsonicus*, LINN. Syst. Nat. I, 1766, 128.
Falco uliginosus, GMELIN, Syst. Nat. I, 1788, 278.
 " " WILS. Am. Orn. VI, 1812, 67, pl. li, fig. 2.
Falco cyaneus, BONAP. Am. Orn. II, 30.
 " " NUTTALL, Manual, I, 1832, 109.
 " " AUD. Orn. Biog. IV, 1838, 396, pl. cclvi.
Buteo cyaneus, RICH. & SWAINS. F. B. A. II, 1831, 55.
Strigiceps uliginosus, BONAP. Geog. and Comp. List, 1838, p. 5.
Circus cyaneus, AUD. Synopsis, 1839, p. 19.
 " " " Birds of America, I, 1840.
Falco europogistus, DAUDIN, Traité, II, 110.
Circus hudsonicus, CASSIN, Syn. N. A. Birds (Illust. Birds of Cal.), 1854, p. 108.
 VULG. — *The Marsh-Hawk. American Hen-Harrier. The Common Hen-Hawk.*

THIS Hawk is one of the most widely distributed birds of North America, breeding from the fur regions around Hudson's Bay to Galveston, Texas, and from Massachusetts to Oregon and California. It is abundant everywhere, with the exception of the southeastern portion of the United States. Sir John Richardson speaks of it as so common on the plains of the Saskatchewan, that seldom less than five or six are in sight at a time (in latitude 65°). Mr. Townsend found it on the plains of the Columbia River and on the prairies bordering on the Missouri. The Vincennes Exploring Expedition obtained specimens in Oregon. Dr. Gambel speaks of it as common in California, and Dr. Heermann also found it abundant in that State. Dr. Suckley's party obtained specimens in Minnesota; Captain Beckwith's, in Utah; Captain Pope, Lieutenant Whipple, and Dr. Henry, in New Mexico; and Lieutenant Couch, in Tamaulipas, Mexico. Dr. Woodhouse met with it abundantly from the Mississippi River to the Pacific Ocean, throughout the summer, showing conclusively that it breeds in those different sections of country. De la Sagra, Lembeye, and Dr. Gundlach all give it as a bird of Cuba, but not as breeding there.

Richardson (*Fauna Boreali-Americana*, p. 55) states that all the nests of this Hawk observed by him were built on the ground by the side of small lakes, of moss, grass, feathers, and hair, and contained from three to five eggs, of a bluish-white color, and unspotted. They measured an inch and three quarters in length, and were an inch across where widest. In regard to the position and manner of constructing the nest,

this corresponds with my own experience, but not so with respect to the size of the eggs. The nests have been invariably on the ground, near water, built of dry grass, and lined with softer materials.

Mr. Audubon found this Hawk breeding on the barrens of Kentucky, the cleared table-lands of the Alleghanies, and in the high covered pine-barrens of the Floridas. Having considerable doubts whether any American writer who had spoken of the Marsh Hawk had ever seen one of its nests, this same writer gives a very minute account of one which he found on Galveston Island, Texas. It was about a hundred yards from a pond, on a ridge just raised above the marsh, and was made of dry grass; the internal diameter was eight, and the external twelve inches, with the depth of two and a half. *No feathers were found.* If, however, by dwelling upon their absence, Mr. Audubon intended to cast any discredit upon Sir John Richardson's accuracy in his description of the nests of this species, as seen by him, because the latter speaks of feathers having been employed, I am convinced he really had no good grounds. A warm lining to a nest may be required in a climate of latitude 65° north, while the same necessity will not be found in one of 29° . A nest observed in Concord, Mass., by Dr. H. R. Storer, was on the edge of a pond, and was warmly lined with feathers and fine grasses. Many other instances might be named, but one well-attested example is sufficient.

Mr. Audubon speaks of the eggs found in the Galveston nest as four in number, smooth, considerably rounded or broadly elliptical, bluish-white, an inch and three quarters in length, and an inch and a quarter in breadth. Another nest, found under a low bush on the Alleghanies, was constructed in a similar manner, but was more bulky, the bed being four inches above the earth, and the egg slightly sprinkled with small marks of pale reddish-brown.¹

One egg represented in the plate was obtained on Galveston Island, by Mr. Audubon. Three others in my collection were taken, one in New Jersey, by Mr. John Krider, of Philadelphia, one in Louisiana, by Dr. Trudeau, and one in Concord, Massachusetts. The first, which is one of the four referred to above, is marked on the shell, in Mr. Audubon's handwriting, "April 29, 1837, Galveston Island." Its color is rather a soiled than a bluish white, and its exact measurements are, length, $1\frac{1}{6}$ inches; breadth, $1\frac{5}{16}$. The third measures $1\frac{1}{6}$ by $1\frac{7}{16}$ inches; and the last $1\frac{1}{6}$ by $1\frac{6}{16}$ inches. Their color is white, with a very slight shade of bluish, and faintly marked with brown. They are much longer than the one obtained by Mr. Audubon,—almost enough so to be suggestive of specific differences. Their shape is also different, both being more pyriform, especially the specimen from Massachusetts, which is quite pointed at the smaller end. The last was obtained early in June.

Since the above was prepared for publication, I have received, through the

¹ I think that a more careful scrutiny of the egg of this Hawk may show that the prevalent impression of the absence of spots and markings will prove to be an error. All that I have seen, except the one referred to from Louisiana, are more or less marked with light-brown blotches. These markings are not always very distinct, but so far as my present experience goes, they are to be found if carefully sought.

attention of Dr. Robert Dixon, of Damariscotta, Maine, the contents of the nest of a Hawk of this species. There are several facts in connection which are worthy of consideration. The female was shot as she flew from the nest; there is, therefore, no question as to the identity of the eggs, of which there were six, contained in the nest. With but a single exception, all these eggs are very distinctly blotched and spotted. This, to us, presents an entirely new feature in their markings, although Mr. Audubon (*Birds of America*, 8vo, I, 108) mentions finding a nest on the Alleghanies, the eggs of which were slightly sprinkled with small marks of pale reddish-brown. In the present instance, the shape of the eggs is a rather oblong oval, rounded at both ends, the smaller end well defined. They varied in length from 2 to $1\frac{1}{6}$ inches, and in breadth from $1\frac{7}{16}$ to $1\frac{6}{16}$ inches. Their ground color is a dirty bluish-white, which in one is nearly unspotted, the markings so faint as to be hardly perceptible, and only upon a close inspection. In all the others, spots and blotches of a light shade of purplish-brown occur, in a greater or less degree, over their entire surface. In two, the blotches are large and well marked; in the others, less strongly traced, but quite distinct. This has led to a closer examination of eggs from other parts of the country, and nearly all are perceptibly spotted!

The nest was found in a tract of low land, which was also wet and miry, covered with grass and clumps of sedge. On one of the latter it had been constructed. It is described as about the size of a peck basket, circular, and composed entirely of small dry sticks, "finished off or topped out with small bunches of pine boughs." There was very little depth to the nest, or not enough to cover the eggs from view in taking a sight across it. "No feathers were found in or about it. It was simply made of small dry sticks, about six inches thick, with about one inch of pine boughs for finishing off the nest."

The eggs were found about the 20th of May. They contained young at least two weeks advanced, showing that the bird began to lay in the latter part of April, and to sit upon her eggs early in the following month.

The nest was found near the village of Damariscotta, Maine, about twenty miles east of the Kennebec River. The circumstances of chief interest are the number of the eggs, greater than usual in the birds of this family, their markings, the construction of the nest, which was different from any before described, the absence of feathers or any other lining, the point of time at which the eggs were probably deposited, and their size and shape.

That there might be no possible doubt as to the identity of these eggs, the parent bird was sent for examination to my very accurate friend, Mr. Cassin, and his closest scrutiny challenged to its specific markings. After a very careful examination of the bird, he writes, "I cannot detect any character distinguishing it from others which are undoubtedly the common species. It is in rather unusual plumage, a transition or change from young to adult."

AQUILINÆ.

AQUILA CHRYSÆTOS.

- Falco chrysactos*, LINN. Syst. Nat. I, 1766, 125.
 “ “ AUD. Orn. Biog. II, 1835, 464, pl. clxxxii.
Falco fulvus, LINN. Syst. Nat. I, 1766, 125.
 “ “ WILS. Am. Orn. VI, 1815, 13.
 “ “ BONAP. Syn. 1828, p. 25.
 “ “ NUTTALL, Manual, I, 1832, 62.
Falco canadensis, LINN. Syst. Nat. I, 1766, 125.
Falco niger, GMELIN, Syst. Nat. I, 1788, 259.
Aquila chrysactos, RICH. & SWAINS. F. B. A. II, 1831, 6.
 “ “ BONAP. Geog. and Comp. List, 1838, p. 2.
 “ “ AUD. Synopsis, 1839, p. 2.
 “ “ “ Birds of Am. I, 1840, 50, pl. xii.
 “ “ CASSIN, Syn. N. A. Birds (Illust. Birds of Cal.), 1854, p. 109.
Aquila nobilis, PALLAS, Zoög. Ross. As. I, 338.
 VULG. — *The Golden Eagle. Royal Eagle. Ring-tailed Eagle. Black Eagle.*

THE Golden Eagle of Europe and of North America have been regarded as identical in all works upon the ornithology of the two continents. Mr. Cassin of Philadelphia, whose accuracy in determining species, and whose critical eye in recognizing specific diversities, are so well known, has recently expressed doubts as to the correctness of the supposed identity of these two birds. It is therefore a matter of no small regret, that so little aid can be given towards solving these doubts from the oölogy of the two continents. In both countries the Golden Eagle breeds in remote and nearly inaccessible places, and but little is known of its eggs, especially in regard to those of the American bird, of which I regret that I have only a drawing, made by Dr. James Trudeau, from an egg taken near the Hudson River. It differs essentially from any European specimen, or any descriptions that I have ever seen. The variations in a single instance, however, should not be regarded as decisive of specific distinctions, in a family the eggs of which are often known to present great differences, even among those taken from the same nest.

In its geographical distribution, the Golden Eagle of North America appears to be chiefly confined to the mountainous regions, and the more northern portions, but to be nowhere abundant. Sir John Richardson saw but few individuals in the Arctic regions, nor does he appear ever to have met with its nest. Individual birds on the Atlantic coast have been occasionally obtained, — once as far south as Philadelphia, — but very rarely. It was observed in Oregon by Dr. Townsend, but was not met with in California, either by Dr. Heermann or Dr. Gambel; yet several appear to have been obtained among the mountains of New Mexico by Dr. Henry's party.

A bird was secured alive near Boston, in 1837, by being taken in a trap, which had been set for another purpose. It was purchased for Mr. Audubon, and its life destroyed,

for purposes of anatomical examination, by being let down into a vat highly charged with carbonic acid gas. Its occurrence, however, near the sea-coast is very rare, and even among the mountains it is never found except in occasional pairs. It breeds in the mountainous portions of Maine, New Hampshire, Vermont, and New York, and was formerly not unfrequent among the cliffs of the Hudson River. Steamboats and railroads have, however, nearly driven this wild bird from its romantic retreats in that quarter. In Franconia, N. H., for quite a number of years a pair have occupied a nest on an inaccessible rock, near the top of a mountain, in sight of, and opposite, the Flume House. Repeated efforts have been made to reach its nest, but thus far without success. In the summer of 1855 a renewed attempt was made to scale the precipice over which the shelving rock, on which the nest stands, projects. A party was formed, and although they succeeded in ascending the mountain, which had never been achieved before, they could reach only a point beyond and above, not the nest itself. The attempt to pass to it was abandoned, being regarded as too perilous. The party reported a large collection of bones in its immediate vicinity, with other evidences of the accumulated plunder of many years, as well as a plentiful supply of fresh food at the time visited.

The Golden Eagle usually constructs its nest on the sides of steep, rocky crags, where its materials are coarsely heaped together on a projecting shelf of rock. These consist of large sticks, loosely arranged. In rare instances they are said to have been built on trees in the Western States, where rocky cliffs are not to be met with. The eggs are usually three in number; sometimes two, or only one. Mr. Audubon describes them as measuring $3\frac{1}{2}$ inches in length by $2\frac{1}{2}$ in breadth; the shell thick and smooth, dull white, brushed over with undefined patches of brown, which are most numerous at the larger end. This description is probably not quite accurate in regard to size. The European is presumed to be larger than the American, yet the largest I have ever seen measures but $3\frac{2}{16}$ inches in length by $2\frac{5}{16}$ in breadth. The one represented in the drawing referred to measured $3\frac{3}{16}$ inches in length by $2\frac{4}{16}$ inches in breadth. It was in its shape more elongate than the European egg, and its capacity considerably less than any I have met with. The markings differ in their color from those of well-marked specimens of the European, the latter being of a much more reddish shade of brown. Another European egg in the British Museum, and also one represented in Hewitson's British Oölogy, which closely resembled it, were marked over the entire surface with small but distinct blotches of reddish-brown on a white ground. One in my collection, taken in Scotland, and presented me by H. F. Walter, Esq. of London, is nearly unmarked. A distinctly bluish-white ground is faintly stained with a few very obscure markings of slate and purplish-brown. More information in regard to the variations of both the American and the European eggs, and the degree of uniformity of these variations, is needed, before they can help to throw any sure light upon their specific identity or diversity.

HALIÆTUS ALBICILLA.

- Vultur albicilla*, LINN. Syst. Nat. I, 1766, 123.
Falco ossifraga, “ “ “ “ 124.
Falco melanotos, “ “ “ “ “
Falco albicilla, BEWICK, Brit. Birds, I, 1804, 9.
“ “ PENN. Brit. Zool. I, 209.
“ “ TEMM. Man. d'Orn. I, 1820, 49.
“ “ MONTAGU, Orn. Dict. 1831.
“ “ YARRELL, Hist. Brit. Birds, I, 1839, 15.
Aquila albicilla, FLEM. Brit. An. p. 53.
“ “ JENYNS, Brit. Vert. An. p. 80.
Haliætus grænlandicus, BREHNI, Vog. Deuts. I, 1831, 16.
Haliætus albicilla, SELBY, Brit. Orn. I, 18.
“ “ GOULD, Birds of Europe, I, 1832, pl. x.
“ “ CASSIN, Syn. N. A. Birds (Illust. Birds of Cal.), 1854, p. 111.
VULG. — *The Gray Sea-Eagle. The European Sea-Eagle. The White-tailed Eagle. The Cinereous Eagle. The Erne. Cinereous Sea-Eagle. The Sea-Eagle. Aigle pygargue.*

I HAVE not included this among my illustrations of the eggs of North American species, because I have no specimen actually obtained upon this continent. Indeed, its claims to be included in our Fauna rest only upon its supposed existence in the neutral ground of Greenland. I have, however, deemed it best to include a brief description of the markings of its eggs, with some account of its mode of breeding. Further knowledge may possibly authorize us to add it to our list of American birds.

The Sea-Eagle of Europe, as its name implies, frequents the sea-coast of the northern portions of that continent, and is rarely found inland. It builds its nest on rocky cliffs projecting over the water, on the shores of Scotland, the Orkney and Shetland Islands, Norway, Russia, &c. The nest is constructed of sticks, or, where these are not convenient, of sea-weed. The eggs are two or three in number. Their ground color is a clear white, usually unmarked, but occasionally stained with small, faint spots of light-brown. The measurements of two in my collection, both from Scotland, but obtained at different times by H. F. Walter, Esq. of London, are as follows: length $2\frac{1}{6}$ inches, breadth $2\frac{3}{6}$ inches; length $2\frac{2}{6}$, breadth $2\frac{4}{6}$ inches.

The following, in relation to their breeding and distribution, is taken from Mr. Yarrell's excellent work on the Birds of Great Britain:—

“The White-tailed Eagle builds its nest on high rocks, and lays two eggs, about the same size of those of the Golden Eagle, but with very little or no red color on the white ground. The young are at first covered with a soiled-white down; and even at this age, the beaks and claws of the eaglets are of very large size. A pair of Golden Eagles have been known to rear their young in the same spot for eight seasons in succession; and Mr. Mudie has mentioned, that, being thus attached to a particular locality, their young, when able to provide for themselves, are driven away by the parent birds to get their living elsewhere; but the more erratic White-tailed

Eagle, quitting the breeding station when the season is ended, leave their young to forage over the district in which they have been raised. In confinement, the White-tailed Eagle sometimes becomes sociable. . . . One kept by Mr. Hoy laid three eggs in the same season; and a female in the possession of Mr. Selby laid an egg after having been kept in confinement twenty years. . . . The White-tailed Eagle breeds in the Hebrides, in Orkney and Shetland. Mr. Dunn, in his useful guide to these latter islands, names the particular localities in which they may be found, but states that they are much more numerous in winter than in summer. This accords with the opinion of M. Temminck and others, that this species returns to the southward from high northern latitudes as the season advances. . . . This Eagle frequents Denmark, Sweden, the west coast of Norway, and from thence as far north as Iceland and Greenland, but is not found in North America. Mr. Temminck believes that this Eagle follows the flocks of Geese that annually resort to the Arctic regions in summer to rear their young. It is found in Siberia, at Lake Baikal, and inhabits Russia, from whence to the southward it is spread over the European continent generally."

HALLETUS LEUCOCEPHALUS.

- Falco leucocephalus*, GMELIN, Syst. Nat. I, 1788, 255, sp. 3.
 " " WILS. Am. Orn. IV, 1812, 89, pl. xxxvi.
 " " BONAP. Synopsis, 1828, p. 26.
 " " NUTTALL, Manual, I, 1832, 72.
 " " AUD. Orn. Biog. I, 1832, 160; II, 160; V, 354; pls. xxi and cxxvi.
Falco ossifragus, WILS. Am. Orn. VI, 1812, 16, pl. lv.
Falco pygargus, DAUD. Traité, II, 62.
Aquila leucocephalus, RICH. & SWAINS. F. B. A. II, 1831, 15.
Haliaetus leucocephalus, BONAP. Geog. and Comp. List, 1838, p. 3.
Haliaetus leucocephalus, AUD. Synopsis, 1839, p. 10.
 " " " Birds of America, I, 1840, 57, pl. xiv.
 " " CASSIN, Syn. N. A. Birds (Illust. Birds of Cal.), 1854, p. 111.
 VULG. — *The Bald Eagle. The White-headed Eagle. Le Pygargue à Tête Blanche* (Buffon).
Aigle à Tête Blanche (Cuvier).

THE White-headed, or, as it is also incorrectly called, the Bald Eagle, is widely diffused throughout the North American continent, from at least latitude 66° 34' north, to the Gulf of Mexico and Central America. It is also of accidental occurrence in Europe. Temminck records two specimens as having been obtained in Central Europe, one in Zurich in Switzerland, the other in the kingdom of Wurtemberg. He also speaks of this species as frequenting the North of Europe, and in his latest edition, on the authority of Mr. Boie, states that they breed on some of the Norwegian islands. Their accidental occurrence in Central Europe may perhaps be readily accounted for by the escape of birds who had been in confinement. Their frequenting Northern Europe, excepting as chance visitants, needs confirmation.

Sir John Richardson, in *Fauna Boreali-Americana*, Vol. II, p. 15, states that he did not meet with this species north of 62° , although he speaks of finding them common between that point and Lake Superior. He also states that they leave the fur countries in October, when the rivers are frozen, and expresses the opinion that their nests are more numerous in these regions than in the United States. In the last point he is probably mistaken. Their nests are undoubtedly more common in the South Atlantic States than anywhere else. Subsequently, in his expedition over land to the Arctic Seas, in 1848, his observations in regard to this bird differ materially from his first impressions. He found this Eagle abundant at Half-moon Lake, in latitude 56° north.¹ He also speaks of finding both the Osprey and White-headed Eagle building their nests on the banks of Bear Lake River, in about 60° north. At Fort Confidence, latitude $66^{\circ} 54'$, we find in his notes, that White-headed Eagles made their appearance as early as May 17th, before the ice had given way in the rivers; and in his tables of phenomena observed at the Cumberland House, in latitude 54° , we also observe that a White-headed Eagle was seen as early as the 24th of March, "being almost always the first of the summer birds which arrives."

Dr. Woodhouse found this Eagle, though nowhere very abundant, from the Gulf of Mexico to the Pacific, in the expedition to the Zuñi and Colorado Rivers. Dr. Gambel found it common in California, breeding on the rocky cliffs of its Pacific coasts early in February. Dr. Townsend also met with it in Oregon, and Dr. Cooper's party in Washington Territory.

It breeds along the Atlantic coast from Maine to Florida, and thence along the Gulf of Mexico to the Rio Grande. It has not been observed either in Cuba or Jamaica. It constructs its nest somewhat in accordance, both as to time and place,² with the climate,³ and other peculiarities of the locality. For the most part these are placed on trees, but in California it resorts, in preference, to the rocky cliffs of the sea-coast; and in the fur countries Sir John Richardson noticed the same deviations from its usual habits. Mr. Audubon, after Dr. Richardson had made public

¹ Sir John Richardson also states: "This Fishing Eagle abounds in the watery districts of Rupert's Land, and a nest may be looked for within every twenty or thirty miles. Each pair appropriates a certain range of country, on which they suffer no intruders of their own species to encroach; but the nest of the Osprey is often placed at no great distance from that of the Eagle. Some of our voyagers had the curiosity to visit an Eagle's nest, which was built on the cleft summit of a balsam poplar, of sticks, many of them as thick as a man's wrist. It contained two young birds, well fledged, with a good store of fish, in a very odoriferous condition. While the men were climbing the tree, the female parent hovered close around, and threatened an attack on the invaders; but the male kept aloof, making circles high in the air."

² In California, where the rocky coast is destitute of convenient trees, the White-headed Eagle resorts to rocky cliffs as the safest and most convenient places for nesting. We have the authority of Sir John Richardson for the same deviation from its usual resort to trees, in parts of the fur countries where the latter are wanting.

³ The climate apparently exerts some influence, though not so much as might be supposed. In the Southern States this Eagle nests seven weeks earlier than in Maine, in both of which regions they are resident throughout the year. Farther north, where the severity of the cold, by closing the ponds and rivers with solid ice, places their food beyond their reach, and where they are only visitants in the warmer season, they of course breed still later, for the reason that they do not reach these regions until after the breeding season of more southern birds of the species.

his own observations, repeats the statement that this Eagle *is never known to nest on rocks.*¹

In the extreme Southern States, as in California, the White-headed Eagle breeds as early as February. In Maine, the general impression is that the eggs are not deposited before May, and at a still later period in the more northern portions of the United States. More recent observations show this to be incorrect, and leave hardly a doubt that these birds breed at a much earlier season of the year than is generally supposed, and greatly in advance of most of their family. Mr. Audubon speaks of having once shot a female on her eggs, near the Mississippi, as early as the 17th of January. Dr. Gambel found White-headed Eagles nesting on the cliffs along the shores of the Pacific in February and March. Relying upon the information I had generally received from others, I supposed that in the New England States their incubation commenced at a somewhat later period. Some facts, however, which came to my knowledge the present season (1856), assure me that even there the amatory season of the White-headed Eagle is in the most inclement portion of the winter.

Having occasion to visit the State of Maine in April, 1856, near the Damariscotta River, the banks of which stream are frequented by these birds on account of the abundance of fish, I received information which is materially inconsistent with my previous impressions. I was informed, by a person who had long observed them with some attention, that a pair had constructed a nest in a neighboring wood, which they had occupied for several successive years. The previous season (1855), late in May, he had climbed a tree in the immediate neighborhood, commanding a full view of the nest. It then contained young, nearly grown. From this statement I was led to conclude that the female must have deposited her eggs at some period in March, if we allowed four weeks for incubation, and as many more for the growth of the young eaglets, and that there was no time to be lost if we would secure the eggs before hatching. We accordingly visited the nest on the 27th of April, and found it situated on a tall pine, at least sixty feet from the ground. The tree stood in a swampy wood, within a few rods of the stage road, and not more than half a mile from the village of Damariscotta. It contained no limbs or branches to facilitate ascent for at least the distance of thirty feet, and the trunk at the base was from six to nine feet in circumference, rendering it impossible to mount the tree by the aid only of the hands and feet. My assistant was, however, drawn up by means of a rope fastened round his body, the other end having been thrown over a fork in the trunk, which occurred at the height of some eighteen feet, and from which point the tree assumed the shape of two tall and perpendicular columns. Having been aided in climbing to this fork, the rope was again thrown over the nearest branch, about twelve feet above his head, and our adventurous climber was again raised, by the aid of those on the ground, to a height where the branches of the tree rendered the remainder of the ascent comparatively easy.

While he was ascending, we observed several Eagles flying over our heads, but at

¹ Birds of America, (8vo,) I, 61.

a great height. One only approached us, but as soon as we were noticed, the bird made a precipitate retreat. It was apparently conveying food to the nest, and was not at first aware of our presence; after which it hovered at a distance, suggestive of more prudent caution than of parental devotion or courage, uttering hoarse, disagreeable cries of displeasure, not unlike imperfect barkings of a dog. No attempt was made to molest or interrupt the man as he ascended to, or after he had reached the nest, which we supposed to be unoccupied. We were however surprised to find, when he had climbed to the nest, that the female had been sitting upon it all the while, and only left when the unwelcome caller was near enough to have reached the bird with his hands. She too flew over the man's head in somewhat closer proximity, uttering frequent cries of distress, but made no effort whatever to attack him. On the contrary, her whole behavior seemed to evince a cowardice and want of spirit very different from that which we usually associate with Eagles when it becomes their parental duty to defend their young.

To our disappointment, the nest was found to contain no egg, and but a single bird, apparently about a fortnight old. It was some six or seven inches in length, its weight between one and two pounds, and its head and claws disproportionately large. It was covered uniformly with a thick, close, and soft downy plumage, which was of a clean deep straw-color. There was not the least admixture of gray or brown.¹ The young bird was completely helpless, and uttered almost constant cries for food. It ate readily whenever fish or meat was offered it, but was unable to support itself upon its legs. It was taken to my host's house, where it was well cared for, and for a while, with careful attention, it did well and grew apace, ever manifesting a most inordinate and ever insatiable appetite for fish and flesh.

The nest was described to me by my assistant as a platform between five and six feet in diameter, and at least four in thickness. It was constructed of regular layers of large sticks, each several feet in length, and from an inch to an inch and a half in thickness. Its surface was perfectly flat, and was "finished off," to use his expression, with tufts of grass, dry leaves, mosses, lichens, small twigs, &c., &c. He found in it, by the side of the young Eagle, four or five large eels, each of which was about two feet in length, showing that the parent birds provide liberally for their own wants and those of their young.

Estimating the age of the young Eagle at ten days, and allowing four weeks for incubation, and at least one week's interval between the deposition and the commencement of the parent bird's sitting upon it, we have very nearly the exact period at which the egg was laid, March 13th. It is interesting to notice, in this

¹ Mr. Audubon describes "the young birds, when not larger than middle-sized pullets," as "covered with a soft, cottony kind of down," and adds, that "their first plumage is of a grayish color, mixed with brown, of different depths of tint." This is a little obscure, but I presume Mr. Audubon intended by "first plumage," not the downy covering of which he speaks, but that which succeeds to it. The color of the down has no gray or brown, but is as described above.

connection, that this occurred at the coldest period of the season, when the ground was covered with snow to an unusual depth, and when the thermometer indicated a temperature at that time frequently as low as 15° below zero. With the exception of the Common Crossbill (*Loxia americana*), a pair of which birds once constructed a nest on a leafless elm early in March, in Vermont, this is the only instance I have ever known of incubation so apparently unseasonable.

The apathetic conduct of the parent birds, especially of the female, is also worthy of notice. Taken in connection with Sir John Richardson's account of a most unparental lack of spirit on a similar occasion, it inclines me to the belief that Mr. Audubon gives our White-headed Eagles more credit than they are entitled to, for parental devotion and courage.¹ Certain it is, I have seen the Common Brown Thrush, the Cat-Bird, and even the little Black-capped Titmouse, evince more of both qualities, in defence of their young, than was shown on this occasion by these recreant specimens of our "national emblem." If we may infer its general character from these two instances, the White-headed Eagle is not only an unscrupulous robber, plundering the Fish-Hawks and the Gulls of the fruits of their honest industry, but is also a rank coward, whom not even parental instinct can stimulate to a respectable manifestation of courage.

Its nest is usually of great size, composed of sticks from three to five feet in length, pieces of turf, weeds, and moss. Its diameter is about five feet, and its depth is not unfrequently as great. In the warmer localities, where it breeds, the pair usually frequent the same nest throughout the year, and make it their permanent place of resort. This is also true, probably, wherever this Eagle remains throughout the year.

The eggs are usually two, sometimes three or four, in number, are nearly spherical, equally rounded at either end, and are more or less granulated on their surface. Their color is a dull white, unspotted, but often stained by incubation to a dirty white or a light soiled drab. Two eggs in my collection present the following measurements: length 3 inches, breadth $2\frac{4}{16}$; length $2\frac{4}{16}$ inches, breadth $2\frac{3}{16}$. The first was obtained in New Jersey by Alexander Wilson, the ornithologist; the latter by Dr. Trudeau, in Louisiana. The egg represented in the plate (Plate IV, fig. 37) was taken from a nest in Texas, by Dr. Heermann.

¹ "Of this I assured myself by climbing to the nest every day in succession, during her temporary absence, a rather perilous undertaking when the bird is sitting. The attachment of the parents to the young is very great when the latter are yet of a small size; and to ascend to the nest at this time would be dangerous." (Birds of America, Svo, I, pp. 61, 62.)

PANDION CAROLINENSIS.

- Falco carolinensis*, GM. Syst. Nat. I, 1788, 263.
Aquila piscatrix, VIEILL. Ois. d'Am. Sept. I, 1807, 29.
Pandion americanus, VIEILL. Gal. I. 33.
Falco haliæctus, WILS. Am. Orn. V, 1812, 13; pl. xxxvii.
 “ “ BONAP. Syn. 1828, p. 28.
 “ “ AUD. Orn. Biog. I, 1832, 415; V, 362; pl. lxxxii.
 “ “ NUTTALL, Manual, I, 1832, 18.
 “ “ DE KAY, Nat. Hist. N. Y., pl. viii, fig. 18.
Pandion carolinensis, BONAP. Geog. and Comp. List, 1838, p. 3.
 “ “ CASSIN, Syn. N. A. Birds, 1854 (Illust. Birds of Cal.), p. 112.
Pandion haliæctus, AUD. Syn. 1839, p. 12.
 “ “ “ Birds of Am. I, 1840, 64; pl. xv.
 VULG. — *The Fish-Hawk. Osprey. Carolina Osprey. Fishing Hawk.*

OWING to the confusion which has existed, until recently, in regard to the identity of the Osprey of the Old World with the Fish-Hawk of the New, there has been a corresponding uncertainty respecting the geographical limits of the American species. As their difference can no longer be questioned, we feel justified in assuming that our bird is found only throughout North America, from the fur regions around Hudson's Bay to Central America. According to Mr. Hill, as quoted by Mr. Gosse in his "Birds of Jamaica," it is found occasionally in that island, and, as I learn by letter from Dr. Gundlach, is also occasionally met with in the island of Cuba; but it is not known to breed in either place.¹ Dr. Woodhouse, in his report of the expedition to the Zuñi River, speaks of this Hawk as common along the coasts of Texas and California. The Vincennes exploring expedition obtained specimens in Oregon. Dr. Heermann mentions it as common on the borders of all the large rivers of California in summer, and Dr. Gambel also mentioned it as abundant along the coast of that State, and on its rocky islands, in which latter localities it breeds. I am not aware that it has ever been found farther south than Texas.

To the north it has been met with by Dr. Richardson in the Arctic regions, where its migrations are supposed not to reach the extreme northern limits of the continent. That observing naturalist saw nothing of this bird when he was coasting along the shores of the Arctic Sea, nor did Mr. Hearne meet with it on the barren grounds north of Churchill.

It is found along the entire Atlantic coast, from Labrador to Florida, with the exception of that of Massachusetts around Boston, where it does not breed, and where it is only occasionally met with. It is most abundant from Long Island to the Chesapeake, and throughout this long extent of coast is very numerous, often breeding in large communities, to the number of several hundred pairs. In the interior it is much less frequent, but is occasionally met with on the banks of the larger rivers and lakes, and in such instances usually in solitary pairs.

¹ Since the above was in type, I have received a letter from Dr. Gundlach, in which the *Pandion carolinensis* is marked as one of the birds which "may breed in Cuba."

The American Fish-Hawk, though quite a distinct species from the European Osprey, is yet so very similar to that bird, that several eminent naturalists still continue to regard the two species as identical. Although the Prince of Musignano, in his Comparative List of the Birds of Europe and North America, published in 1838, gave the American bird as a distinct species from the European, Mr. Hewitson in his British Oölogy, and Mr. Yarrell in his History of British Birds, insist upon regarding them as the same species, and quote long extracts, written exclusively in reference to the American bird, as if they were also applicable to the European species. In many important respects, they are not. Even Mr. Temminck, in the latest edition of his Manual, can find no difference between specimens from all parts of the globe, and Sir William Jardine, in the notes to his edition of Wilson, regards the species of both continents, and also the *P. leucocephalus* of Australia, as one and the same. The Australian species is even more distinct from both the European and the American, than these are from each other. This reluctance to acknowledge specific differences, of which there can be no well-founded doubts, has led, and must continue to lead, to much confusion and perplexity, especially as American specimens, both of birds and eggs, are indiscriminately figured and described in books, and ranged in collections, as if identical with the European. What makes this persistence in error the more unaccountable is, that the habits of these species are totally unlike, and these differences of habit have not escaped the notice of naturalists generally.

The American Fish-Hawk is migratory in its habits, leaving our coasts early in the fall of the year, and returning soon after the close of the winter. Sir John Richardson states, that the time of its arrival in the fur regions is as early as April, and on the coast it has been noticed in the middle of March. It breeds on the coast of Nova Scotia late in June, on that of Maine earlier in the same month, and in New Jersey and Maryland in May. In California its nesting is even earlier.

It constructs its nest almost invariably on the tops of trees, and this habit has been noticed even in its extreme northern resorts. The only instance I have known of a deviation was a nest constructed near West Point, New York, observed by my friend, William H. Edwards, Esq., which was built on a high cliff on the banks of the Hudson River. It is a bold and confiding bird, often constructing its nest near a frequented path, or even upon a highway. Near the eastern extremity of the Wiscasset (Maine) bridge, and directly upon the stage road, a nest of this Hawk has been frequented for several years.¹ It stands upon the top of a low pine-tree, is readily accessible, the tree being easily climbed, and is so near the road that, in passing, the young birds have been frequently heard, in their nest, uttering their usual cries for food.

The trees upon which the nests of the Fish-Hawk are built, are for the most part dead or dying, a condition attributed by some to the fish-oil contained in their food, by others to the excrements of the birds, or the mass of salt materials of which the nests are generally in a large part constructed. The nests are usually composed

¹ It was abandoned the last season (1855).

externally of large sticks, from a half-inch to an inch and a half in circumference, and frequently three feet in length. These are often piled to the height of five feet, with a diameter of three. In a nest described by Wilson, he found, intermixed with a mass of sticks, corn-stalks, sea-weed, wet turf, mullein-stalks, &c.; the whole lined with dry sea-grass (*Zostera marina*). All together, he adds, it formed a mass observable to the distance of half a mile. It was large enough to fill a cart and be no inconsiderable load for a horse. None of the nests which I have observed in New England bear any proportion in size to this. They are not usually more than two feet in their greatest depth.

When the nest of this Hawk is visited, the male bird will frequently make violent, and sometimes dangerous, attacks upon the intruder. In one instance, related to me by a physician in Maine, the talons of one of these Hawks penetrated through a thick cloth cap, and laid bare the scalp of a lad who had climbed to its nest, very nearly hurling him to the ground. A correspondent quoted by Wilson narrates a nearly similar instance of courageous and desperate defence of its young. The Fish-Hawks are also very devoted in their attentions to their mates, and supply them with food while on the nest. Wilson relates a touching instance of this devotion, where a female who had lost one leg, and was unable to fish for herself, was so abundantly supplied by her mate, that she rarely had occasion to leave her nest, and never for food.

The Fish-Hawk usually nests in large communities. Even three hundred pairs have been observed nesting in this manner on one small island. When a new nest is to be constructed, the whole community has been known to take part in its completion, and the work is soon finished. These Hawks are also remarkably tolerant towards smaller birds, and permit the Purple Grackle (*Quiscalus purpureus*) to construct their nests in the interstices of their own. Wilson observed no less than four of these nests thus clustered in a single Fish-Hawk's nest, with a fifth on an adjoining branch.

The eggs of the Fish-Hawk are usually three in number, often only two, and more rarely four. They are subject to great variations as to their ground color, the number, shade, and distribution of the blotches of secondary coloring with which they are marked, and also as to their size and shape. Their ground color is most frequently a creamy white, with a very perceptible tinge of red. This varies, however, from an almost pure shade of cream, without any admixture, to so deep a shade of red that white ceases to be noticeable. The specimens represented in the plate correspond with the more usual varieties of the eggs. In the others, which are only verbally described, this variation of the ground color is quite marked, and nearly all the usual shades of brown appear that are observable in their secondary markings. In one instance these markings are of a dark umber-brown, in another of a light claret-brown; in a third there is an intimate mingling of both shades, as also in the fourth, but with a different distribution, and also with an intermixture of purplish-brown. The eggs represented in the plate (Plate III, figs. 33 and 34) vary from $2\frac{9}{16}$ inches to $2\frac{3}{16}$ in length, and from $1\frac{1}{16}$ inches to $1\frac{1}{16}$ in breadth.

It would be impossible, even if it were desirable, to represent all of the endless

varieties of this species. I have therefore confined myself to the illustration of only the two most common, with verbal descriptions of the more frequent varieties. The following descriptions of eight specimens in my collection, not figured, represent also not unfrequent variations from the above:—

Length $2\frac{5}{16}$ inches, breadth $1\frac{1}{6}$; ground color reddish-white, thickly covered, over the whole egg, with large confluent blotches of umber, with a slight mixture of sienna-brown, — at the larger end completely concealing the ground color, and of varying depths of shade, — less in size, and not quite so numerous at the smaller end; shape slightly pyriform.

Length $2\frac{7}{16}$ inches, breadth $1\frac{1}{6}$; ground color white, with only a faint tinge of reddish; marked round the larger end with a wreath of confluent blotches of umber and chocolate-brown; the smaller end nearly unmarked, with only a few dottings of reddish-brown; the rest of the egg marked with a few isolated and irregular dashes of chocolate; in shape oval, the smaller end but slightly more pointed than the larger.

Length $2\frac{6}{16}$ inches, breadth $1\frac{1}{6}$; broadly oval, slightly pointed at smaller end; ground color dirty reddish-white, marked irregularly with large blotches of deep umber-brown, with fainter markings of a slaty drab, intermixed with which are a few smaller dottings of brownish-purple. All the markings are more frequent at the larger end, but distributed in small groups, without being confluent.

Length $2\frac{8}{16}$ inches, breadth $1\frac{1}{6}$; oblong and slender, more than usually pointed at the smaller end, ground color a bright reddish-white, light and uniform in its shade, sparsely marked with a few large blotches of a brownish-red or light brick-color; larger at the extremity, with more frequent small dottings of the same shade, and a few purplish spots. The unmarked ground color occupies more than half its surface.

All of the above four were from New Jersey.

Length $2\frac{7}{16}$ inches, breadth $1\frac{1}{6}$; ground color a light dirty brick-red; marked at larger end by a confluent mass of blotches of a rusty brown, or dark brick-red, completely covering it; the rest only marked by a few scattered and smaller blotches of the same shade; shape pyriform.

Length $2\frac{8}{16}$ inches, breadth $1\frac{1}{6}$; ground color a dirty white with hardly a perceptible shade of reddish; marked at larger end with a confluent ring of dark umber blotches; a few scattered markings of the same distributed at intervals over the rest of the egg, of which the larger part is unmarked.

The last two were taken from the same nest near Halifax, Nova Scotia.

The smallest egg of this species that I have met with measures $2\frac{5}{16}$ inches in length, $1\frac{0}{6}$ in breadth; ground color a beautiful clear white, with the faintest tinge of reddish; nearly unmarked, except at the larger end, which is covered by a mass of confluent blotches of dark umber and chocolate-brown; a few spots of faint purplish-brown and darker umber sprinkled over the rest of its surface.

The largest that I have seen measures $2\frac{9}{16}$ inches in length, $1\frac{4}{6}$ in breadth; the ground color is a creamy white, with a perceptible shade of red; marked with large confluent blotches of dark umber-brown.

One undoubted egg of this bird, in the collection of Mr. Krider, is hardly distinguishable from a common variety of the Caracara Eagle (*Polyborus tharus*).

As there yet exist differences of opinion among naturalists as to the identity or diversity of the European, American, and Australian species, it is interesting, in this connection, to observe how far their eggs correspond, as well as how far the habits of these birds are similar or dissimilar. In regard to the habits of the Australian bird, our information is not so full as could be wished. Specimens of the eggs of this variety in the collection of the Philadelphia Academy, and in my own, obtained by Mr. Gould, are more spherical and larger than the average of the American. Neither end is perceptibly more pointed than the other. Its ground is a pure cream-color, untinged with red, and the surface is beautifully marked with large blotches of dark brownish-purple, intermixed with a few smaller markings of umber, a dark wine-color, and purple; colors and combinations of colors such as I have never observed in any European or American specimens.¹

The European is smaller than the American, is often, but not always, more spherical, and is less pointed at the smaller end. Among its varieties is one which is quite common, and is very different from any I have ever observed among at least five hundred specimens of the American which I have examined. Of this variety I have one in my collection, obtained in Scotland, and given me, by Henry F. Walter, Esq. of London. Its length is $2\frac{7}{16}$ inches, breadth $1\frac{1}{8}$; it is oblong and oval in shape, the ground color is a dull white, or very light cream-color, *almost unspotted*, and only marked by a few faint spots of light umber around the larger end. Another essentially resembling this is in the collection of Mr. Walter, which was also taken in Scotland. The Philadelphia Academy possesses a third, and Mr. Charles St. John, in his Tour in Sutherlandshire, describes an Osprey's egg which he took from a nest near Scowrie, in the Highlands of Scotland, which is also very similar to mine, but is like no specimen of the American species.²

Another Osprey's egg in my collection, taken near Aarhus, in Denmark, by Rev. H. B. Tristram, of Castle-Eden, Eng., measures only $2\frac{2}{16}$ inches in length, — shorter by a fourth of an inch than the smallest American, — in breadth $1\frac{0}{16}$ inches; its ground color is a rich cream, with a slight tinge of claret, and it is marked over its whole surface with large blotches of a beautifully deep shade of chocolate.

¹ The *Pandion leucocephalus* of Australia is indisputably a distinct species. Unlike our Fish-Hawk, it is nowhere abundant, though widely diffused. Its habits, so far as they are known, are very similar to those of our bird. It constructs a large and conspicuous nest, usually on rocks, occasionally on tree-tops. Mr. Gould, in the Birds of Australia, mentions a nest that was fifteen feet in circumference. In his description of the eggs, besides some marked like the one described above, he also speaks of a common variety which is boldly spotted and blotched with a deep, rich reddish-brown, so dark as to be nearly black, on a yellowish-white ground. No eggs, European or American, correspond exactly with this description.

² "We found two beautiful eggs in the nest, of a roundish shape; the color white, with numerous spots and marks of a fine rich red brown. . . . Mr. Dunbar, with his usual perseverance, went to this nest [the same], and found that the male bird had got another mate [Mr. St. John had shot her former mate], and she was already busily employed in sitting on a single egg. . . . The two eggs which I took from this nest were beautifully marked with fine rich red spots, while the egg now taken by Dunbar was of a dirty-white color, marked, at one end only, by a splash of brown, and was also smaller than the others." (Tour in Sutherlandshire, London, 1849, I, 31, 105.)

In their habits the European and the American birds are much more decidedly different than in their own markings, or in those of their eggs. The American is a very social bird, generally living in large communities during the breeding season. The European is found only in solitary pairs. Never, that I can learn, do more than one pair frequent the same neighborhood. The European frequents almost exclusively fresh water. The American, though found also on large rivers and lakes, is much the most abundant on the sea-shore. The European bird rarely builds on trees, the American almost always. The European bird sometimes "builds on the ground among reeds," the American never. The latter rarely resorts to rocky cliffs to breed, the European almost uniformly. There is no instance on record of the American species attacking smaller birds or inferior land animals with intent to feed on them. The European species is known to prey on Ducks and other wild-fowl.¹ In the construction of their nests, the European and the American species approach more nearly, though the former has been known to build them in a manner of which I know of no instances in this country.²

These are some of the more prominent points of difference between the Osprey and the Fish-Hawk. They are sufficiently striking, one would think, to have satisfied naturalists long since of their specific difference, even if no constant variations in size, markings, and other peculiarities of structure, had been noticeable.

POLYBORUS THARUS.

- Falco tharus*, MOLINA, Sagg. Stor. Nat. del Chile, 1782.
Falco cheriway, JACQUIN, Beytr. Gesch. der Vög., p. 17.
Falco plancus, MÜLLER, Cimelia Physica, pl. xvii.
Polyborus vulgaris, AUD. Orn. Biog. II, 1835, 350; VI, 351; pl. clxi.
 " " VIEILL. Nouv. Dict. V, 1817, 257.
Polyborus brasiliensis, AUD. Syn. 1839, p. 4.
 " " " Birds of Am. I, 1840, 21, pl. iv.
Polyborus tharus, CASSIN, Syn. N. A. Birds, 1851 (Illust. Birds of Cal.), p. 113.
 " " " Birds of Gilliss's U. S. Nav. Astron. Ex. II, 1855, 173.
Caracara vulgaris, GAY, Fauna Chilena, Aves, 1855, p. 207, pl. i.
 VULG. — *Caracara Eagle*. *Traro*. *The Mexican Eagle*. *Totache*. *Carrancha*.

This species, which appears more nearly connected with the Vultures than with the Eagles in nearly all that relates to its habits, occurs only in the more southern

¹ "An Osprey was seen to stoop and carry off a young, half-grown Duck from the surface of the water, at Slapton Ley. In the struggle the Duck fell from the talons, but was recovered before it reached the water." (Rennie's edition of Montagu's Ornithological Dictionary, London, 1831, p. 348.)

² In Sweden, Oedman states that the Osprey makes its nest in the highest trees, of pine-tops, lined with the leaves of the *Polypodium vulgare*, a structure very different from any our species are known to build.

portions of the United States. It was first observed by Mr. Audubon in Florida, where it is not of uncommon occurrence, and where it is supposed also occasionally, though rarely, to breed. I am not aware that the Caracara has ever been observed in Alabama, Mississippi, or Louisiana,¹ although it is quite probable that it may be found not unfrequent in the more southern portions of these States. In Texas, especially on the Rio Grande, it is a quite common bird, as it is also in Mexico and Central America. Throughout South America it is one of the most abundant species, its geographical range extending even to Cape Horn. Dr. Darwin found the *Polyborus* nowhere so common as on the grassy savannas of the La Plata, and says that it is also found on the most desert plains of Patagonia, even to the rocky and barren shores of the Pacific. It occurs also in the West Indies, especially in the island of Cuba, where it is known to breed. The eggs represented in the drawing were obtained and identified by the late Dr. Berlandier of Metamoros, in Northern Mexico, on the Rio Grande.

It is possible that two distinct species are now confounded together under the common name of Caracara Eagle. Mr. Cassin informs me that his suspicions have been excited by certain variations in specimens which have fallen under his notice, and Mr. Darwin states that he met with individuals on the plains of Santa Cruz which he and Mr. Gould were almost persuaded to be distinct species. In partial confirmation of this suspicion, I may in this connection refer to the great variations noticeable in the eggs of this vulturine Eagle. These are neither slight nor occasional, but are constant, and of so radical a character as to excite the strongest doubts of their belonging to birds of the same species, the differences affecting both their size and their ground color. The eggs from Cuba, so far as I am aware, represent one variety exclusively, those from Brazil the other, while, on the other hand, both varieties were obtained on the Rio Grande by Dr. Berlandier, who assigned them to a single species, which, in his manuscript notes, he called *Totache*. In Chile the popular name of this bird is *Traro*, but its more common title in other portions of South America is *Carrancho*.

The *Caracara* builds a coarse, flat nest, composed of flags, reeds, and grass, usually on the tops of trees, but occasionally, according to Darwin, on a low cliff, or even on a bush. The number of the eggs is rarely, if ever, more than three. Four from the Rio Grande, in my collection, exhibit the following measurements: length $2\frac{7}{16}$ inches, breadth $1\frac{1}{16}$; length $2\frac{7}{16}$, breadth $1\frac{3}{16}$; length $2\frac{5}{16}$, breadth $1\frac{1}{16}$; length $2\frac{1}{16}$, breadth $1\frac{3}{16}$. These eggs not only present the great and unusual variation in their length of nearly eight per cent (between the two extremes), but very striking and anomalous deviations from uniformity are also noticeable in their ground color and markings. The ground color varies in these specimens from a nearly pure white to a very deep russet, or tan-color, and their markings, though all of sepia-brown, differ greatly in their shades. So far as I may be justified in determining from the few specimens I have seen, the eggs with the light ground are

¹ Since writing this article, I have learned that the Smithsonian Institution possesses specimens from the Gulf coast of Louisiana, and from New Mexico and California.

uniformly the larger in size and in shape, and are somewhat more oblong. In the largest, the measurement of which is given above, the ground color is nearly pure white with a slight pinkish tinge, nearly unspotted at the smaller end, and only marked by a few light blotches of a sepia-brown. These markings increase both in size and frequency, and become of a deeper shade, as they are nearer the larger end, until they become almost black, and around this extremity they form a large confluent ring of blotches and dashes of a dark sepia. The second in size, which is but just perceptibly smaller, has a ground color of light russet, or rather white with a very slight russet tinge, and is marked over its entire surface, in about equal proportion, with irregular lines and broad dashes of dark sepia. In the third, the ground is of the deepest russet, or tan-color, and in the smallest, of the same, but of a somewhat lighter shade, and both are beautifully marked with deep blotches of a dark sepia, almost black. The eggs of this species are much more oblong than those of most birds of prey, and in this respect also show their relation to the Vultures rather than to the Hawks or Eagles. They are pyriform, the smaller end tapers quite abruptly, and varies much more, in its proportions, from the larger extremity, than the eggs of any true Hawk with which I am acquainted.

MORPHINUS UNICINCTUS.

- Falco uncinatus*, TEMM. Pl. Col. I, 1827, 313.
 “ “ GAY, Fauna Chilena, Aves, 1855, p. 216.
Falco harrisii, AUD. Orn. Biog. V, 1835, 30, pl. cccxcii.
 “ “ BONAP. Geog. and Comp. List, 1838, p. 3.
Buteo harrisii, AUD. Syn. 1839, p. 5.
 “ “ “ Birds of Am. I, 1840, 25, pl. v.
Polyborus tenuirus, TSCHUDI, Wieg. Archiv. X, 1844, 263.
 “ “ “ Fauna Peruana, Orn. pl. i.
Morphnus uncinatus, CASSIN, Syn. N. A. Birds, 1854 (Illust. Birds of Cal.), p. 114.
 “ “ “ Birds of Gilliss's U. S. Nav. Astron. Ex. II, 1855, 174.
 VULG. — *Harris's Buzzard*. *Red-winged Hawk*. *Red-winged Buzzard*. *Peuco*. *Aquililla* (Berlandier, MSS. Mexico).

THIS Hawk has a very limited range within the United States. Mr. Audubon, who was the first to meet with it within the limits of the Union, obtained a single specimen in Louisiana. Supposing it to be an undescribed species, he named it in honor of his friend, Mr. Edward Harris, a distinguished naturalist of New Jersey. It had, however, been previously described by Temminck.

The Red-winged Buzzard is occasionally found in the lower portions of the States of Mississippi and Louisiana. It becomes much more abundant in the southwestern sections of the latter State, and in Texas is a very common species, especially about

the mouth of the Rio Grande. It is also frequently met with throughout Mexico, Central America, Peru, and Chile. It is an occasional visitant of Cuba and Jamaica.

In its habits this Hawk is heavy and sluggish. It frequents streams of water, and its food consists chiefly of the reptiles and smaller animals which frequent the banks of rivers and creeks. They build their nests on low trees, in the immediate vicinity of their hunting-ground, and often over the water, constructing them of coarse flags and water plants. The nests are usually not very large for the birds, are flattened or with very slight depressions, and the materials are very loosely put together. The eggs are from three to five in number, usually white and unspotted, occasionally with more or less of a yellowish or tawny tinge. In some instances they are faintly marked with light dashes or stains of a yellowish-brown, and, more rarely, are also marked with small blotches of sepia-brown, and with smaller dottings of purplish-drab. Their average measurement is, length $2\frac{2}{16}$, breadth $1\frac{1}{16}$.

All the knowledge at present possessed in regard to the eggs of these Hawks is derived from the collection of the late Dr. Berlandier, of Metamoros, in the Province of Tamaulipas, Mexico. In the cabinet of that gentleman were several varieties, now in the possession of the Smithsonian Institution. These are shown, by the notes and private memoranda of Dr. Berlandier, who was a diligent observer of birds, to belong to this Hawk. For the preservation of this collection, the public is indebted to the timely intervention of Lieutenant Couch, by whom they were purchased, and through whose offices they were secured for the purposes of science.

FAMILY STRIGIDÆ.

STRIGINÆ.

STRIX PRATICOLA.

- Strix flammea*, WILSON, Am. Orn. VI, 1812, 57, pl. 1, fig. 2.
 “ “ BONAP. Syn. 1828, p. 38.
 “ “ NUTTALL, Manual, I, 1832, p. 139.
 “ “ AUD. Orn. Biog. II, 1835, 403; V, 388; pl. clxxi.
Strix pratincola, BONAP. Geog. and Comp. List, 1838, p. 7.
 “ “ CASSIN, Syn. N. A. Birds (Illustr. Birds of Cal.), 1854, p. 116.
Strix americana, AUD. Syn. 1839, p. 25.
 “ • “ “ Birds of Am. I, 1840, 127, pl. xxxiv.
 “ “ DE KAY, Nat. Hist. N. Y., Birds, 1844, pl. xiii. fig. 28.
 VULG. — *The American Barn Owl. The White Owl.*

THE geographical limits of the North American Barn Owl cannot be determined with precision. Some disagreement exists among naturalists as to the identity and diversity of several varieties in different parts of the world, all closely related to each other, yet specifically distinct. The *Strix flammea* of Europe is both a distinct species from the *Strix pratincola* and a smaller variety. The African is, again, probably a different bird from either. On this continent three distinct varieties, closely resembling each other, are recognized by more recent writers as different species. These are *S. perlata* of South America, *S. furcata* of Cuba, and the *S. pratincola* of North America. The last-named Owl rarely, if ever, occurs, except by accident, north of Pennsylvania, and is not common until we reach South Carolina. From there it is distributed south and west to the Pacific. It is quite common in Texas and New Mexico, and is one of the most abundant birds of California. It was not met with by Dr. Woodhouse in the expedition to the Zuñi River, but this may be attributed to the desolate character of the country through which he passed, as this Owl is chiefly found about habitations, and is never met with in wooded or wild regions.

Dr. Heermann and Dr. Gambel, whose visit to California was before the present increase in population, speak of its favorite resort as being in the neighborhood of the Missions, and of its nesting under the tiled roofs of the houses. The latter also refers to his finding numbers under one roof, and states that they showed no fear when approached. The propensity of the California bird to drink the sacred oil from the consecrated lamps about the altars of the Missions was frequently referred to by the priests, whenever any allusion was made to this Owl.

The South American variety was met with by Lieutenant Gilliss as far south as Chile, where it was of unusual occurrence. This bird is readily distinguished from the North American by its smaller size and longer legs. The Cuban bird, which is

probably also the same as that of Jamaica, is not so readily distinguished. Mr. Gosse, in his "Birds of Jamaica," regards it as identical. As that writer had several good opportunities of observing the breeding habits of the Jamaica Barn Owl, I shall adopt his account, as in all probability essentially agreeing with that of our own bird. He found the breeding-place of this Owl at the bottom of a deep limestone pit. In the middle of October there was one young bird with several eggs. There was not the least vestige of a nest; the bird reposed on a mass of half-digested hair mingled with bones. At a little distance were three eggs. They were not collected for sitting, as no one of them was within six inches of another. On the 12th of the next month he found in the same place the old bird sitting on four eggs, this time placed close together. There was still no nest. The eggs were advanced towards hatching, but in very different degrees, and an egg ready for deposition was found in the oviduct of the old bird. He speaks of these eggs as differing in no wise, except in size, from those of the common Hen. The size he does not give.

An egg taken in Louisiana by Dr. Trudeau, and of which I have an accurate drawing, measures $1\frac{1}{6}$ inches in length, by $1\frac{2}{6}$ in breadth. Another, obtained in New Mexico, measures $1\frac{1}{6}$ by $1\frac{4}{6}$. Its color is a dirty yellowish-white, without any spots. Its shape is an oblong oval, hardly more pointed at the smaller than at the larger end. An egg of the *Strix flammea*, from France, measures $1\frac{3}{6}$ inches by $1\frac{4}{6}$. Another, from Africa, given me as that of the Barn Owl of that region, is much larger than any of the above, measuring $1\frac{4}{6}$ inches in length by $1\frac{6}{6}$ in breadth. The last two are undoubtedly different species from our corresponding variety.

BUBONINÆ.

BUBO VIRGINIANUS.

- Strix scandiaca*, LINN. Syst. Nat. I, 1766, 132. (?)
Strix virginiana, GMELIN, Syst. Nat. I, 1788, 287.
 “ “ WILSON, Am. Orn. VI, 1812, 52.
 “ “ BONAP. Syn. 1828, p. 37.
 “ “ RICH. & SWAINS. F. B. A. II, 1831, 82.
 “ “ NUTTALL, Manual, I, 1832, 121.
 “ “ AUD. Orn. Biog. I, 1832, 313; V. 392.
 “ “ DE KAY, Nat. Hist. N. Y., Birds, 1841, pl. x, fig. 22.
Strix pythaulas, BARTRAM, Trav. 1791, p. 289.
Bubo ludovicianus, DAUDIN, Traité d'Orn. 1800, II, 210.
Bubo pinicola, VIELLE. Ois. d'Am. Sept. I, 1807, 51.
Bubo arcticus? RICH. & SWAINS. F. B. A. II, 1831, 86, pl. xxx.
Bubo septentrionalis, BROHM, Vög. Deutschl. 1831, p. 120. (?)
Bubo virginianus, BONAP. Geog. and Comp. List, 1838, p. 6.
 “ “ AUD. Syn. 1839, p. 29.
 “ “ “ Birds of Am. I, 1840, 113, pl. xxxix.
 “ “ CASSIN, Syn. N. A. Birds (Illust. Birds of Cal.), 1854, p. 177.
Bubo sub-arcticus, HOY, Proc. Acad. Phila. VI, 1852, 211. (?)
 VULG. — *The Great Horned Owl. Cat Owl. Great Screech-Owl. Le Grand Hibou d'Amérique* (Cuvier). *The Virginian Owl. Tejolote Grande* (Berlandier MSS. Mexico).

THE Great Horned Owl of North America has a very wide geographical distribution, being found abundantly from the Arctic regions to Mexico, and throughout North America, both on the Atlantic and the Pacific. Mr. Cassin considers the *arcticus* of Swainson and the *magellanicus* of Gmelin as mere varieties of this species. He does not appear to regard it as being a South American bird, where the *B. crassirostris* has probably been mistaken for this species. Sir John Richardson speaks of it as not uncommon in the Arctic regions. It is abundant in Canada, and throughout all parts of the United States. Dr. Gambel met with it also in large numbers in the wooded regions of Upper California. Dr. Heermann found it very abundant around Sacramento in 1849, but since the increase in population it has become comparatively rare. Dr. Woodhouse met with it in the Indian Territory, though not abundantly. Lieutenant Couch obtained specimens in Mexico, and Mr. Schott in Texas.

This Owl usually breeds in the more unsettled and wooded parts of the country. For the most part, it constructs for itself a large nest, composed of dry sticks, lined with leaves and a few feathers. Mr. Audubon also states that he has found nests belonging to the Great Horned Owl in large hollows of decayed trees, and twice in the fissures of rocks. In all these cases, little preparation had been made previous to the laying of the eggs, as the nest consisted of only a few grasses and feathers. I have never heard of instances of a construction of the nests in this manner, but in all cases that have come under my observation this Owl has built for itself a large and somewhat elaborate nest. Wilson, who found them breeding in the swamps of

New Jersey, states that the nest was generally constructed in the fork of a tall tree, but adds that they sometimes choose a smaller tree.

These birds begin to construct their nest towards the close of winter, and, even in the Arctic regions, Sir John Richardson speaks of their hatching their eggs as early as March. The shape of the egg is very nearly exactly spherical, and its color is a dull white with a slightly yellowish tinge. An egg formerly in the old Peale's Museum of Philadelphia, taken in New Jersey by Alexander Wilson, the ornithologist, and bearing his autograph upon its shell, measures $2\frac{5}{16}$ inches in length by 2 in breadth. Another, obtained in the vicinity of Salem, Mass., measures $2\frac{4}{16}$ inches in length by $1\frac{4}{16}$ in breadth. In the latter instance the nest was constructed on a tall and inaccessible tree, in a somewhat exposed locality. The female was shot on the nest, and as she fell, she clutched one of the eggs in a convulsive grasp, and brought it in her claws to the ground. Mr. Cassin states that the southern varieties are also different in their size, being smaller than the more northern. This is true also of their eggs. One obtained in Tamaulipas, Mexico, near the Rio Grande, measures $2\frac{3}{16}$ inches in length by $1\frac{3}{16}$ in breadth. This egg is one of the Berlandier collection, now in the possession of the Smithsonian Institution, and is the one represented in the plate (Plate IV, fig. 39).

SCOPS ASIO.

Strix asio, LINN. Syst. Nat. I, 1766, 132.

“ “ WILSON, Am. Orn. V, 1812, 83, pl. xlii, fig. 1.

“ “ BONAP. Syn. 1828, p. 36.

“ “ AUD. Orn. Biog. I, 1832, 486; V, 392; pl. xcvi.

“ “ NUTTALL, Manual, I, 1832, 120.

Strix nevia, GMELIN, Syst. Nat. I, 1788, 289.

“ “ WILSON, Am. Orn. III, 1812, 16, pl. xix, fig. 1.

Bubo striatus, VIEILL. Ois d'Am. Sept. I, 1807, 51, pl. 21.

Scops asio, BONAP. Geog. and Comp. List, 1838, p. 6.

“ “ CASSIN, Syn. N. A. Birds (Illust. Birds of Cal.), 1851, p. 179.

Bubo asio, AUD. Syn. 1839, p. 29.

“ “ “ Birds of Am. I, 1840, 147, pl. xl.

“ “ DE KAY, Nat. Hist. New York, 1844, pl. xii, figs. 25 and 26.

Hibou asio, TEMM. Pl. Col. pl. lxxx.

VULG. — *The Mottled Owl. The Red Owl. Little Screech-Owl. Little Owl. Screech-Owl. Little Cat-Owl.*

The little Red or Mottled Owl is a very widely distributed bird. It is found in Greenland, and probably in all parts of North America. Sir John Richardson did not, however, meet with it in the Arctic regions. It is much more abundant in some parts of the continent than in others. It is quite common throughout New England, as well as in the Middle and some of the Southern States. Mr. Audubon

speaks of it as not common in Louisiana, although occasionally found there. Dr. Hall mentions it as abundant in the vicinity of Montreal. It is also said to be frequently met with in Ohio, Minnesota, and Oregon. Dr. Heermann mentions it as not rare in California, although Dr. Gambel does not appear to have met with it in his investigations in that quarter. Dr. Woodhouse, in his report of the expedition to the Zuñi River, speaks of finding this noisy little Owl very abundant throughout the Indian Territory, but adds that he did not meet with it so frequently in Texas.

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

The Screech-Owl can hardly be said to construct any nest, but lines the hollow in which it rears its young with a few loose leaves, dry grasses, and feathers. The eggs are usually five or six in number, are pure white, and nearly round. Their average measurement is $1\frac{6}{16}$ inches in length by $1\frac{3}{16}$ in breadth.

SCOPS McCALLII.

Ephialtes choliba, LAWRENCE, Annals of New York Lyceum of Nat. Hist. VI, 1853, 4.

Scops McCallii, CASSIN, Syn. N. A. Birds (Illust. Birds of Cal.), 1854, p. 180.

VULG. — *The Western Mottled Owl. McCall's Mottled Owl. Tejolote* (Berlandier).

This is a new species recently described by Mr. Cassin, and little is as yet known as to the extent of its geographical distribution. The first specimen of this Owl ever obtained was taken by E. S. Holden, Esq. near Sacramento, and described by George S. Lawrence, Esq. of New York, as *Ephialtes choliba*, Vieill. (*Strix crucigera*, Spix). It was found in Texas by Mr. Schott, and in Northern Mexico by Lieutenant Couch. It also occurs in the collection of Dr. Berlandier, now in the possession of the Smithsonian Institution, and was obtained in the Province of Tamaulipas in Eastern Mexico. An egg in the same collection, of this species, measures $1\frac{2}{16}$ inches in length by $\frac{1}{16}$ of an inch in breadth. Its shape is nearly that of a sphere, and the color is a clear crystal-white.

OTUS WILSONIANUS.

- Strix americana*, GMELIN, Syst. Nat. I, 1788, 288.
 “ “ BONAP. Cons. Avium, p. 50.
Strix peregrinator, BARTRAM, Trav. 1791, p. 289.
Strix otus, WILSON, Am. Orn. VI, 1812, 52.
 “ “ BONAP. Syn. 1829, p. 37.
 “ “ NUTTALL, Manual, I, 1832, 130.
 “ “ AUD. Orn. Biog. IV, 1835, 573, pl. cccclxxxiii.
Otus wilsonianus, LESSON, Traité d'Orn. I, 1831, 110.
 “ “ CASSIN, Syn. N. A. Birds (Illust. Birds of Cal.), 1854, p. 181.
Otus americanus, BONAP. Geog. and Comp. List, 1838, p. 7.
Otus vulgaris, AUD. Syn. 1839, p. 28.
 “ “ “ Birds of Am. I, 1840, 136, pl. xxxvi.
 VULG. — *The Long-eared Owl. American Long-eared Owl. The Prairie Owl.*

This is a Northern and Eastern species, and does not appear to have been met with on the western coast south of Oregon. At least, neither Dr. Gambel nor Dr. Heermann observed the present species in California, although Dr. Cooper obtained specimens in Washington Territory and Dr. Townsend in Oregon. Its supposed absence, however, from that State may be an error, as, owing to its strictly nocturnal habits, it is not readily procured, and may in consequence have been overlooked. Sir John Richardson found this Owl as far to the north as latitude 60°, and thinks that its range probably extends to the extreme limits of the forests. It breeds on the eastern coast, from the Arctic regions to New Jersey, but is rarely found south of that State. On the Pacific its limits are as yet not well defined. It is said to be plentiful on the Saskatchewan, but its abundance elsewhere is rather inferred than actually known. Appearing rarely in the daytime, it is not very frequently met with by naturalists. According to Sir John Richardson, in the fir regions it sometimes lays its eggs on the ground, at other times in the deserted nests of other birds, on low bushes. Mr. Hutchins speaks of its depositing them as early as April. Richardson received one found in May, and another nest was observed, in the same neighborhood, which contained three eggs on the 5th of July. Wilson speaks of this Owl as having been abundant in his day in the vicinity of Philadelphia, and of six or seven having been found in a single tree. He also mentions it as there breeding among the branches of tall trees, and in one particular instance the Long-eared Owl had taken possession of the nest of a Qua Bird (*Ardea nycticorax*), where Wilson found it sitting on four eggs, while one of the Herons had her own nest on the same tree.

Audubon states that the American Long-eared Owl usually accommodates itself by making use of the abandoned nests of other birds, whether these are built high or low. It also makes use of the fissures of rocks, or builds on the ground. He also states that it sometimes constructs a nest of its own. He found one near the Juniata River, in Pennsylvania, composed of green twigs with the leaflets adhering, and lined with fresh grass and sheep's wool, but without feathers. In the summer of

1856 I received from Robert Kinnicott, Esq., of Cook County, Illinois, an Owl's egg found by a boy on the ground, in a prairie. It was sent to me as probably an egg of the Short-eared Owl, but from its close resemblance to all the eggs of the *Otus wilsonianus* I have ever seen, and its dissimilarity from those of the *Brachyotus cassinii*, I have no doubt that it was an egg of the former.

As this species is variously spoken of as breeding in April and in July, it probably raises more than one brood in a season. The eggs are usually four in number, are nearly round, and of a uniform dull-white color. One from New Jersey, obtained by Mr. Alexander Wilson, measures $1\frac{7}{8}$ inches in length, by $1\frac{5}{8}$ in breadth.

BRACHYOTUS CASSINI.

- Strix brachyotus*, FORSTER, Philos. Trans. London, 1772, LXII, 384.
 " " WILSON, Am. Orn. IV, 1812, 64, pl. xxxiii, fig. 3.
 " " BONAP. Syn. 1828, p. 37.
 " " RICH. & SWAINS. F. B. A. II, 1831, 75.
 " " NUTTALL, Manual, I, 1832, 132.
 " " AUD. Orn. Biog. V, 1835, 373, pl. 432.
Brachyotus palustris (americanus), BONAP. Geog. and Comp. List, 1838, p. 7.
 " " " " Cons. Av. p. 51.
Otus brachyotus, AUD. Syn. 1839, p. 28.
 " " " Birds of Am. I, 1840, 110, pl. xxxviii.
 " " CASSIN, Syn. N. A. Birds (Illust. Birds of Cal.), 1854, p. 182.
Brachyotus cassinii, BREWER, Proceedings Boston Nat. Hist. Soc., Feb. 1856.
 VULG. — Short-eared Owl. American Short-eared Owl. Cassin's Short-eared Owl.

So long as the Short-eared Owl of North America was supposed to be identical with the *Brachyotus palustris* of Europe, and its representative variety in South America, it was permitted to lay claim to the widest geographical range of any bird known to us. With this supposition of its identity, we should have to assign to it, as its habitat, a very large portion of the globe, embracing the whole American continent, from its most northern point — inclusive of Greenland — to some of the most extreme southwestern portions of South America, together with all the northern and temperate portions of the Eastern continent. The grave doubts which have long existed as to its right to this claim of identity with either the European or the South American bird may now be regarded as having become certainties, and our American species must be received as separate and distinct, though closely allied. From the European it is certainly quite different. From the South American it differs in a less degree, yet still presents certain constant deviations, hardly less than specific.

The Short-eared Owl of our Southern continent has been obtained as far to the

south as the Straits of Magellan.¹ Lieutenant Gilliss brought home quite a number from Chile,² and Mr. Gould has received specimens from Brazil.¹ Two of these birds are also said to have been brought from the Sandwich Islands.¹ I cannot, however, find that this variety has ever been found to have a more northern range than the central regions of South America.

The North American bird is larger, and for the most part of a darker color, than the European Owl. This is especially true of the female. As the differences between these varieties are constant, and are as well marked as in many other instances where the birds are now acknowledged to be distinct species, there is no good reason why they should be regarded as identical. If we assume Mr. Gould's genus of *Brachyotus* to be a good one, it leaves our own immediate species with no specific name, and I have been able to find none more appropriate or deserved than one giving to it an association with the name of the naturalist who first pointed out the specific differences between these species. I have therefore named it in honor of my esteemed friend, Mr. Cassin, of Philadelphia, a gentleman who stands confessedly in the first rank of American ornithologists, and who, in patient and diligent research, and in skilful and discriminating investigations into the intricate problems of Natural History, has no superior among her votaries.

The South American variety (*Brachyotus galapagoensis*, Gould) more closely resembles the *B. cassinii*, and is not readily distinguished from it. It is, however, without any doubt, a quite distinct species, though the points of specific difference cannot at present be very clearly pointed out. The most noticeable is the constantly deeper shade of fulvous in the South American bird. Another circumstance which, as it seems to me, should have no small weight in determining the question, is, that so long an interval of territory exists between the several habitats of these species, in which neither occurs. Latitude 40° north on the Atlantic coast, and about 38° on the Pacific, is believed to be the southern limit of the range of the Northern species, and somewhere about 20° south the northern line of the South American variety.

Having thus assumed the Short-eared Owl of North America to be a distinct species from either the European or the South American variety, I must claim for it much more restricted limits than have generally been assigned, yet still a range quite as extended as that of any of this family. Sir John Richardson met with it as far to the north as latitude 67°. Professor Holboll gave it as a bird of Greenland. Dr. Cooper has obtained specimens in Oregon, and Dr. Heermann speaks of it as common in California, though Dr. Gambel, a very diligent and observing naturalist, met with no specimens there.³ In the United States, there are no well-authenticated instances of its having been noticed south of Pennsylvania, though both Dr. Gundlach and Mr. Lembeye mention this Owl as an occasional visitant of Cuba. Dr.

¹ Yarrell's British Birds, I, 125.

² The U. S. Naval Astronomical Expedition to the Southern Hemisphere, II, 177.

³ Since the above was written, and while these pages are passing through the press, an undoubted specimen of the *Brachyotus cassinii* has been received from California. It was obtained in February (1856), near Petaluma, by Mr. Emanuel Samuels, and accompanied the collection made by him of the natural history of that region for the Smithsonian Institution and the Boston Society of Natural History.

Woodhouse did not observe this bird in the expedition to the Zuñi River, nor am I aware that it has ever been obtained in any of our Southern or Southwestern States.

Very little is known in regard to the habits of these varieties, and not enough to have much influence in determining the question of their non-identity. According to the observations of Sir John Richardson, the principal haunts of the American are dense thickets of young pine-trees, or dark and entangled willow-clumps, where it sits on a low branch watching assiduously for mice. When disturbed, it flies for a short distance, and then hides itself in the heart of a bush, whence it is not easily driven.

On the other hand, we learn that the European bird, unlike the short-eared species of North America, which thus hides itself in large woods or dense plantations, "frequents wide, open fields, extensive commons, heaths, and moors." In the Orkney Islands, the European Owl "forms an artless nest among the heath." Sir William Jardine, describing two nests of that Owl which he met with in Dumfriesshire, says: "They were formed upon the ground, among the heath, the bottom of the nest scraped until the fresh earth appeared, on which the eggs were placed without any lining or other accessory covering."

According to Dr. Richardson, the American species forms a nest of withered grass and moss, placed on a dry spot of ground. Mr. Audubon, the only other naturalist who has described the nest of this bird, speaks of having once met with one on a high ridge in the Great Pine Forest of Pennsylvania. The nest contained four eggs nearly ready to be hatched. He describes them as dull bluish-white, of a somewhat elongated or elliptical form, measuring an inch and a half in length, and an inch and an eighth in breadth. This nest was found on the 17th of June, was placed under a low bush, and covered over by tall grass, raked together in a slovenly manner, and quite flat. I have in my possession a copy of the drawing made by Mr. Audubon, which was probably a sketch hastily taken by him on the spot. The drawing is however a little larger than the measurements in his description represent the eggs to have been.

Another specimen of the eggs of this bird, from Hudson's Bay, in my collection, is more elongated than is usual in an Owl's egg, is of a dull-white color, with no apparent shade of blue, and measures $1\frac{9}{16}$ inches in length by $1\frac{1}{6}$ in breadth.

The egg represented in the plate was obtained by my friend, Eliot Cabot, Esq., on an island in the Bay of Fundy, and by him well identified. Its shape is also much more oblong than is usual in birds of this family. It is in form an elliptical ovoid, in color a uniform dull-white, and its measurements correspond exactly with the specimen from Hudson's Bay above referred to. Dr. Henry Bryant, who accompanied Mr. Cabot in the visit to the Bay of Fundy, has furnished the following in addition: "A nest of this bird was found by Mr. Cabot in the midst of a dry peaty bog. It was built on the ground, in a very slovenly manner, of small sticks and a few feathers, and presented hardly any excavation. It contained four eggs on the point of being hatched. A young bird the size of a robin was also found lying dead on a tussock of grass in another similar locality."¹

¹ Proceedings of Boston Natural History Society, January, 1857.

SYRNIUM.

SYRNIUM CINEREUM.

- Strix cinerea*, GMELIN, Syst. Nat. I, 1788, 291.
 “ “ RICH. & SWAINS. F. B. A. II, 1831, 77.
 “ “ AUD. Orn. Biog. I, 1832, 364; pl. cccli.
 “ “ NUTTALL, Manual, I, 1832, 128.
Strix lapponica, RETZIUS, Faun. Succ. 1800, p. 79.
Strix fuliginosa, SHAW, Gen. Zoöl. VII, 1809, 244.
Strix barbata, PALLAS, Zoöl. Ross. I, 1811, 318.
Syrnium cinereum, GOULD, Birds of Europe, I, 1832, pl. xlii.
 “ “ BONAP. Geog. and Comp. List, 1838, p. 6.
 “ “ AUD. Syn. 1839, p. 1839.
 “ “ “ Birds of Am. I, 1840, 130, pl. xxxv.
 “ “ DE KAY, Nat. Hist. N. Y. 1844, pl. xiii, fig. 29.
 “ “ CASSIN, Syn. N. A. Birds (Illust. Birds of Cal.), 1851, p. 184.
 VULG. — *The Great Gray Owl. The Cincereous Owl. The Great Cincereous Owl.*

THE Cincereous Owl is confined to the more northern portions of Europe, Asia, and America, and is very rarely met with even in the extreme northern portions of the United States, and then only in midwinter. Its farthest southern limit on the Atlantic, so far as known, is Massachusetts, where only two or three instances of its occurrence are on record; and on the Pacific, the Territory of Oregon, where it was met with by Dr. Townsend. In Europe it is even more exclusively Arctic than on this continent. Lapland and Iceland are the only localities indicated by Temminck, and even there it is spoken of as quite rare. Mr. Temminck also received two specimens taken in Greenland. Its presence in Northern Asia is rather inferred than really known.

Our only positive knowledge of its nest is furnished by Richardson, who also states that it is by no means a rare bird in the fur countries, and that it is an inhabitant of all the woody districts between Lake Superior and latitude 68°, and between Hudson's Bay and the Pacific. He discovered the nest in question on the 23d of May, on the top of a lofty balsam-poplar. It was composed of sticks and lined with feathers, and contained young.

Having no specimen of the egg, I am unable to illustrate it. I have, however, in my possession a drawing of an egg of this Owl, sketched by Mr. Audubon from a specimen from the fur regions, and afterwards again copied by Dr. James Trudeau. I have no reason to doubt its authenticity. This specimen was of a clear, but not a bright, white color, was nearly spherical, and measured $2\frac{7}{16}$ inches in length by exactly 2 in its greatest breadth.

SYRNIUM NEBULOSUM.

- Strix nebulosa*, FORSTER, Trans. Philos. Soc. London, LXII, 1772, 386 and 424.
 “ “ WILS. Am. Orn. Biog. IV, 1812, 61, pl. xxxiii, fig. 2.
 “ “ BONAP. Syn. 1828, p. 38.
 “ “ RICH. & SWAINS. F. B. A. II, 1831, 81.
 “ “ NUTTALL, Manual, I, 1832, 133.
 “ “ AUD. Orn. Biog. I, 1832, 242; V, 386, pl. xlvii.
 “ “ DE KAY, Nat. Hist. N. Y. 1844, pl. x, fig. 21. ~
- Strix chichictli*, GMELIN, Syst. Nat. 1, 1788, 296.
Strix acclamator, BARTRAM, Trav. 1791, p. 289.
Strix varius, BARTRAM, Mss. Frag. Nat. Hist. Penn. 1799, p. 11.
Strix fernandica, SHAW, Gen. Zool. VII, 1809, 263.
Ulula nebulosa, BONAP. Geog. and Comp. List, 1838, p. 7.
Syrnium nebulosum, GOULD, Birds of Europe, I, 1832, pl. xlvi.
 “ “ AUD. Syn. 1839, p. 27.
 “ “ “ Birds of Am. I, 1840.
 “ “ CASSIN, Syn. N. A. Birds (Illust. Birds of Cal.), 1854, p. 181.
- VULG. — *The Barred Owl. The Whooping Owl* (Bartram). *La Chouette du Canada* (Cuvier).
Chouette Nebulose (Temm.).

THE Barred Owl has an extended range, having been met with nearly throughout North America. It is distributed from the fur regions to Texas. Minnesota is the most western point to which, so far as I am aware, it has been traced. It is more abundant in the Southern States than elsewhere, and in the more northern portions of North America is somewhat rare. Richardson did not encounter it in the more Arctic portion of the fur countries, nor has it, so far as I can learn, been observed on the Pacific. In Europe, it is of accidental occurrence in the northern parts. In Louisiana, as Mr. Audubon states, it is more abundant than anywhere else, and Dr. Woodhouse speaks of it as very common in the Indian Territories, and also in Texas and New Mexico, especially in the timbered lands bordering the streams and ponds of that region. In July, 1846, while in pursuit of shore birds in the island of Muskeget, near Nantucket, in the middle of a bright day, I was surprised by meeting one of these birds, who, uninvited, joined us in the hunt. My companion soon arrested his course. He proved to be a fine male adult specimen.

I have never met with the nest of this bird, but Mr. Wilson describes one found in the crotch of a white oak, among thick foliage, as rudely put together, composed outwardly of sticks intermingled with some dry grass and leaves, and lined with smaller twigs. Mr. Audubon speaks of them as breeding in the hollows of trees, and at other times as taking possession of the old nest of a Crow or Hawk. The latter also states that they breed early in March. The last statement is to some extent confirmed by the fact, that, in two instances, in the month of February a fully developed egg has been taken from the oviduct of the female. One of these cases occurred near Niagara Falls in the spring of 1852. The other, in 1854, was noticed by Professor William Hopkins, then of Auburn, N. Y., to whose kindness I am indebted for the egg the parentage of which is so unquestionable. It is purely white,

almost globular, and, except in shape, hardly distinguishable from the egg of the domestic Hen. It is two inches in length, $1\frac{1}{6}$ in breadth.

NYCTALÆ RICHARDSONI.

Strix tengmalmi, RICH. & SWAINS. F. B. A. II, 1831, 94, pl. xxxii.

“ “ AUD. ORN. BIOG. IV, 1835, 559, pl. cccclxxx.

Nyctale richardsoni, BONAP. Geog. and Comp. List, 1838, p. 7.

“ “ CASSIN, SYN. N. A. BIRDS (ILLUST. BIRDS OF CAL.), 1854, p. 185.

Uhula tengmalmi, AUD. SYN. 1839, p. 24.

“ “ “ BIRDS OF AM. I, 1840, 122, pl. xxxii.

VULG. — *Richardson's Owl*. “*Tengmalm's Owl*” (Richardson and Swainson, Audubon, &c., incorrectly).

This Owl is an exclusively Northern bird, peculiar to North America, and rarely met with in the limits of the United States. A single specimen has been obtained in Massachusetts. Dr. Hoy mentions it as a bird of Wisconsin, and on the Pacific Dr. Townsend met with it as far south as Oregon, where it is more abundant than on the eastern coast. According to Richardson, it inhabits all the wooded country from Great Slave Lake to the United States, and is very common on the banks of the Saskatchewan. It was obtained in Canada by the Countess of Dalhousie, but at what season the bird was met with is not stated; the Smithsonian Institution also possess specimens from the vicinity of Montreal. It probably does not breed so far south as that place, or, if so, very rarely. Mr. Audubon procured a specimen near Bangor in Maine, in September, the only one he ever met with.

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

I have in my possession the copy, made by Dr. James Trudeau, of a drawing taken by Mr. Audubon from a specimen in an English cabinet. It is nearly spherical, the color white with a slight tinge of yellowish, and measures $1\frac{3}{16}$ inches in length by one inch in breadth.

As I have no means of access to any authenticated egg of this Owl, I am unable to illustrate it, though it probably would not be distinguishable from that of Tengmalm's Owl, to which it is so closely allied.

NYCTALE ACADICA.

- Strix acadica*, GMELIN, Syst. Nat. I, 1788, 296.
 “ “ BONAP. Syn. 1828, p. 38.
 “ “ RICHL. & SWAINS. F. B. A. II, 1831, 97.
 “ “ NUTTALL, Manual, I, 1832, 137.
 “ “ AUD. Orn. Biog. II, 1835, 567; V, 397; pl. excix.
 “ “ DE KAY, Nat. Hist. N. Y. 1844, pl. xi, fig. 23.
Strix acadensis, LATHAM, Ind. Orn. I, 1790, 65.
Strix passerina, WILSON, Am. Orn. IV, 1812, 61, pl. xxxiv, fig. 1.
Nyctale acadica, BONAP. Geog. and Comp. List, 1838, p. 7.
 “ “ CASSIN, Syn. N. A. Birds (Illustr. Birds of Cal.), 1854, p. 186.
Uula acadica, AUD. Syn. 1839, p. 24.
 “ “ “ Birds of Am. I, 1840, 123, pl. xxxiii.
 VULG. — *The Acadian Owl. The Little Owl. The Saw-Whet. American Sparrow-Owl.*

THE Saw-Whet Owl, as this bird is often called, seems to be distributed throughout nearly all North America, but with some degree of irregularity. Although not observed by Sir John Richardson in the Arctic regions, it has been obtained as far north as New Caledonia. Dr. Townsend observed it in Oregon, Dr. Gambel in California, Mr. Audubon in Kentucky and Louisiana, Wilson in New Jersey, McCulloek in Nova Scotia, and Dr. Hoy in Wisconsin. I have an egg from Northern Ohio, and have also observed the bird in various parts of New England. Its nocturnal and secluded habits withdraw it from general observation, so that it is quite possible that this species is a very common one, even where its very existence has been unknown. The Acadian Owls rear their young in the hollows of trees, often only a few feet from the ground, in the deserted nests of other birds, in the crevices of rocks, and, according to Wilson, occasionally construct nests for themselves among thick pine-trees. The eggs are nearly spherical, are of a bright clear white, and more like a Woodpecker's than an Owl's in their crystalline clearness. A specimen from Northern Ohio measures $1\frac{2}{16}$ inches by $\frac{1}{16}$.

ATHENINÆ.

ATHENE HYPUGÆA.

- Strix cucularia*, SAY, Long's Expedition, I, 1819, 200.
 " " BONAP. Am. Orn. I, 1825, 68.
 " " NUTTALL, Manual, I, 1832, 118.
 " " AUD. ORN. Biog. V, 1835, 264, pl. cccxxxii, fig. I.
Strix hypugæa, BONAP. Am. Orn. I, 1825, 72.
Athene cucularia, BONAP. Geog. and Comp. List, 1838, p. 6.
Surnia cucularia, AUD. Syn. 1839, p. 23.
 " " " Birds of Am. I, 1840, 119, pl. xxi. ?
Athene socialis, GAMBEL, Proc. Acad. Phil. III, 1852, 47.
Athene hypugæa, CASSIN, Syn. N. A. Birds (Illust. Birds of Cal.), 1854, p. 188.
 VULG. — *The Burrowing Owl.*

THE Burrowing Owl of North America has been ascertained to be a distinct species from the *Athene cucularia* of South America, with which it was confounded by Audubon, and, since the publication of his Ornithology, by other writers. The *cucularia* closely resembles the Northern species, as well as several other South American varieties, from which, however, it is specifically different. In Western North America, especially in Oregon and California, as well as in Nebraska, Kansas, Arkansas, Utah, Texas, and New Mexico, this Owl is very abundant in certain localities, where the birds live together in large communities, and differ from most members of this family by living and breeding in burrows in the ground. As the habits of this species in this respect are peculiar and interesting, and as I have never had an opportunity to observe them in their native haunts, in order to present a full account of their peculiarities I must avail myself of the observations of others.

Mr. Thomas Say was the first of American naturalists to add this bird to our fauna. He met with it in Colonel Long's expedition to the Rocky Mountains. He encountered them in our trans-Mississippian territories, where he described them as residing exclusively in the villages of the Prairie Dog, whose excavations are so commodious as to make it unnecessary for the bird to dig for itself, which, however, it is able to do when occasion requires. Mr. Say states that these villages are very numerous, and variable in their extent, sometimes covering only a few acres, and at others spreading over the surface of the country for miles together. They are composed of slightly elevated mounds, having the form of a truncated cone, about two feet in width at base, and seldom rising as high as eighteen inches above the surface. The entrance is at the top or on the side. From the entrance the passage descends vertically one or two feet, and thence it continues obliquely downward until it terminates in the snug apartment where the Marmot enjoys its winter's sleep, and where it and the Owl are common, but unfriendly occupants.

Dr. Townsend states that in the plains near the Columbia River this Owl resorts to the forsaken burrows of the marmots and the badgers, but never lives on terms of intimacy with either. The nest he describes as of fine grass, and placed at the

extremity of the hole. The eggs are uniformly four in number, pale white, and about the size of those of the common House Pigeon, the great end, however, being remarkably large, and tapering abruptly.

Dr. Heermann's account, describing individuals met with in California, differs somewhat from the above. He speaks of the nest as composed of a few straws placed at the end of a winding burrow, varying from four to ten feet in length, and the eggs as four in number, pure white, and nearly spherical. Dr. Gambel, who also observed this bird in California, states that he has occasionally found the bird in solitary burrows, and also that it often makes use of the holes dug by the large ground-squirrel (*Spermophilus beecheyi*), which is there a very common species. The Owls often dig their own burrows, and live in scattered companies of four or five. Dr. Gambel also states that the bird is a resident of California throughout the year. Dr. Woodhouse found it abundant west of the Arkansas River, and noticed that, though he often found the Owl and Marmot together, he also frequently met with them separately, the Marmots where there was apparently no water, the Owls always in the vicinity of water. He frequently found the latter in villages by themselves. On being approached, they commenced chattering and bowing, presenting quite a ludicrous appearance.

Mr. Darwin, in the Zoölogy of the Beagle, met with the *A. cunicularia*, a larger species, in crossing the Pampas of South America. In Banda Oriental, he says, it is its own workman, and excavates its burrows on any level spot of sandy soil, but in the Pampas, or wherever the Bizcacha is found, it uses those made by that animal. This bird, he states, preys on mice and reptiles, the North American bird on insects. Lieutenant Gilliss gives a similar account of it, from observations made in Chile. The egg of this Owl is slightly oblong and somewhat more pointed at one end, differing in this from the eggs of most Owls. It measures $1\frac{5}{16}$ inches in length by $1\frac{2}{16}$ in breadth. Its color is clear and uniform white.

Since the above was prepared, my esteemed young friend, Mr. Nathaniel H. Bishop, of Medford, Mass., has kindly furnished me with the following interesting account of his observations on the habits of the *A. cunicularia*. They were made by him during his adventurous journey across the Pampas of South America. Although the *cunicularia* is not a North American bird, his notes are appropriate here as affording an interesting comparison between the habits of two very closely allied species.

"I first met with the bird on the banks of the river San Juan, in Banda Oriental, one hundred and twenty miles west of Montevideo, where a few pairs were seen, devouring mice and insects. From the San Juan, travelling westward, thirty miles, I did not meet with a single individual; but after crossing the River Las Vacas, and coming upon a sandy waste covered with scattered trees and low bushes, I again met with several.

"Upon the Pampas of the Argentine Republic they are found in great numbers, from a few miles west of Rosario, which lies on the Parana, in latitude $32^{\circ} 56'$ south, long. $60^{\circ} 32'$ west, to the vicinity of San Luis, where the Pampas end and the Travesia or desert commences. On these immense plains of grass it lives in company

with the Bizcacha (*Lagostomus trichodactylus*), an animal that bears resemblance to the rabbit and agouti, and undermines a great extent of country with its burrows. This Owl is similar to that which inhabits the holes of the marmots upon the prairies of Western North America. A writer, speaking of the habits of that variety, remarks: 'We have no evidence that the Owl and Marmot habitually resort to one burrow'; and Say adds, that they were either common though unfriendly residents of the same habitation, or that our Owl was the sole occupant of a burrow acquired by the right of conquest. In this respect they differ from their South American brothers, who live in perfect harmony with the Bizcacha, and during the day, while the latter is sleeping, a pair of Owls stand a few inches within the main entrance of the burrow, and at the first sound, be it near or distant, they leave their station and remain outside the hole, or upon the mound that forms the roof of their domicile. When man approaches, both birds mount above him in the air, and keep up an alarm-note, with their irides dilated, until he passes. Then they quietly settle down in the grass, or return to their former place. On the Pampas I did not observe these birds taking their prey during the daytime, but as soon as the sun had set, the Bizcacha and Owls leave their holes, in search of food, the young of the former playing about the birds as they alight near them. They do not associate in companies, there being but one pair to a hole. Each couple keeps separate from their neighbors, and at night do not stray from their homes.

"In North America this species suddenly disappears in the early part of August, and, the Indians say, returns into its burrow and spends the winter in a torpid state, and also it is 'strictly diurnal.' In South America, it has not these habits; it does not disappear for a season, and it is both diurnal and nocturnal, for in Banda Oriental and the province of San Juan I have seen it feed at all hours. At longitude 66° west, our company struck the Travesia, and during fourteen days' travel on foot I did not see a dozen of these birds. But while residing outside the town of San Juan, which lies upon the eastern base of the Andes, one hundred and fifty miles north of Mendoza, I had a fine opportunity to watch their habits in a locality differing entirely from the Pampas. The country around San Juan is a dreary desert, covered with low thorn-trees, and over this waste a few Owls are found, principally near the town itself, in the vicinity of the pastures that are cultivated by irrigation. The months of September and October are the conjugal ones. One evening I was attracted by a strange sound that I supposed proceeded from a frog, but it proved to be the love-note of a little *Athene cunicularia*, and which was answered by his mate. The little fellow alighted upon a post and commenced turning around upon it, with throat dilated and emitting a guttural sound. These antics were continued for more than a minute, he occasionally bowing his head in a mysterious manner, which reminded us of an old male Pigeon of our dove-cots. The female soon after joined him, and they flew away. Each night he perched himself upon a tall flag-staff and uttered his love-note. Close by the house was a lagoon, the borders of which were swampy, and over this a pair often hovered in search of food. I watched one that kept on the wing for nearly two hours, some fifty feet from the ground, and during that time did not change his position in any other way than by rising

or falling a few feet. During the middle of September I had given me a male bird with a broken wing. He lived in confinement two days, and died from the effects of the wound. Soon after, a boy brought me a female with five eggs that had been taken from a burrow, five feet from the mouth. The burrow wound among the roots of a tree beneath which it was dug. The bird was very fierce on her cage, and fought me with her wings and beak, uttering all the while a long shrill note, resembling a file drawn across the teeth of a saw. I supplied her with eleven full-grown mice, which she devoured during the first thirty-six hours of her confinement. In San Juan and Banda Oriental, they do not *hover* for prey in the daytime, but watch from the top of some low trees, and do not perch on the fruit-trees, such as the orange, fig, olive, &c.

“My object was to discover if this bird burrowed its own habitation, and my observations of eight months failed to impress me with that belief. I have conversed with intelligent persons who have been familiar with their habits, and never did I find one that believed it to be its own workman. It places a small nest of feathers at the end of the hole, in which are deposited five white eggs, though Nuttall mentions that this bird in North America lays but two.

“In Banda Oriental, where the country is as fine and food far more plenty than upon the Pampas, this Owl is not common compared with the latter locality. The reason is obvious. The Bizcacha does not exist north of the Plata, and consequently these birds have a poor chance for finding habitations.

“For thirty miles beyond the San Juan River, in Banda Oriental, the ground was covered with dead beetles and other insects, the food of this bird; but I did not meet a single Owl during that day’s journey. On the Pampas, where thousands upon thousands of Bizcachas undermine the soil, there in their true locality you find the same number of Owls. About San Juan (not the river), at the foot of the Andes, where a Bizcacha is rarely met with, we find only a few pairs; and does the hole dug among the roots of a tree appear to be the work of a bird or animal?

“Of this Owl in North America, Audubon says it lives in the excavations of the marmots, and *does not dig for himself*, as he is said to do in other parts of the world where no burrowing animals exist. The several works that I have consulted do not in one instance state the manner in which these Owls work when digging out a habitation, though all agree that it does burrow. Why could not some of these gentlemen state the result of the observations regarding this particular fact? Perhaps at some distant day some lucky ornithologist may catch a little fellow at work, and by reporting his evidence will upset my views upon the subject.”

GLAUCIDIUM INFUSCATUM.

- Strix infuscata*, TEMM. Manual d'Orn. I, 1820, 97.
Glaucidium gnoma, WAGLER, Isis, XXV, 1832, 275.
Strix passerinoides, AUD. Orn. Biog. V, 1835, 271, pl. ccccxxxii, figs. 4, 5.
 " " " Syn. 1839, p. 23.
 " " " Birds of Am. I, 1840, 117, pl. xxx.
Glaucidium infuscatum, CASSIN, Syn. N. A. Birds (Illust. Birds of Cal.), 1854, p. 189.
 VULG. — *Little Columbian Owl. The Pigmy Owl. Chereche Cherechoide* (Temm).

LITTLE is known in regard to the habits of this, the smallest of American Owls. It was first obtained by Dr. Townsend on the Columbia River, near Fort Vancouver, and subsequently by Dr. Gairdner near the same locality. Drs. Cooper and Suckley also found it in various portions of Washington Territory. Mr. Bell and Dr. Heermann have since observed it in California, where the latter met with four birds, three of which he obtained in the daytime on trees bordering the Calaveras River. They were gentle, unsuspecting, and easily approached, and their stomachs were filled with crickets. I have a drawing of an egg of this bird, taken by Dr. James Trudeau, but where the egg was obtained from which it was drawn, or how or where it nests, I am unable to state. The egg is of a clear crystal white. Its shape is nearly exactly spherical. Its measurements are $1\frac{1}{6}$ inches in length by one inch in breadth. I am as yet unable to illustrate its egg.

NICTEININÆ.

NYCTEA NIVEA.

- Strix nyctea*, LINN. Syst. Nat. I, 1766, 132.
 " " WILS. Am. Orn. IV, 1812, 53, pl. xxxii, fig. 1.
 " " BONAP. Syn. 1828, p. 31.
 " " RICH. & SWAINS. F. B. A. II, 1831, 88.
 " " LATHAM, Index Orn. I, 1790, 57.
 " " AUD. Orn. Biog. II, 1835, 135; V, 382; pl. cxxi.
Strix candida, LATHAM, Ind. Orn. Supp. 1801, p. 14.
Strix erminea, SHAW, Gen. Zoöl. VII, 1809, 251.
Strix arctica, BARTRAM, Trav. 1791, p. 289.
Strix nivea, DAUDIN, Traité d'Orn. II, 1800, 190.
Nyctea candida, BONAP. Geog. and Comp. List, 1838, p. 6.
Surnia nyctea, AUD. Syn. 1839, p. 21.
 " " " Birds of Am. I, 1840, 113, pl. xxviii.
Nyctea nivea, CASSIN, Syn. N. A. Birds (Illust. Birds of Cal.), 1854, p. 190.
 VULG. — *The Snowy Owl. The White Owl. Great White Owl. Snow Owl.*

This is an exclusively Northern species, and is probably chiefly confined to the Arctic Circle and the adjacent portions of the temperate zone, in both the Eastern

and Western continents. It is only met with in the United States in midwinter, and is much more abundant in some years than in others. Individual specimens have been occasionally noticed as far south as South Carolina, but very rarely. It has also been observed in Kentucky, Ohio, the Bermuda Islands, and in nearly every part of the United States. On the Eastern continent it appears to be much less abundant, and its visits south are neither so frequent nor to the same extent. Although in one instance it has been known to breed on the Shetland Islands, very few instances are on record of its having been obtained in Great Britain, and only one in Holland. It is found in Iceland, Sweden, and Norway, and probably also throughout Northern Europe and Asia.

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

It nests on the ground, and lays three or four globular white eggs, only two of which, Richardson states, are in general hatched.

I am unable to represent the egg in my plates, having never seen a specimen. I have only a drawing, made by Mr. Audubon, of a specimen in an English cabinet. It is nearly spherical, and its color is a dull white with a slightly yellowish tinge. It measures $2\frac{5}{16}$ inches in length by 2 inches in breadth.

SURNIA ULULA.

- Strix ulula*, LINN. Syst. Nat. I, 1766, 133.
Strix uralensis, GMELIN, Syst. Nat. I, 1788, 295.
Strix hudsonica, " " " " "
 " " WILS. Am. Orn. VI, 1812, 64, pl. 1, fig. 6.
Strix doliata, PALLAS, Zoöl. I, 1811, 316.
Strix borealis, LESSON, Traité d'Orn. I, 1831, 100.
Strix fumerea, BONAP. Syn. 1828, p. 25.
 " " RICH. & SWAINS. F. B. A. II, 1831, 92.
 " " NUTTALL, Manual, I, 1832, 115.
 " " AUD. Orn. Biog. IV, 1835, 350, pl. cccclxxviii.
 " " DE KAY, Nat. Hist. N. Y. 1844, pl. ix, fig. 19.
Surnia fumerea, BONAP. Geog. and Comp. List, 1838, p. 6.
 " " AUD. Syn. 1839, p. 21.
 " " " Birds of Am. I, 1840, 112, pl. xxvi.
Surnia ulula, CASSIN, Syn. N. A. Birds (Illustr. Birds of Cal.), 1854, p. 191.
 VULG.— *The Hawk Owl. Little Hawk-Owl. Le Chat-Huant du Canada* (Brisson).

I AM unable to illustrate the egg of this species. The only knowledge that I possess, which seems to be authentic, in regard to the nest of these birds, as well as

in regard to their eggs, is derived from Richardson's Northern Zoölogy. We are there informed that it builds on a tree. Its nest consists of sticks, grass, and feathers. It lays two white eggs. It is exclusively an Arctic species, and is common to the northern regions of both continents. Occasional specimens are obtained in different parts of the United States, though none, so far as I am aware, farther south than New Jersey. It is, however, a rare species,¹ excepting in the Arctic regions, where it is said to be quite abundant. Only a single specimen is known to have been taken in Great Britain, and it has only occasionally been met with in Germany. From this we may infer that it is as rare a bird in the more temperate parts of Europe as in the corresponding regions of America.

¹ Mr. Audubon, in his account of the Hawk Owl, states that he had received a letter from me informing him that the Hawk Owl is very common about Memphremagog Lake in Vermont, &c. This was a mistake, and an unintentional misquotation of what I wrote. I did not make this statement as of my own knowledge, for I had never been in that region, but as the information given me by a resident of that part of the country, which I have since had reason to believe is incorrect. The Hawk Owl is probably a rare species throughout Vermont.

ORDER INSESSORES.

TRIBE FISSIROSTRES.

FAMILY CAPRIMULGIDÆ.

ANTROSTOMUS CAROLINENSIS.

- Caprimulgus carolinensis*, GMELIN, Syst. Nat. II, 1788, 1028.
 “ “ WILS. Am. Orn. VI, 1812, 95, pl. liv, fig. 2.
 “ “ BONAP. Syn. 1828, p. 61.
 “ “ AUD. Orn. Biog. I, 1832, 273; V, 401, pl. lii.
 “ “ NUTTALL, Manual, I, 1832, 612.
 “ “ AUD. Syn. 1839, p. 31.
 “ “ “ Birds of Am. I, 1840, 151.
 “ “ LEMBÈYE, Aves de la Isla de Cuba, 1850, p. 130.
Caprimulgus lucifugus, BARTRAM, Travels, 1793, p. 292.
Caprimulgus rufus, VIEILL. Ois d'Am. Sept. I, 1807, 57.
Caprimulgus brachypterus, STEPHENS, Gen. Zoöl. X, 1817, 150.
Antrostomus carolinensis, BONAP. Geog. and Comp. List, 1838, p. 8.
 “ “ CASSIN, Syn. N. A. Birds (Illust. Birds of Cal.), 1854, p. 236.
 VULG. — *Chuck-wills-widow*. *The Great Carolina Goat-Sucker*.

HAVING had no opportunities of observing the Chuck-wills-widow in its extremely southern habitat, the present account of its habits and geographical range is necessarily drawn from the investigations, and given on the authority, of others. James River in Virginia has been assigned as the utmost northern limit of its migrations. It is, indeed, quite probable that it is seldom, if ever, found, except as an occasional visitant, so far to the north, although Wilson speaks of having met with it between Richmond and Petersburg, and on the Cumberland River. Dr. Bachman states that it is not a common bird even in the neighborhood of Charleston. Mr. Audubon, who claimed to have been a very close and careful observant of its habits, states, in his account of it, that it is seldom to be met with beyond the limits of the Choctaw nation in Mississippi, or the Carolinas on the Atlantic shore. Florida, Louisiana, the lower portions of Georgia, Alabama, and Mississippi, and probably Arkansas and Texas, are the States to which it is principally confined.

My friend, Dr. Kollock, informs me that it is rather common near Cheraw, in the northern part of South Carolina. Dr. Bryant found it abundant near Indian River, in Florida. Colonel McCall met with this bird in New Mexico. Lembeye gives it a place among the birds of Cuba. Dr. Woodhouse, in his report upon the birds observed by the expedition of Captain Sitgreaves down the Zuñi and Colorado rivers speaks of the *Caprimulgus carolinensis* as common in the Creek and Cherokee country, extending into Texas and New Mexico.

Like most birds of this family, the Chuck-wills-widow makes no nest, but deposits her eggs on the bare ground. These are two in number, and the places selected for them are usually thickets and solitary parts of dark woods. The ground color of their eggs is a clear crystal white. They are more or less spotted, or marked over their entire surface with blotches of purplish-brown and a grayish-lavender color, with smaller occasional markings of a light raw-umber-brown. They are oval in shape, large for the size of the bird, and alike at either end. The accompanying representation is taken from an egg obtained in Florida, by Dr. Henry Bryant, of Boston, who found the eggs of this bird in the same situations, in thick woods, that are mentioned by Mr. Audubon, deposited on the dry leaves, without any attempt at a nest.

According to the careful observations of this watchful naturalist, the Chuck-wills-widow, although it makes no nest, usually scratches a little space on the ground, among some dead leaves. In this she deposits her two elliptical treasures. If the eggs or the young are meddled with, this bird is sure to take alarm, and to remove them, each parent aiding, to some other and distant part of the wood. After a removal, it would be extremely difficult, if not impossible, to find them. This has been observed in respect to their eggs, and it is presumed that they do the same with their young, when these are quite small. Mr. Audubon spent much time in trying to ascertain by what means these birds remove their eggs when they have been touched or handled. He states that they are carried off in the capacious mouths of their parents. Each bird was observed by him, when on the watch for the purpose of ascertaining, to take an egg in this manner and fly off, skimming closely over the ground, until lost among the branches and trees. To what distance they were removed he was never able to ascertain. He has also known the young to be removed, and he presumed the removal to have been made by their parents in the same manner, although he was never eyewitness to it.

During incubation they are said to cease from repeating their peculiar cry, from which they take their name, especially after their young are hatched, although it is resumed before they depart on their southern migrations, in August.

In shape and marking, their eggs closely resemble those of the Whip-poor-will, differing only in their larger size. All that I have seen are broadly oval in shape, and measure $1\frac{7}{16}$ inches in length by $1\frac{1}{16}$ in the greatest breadth.

ANTROSTOMUS VOCIFERUS.

- Caprimulgus vociferus*, WILS. Am. Orn. V, 1812, 71, pl. xli.
 “ “ BONAP. Syn. 1828, p. 62.
 “ “ AUD. Orn. Biog. I, 1832, 422 ; V, 405 ; pl. lxxxii.
 “ “ NUTTALL, Manual, I, 1832, 614.
 “ “ AUD. Syn. 1839, p. 31.
 “ “ “ Birds of Am. I, 1840, 155, pl. xlii.
 “ “ RICH. & SWAINS. F. B. A. II, 1831, 336.
 “ “ LEMBEYE, Aves de la Isla de Cuba, 1850, p. 130.
Caprimulgus virginianus, VIEILL. Ois d'Am. Sept. I, 1807, 65.
Caprimulgus clamator, VIEILL. Nouv. Dict. X, 1817, 234.
Caprimulgus macromystax, WAGLER, Isis, 1831, p. 533.
Antrostomus vociferus, BONAP. Geog. and Comp. List, 1838, p. 8.
 “ “ CASSIN, Syn. N. A. Birds (Illust. Birds of Cal.), 1854, p. 236.
 VULG. — *The Whip-poor-will.*

THE nocturnal habits of the Whip-poor-will do not enable the naturalist either very closely to observe them, or to ascertain them with accuracy. Much is necessarily inferred, rather than positively known, in regard to them. Seldom approaching the habitation of man, except in remote and thinly settled parts of the country, and then only in the obscurity of night, its singular note is nearly all that we are quite familiar with in regard to it. To this only can be attributed the singular fact that, notwithstanding the well-marked distinctions between it and the Night-Hawk, they have been, and still are, in many parts of the country, confounded together by the uninformed. The correctness of a statement to the same effect made by Mr. Wilson has been questioned by Mr. Audubon, but without good grounds. Unaccountable as it may appear, the vulgar error that these birds are the same is still very prevalent in many parts of New England, and even finds a place among those who are not wanting in intelligence upon other matters. Incapacitated by its optical conformation from going abroad in the daytime, the Whip-poor-will carefully conceals itself in the most retired and shady parts of deep woods. There it remains perfectly silent through the day, seldom disturbed by the steps of man. In these retreats this bird is rarely met with, and naturalists have but few opportunities to study its habits. The sight of the Whip-poor-will, like that of nocturnal Owls, appears not to be adapted to the light of day. Its chief food is nocturnal insects, obtainable only by twilight, or at night; it is therefore seldom seen abroad in the daytime, and then only in dark or cloudy weather. The habits both of the preceding species and the Whip-poor-will, so far as they have been observed, are closely identical with each other. Like the Chuck-wills-widow, the Whip-poor-will, if its eggs or young are handled, will remove them to another part of the woods. Wilson relates that, having once accidentally met with a young bird of this species, in passing through a wood, he stopped and sketched it. Returning to the same place in search of a pencil he had left behind him, after a short absence, the young bird was nowhere to be found. It had in the mean while, we are left to infer, been conveyed away by

its parent, who had, in the first place, sought in vain to entice the intruder away by well-feigned stratagems. Mr. Audubon's observations in the case of the Chuck-wills-widow suggest the manner of its removal.

If disturbed by a too near approach to her eggs or her young, the Whip-poor-will attempts to draw off the intruder by well-acted feints, fluttering about his feet as if wounded, or beating the ground with her wings, as if hardly able to move, or nearly expiring.

Massachusetts is the extreme northern limit of its distribution along the Atlantic coast. It is nowhere very abundant near the sea, but becomes more common as we leave the coast, and as we proceed westward is found much farther to the north. In the central parts of the continent, it has even been met with in latitude 49°. It is to be met with nearly throughout the United States, with the exception of the extreme northeastern and southern and southwestern portions.

Sir John Richardson observed this bird on the northern shores of Lake Huron only, but did not meet with it north of the fiftieth parallel. Dr. Hall, of Montreal, mentions it as a Canadian bird. It is found in all the New England States, but is less common north of Massachusetts. In a list of the birds of Nova Scotia, prepared by Lieutenant Bland, Royal Engineers, the *Caprimulgus vociferus* is given as a rare species. Mr. Lembeze gives it as a Cuban species, and Bartram found it in Florida. Dr. Woodhouse, in his account of the birds noticed by the party who explored the Zuñi and Colorado rivers, under Captain Sitgreaves, did not meet with this species, nor can I learn that it has been met with west of the Mississippi.

The Whip-poor-will constructs no nest, but deposits her eggs on the bare ground, in the thickest and most shady part of the woods. They always select elevated and dry places, and usually scratch a small hollow among some dry leaves or sticks, or near some prostrate log, in which they deposit their two elliptical eggs. The young, when just hatched, are perfectly helpless, and depend for their safety upon their resemblance to a piece of mouldy earth. They are very soon able to follow their parents, and to take care of themselves.

The egg of the Whip-poor-will is not much unlike that of the Night-jar of Europe. It is oblong and oval, each end nearly exactly alike in size and shape. Nothing could well surpass it in the beauty of its markings. Its ground color is a clear pure shade of cream-white, and the whole egg is irregularly spotted and marbled with patches, lines, and bars of purplish-lavender intermixed with reddish-brown. The lavender-colored markings have a very peculiar effect, as if, after the color had been first laid on, a thin coating of the ground shade had been superadded, so as to slightly dim, without concealing them. The brown markings appear to stand out much more distinctly. The eggs also exhibit slight variations in the distribution of these tints. In some, the brown-colored markings predominate, in others the lavender spots are the more abundant; but I have seen none in which either of these shades was wanting. The egg measures $1\frac{1}{4}$ inches in length by $\frac{7}{8}$ of an inch in breadth.

In the Southern and Middle States, the Whip-poor-will deposits her eggs as early as the first or second week in May. In Massachusetts and its more northern and western places of resort, it seldom sits on its eggs before the first week in June. It

does not remain in its breeding-places long after it has reared its first and only brood for the season. As soon as its young are ready for the journey, they all depart for their southern quarters, which is usually in the month of August. They are silent in the breeding season, but resume their peculiar cries as soon as their young are able to take care of themselves.

ANTROSTOMUS NUTTALLII.

Caprimulgus nuttallii, AUD. Orn. Biog. V, 1839, 335.

“ “ “ Birds of Am. VII, 1844, 350, pl. cccxcv.

Antrostomus nuttallii, CASSIN, SYN. N. A. Birds (Illust. Birds of Cal.), 1854, p. 237.

VULG. — *Nuttall's Whip-poor-will*. *Parauque* (Matamoras, Tamaulipas).

THE egg represented in Plate V, fig. 58, was found among the collection of Dr. Berlandier, and obtained by that gentleman in the vicinity of Matamoras in the Province of Tamaulipas, Mexico. It is not positively known to be the egg of this newly-discovered species, yet I have very little doubt that it is so. Its shape, markings, and general characteristics show it to be an egg of a *Caprimulgus*, and its size indicates as its parent a bird not larger than this species, which is the only one now known to be found in that neighborhood. The only name bestowed upon it by Dr. Berlandier was *Parauque*, by which he also designated another egg, supposed to be that of a *Chordeiles*, and which I presume to belong to the species recently described by George N. Lawrence, Esq. as *C. texensis*.¹ Nothing is said, in his notes, of the habits of the bird described under the name of *Parauque*, its manner of breeding, or the peculiarities of the eggs. The description of the birds is quite obscure, and designates with certainty no known species. The probability is, however, so strong that the egg referred to is that of *Caprimulgus nuttallii*, and that the one represented in Plate V, fig. 62, is the egg of *C. texensis*, that I have felt justified in including both among the illustrations, stating only the uncertainty of the ground upon which the assignment rests.

The *Caprimulgus nuttallii* was first obtained by Mr. Audubon near the Rocky Mountains in the Northwest Territory, and was described by him in the fifth volume of the Ornithological Biography (p. 335). Nothing was observed by that writer of its habits. It was obtained in Oregon by the United States (Vincennes) Exploring Expedition. Specimens have been procured in Washington Territory by Drs. Cooper and Suckley. Mr. T. H. Clark obtained it in Texas, and Dr. Woodhouse, in the expedition to the Zuñi, in passing down the Little Colorado River, found this species quite abundant. He also met with it afterwards in the San Francisco Mountain, near the same river. In the collection made by Dr. Woodhouse there are several

¹ Ann. Lyc. Nat. Hist. VI, 167.

specimens of this bird, both male and female, exhibiting no observable variation in their plumage. These observations fix with some probable approach to exactness the distribution of this handsome species during the breeding season, showing that it is found throughout Texas, New Mexico, the more northern provinces of Mexico, the Indian Territories, Kansas, and Nebraska, and thence to the Pacific; and that it is in all probability to be found in the State of California, as well as in the Territories of Washington and Oregon.

The peculiar and uncertain blending of shades make a verbal description of the eggs supposed to belong to this species difficult and unsatisfactory, and one which can only be approximated. It is almost exactly elliptical in shape, equal at either end, measures 1 inch in length and $\frac{1}{4}\frac{2}{6}$ of an inch in breadth. Its ground color, examined through a magnifying-glass, appears to be a yellowish-white, but is so generally marbled and spotted with blotches of a purplish-gray and smaller spottings of a lightumber-brown, that the ground is hardly distinguishable to the naked eye.

CHORDEILES VIRGINIANUS.

- Caprimulgus virginianus*, BRISSON, Orn. II. 1760, 477.
 “ “ BONAP. Syn. 1828, p. 62.
 “ “ RICH. & SWAINS. F. B. A. II, 1831, 337.
 “ “ NUTTALL, Manual, I, 1832, 619.
 “ “ “ “ II, 1834, 609.
 “ “ AUD. Orn. Biog. II, 1835, 233; V, 407; pl. cxlvii.
Caprimulgus popetue, VIEILL. Ois d'Am. Sept. I, 1807, 56, pl. xxiv.
Caprimulgus americanus, WILSON, Am. Orn. V, 1812, 65, pl. xl.
Chordeiles virginianus, BONAP. Geog. and Comp. List, 1838, p. 8.
 “ “ AUD. Syn. 1839, p. 32.
 “ “ “ Birds of Am. I, 1840, 159, pl. xliii.
 “ “ GOSSE, Birds of Jamaica, 1847, p. 33.
 “ “ DE KAY, Nat. Hist. N. Y., Birds, 1844, pl. xxvi, fig. 60.
 “ “ LEMBEYE, Aves de la Isla de Cuba, 1850, p. 51.
 VULG. — *The Night-Hawk*. *The Pisk*. *Peesquaw* (Cree Indians). *Musquito-Hawk*. *Pyramidig* (Jamaica). *Berequetec* (Cuba).

THE geographical distribution of the Night-Hawk is very nearly the same as that of the Whip-poor-will, though somewhat more extended. While not found, in its breeding season, quite so far to the south, its distribution, especially along the Atlantic coast, extends considerably farther to the north. I have met with it throughout the provinces of Nova Scotia and New Brunswick. It has been found in all parts of Canada, and has even been met with breeding as far to the north as the shores of Hudson's Bay. It is also widely diffused from east to west, although the extent of its distribution in the latter direction is not known with exactness or cer-

tainty. They have been at least ascertained to extend as far to the west as the sources of the Mississippi. The extreme southern point at which it is known to breed is the northern portion of Georgia and South Carolina. Throughout nearly the whole of this wide range, the Night-Hawk appears to be distributed in about equal numbers.

In many of its habits, as well as in its external generic distinctions, this bird exhibits so many and so broad differences from the Whip-poor-will, that there is little apparent occasion to confound them. It is much less nocturnal in every respect, and is not, strictly speaking, entitled to its name of Night-Hawk. It is rather to be regarded as occupying more nearly a middle ground between nocturnal and diurnal birds. It is not unfrequently to be seen on the wing, even in bright, sunny weather, at midday, in pursuit of its winged prey. It is, however, usually most lively early in the morning and just before nightfall, and is usually inactive and slothful in the middle of the day. It is not improbable that its supply of food has much to do with its sluggishness or state of activity. The Night-Hawk is not to be found on the wing after dark. As soon as the twilight begins to deepen into the shades of night, it retires to rest as regularly, if not at quite as early an hour, as other birds, in regard to whose diurnal habits there is no question.

In some of its peculiarities at the time of breeding, the Night-Hawk also displays very marked variations from the habits of the Whip-poor-will at the same period. While the latter always deposits its eggs under the cover of shady trees and in thick woods, the Night-Hawk selects an open rock, a barren heath, or an exposed hill-side for its breeding-place. This is not unfrequently in wild spots in the vicinity of a wood, but is always open to the sun. I have even known the eggs carelessly dropped on the bare ground in a corner of a potato-field, and have found the female sitting on her eggs in all the bright glare of a noonday sun in June, and to all appearance undisturbed by its brilliance. The more common situation for the eggs is a slight hollow of a bare rock, the dark, weather-beaten shades of which, with its brown and slate-colored mosses and lichens, resembling at once the parent and the egg in their coloring, is well adapted to save them from being detected by any chance intruder. If approached when sitting on her eggs, the female will usually suffer you almost to tread upon her before she will forsake them. Then, to draw you from her treasure, she will tumble about and flutter at your feet with an imitation of a wounded bird so perfect, an adroitness in pretending disability so inimitable, that it is hardly possible to resist the temptation to follow in pursuit of her. I know of no better or more skilful adept in these cunning devices than the Night-Hawk.

The eggs of this bird are two in number, and except in their shape, which is uniformly elliptical, exhibit great variations. They vary in size, in their ground color, and in the shades, shape, size, and number of their markings. Yet notwithstanding all these differences in their general effect, they are alike. They all closely resemble oblong-oval, dark-colored pebble-stones. The design of this resemblance is obviously to assure their safety in the exposed situations in which they are placed, causing them to be readily confounded with the stones among which they lie. Six eggs

now by me exhibit the following varying measurements, none of which, it will be seen, exactly correspond: $1\frac{5}{16}$ inches by $\frac{7}{8}$; $1\frac{1}{4}$ by $\frac{29}{32}$; $1\frac{1}{4}$ by $\frac{27}{32}$; $1\frac{3}{16}$ by $\frac{7}{8}$; $1\frac{5}{8}$ by $\frac{27}{32}$; $1\frac{1}{8}$ by $\frac{15}{16}$. In these the ground is of various shades of stone-color; in one, almost a dirty white; in another, with a slight tinge of yellowish; in a third, the shading is somewhat bluish, and in yet another again it is almost clay-colored. The spots and markings, which are thickly diffused over the whole egg, also vary more or less in each specimen. One is finely dotted with small specks of light slate and yellowish-brown. In another, the spots are of the same colors, but are larger and more distinct, and seem as if laid on with a bolder pencil. Again, in a third, they are lighter and more indistinct than in either, the shade of yellow more predominant, and each blending confusedly into the other. In a fourth, the spots are again small, but are all of a dark-brown color, while the remaining two are marbled, but in different degrees, with large lines, veins, and dashes of the same color. With an increased number of specimens these variations might without doubt be extended indefinitely. Still, notwithstanding all these deviations, the egg is readily distinguishable, for I know of no egg, certainly no American, which in shape, size, and markings it at all resembles, with the single exception of an egg which is presumed to belong to the following species.

In regard to the geographical distribution of this species, later observations, published since the above was prepared, are confirmatory of all that has been stated, but do not make our knowledge quite exact as to its western distribution. It is assigned by Mr. Cassin to all temperate North America, and probably passes this limit. Dr. Townsend obtained specimens in Oregon; Dr. Heermann, also, in California; Dr. Hall mentions it in a catalogue of the Birds of Canada which he furnished to Mr. Cassin; Dr. Woodhouse found it throughout the south and west, from the Mississippi River to the Pacific Ocean, in great abundance; Colonel McCall observed it in New Mexico; and specimens from Mexico occur in the Rivoli collection. It has been found also in Nicaragua by Barruel, in Jamaica by Gosse, and in Cuba by Lembeye and Gundlach. Lieutenant Bland, in his catalogue of the Birds of Nova Scotia, mentions it as "common, migratory, and breeding" in that Province. From this it is to be inferred that during the breeding season it has one of the most extended ranges among North American birds, — from Central America on both the Atlantic and Pacific shores to the extreme north.

CHORDEILES TEXENSIS.

?? *Chordeiles sapiti*, BONAP. Cons. Av. 1849, p. 63.

“ “ CASSIN, Syn. N. A. Birds (Illust. Birds of Cal.), 1854, p. 238.

Chordeiles brasilianus, LAWRENCE, Ann. Lyc. Nat. Hist. of N. Y. V, 1851, 114.

Chordeiles texensis, “ “ “ “ “ “ “ VI, 1856, 167.

VULG. — *Parauque* (Berlandier, Matamoros).

NOTHING is known in regard to the habits, and but little as to the distribution, of this newly discovered species. A bird supposed by Mr. Cassin to be the same is given by Bonaparte (Cons. Av. 1849, p. 63), and is very similar in form and general appearance to the preceding species. It differs chiefly in its size. In a paper read before the New York Lyceum, April, 1851, by George N. Lawrence, Esq., of New York, giving a list of additional birds to the North American Fauna, reference is made to this bird as *Chordeiles brasilianus* of Gmelin. In a subsequent paper, read December, 1856, it is described as a new species, under the name of *Chordeiles texensis*. The egg represented (Plate V, fig. 62) is supposed to be that of this species, in part from the description of the parent bird given by Dr. Berlandier, in whose collection it was found, and partly from its apparent affinity, in all but size, to the eggs of the common Night-Hawk. It is possible, however, that it may be the egg of the latter, though it is smaller, and its markings are of a lighter shade, than I have ever observed in the eggs of that bird.

The *C. texensis* has been observed in Texas, by Mr. Clark and Captain McCown; also in New Mexico, Mexico, and Central America, by other naturalists.

The egg presumed to have belonged to a bird of this species may be described as follows: length $1\frac{3}{6}$ inches, breadth $\frac{1}{6}$ of an inch; ground color a clear crystal-white, but so closely covered with overlying markings as not to be discernible except when examined through a magnifying-glass. The egg is marked over its entire surface with small, irregular confluent spots and blotches of a color that seems a compound of black, umber, and purplish-gray. The general appearance of the egg is that of a dark-grayish marble, and, as stated, it is smaller and of a lighter color than that of the common Night-Hawk.

FAMILY HIRUNDINIDÆ.

HIRUNDO RUFÆ.

- Hirundo erythrogaster*, BODDAERT, Tab. Pl. Enl. 1783, p. 45. (?)
Hirundo rufa, GMELIN, Syst. Nat. I, 1788, 1018.
 “ “ BONAP. Syn. 1828, p. 24.
 “ “ NUTTALL, Manual, I, 1832, 601.
 “ “ “ “ II, 1834, 607.
 “ “ BONAP. Geog. and Comp. List, 1838, p. 9.
 “ “ DE KAY, Nat. Hist. N. Y. 1844, pl. xxix, fig. 64.
 “ “ CASSIN, Syn. N. A. Birds (Illust. Birds of Cal.), 1854, p. 243.
Hirundo horreorum, BARTON, Frag. Nat. Hist. of Pa. 1799, p. 17.
Hirundo americana, WILS. Am. Orn. V, 1812, 34, pl. xxxviii, figs. 1 and 2.
 “ “ RICH. & SWAINS. F. B. A. II, 1831, 329.
 “ “ LEMBEYE, Aves de la Isla de Cuba, 1850, p. 41.
Hirundo cyanopyrrha, VIEILL. Nouv. Dict. XIV, 1817, 510.
Hirundo rustica, AUD. Orn. Biog. II, 1835, 413; V, 411; pl. clxiii.
 “ “ “ Syn. 1839, p. 35.
 “ “ “ Birds of Am. I, 1840, 181, pl. xlviiii.
 VULG. — *American Barn Swallow*. *Barn Swallow*. *Swallow*. *Chimney Swallow*. *Golon-
 drina Bifurcata*. *American Swallow*.

NONE of our more common birds are better known or are more universal favorites than the familiar, graceful little Barn Swallows. They are not welcomed merely as the early harbingers of milder skies and summer weather; we greet with even greater pleasure in them the return of gladsome and cheerful companions, — of pleasant and joyous visitors, ever welcome because they never abuse the hospitality they receive. The confiding trust with which they enter the barns and out-buildings of the farmer, or will even venture into the very midst of our most crowded cities, and construct their curiously elaborate nests over our windows and door-sills, wins them an easy way to our affectionate interest. Even this interest is not a little increased and confirmed as we know more of their blameless and innocent lives. Social, affectionate, and kind in their intercourse with their fellows; unceasingly devoted to each other in their conjugal loves and duties; exemplary in their attachment to, and constant, watchful, and faithful in their zealous care of, their offspring; sympathizing, active, and benevolent when their kindred or associates are in difficulties, — there are few indeed among us who might not find, in the daily life of these graceful and lovely birds, bright examples of fidelity to social duties and the practice of domestic virtues which we need not be ashamed ourselves to imitate. In all its intercourse with man, it is his constant benefactor and friend. In no instance is it known, even indirectly, to do him the least injury. It makes its daily food the insects that annoy his cattle, injure his trees, devour his fruit, or attack his own person. Its benefits are unalloyed by any mischievous propensities.

It is therefore hardly to be wondered at that the American Barn Swallow is so general a favorite.

The range of the Swallow is nearly coextensive with North America. Sir John Richardson observed numbers of them, in the month of May, at Fort Good Hope, the most northerly post of America, latitude $67^{\circ} 30'$. The same writer also observed them at Fort Chippewyan, latitude 57° , as early as the 15th of May, taking possession of their nests. They are abundant in Canada, and also in all the British provinces. Dr. Townsend observed them in Oregon, Colonel McCall met with them in New Mexico, and Dr. Woodhouse, in his Report of the Zuñi Expedition under Captain Sitgreaves, speaks of this species as common throughout certain portions of the Indian Territory and Texas, as well as New Mexico. He also found it very abundant, in company with *H. lunifrons*, on the prairies north of the Red Fork of the Arkansas River. Dr. Gundlach and Mr. Lembeye both give it as one of the common birds of Cuba, but Mr. Gosse does not mention it as among those of the neighboring island of Jamaica.

Little is now known with certainty in regard to the localities that were once the natural breeding-places of these birds before the country was settled by civilized man, and before there were any of the present convenient buildings to tempt them to a general and nearly universal desertion of their primitive haunts. We are, however, led to conjecture, from their being occasionally found to make use of the sides of an old well, the abutment of a bridge, or the walls of the natural "sink-holes" which abound in a limestone country, that steep, overhanging rocks, cliffs, caves, and similar places, must have been their chief dependence and resort until they could find safer and more convenient sites in the barns and sheds of the first settlers. Swallows' Cave at Nahant, even within the recollection of many, has been one of these original and primitive breeding-places.

In the Fur countries, where the habitations of man are few and far between, according to Richardson, it inhabits caves, particularly in limestone rocks, and frequents the outhouses of the trading-posts. This is also the case in the vicinity of the Lake Superior copper-mines.

Both Wilson and Audubon have given with so much minuteness and accuracy descriptions of the nest of this bird, that I can hardly hope to add anything to their accounts of its elaborate and beautiful structure. A nest which I very carefully examined while preparing this paper, and which was constructed at the junction of two rafters, under the roof of a barn, intersecting each other at a right angle, furnishes me with what are sufficiently near the average measurements. One of these rafters was placed horizontally; upon this the nest rested. On the left side, against the upright rafter, had been constructed by the pair a very curious platform, which was used by them as a roosting-place, and upon which each partner alternately rested, in order to keep company with and cheer the mate, when occupied with the duties of incubation. Wilson, in describing the nest, speaks of this platform as an extension of its edge, or as an offset. In the present case, it was an independent and separate structure, though closely adjoining the nest. It seemed to afford room sufficient for both birds to occupy it together, when their young were large enough

to fill the nest. It was three inches in length and nearly an inch and a half in breadth, united with the nest only at its extremity. Mr. Audubon states that he never met with this expansion in one recently constructed.

The nest I have referred to was made up of ten distinct and separate layers of mud, worked into small pellets and placed in close juxtaposition. Between each of these layers were interposed successive strata of fine dry grass. The nest measured externally less than five inches in depth, and over five in its largest diameter. The average thickness of its mud wall was about an inch. It was warmly stuffed with fine soft hay, and thoroughly lined with downy feathers. The cavity was two inches deep in its centre, and its largest diameter was three inches. This nest had been several years in constant use by what is presumed to be the same pair of Swallows. Although from eight to ten young have been reared from it yearly, for the last six years, at least, none of them are known to have returned to the shelter of the same roof to increase and multiply in their turn. This suggests the remark, that, although I have occasionally found them, as described by Wilson, Audubon, and Nuttall, breeding together in the larger barns of the farmers, several pairs under the same roof, I have as often found, as in the present instance, a pair occupying for successive years the same locality, without any companions.

Mr. Audubon's measurements of the nest figured by him exceed those here given. This may be owing to his having taken for his subject a nest that was not rested upon, but built against, a rafter, or the side of a building. The stronger and more solid foundation required to support it in that position would explain its superior length and size, as well as account for its more conical shape.

In favorable seasons the Barn Swallows raise two, rarely three, broods in the same year. The number is usually five, often four, but rarely six, in a brood. Nothing can be more interesting than to watch the first lessons in the art of flying and feeding themselves given to the young Swallows by their parents, their stratagems to entice them from their nest, the support given them in their descent to break their fall, and the attentive watchfulness of the one contrasted with the timid awkwardness of the other.

The ground color of their eggs is pure white. When fresh, their shell is so thin and transparent that their yolk imparts to them a beautiful roseate tint. They are marked with spots, usually of a reddish but occasionally of a purplish brown, chiefly at the larger end, varying in number and size. The eggs are smaller, more elongate, and the spots with a more distinctly reddish shade, than those of the Cliff Swallow. They vary in their shape as well as in their markings. One now before me, unusually elongated, measures $\frac{1}{16}$ of an inch in length and only $\frac{8}{16}$ in its greatest breadth. Another is $\frac{1}{16}$ by $\frac{9}{16}$. It will at once be seen how much these two eggs must differ in their shape.

The following are the measurements of a large series of the eggs of this bird: greatest length $\frac{1}{16}$ inch; least do. $\frac{1}{16}$ inch; average do. $\frac{2}{32}$ inch. Average breadth $\frac{9}{16}$ inch; greatest do. $\frac{1}{16}$ inch; least do. $\frac{8}{16}$ inch.

HIRUNDO LUNIFRONS.

- Hirundo lunifrons*, SAY, Long's Exp. to Rocky Mountains, II, 1823, 47.
 " " RICH. & SWAINS. F. B. A. II, 1831, 331.
 " " CASSIN, Syn. N. A. Birds (Illust. Birds of Cal.), 1854, p. 243.
Hirundo opifex, CLINTON, Ann. Lyc. Nat. Hist. of N. Y. I, 1824, 161.
Hirundo respublicana, AUD. Ann. Lyc. Nat. Hist. of N. Y. I, 1824, 164.
Hirundo fulva, BONAP. Am. Orn. I, 1825, 63, pl. vii, fig. 1.
 " " " Syn. 1828, p. 64.
 " " NUTTALL, Manual, I, 1832, 601.
 " " AUD. Orn. Biog. I, 1832, 353; V, 415; pl. lxxviii.
 " " NUTTALL, Manual, II, 1834, 607.
 " " BONAP. Geog. and Comp. List, 1838, p. 9.
 " " AUD. Syn. 1839, p. 35.
 " " " Birds of Am. I, 1840, 177, pl. xlvii.
 " " DE KAY, Nat. Hist. N. Y., Birds, 1844, pl. xxx, fig. 64.
 VULG. — *Cliff Swallow*. *Fulvous Swallow*. *White-nosed Swallow*. *Republican Swallow*.
Eave Swallow. *Rocky Mountain Swallow*. *Mud Swallow*. *White-fronted Swallow*.

THE careful investigations of Mr. John Cassin, of Philadelphia, have very clearly established sufficient specific differences between the Cliff Swallow of the United States and the *Hirundo fulva* of Vieillot to justify their separation into distinct species. The specific name of *lunifrons*, first given to our species by Mr. Say, belongs to it, therefore, by the strict rules of nomenclature, and well expresses its most striking characteristic. In some parts of New England these new-comers are distinguished from the common inmate of our barns by the name of the "White-faced Swallow."

The history of this social bird, in all that relates to its mode of breeding and its habits at that busy period, is replete with interest and full of attractive incidents. Intimately connected with its domestic economy arises the difficult problem of its geographical distribution, past and present. The opinion is very generally entertained, and certainly has the weight of evidence in its favor, that the Cliff Swallow was formerly found only on the western side of the continent, and that its appearance on the Atlantic coast has been a very recent occurrence. A negative fact of this nature is not often so susceptible of positive proof as naturalists would usually insist upon. It is now too late to establish by certain evidence, and beyond all doubt, the fact of its former absence from our Atlantic shores. Yet it would certainly be difficult, I am almost justified in saying impossible, to reconcile with its presence, now so conspicuously manifest, the profound ignorance of its very existence that prevailed until within a few years. There are not wanting, however, those who are not ready to admit the correctness of conclusions apparently so well founded. Some boldly contend that it has always been here, but that its presence has somehow been unaccountably overlooked by naturalists, though known to the common people. Others urge the hardly less improbable supposition that it has always existed on the more northern portion of the eastern coast, where naturalists have only recently pushed

their investigations, and that they have not since very materially extended the area of their habitat. In favor of this theory, they appeal to the fact that Vieillot was one of the first to receive a specimen of this bird obtained at sea off the coast of Nova Scotia. It is true that these birds are much more abundant in the British Provinces, in Maine, and in the northern parts of New Hampshire, Vermont, and New York, than elsewhere this side of the Alleghanies. They are also well known to have existed in those localities long before they appeared in places farther south, where their presence is also known to be of very recent date. Still, my own impressions favor the belief that its presence to any considerable extent on this side of the Mississippi valley is an event at least coincident with their discovery by Major Long, and that, in its migrations eastward, this species has followed the shores of the great lakes and the banks of the Ohio and other tributaries of the Mississippi. Spreading out from these great highways, they have peopled the country around, and extended their busy colonies to their present habitat far to the south and east. In these views I am indirectly confirmed by the observations of Sir John Richardson, who in his description of the habits of this species (*Fauna Boreali-Americana*, II, 331) makes the following interesting observations: —

“This species was discovered by Major Long in 1820. It was seen the same year in great numbers by Sir John Franklin’s party on the journey from the Cumberland House to Fort Enterprise, and on the banks of Point Lake, in latitude 65°. Its clustered nests are of frequent occurrence on the faces of the rocky cliffs of the Barren Grounds, and are not uncommon throughout the whole course of the Slave and Mackenzie rivers. On the 25th of June, in the year 1825, a number of them made their *first appearance* at Fort Chippewyan, and built their nests under the eaves of the dwelling-house, which are about six feet above a balcony that extends the whole length of the building, and is a frequent promenade. Fort Chippewyan has existed for many years, and trading-posts had been established in the Fur countries for a century and a half; yet this is the first instance of this species of Swallow placing itself under the protection of man within the widely extended lands north of the great lakes. What cause could have thus suddenly called into action that confidence in the human race with which the Framer of the universe has endowed this species, in common with others of the Swallow tribe?”

It is not improbable that this species has not even now reached the final limits of its migrations. It is at least certain, that, wherever met with, the inhabitants almost invariably speak of them as new-comers, and give very exact and generally recent dates for their first appearance in the neighborhood.

The cause of this remarkable change of locality may readily be found in the greater conveniences for breeding-places supplied by the spread of civilization in the country. The eaves of houses, barns, and other buildings, furnish much safer shelter against storms, and greater security against their natural enemies, than the steep cliffs, rocks, and river-banks which formed their original breeding-places. To similar superior attractions presented by the dwellings of man may we also attribute corresponding changes in the natural habits of other species of the Swallow tribe. The common Swallow, on the appearance of man, at once deserts his natural haunts

for the beams and rafters of barns and out-buildings, and even ventures into the streets of crowded cities for convenient sites, alike on private and on public buildings.¹ The Purple Martin, the Swift, and the White-bellied Swallow leave the hollow trees and stumps that formed their original nesting-places, for the chimneys of dwelling-houses, or boxes adapted to their wants by their human friends, and so disposed as to attract them around their dwelling-houses.

Mr. Audubon first met with this species on the Ohio River, at Henderson, in 1815. Two years later, he found a colony breeding in Newport, Ky., opposite to Cincinnati, which dated back to the same year for its origin. So also did several other colonies in the immediate neighborhood.

Their presence in New England was first made known to me by receiving, in 1837, some of their eggs, from the town of Coventry, in Vermont, near Lake Memphremagog. The birds were designated as "Eave Swallows." How long they had been known there I was never able to ascertain. DeWitt Clinton mentions that they made their first appearance at Whitehall, New York, on the southern extremity of Lake Champlain, as early as 1817.² It is quite probable they were really present in various other places in that neighborhood several years before naturalists were made aware of it. In the year following, they were noticed by a gentleman whose word is good authority, at Crawford's, near the base of the White Mountains in New Hampshire. In 1830, General Dearborn observed them for the first time in Winthrop, in Maine. It is to be regretted that our knowledge of their first appearance in different parts of the Atlantic States is so imperfect, limited as it is to only a few unconnected observations, remote in point of time, in scattered localities, and presenting, in consequence, no connected chain, or any available clew by which we may trace with any degree of certainty the course followed in their migrations into their new haunts. Even at the present day, there are so few to watch their movements, that very little is known as to the extent of their actual increase throughout the country, or even whether they are increasing. The scattered observations seem to justify the belief, that they have become very generally diffused from Southern Pennsylvania throughout the northern and eastern portion of the continent.

I am not aware that it has been observed on the Atlantic coast farther south than Pennsylvania,³ or even in the States bordering upon the Gulf of Mexico, until we

¹ Since the above was written, and while these pages are passing through the press, a small colony of Cliff Swallows have taken possession of the freestone front of the Boston Athenæum, immediately upon a frequented street, have there constructed their curiously elaborate nests, and reared their young in security, undisturbed either by the busy throng beneath or the attentions of curious boys.

² *Annals of the Lyceum of Natural History of New York*, I, 160. "The Swallow which forms more especially the subject of this communication first made its appearance at Winchell's Tavern, on the high-road about five miles south of Whitehall, near Lake Champlain, and erected its nest under the eaves of an outhouse, where it was covered by the projection of the roof. This was in 1817, and in this year there was but one nest; the second year, seven; the third, twenty-eight; the fourth, forty; and in 1822, there were seventy, and the number has since continued to increase." (Read in 1824.)

³ Professor Baird of the Smithsonian Institution informs me that it was first observed at Carlisle, Pennsylvania, in 1841, since which time it has become very abundant. He does not know of its existence in the Atlantic States south of Pennsylvania.

come to the valley of the Mississippi. It is abundantly distributed along the Pacific shores, from Southern California to Russian America. Dr. Townsend met with it in great numbers in Oregon; Drs. Gambel and Heermann and Mr. Samuels found it abundant throughout California; Colonel McCall met with it also in New Mexico; and Dr. Woodhouse (Expedition down the Zuñi and Colorado Rivers, p. 64) speaks of this species as very common throughout the Indian Territory, Texas, New Mexico, and California. Sir John Franklin's party observed this bird in 1820, (the same year that it was first discovered by Major Long's party, near the Rocky Mountains.) on the journey from Cumberland House to Fort Enterprise, and on the banks of Point Lake, in latitude 65° north. This is the highest northern point to which it has been traced, so far as I am aware.

I met with these birds for the first time in 1839, in Jaffrey, N. H., where a large colony had taken possession of the side of an old church, filling its eaves with nearly a hundred of its curiously formed nests. This large colony had made its first appearance in that town only the year previous. After flying about, apparently in some uncertainty where to found their little city, they finally pitched upon the side of a large barn in the midst of the village. The inhospitable treatment they received from the boys of the village soon drove them from this place, to find, later in the same season, in the high eaves of the church, a safe asylum against the poles and ladders of their inhospitable tormentors. In the course of the same year, I met with several families of this Swallow in the vicinity of Burlington, Vt. They had been commenced, I was informed, only a few years previously. A few pioneers only appeared the first year, but the following spring they were succeeded by large colonies. In almost all instances, the first appearance of these birds in any section of the country has been in places not far from watercourses, but this has not been universal.¹

It was several years after this Swallow was known to have become quite common in Maine, New Hampshire, and Vermont before we have any knowledge of it in any part of Massachusetts, though probably there some years before it was discovered. In 1842, I saw a large colony on the sides of a church in Attleborough, founded the year before. The same year attempts were made to found colonies in Hingham, but the sandy nature of the soil, which made the construction of their nests very difficult, and liable to fall to pieces as soon as the materials dried, have never favored their increase in that town, though a few have bred there each year since that period, but chiefly in solitary pairs. Connected with these unsuccessful attempts, many of which came at the time under my daily notice, are several interesting incidents, attesting at once the industry and perseverance, as well as the sagacity, of these birds. One of these I will mention.

In the summer of 1843, a pair of Cliff Swallows, supposed to belong to a colony that had attempted unsuccessfully to make a settlement in the neighborhood, and had abandoned it in disgust at the friable nature of their structures, more perse-

¹ Rev. Zadock Thompson, in his History of Vermont, mentions the appearance of the Cliff Swallow in Randolph, an inland town, very soon after their being first noticed at Whitehall.

vering than their associates, selected a sheltered corner, under the piazza of a dwelling-house near the steamboat landing. It was directly over the front door of the house, and opposite to a window from which the birds could be readily overlooked while at their work. For several days the industrious pair persevered in their Sisyphean task. As fast as the materials dried, their nest would crumble into powder. Each morning found them in no wise advanced in their labors. In the mean while, the incredibly large accumulations of dirt under their nest, collected in vain by these persevering little creatures, sorely taxed the forbearance of the lady of the house, but who, in spite of the dirt they made about her threshold, watched their progress with a benevolent and a forbearing interest. At length the birds themselves appeared to realize the necessity of some change in their proceedings. After some four or five days' unsuccessful toil, they paused, and seemed to be hesitating whether to abandon the attempt altogether, or to try other materials. It was late in the season, — July. No time was to be lost. After a day's interval of deliberation their labors were renewed; but this time pellets of soft cow-dung were carefully interposed between each layer of muddy sand, and, in a wonderfully short space of time, a firm and lasting nest was constructed, in which five young were reared in safety. Was this all instinct? Was there not more than a mere scintillation of reason, suggesting this change and the substitution of a novel material?

The nest of the Cliff Swallow, under favorable circumstances, is constructed with a degree of ingenuity that is truly wonderful. In shape it is not unlike a gourd, with a handle curving downward. The larger part is against the wall, or the side of the object to which the nest is attached, while its entrance is through the lower end of its narrow neck. Its arched roof furnishes complete protection against inclement weather, while its narrowed and descending entrance shields the brood from their various enemies. In situations where these precautions are not so necessary as in their natural resorts, or where the presence of man keeps their natural enemies at a distance, they often deviate from their normal structure, curtailing or even dispensing altogether with the neck-like entrance. A large colony which I met with on a small island near the mouth of the Bay of Fundy,¹ availing themselves of a protected shelf under the eaves of a barn, prepared for them by the friendly owner, omitted in many instances even the protecting roof, no longer required for their shelter.

Their nests are constructed of various kinds of adhesive earths and mud. Both birds labor incessantly at the task of construction, and, when in colonies, receive assistance from their neighbors. They are neatly and often warmly lined with fine

¹ This was observed in 1851. At that time it was the only settlement of this bird noticed in that locality. Dr. Henry Bryant, who visited the same place in the summer of 1856, in a paper read before the Boston Natural History Society, January, 1857, says, having reference unquestionably to this species: "By far the most common Swallow, particularly at Manan. The nests were almost universally built without the projecting neck. Of late years, these birds, as they become more habituated to building in sheltered situations, have nearly discontinued their former habit of building their nests in a retort shape." This is interesting, as showing that in the course of five years the single colony we met with had so far multiplied as to have become the most common Swallow in that group of islands.

dry grass, soft leaves, and straw, intermixed with occasional feathers, down, and wool. It is thought by some, that, in constructing their nests, the mud of which the foundation is composed is tempered by these birds with their glutinous saliva, and is thus rendered more adhesive. By this means it is supposed to be the more readily and securely attached to its selected site. But if so, it would hardly appear, judging from their usual crumbling nature and the frequency with which, at the lightest touch, they fall to pieces, to be resorted to after the first few layers have been arranged, or certainly sparingly. Mr. Nuttall, in the introduction to his work on the Ornithology of the United States and Canada, speaks of the Cliff Swallow as "concealing its warm and feathered nest in a receptacle of agglutinated mud resembling a narrow-necked purse or retort." A person who had never seen these nests would receive from this an exaggerated idea of the adhesive nature of the external nest, as well as of its internal construction. Feathers are by no means its universal, or even general, lining. While they are often found intermixed with coarser materials, the nest is as often found without as with them. A well-informed and accurate observer, Mr. C. S. Paine, of Randolph, Vermont, writes me in reference to these birds: "They are very common here, and congregated in large communities. A neighbor has a barn with more than a hundred nests under its eaves. They have built there a good many years. A few years ago I spent several weeks in Illinois, on Rock River. I found these Swallows in great abundance there. They built their nests on the face of the rocks that line the river. In one place there were at least five hundred nests. The birds would come and go from them like bees from a hive. I frightened them from their nests, and they accumulated in a perfect cloud over my head."

I have several times seen a settlement disturbed in this manner. It is a very striking sight. The whole colony form into what is well called a cloud, sail over your head in rapid circles, with a combination of sharp outcries and sounds perfectly indescribable. If in the height of the breeding season, and any have young, their agitation is greatly increased, and they will even manifest a disposition to attack you as you approach the nests, fly close to your head, with sharp, angry cries, and make a snapping or clicking sound with their bills.

The eggs of this Swallow exhibit greater variations in markings, size, and shape than are usual with birds of this family, as the variations in the accompanying figures may attest. They may usually be distinguished from those of the Barn Swallow by their coarser spots, the less elongated shape of the egg, and the browner color of the markings. It is, however, frequently very difficult to distinguish them. The ground color of the egg is white; the spots vary in number, size, shade, and distribution, but are usually reddish-brown, and scattered over the whole egg. The following are their several measurements: greatest length, $\frac{7}{8}$ of an inch; least length, $\frac{6}{8}$; average length, $\frac{1}{1}\frac{3}{6}$; greatest breadth, $\frac{5}{8}$ of an inch; least breadth, $\frac{1}{1}\frac{9}{6}$; average breadth, $\frac{1}{3}\frac{9}{2}$.

HIRUNDO BICOLOR.

- Hirundo bicolor*, VIEILL. Ois. d'Am. Sept. I, 1807, 61, pl. xxxi.
 " " BONAP. Syn. 1828, p. 65.
 " " RICH. & SWAINS. F. B. A. II, 1831, 328.
 " " AUD. Am. Biog. I, 1832, 491; V, 417; pl. xcvi.
 " " NUTTALL, Manual, I, 1832, 605.
 " " AUD. Syn. 1839, p. 35.
 " " " Birds of Am. I, 1840, 175, pl. xlvi.
 " " DE KAY, Nat. Hist. N. Y., Birds, 1844, pl. xxix, fig. 1.
 " " LEMBEYE, Aves de la Isla de Cuba, 1850, p. 46.
 " " CASSIN, Syn. N. A. Birds (Illust. Birds of Cal.), 1854, p. 244.
Hirundo viridis, WILSON, Am. Orn. V, 1812, 44, pl. xxxviii, fig. 3.
 " " SABINE, Franklin's Journ. p. 679.
 " " AUD. Ann. Lyc. Nat. Hist. of N. Y. I, 1824, 166.
Hirundo leucogaster, STEPHENS, Gen. Zoöl. X, 1817, 106.
Chelidon bicolor, BONAP. Geog. and Comp. List, 1838, p. 8.
 VULG.— *Green and Blue Swallow.* *White-bellied Swallow.* *The Martin* (about Boston).
Stump Swallow. *Wood Swallow.* *White Martin.* *Golondrina verdosa.*

IN the habits of different individuals of this species we find presented, in remarkable contrast, a strict adherence to its primitive breeding peculiarities in certain localities, and a complete departure from them in others. In the more thinly settled portions of the country, especially where old forests with their many hollow trees and decayed stumps are still abundant, we find this Swallow breeding in their convenient cavities, and seldom induced, even when the effort is made to tempt them to do so, to occupy the boxes put up for their better accommodation. This was the case in the cluster of small islands in the Bay of Fundy around Grand Menan, where these birds are very abundant, and where, although martin-boxes had been prepared for their use, in no instance had they, when I last visited that locality (1851), been induced to occupy them. Hollow trees, holes in stumps, fences, and logs seemed to be their preferred places for nesting. They are in consequence known in such localities by the name of the Wood Swallow. So also, in the western part of the country, hollow trees are so generally their resort, that even Audubon, at the time of the publication of the first volume of his Ornithological Biography, was not aware that they had, in any instances, been known to imitate the Blue-Bird, the Martin, and the Wren, in accepting the hospitalities of man. Yet this fact had not escaped the observation of Wilson. In some parts of the country, especially in Eastern Massachusetts, these Swallows have undergone a change of habit as complete as that of the Purple Martin, of whose boxes they have there possessed themselves. I have even known of their nesting in a rough candle-box with one end knocked out, and placed for them in an accessible situation. Mr. Audubon speaks of their driving the Barn Swallow from its nest and taking possession, and Nuttall mentions their breeding on flat horizontal branches of trees. I have never met with them in either of these situations.

This species is widely distributed, from the Middle States to the extreme northern

regions. Sir John Richardson found them breeding in hollow trees at Fort Norman, on the Mackenzie River, in latitude 65° . They are spoken of by writers as not so numerous as the Barn Swallow; but this my own observations would lead me to doubt. Along the Atlantic coast, from latitude 38° to the St. Lawrence, they are our most common species. They are said to be equally abundant on the shores of the Pacific and the banks of the Columbia River. They seem to be less abundant in the interior, especially in the absence of water.

If, as we presume to be the case, the species of the Pacific coast is identical with this, the White-bellied Swallow has a range coextensive with the habitable portions of North America, from the West India Islands to Greenland, on the Atlantic, and from Southern California to the Russian possessions, on the Western coast. Dr. Townsend observed it throughout Oregon; Dr. Gambel, Dr. Heermann, and Mr. Samuels met with it breeding in California; Lembeye and Gundlach give it as one of the common birds of Cuba (though not mentioned by Mr. Gosse as found in Jamaica); and Dr. Woodhouse found it throughout the Indian Territories, Texas, and New Mexico, as well as in California.

This species, during the breeding season, is more quarrelsome than any other of their relatives, and are quite a match even for the Purple Martin, upon whose premises they often intrude and keep possession. They evince a strong attachment to their offspring, and manifest great affliction when robbed of them, uttering low but exceedingly plaintive complaints. When a pair of these Swallows have become familiarized to a certain locality, returning to it year after year, with a little pains it is not difficult to enter into a limited intercourse with them, especially in supplying them with the materials of their nest. Two of these birds, who have for several years occupied an old and rudely-constructed tenement in the very heart of Boston, receive each year an abundant supply of feathers, almost from the very hands of the members of the family under whose protection they find a shelter. Nearly all the materials they used were feathers blown to them from the window, which with the quickness of thought they would dart at and catch with their bills, and immediately convey to their retreat. In time they became so familiar, as almost to take them from the hands of the person who supplied them. This has been repeated several seasons. When they have young just hatched, or eggs on the point of hatching, they sit so close as to be easily taken on their nest. When taken and released, they fly but a few feet from their nest, hovering over the heads of the intruders.

They construct a very loose, soft, warm nest of fine hay and leaves, abundantly supplied with down and soft feathers, by which the eggs are often found completely covered. Great pains are apparently taken to keep the nest clean and dry by constant additions of soft, dry materials during incubation. They have usually two broods in a season.

Their eggs are of a beautifully pure white. When unblown, they have a delicate pinkish shade, imparted by the yolk. They are somewhat oblong in shape, the smaller ends are well defined and pointed, and the eggs are only subject to occasional variations in size. Their measurements vary from $\frac{1\frac{2}{6}}$ to $\frac{1\frac{4}{6}}$ of an inch in length, and from $\frac{8}{16}$ to $\frac{9}{16}$ in breadth.

HIRUNDO THALASSINA.

- Hirundo thalassina*, SWAINS. Syn. Mexican Birds, Philos. Mag. 1827, p. 366.
 “ “ AUD. Orn. Biog. IV, 1835, 497, pl. cccclxxxv, figs. 1 and 5.
 “ “ BONAP. Geog. and Comp. List, 1838, p. 9.
 “ “ AUD. Syn. 1839, p. 36.
 “ “ “ Birds of Am. I, 1840, 186, pl. xlix.
 VULG. — *The Violet-Green Swallow.*

THE first knowledge I possessed of the markings of the egg of this species was supplied me by Mr. Audubon, in the drawing of an egg obtained by Mr. Nuttall in Oregon. But a very limited knowledge is as yet in our possession in regard to its habits, its distribution, or general peculiarities. For nearly all that we do know, we are indebted to the observations of Messrs. Townsend and Nuttall. The latter met with this Swallow on a branch of the Colorado. They were in great numbers, associating with the Cliff Swallow. He states that they occupied the old nests of the latter, in preference to constructing their own. He also conjectured, probably without good reason, that they breed in trees, after the manner of the White-bellied Swallow.

Mr. Townsend's account of this Swallow differs materially. He also speaks of finding them breeding on the banks of the Colorado, where, he adds, it nests along its margin on bluffs of clay, to which it attaches a nest formed of mud and grasses resembling that of the Cliff Swallow, but wanting the pendulous neck. It is quite probable that the nests supposed by Mr. Nuttall to be old nests of *H. lunifrons* were in reality constructed by this species for their own use. Mr. Townsend speaks of the eggs as having been four in number, and of a dark clay-color, with a few spots of reddish-brown at the larger end. This hardly corresponds with the drawing of the egg obtained by Mr. Nuttall, nor yet with the one represented in the plate. Mr. Townsend adds, that it is also abundant on the Columbia River, and that it there breeds in hollow trees. He does not say whether this is the result of his own observations, or is given on the authority of others.¹

The ground color of the egg of this bird, as given in the painting by Mr. Audubon, is a light stone-color, or clayish-white, — not a “dark clay-color,” as Townsend describes it; and the spots, which are of varying light and dark shades of reddish and purplish brown, are scattered over the whole egg, instead of being confined to the larger end. Its shape is sub-oval, and more than usually oblong. It measures $\frac{2}{3}$ of an inch in length by $\frac{7}{16}$ in breadth. The egg represented (Plate V, fig. 74) was obtained by Dr. Thomas H. Webb when engaged on the Mexican boundary survey. The nest is described by him as built on the side of a cliff, open at the top, and resembling the nest of the common *Hirundo rufa*. He obtained it on the bank of Mulberry River, near Mimbres, New Mexico. It measures $\frac{1}{6}$ of an inch in length by $\frac{8}{16}$ in its greatest breadth. Its shape is an oblong oval, pointed at

¹ Dr. Cooper corroborates this statement as within his own experience.

one end. The ground color is white, with a few sub-markings of a grayish color, but without any of the usual shadings of purple. It is spotted, chiefly at the larger end, with scattered markings of a burnt terra-sienna color.

PROGNE PURPUREA.

- Hirundo purpurca*, LINN. Syst. Nat. I, 1766, 344.
 “ “ WILSON, Am. Orn. V, 1812, 58, pl. xxxix, figs. 2 and 3.
 “ “ BONAP. Syn. 1828, p. 61.
 “ “ SABINE, Franklin's Journ. p. 678.
 “ “ RICH. & SWAINS. F. B. A. II, 1831, 335.
 “ “ AUD. Orn. Biog. I, 1832, 115; V, 408; pl. xxii.
 “ “ NUTTALL, Manual, I, 1832, 598.
 “ “ “ “ II, 1831, 608.
 “ “ AUD. Syn. 1839, p. 34.
 “ “ “ Birds of Am. I, 1840, 170, pl. xlv.
 “ “ DE KAY, Nat. Hist. N. Y., Birds, 1841, pl. xxviii, fig. 61.
Hirundo violacea, GMELIN, Syst. Nat. I, 1788, 1026.
Hirundo carulea, VIEILL. Ois. d'Am. Sept. I, 1807, 57, pls. xxvi and xxvii.
Hirundo versicolor, VIEILL. Nouv. Dict. XIV, 1817, 309.
Hirundo ludoviciana, CUVIER, Reg. An. I, 1817, 374.
Progne purpurea, BONAP. Geog. and Comp. List, 1838, p. 8.
 “ “ CASSIN, Syn. N. A. Birds (Illust. Birds of Cal.), 1851, p. 245.
 VULG. — *The Martin*. *The Purple Martin*. *The House Martin*. *Great American Martin* (Edwards). *Purple Swift* (Pennant). *Sashun-peesheew* (Croc Indians). *Hirondelle bleu de la Caroline* (Buffon).

THE introduction of the modes and customs of civilized life, and provident attentions to their wants and conveniences, have induced in the Purple Martin yet another instance of total change from natural habits in the breeding season. Social, familiar, and confiding, they have become general favorites, and, in return for obligations conferred upon man by keeping far off other and more dreaded feathered intruders and depredators, receive from him many favors. Comfortable, convenient, and safe dwellings, adapted to their wants, tempt them to rear their young in the society of their protectors and friends, no longer seeking for that purpose the holes of hollow trees. This change has become quite universal. Martin-boxes abound throughout the country. Even the Indians and Southern slaves are said to tempt them around their cabins by suspending hollow gourds and calabashes from saplings and cane-poles, and in these rude cradles they construct their nests. Audubon mentions an instance of a pair of Martins driven from the eaves of a house, where they had been in the habit of nesting, on account of the vermin they brought with them, who, having no convenient place to build in, resumed their natural resort, a hollow

tree. The following season, a martin-house was prepared for them, of which they immediately took possession.

During the breeding season, the Purple Martin is one of the most widely diffused of North American birds. It is found throughout the Union, in every State, from Louisiana to the Canadas. It was met with by Mr. Harris as far to the westward as the mouth of the Yellowstone River. It even extends its migrations to the extreme verge of Northern civilization. Sir John Richardson speaks of it as arriving within the Arctic Circle earlier than the others of its tribe. It makes its first appearance about Great Bear Lake as early as the 17th of May, when the ground is covered with snow, and the rivers and lakes are ice-bound. Dr. Woodhouse found it abundant in Texas and the Indian Territory, Dr. Townsend in Oregon, and Mr. Lembeye and Dr. Gundlach give it as a common bird in Cuba. It is found in every one of the United States, unless in California its place is occupied exclusively by its relative, *Progne chalybea*, and that species has been mistaken for it.

In the Southern States it raises three broods in a season; in its more northern resorts, the shortness of the season permits but one. In the maritime portion of Massachusetts, the Martins are less numerous now than formerly, though still abundant in the interior. This is attributable to the destruction of a large number of these birds, several years since, by an unusually cold and inclement season, in which both old and young suffered alike. But few escaped. It is probable their empty boxes would all have been reoccupied by new-comers ere this, had not the White-bellied Swallows of the neighborhood availed themselves of the occasion to desert their hollow trees and take possession of the vacant martin-boxes. These they have never since relinquished. The early migrations of the Martins expose them to frequent suffering, and even destruction, from unfavorable changes in the weather, as, notwithstanding the high parallels to which they penetrate, they do not appear to be a hardy bird.

The Purple Martin prepares a loosely-arranged nest, which is composed of various materials, such as fine leaves both dry and green, straw, hay, slender twigs, pieces of cloth, rags, &c. The whole is warmly lined with feathers and other soft materials. Each year it is repaired or reconstructed, with material additions, until successive seasons gather quite an accumulation. The eggs are uniform in color and shape, and do not vary much in size. They are rather small in proportion to the size of the bird. Their color is a pure cream-white, without spots. One end is much smaller and more pointed than the other. Their average measurements are $\frac{1}{16}$ of an inch in length by $\frac{1}{16}$ in their greatest breadth.

COTYLE RIPARIA.

- Hirundo riparia*, LINN. Syst. Nat. I, 1766, 344.
 “ “ GMELIN, Syst. Nat. I, 1788, 1019.
 “ “ WILSON, Am. Orn. V, 1812, pl. xxxviii, fig. 4.
 “ “ TEMMINCK, Manuel d'Ornithologie, I, 1820, 429 ; III, 300.
 “ “ BONAP. Syn. 1828, p. 65.
 “ “ RENNIE, Montagu's Ornithological Dict. 1831, p. 17.
 “ “ RICH. & SWAINS. F. B. A. II, 1831, 333.
 “ “ NUTTALL, Manual, I, 1832, 607.
 “ “ AUD. Orn. Biog. IV, 1835, 584, pl. cccclxxxv.
 “ “ “ Syn. 1839, p. 36.
 “ “ “ Birds of Am. I, 1840, 187, pl. 1.
 “ “ DE KAY, Nat. Hist. N. Y., Birds, pl. xxviii, fig. 62.
 “ “ LEMBEYE, Aves de la Isla de Cuba, 1850, p. 47.
Hirundo cinerca, VIEILL. Nouv. Dict. XIV, 1817, 526.
Cotyle riparia, BONAP. Geog. and Comp. List, 1838, p. 9.
 “ “ CASSIN, Syn. N. A. Birds (Illust. Birds of Cal.), 1854, p. 247.
 VULG. — *Bank Swallow*. *Sand Martin*. *Hirondelle de Rivage*. *Sand Swallow*. *Shec-shec-winae-paeshoo* (Cree Indians). *Golondrina Ribariega* (Cuba).

THE common Bank Swallow of this country is still supposed to be the same with the European species. This identity has been carefully examined by Mr. Cassin, who unhesitatingly expresses the opinion that they are absolutely identical. It seems never to have been seriously doubted. It appears, therefore, no longer probable that closer investigations can demonstrate sufficient specific differences to justify a separation. Be this as it may, however, no perceptible variations are observable in the habits, mode of breeding, nesting, or eggs of the birds of either continent.

The American representatives of this species are found throughout the United States, from the Atlantic to the shores of the Pacific, as well as from the extreme southern States to the farthest northern limits. As, however, it has most probably been confounded in some places with the Rough-winged species, as it is still liable to be, without a close inspection, it may well be doubted whether full reliance can be placed upon all the accounts we have of its extended distribution. Certain it is, that, in the parts of the country where the Rough-wing is known to abound, this bird, if met with at all, is not common. Edward Harris, Esq. found the *serripennis* in the region of the Upper Missouri and the Yellowstone, but not this species. It seems not improbable, therefore, that a more careful investigation into the distribution of these two birds may show a more exclusively northern habitat for the Bank Swallow, while the Rough-wing may be found to be chiefly a denizen of the States south and west of Pennsylvania. The northern migrations of the Bank Swallow appear to be limited only by the extent of land for it to occupy. It is among the most northern of the land birds. Richardson found them breeding by thousands at the mouth of Mackenzie's River, in the sixty-eighth parallel of latitude. They are of course a very hardy bird, migrating to the north quite early in spring, when they

are often exposed to great inclemencies of weather, from which they take refuge in their holes.

They are a very social species, almost always breeding together in large communities, of hundreds, and even of thousands. They seem more independent of man than many of their kindred genera, only availing themselves of the incidental aid they may derive from excavations through sand-banks, opening convenient situations for their nests. These they construct in holes in the sides of banks, or cliffs, of sand, soft earth, and even of gravel, wherever the passage of a stream of water, the washing of waves, excavations for canals or railroads, or any similar exposure of convenient sites, afford them opportunities. These holes are usually as near the surface of the ground as the yielding nature of the soil will permit it to be readily penetrated, — generally from two to five feet. They extend to a depth of from three to four feet, — seldom less than two, or more than four. Their diameter is from three to four inches. In excavating such long channels to their nests, these little birds exhibit a remarkable industry and perseverance. After selecting the place, both sexes work alternately at the task, which usually occupies them four days of constant labor. The extremity of the passage is widened into a small chamber, the floor of which is warmly carpeted with fine dry grass, and soft, downy feathers. Upon this they deposit five beautiful crystal-white eggs. When recently deposited and unblown, the yolk, seen through the semi-transparent shell, imparts to it a delicate roseate shade. The eggs vary considerably in size and shape. Their length is from $\frac{1}{16}$ to $\frac{1}{16}$ of an inch, the average $\frac{2}{3}$. Their breadth also varies from $\frac{1}{2}$ to $\frac{7}{16}$ of an inch. In shape they are often as nearly oval as the eggs of the Swift, but generally one end is much more pointed than the other.

In regard to its geographical distribution, but little needs to be said. It is probably found throughout North America, from Cuba, where both Mr. Lembeye and Dr. Gundlach speak of it as common, to the mouth of Mackenzie's River, latitude 68° north. If identical with the Sand Martin of Europe, &c., it is found in all the four quarters of the globe. It is as abundant on the Pacific as on the Atlantic, and, according to Sir John Richardson, is as common in the Arctic regions as in the more temperate.

COTYLE SERRIPENNIS.

Hirundo serripennis, AUD. Orn. Biog. IV, 1835, 593.

“ “ “ Syn. 1839, p. 37.

“ “ “ Birds of Am. I, 1840, 193, pl. li.

Cotyle serripennis, CASSIN, Syn. N. A. Birds (Illust. Birds of Cal.), 1854, p. 247.

VULG. — *The Rough-winged Swallow.*

MUCH yet remains to be learned of the habits and geographical distribution of this species; so closely resembling the Bank Swallow in many respects as to be liable

to be confounded with it, though readily distinguishable from it by careful observations. It is difficult, if not impossible, now to say how much of the history of that bird has had reference to this species. My own observations in regard to it have been confined to the neighborhood of Carlisle, Penn., the only place in which I have ever met with it, or where, to my certain knowledge, it has been ascertained to breed. They have also been seen in Louisiana, — where they were first discovered by Audubon, — Florida, Missouri, and Virginia, and were found by Dr. Heermann in California. They probably breed in each of these States, especially the last two, where they have been noticed in the breeding season. My friend, Professor Baird, then of Carlisle, found them breeding in that vicinity in the summer of 1843. Visiting that locality early in June, the following year, I had an opportunity to observe their habits in the breeding season, in company with that accurate ornithologist. We found it quite common, and examined a number of nests. It is worthy of remark, that none of those we found that season were in places excavated by the bird, although Professor Baird informs me he has known them to nest in holes apparently prepared in the same manner as those of the Bank Swallow. All the nests I have ever seen were in situations accidentally suited to their wants, and all were directly over running water. We found seven nests, all of which were in similar situations. This may not be enough to be decisive of this reliance upon accidental aids, or rather of its universality, but certainly shows it to be at least very common. Several were constructed in crevices between the stones in the walls and arches of bridges. In numerous instances the nests were but little above the surface of the stream. One had been flooded by the rise of the water, and the eggs addled. Instead of forsaking the locality, the birds had constructed another nest directly over the first. In this double nest we found twelve eggs, six of which were quite fresh, and all had been deposited that season. Another nest was constructed between the stones of a wall which formed one of the sides of the flume of a mill. Along the top of this wall was a frequented footpath, while the water of the mill-stream was not two feet below it. One nest was found in a somewhat higher situation, between the boards covering a small building containing a water-wheel. The entrance to the nest was through a knot-hole in the outer partition, and it was placed upon a small rafter between the outer and inner partitions.

The nest, very similar in its construction to that of the Bank Swallow, is composed of dry grass, straw, and leaves, loosely put together, and lined with downy feathers. Owing, perhaps, to the exposed situations in which we found them, and their danger of being flooded by a rise of the stream, a much greater amount of material was used in their construction than by the Bank Swallow. In other respects there was no apparent difference.

Nor are their eggs readily distinguishable from those of that species, being nearly uniform with them in size, shape, and color. They are pure white, perhaps a little more uniformly oblong, and usually quite pointed at the smaller end. They vary in size from $\frac{1}{16}$ of an inch in length to $\frac{2}{3}$, and in breadth from $\frac{1}{2}$ to $\frac{9}{16}$ of an inch. The average length is $\frac{1}{2}$ and the average breadth $\frac{1}{3}$ of an inch.

CYPSELINÆ.

ACANTHYLIS PELASGIA.

- Hirundo pelasgia*, LINN. Syst. Nat. I, 1766, 345.
 “ “ WILS. Am. Orn. V, 1812, 48.
 “ “ VIEILL. Ois d'Am. Sept. I, 1807, 73.
Hirundo cerdo, BARTRAM, Trav. 1791, p. 292.
Hirundo carolinensis, BRISSON, II, 501.
Cypselus pelasgius, BONAP. Syn. 1828, p. 63.
 “ “ NUTTALL, Manual, I, 1832, 609.
 “ “ AUD. Orn. Biog. II, 1835, 329 ; V, 319 ; pl. clviii.
 “ “ DE KAY, Nat. Hist. N. Y., Birds, 1814, pl. xxvii, fig. 58.
Chatura pelasgia, BONAP. Geog. and Comp. List, 1838, p. 8.
 “ “ AUD. Syn. 1839, p. 33.
 “ “ “ Birds of Am. I, 1840, 164, pl. xlv.
Cypselus acutus, BONAP. Consp. Av. p. 64.
Acanthyli pelasgia, CASSIN, Syn. N. A. Birds (Illust. Birds of Cal.), 1854, p. 249.
 VULG. — *The Chimney Swallow. The American Swift. Chimney Swift. Aculeated Swallow*
 (Arc. Zool.). *American Spine-tail.*

THE Swift, or, as it is more generally called, Chimney Swallow, of North America, in its habits during the breeding season presents a remarkable contrast to the European species. While the latter are shy and retiring, shunning the places frequented by man, and breeding chiefly in caves or ruined and deserted habitations, their American representatives, like most of the Swallow family here, have at once upon the erection of the dwellings of civilized life manifested their appreciation of the protection they afford, by an entire change in their habits in respect to the location of their nests. When the country was first settled, these birds were known to breed only in the hollow trunks of forest-trees. The chimneys of the dwellings of civilized communities presented sufficient inducements, in their superior safety and convenience, to tempt them to forsake for them their primitive breeding-places. So complete has been the change in this respect, that, wherever the country has been long settled, they are hardly known to resort to hollow trees for any other purpose than as occasional roosting-places. It is not impossible that hereafter, when this change of habit shall have become universal, and there are no longer any of the species left to furnish an example of their primitive mode of nesting, it may become a disputed point among naturalists whether they ever did nest in hollow trees, as there are already those who dispute the more extended immigrations of the Cliff Swallow, now that they have become so common in the eastern part of the continent. Even at the present day, in some portions of the country, so universally do they deserve their name, that few realize that chimneys have not always been their natural breeding-places.

The Chimney Swallow is known to breed throughout the central and northern States, from Virginia almost to Labrador, and the recent explorations show that they are found from ocean to ocean. They have been observed in abundance on the

eastern slope of the Rocky Mountains, and are also found in nearly equal numbers along the shores of the Pacific. Sir John Richardson did not meet with them in the Arctic regions. Dr. Woodhouse speaks of having found the Chimney Swallow very common throughout the Indian Territory, Texas, New Mexico, and California.

The nest of the Chimney Swallow is one of the most remarkable structures of the kind to be found among the handiworks of even this interesting family, nearly all of whom are far from being undistinguished for their architectural accomplishments. It is composed of small twigs of nearly uniform size, which are interwoven into a neat semicircular basket. In selecting the twigs with which to construct the nest, the Swift seems to prefer to break from the tree such as are best adapted to its wants, rather than to gather those already scattered upon the ground. This is done, with great skill and adroitness, while on the wing. Sweeping on the coveted twig, somewhat as a Hawk rushes on its prey, it parts it at the desired place, and bears it off to its nest. This fact is familiar to all who have attentively observed their habits. Each of these twigs is strongly fastened to its fellows by an adhesive saliva secreted by the bird, and the whole structure is as strongly cemented to the side of the chimney in which it is built, by means of the same secretion. When dry, this saliva hardens into a glue-like substance, apparently firmer even than the twigs themselves. In separating a nest from the side of a chimney, I have known portions of the brick to which it was fastened to give way sooner than the cement with which it had been secured. When moistened, however, by long or heavy rains, the weight of their contents will sometimes cause them to part, and precipitate the whole to the bottom. The young birds cling very tenaciously to the sides of the chimneys, with their strong claws and muscular feet, and often save themselves from falling, in such accidents, by these means, even at a very early age, and before they have attained their sight. As the nest, even when undisturbed, soon becomes too small for them, the young leave it, long before they are able to fly, and climb to the top of the chimney, where they are fed by their parents.

The eggs are usually four in number. This I have never known them to exceed, although Audubon speaks of their having six. They are pure white, and unspotted. They vary but little in size, which is small for that of the bird, or in shape, which is slightly elliptical. The eggs are from $\frac{3}{4}$ to $\frac{1}{2}\frac{3}{8}$ of an inch in length, and from $\frac{1}{2}$ to $\frac{9}{16}$ in breadth. One end is somewhat smaller, as well as more pointed, than the other, but the difference is not so marked as in the eggs of most of the family *Hirundinidæ*, while they are much less elliptical than the eggs of the *Caprimulgidæ*.

Under favorable circumstances, the Chimney Swift raises two broods in a season.

In its semi-nocturnal habits, the Chimney Swallow resembles the Night-Hawk more than the Swallow. They are to be seen abroad more frequently in the morning or evening twilight than in the middle of the day. When they have young, they are busy feeding them during the greater portion of the night. They are not, however, strictly nocturnal, but may be frequently met with abroad at midday, even when the sky is unclouded.

FAMILY HALCYONIDÆ.

CERYLE ALCYON.

- Alcedo alcyon*, LINN. Syst. Nat. I, 1766, 180.
 “ “ WILS. Am. Orn. III, 1812, 59.
 “ “ BONAP. Syn. 1828, p. 48.
 “ “ RICH. & SWAINS. F. B. A, II, 1831, 339.
 “ “ NUTTALL, Manual, I, 1832, 594.
 “ “ AUD. Orn. Biog. I, 1832, 394; V, 548.
 “ “ NUTTALL, Manual, II, 1834, 609.
 “ “ AUD. Syn. 1839, p. 173.
 “ “ “ Birds of Am. IV, 1842, 205, pl. cclv.
 “ “ LEMBEYE, Aves de la Isla de Cuba, 1850, p. 131.
Ispida ludoviciana, GMELIN, Syst. Nat. I, 1788, 452.
Alcedo jagnacati, DUMONT, Dict. Sci. Nat. I, 1816, 455.
Alcedo gnacu, VIEILL. Nouv. Diet. XIX, 1817, 406.
Ceryle alcyon, BONAP. Geog. and Comp. List, 1838, p. 10.
 “ “ CASSIN, Syn. N. A. Birds (Illust. Birds of Cal.), 1854, p. 354.
 VULG. — *The Belted Kingfisher*. *Okecs-kae-mannaeshew* (Cree Indians). *Martin Pescador* (Cuba).

This species is widely distributed, — in the breeding season throughout nearly the whole North American continent. During the winter months it is found in several of the more southern States. As soon as the ice has melted from northern ponds and streams, it is diffused over nearly the entire Union. According to Richardson, it frequents all the large rivers of the Fur countries up to the sixty-seventh parallel. Townsend met with it along the Missouri and Columbia rivers, and Audubon found it in all the States from Texas to Labrador. Mr. Harris did not, however, meet with it on the Yellowstone, nor did Captain Stansbury in his expedition to the Great Salt Lake and Utah. It is probable that but few, if any, remain to breed in the extreme southern States, although they may be met with there quite abundantly from September to April.

It is not a social bird, living only in solitary pairs. It frequents the vicinity of running water, and nests in holes in the banks of rivers, which it excavates with much toil and labor. The place selected for this purpose is usually near a waterfall or rapid, and if the stream has been made available for a mill, it is quite common to find them nesting near the dam. They usually select for the hole a dry place, just enough above the water to be out of the reach of a freshet. It is often dug through hard gravel to the depth of several feet, and is not always near water.¹

¹ One of the most remarkable instances of the Kingfisher's nesting at a distance from water was observed at the White Mountains in the spring of 1855. By the side of the carriage path then partially constructed on Mount Washington, I found a Kingfisher's hole, nearly a mile distant from the Peabody River, or any other stream of water.

It is usually from four to six feet in depth, and about four inches in diameter, slightly narrowing as it recedes, but again widening at the termination, where it is expanded into a snug little arched chamber, large enough for the whole family to turn round in with ease. The bottom is covered with matted twigs, straw, and feathers. The eggs are six in number, and of a beautifully pure crystal whiteness. They are nearly uniform in size and shape, the latter being very nearly spherical. The average measurement of the eggs is $1\frac{5}{16}$ inches in length, and $1\frac{1}{16}$ in breadth. This is slightly larger than that given by Audubon, but corresponds with my own observations.

The excavation of the hole in which they nest, though a work of much labor, is not so difficult as might be supposed without examining the peculiar adaptation of the bird to its accomplishment. Its wedge-shaped body, powerful and pointed beak, and short muscular feet admirably suit it for burrowing, even in the hardest soil. Its short powerful tarsus, the broad flat palm into which its toes are united, with its strong, short, and sharp claws, combine to adapt its feet to form most efficient co-workers with its beak in digging out the home to which, after it has once made it, it perseveringly adheres in spite even of frequent molestations. The Kingfisher is devoted to its offspring, and exhibits great solicitude if their safety is threatened. I have known the female suffer herself to be repeatedly taken from her nest rather than desert her young, and Mr. Audubon speaks of their resorting to ingenious stratagems to draw off intruders.

CERYLE AMERICANA.

Alcedo americana, GMELIN, Syst. Nat. 1, 1788, 451.

Alcedo viridis, VIEILL. Nouv. Dict. XIX, 1818, 413.

Ceryle americana, LAWRENCE, Ann. Lyc. Nat. Hist. of N. Y. V, 1851, 118.

“ “ CASSIN, Syn. N. A. Birds (Illust. Birds of Cal.), 1854, p. 255.

VULG. — *The Texan Green Kingfisher*.

THE egg represented in the plate was found in the collection of Dr. Berlandier, now in the possession of the Smithsonian Institution, designated as that of a Kingfisher, but with no description accompanying it of the parent bird to which it belonged. Its size, however, sufficiently shows the species, if, as we presume, it was correctly marked. This specimen resembles the eggs of the Belted Kingfisher in every respect except size. Its color is a pure bright crystal white. The egg measures an inch and a sixteenth in length by thirteen sixteenths of an inch in breadth.

Nothing is known, so far as I am aware, of the habits of this species. It is safe

to presume, however, that they do not essentially vary from those of the more common Kingfisher of the Northern States. It has been found throughout that portion of Texas that lies on the Rio Grande, and in nearly all parts of Mexico and portions of New Mexico. It has long been well known as a bird of South America. It has not been traced with certainty to the Pacific coast, but it is probable that it will be found to be a bird of Southern California.

A D D E N D A.

CATHARTES CALIFORNIANUS. — In Newman's "Zoölogist" (Vol. XIII, p. 4633, 1855) occurs the following in reference to the eggs and nesting of the California Vulture. It is contributed by Mr. A. S. Taylor, of Monterey. I have given it with the view of putting on record all the statements and descriptions made public in this connection, though I do not think the account here given will be confirmed in all respects by more full and certain testimony. Mr. Taylor's information is, as may be seen, derived from the reports of others, and is therefore not so reliable as it would be if given from his own observations.

"The egg of the bird is three inches broad and five long, about one third longer than a goose's egg. Its color is a dirty pale blue, spotted brown, and it is nearly as thick as an ostrich's egg. The same person informs me, that the female lays only one egg during the season, and makes her nest on the ground in the ravines of the mountains, and generally near the roots of the red-wood and pine trees. It is three months before the young birds can fly."

HYPOTRIORCHIS FEMORALIS. — Mr. Nathaniel H. Bishop, of Medford, Mass., has furnished me, since the preceding pages were in type, with the following additional facts relative to the history of the Hawk found by him on the Pampas, and called by the inhabitants the "Alcon."

"During my pedestrian tour across the continent of South America, I found the 'Alcon' to be a common resident of the Pampas, where it may be seen standing for hours in the grass, or circling in the air in search of food. Upon the Travesia, or Desert of San Luis, which lies between the Pampas and the Andes, like the Burrowing Owl, it is only occasionally met with, excepting about the farms in the vicinity of the mountains. During the winter, which along the eastern base of the Andes is very mild, the 'Alcons' resort to the wheat-fields and farm-yards, searching in the first-mentioned localities for mice and insects, and in the second for the refuse of the table, devouring cooked as well as raw meat. I do not recollect seeing them prey upon small birds; certainly the latter do not fear them, as it is no uncommon thing to see 'Alcons' and small birds upon the same bush. About San Juan, during the fall and winter months, these Hawks return singly at night to the same nesting-place, living in perfect harmony. I have seen as many as forty collected together,

night after night, upon a thorn-tree, while two yards distant a flock of larks (*Sturnella militaris*) roosted with unconcern. This is the tamest of any South American Hawk, and, as if courting the society of man, it builds its nest near the huts of the natives. The Gauchos say that the 'Alcon' never preys upon chickens; but while visiting a farmer near San Juan, I witnessed a fact showing the contrary. One of these Hawks descended into the yard and carried off a chick that could not have been less than two months old. In September and October they build their nests, and lay two eggs. The nest from which I procured the specimens I send you was built of small sticks, upon the top of a bush that overhung a canal of water, in the immediate vicinity of a mill. At first I took but one egg, which robbery did not seem to trouble the old birds, as they continued to sit upon the remaining one. Frequent visits to the spot did not alarm them, neither did traps placed upon the nest drive them from it; and after the second egg had been removed, they remained about the place as before."

BUTEO SWAINSONI. — Since the preceding pages were printed, I have been informed by Dr. Heermann that I was in error in the statement that the egg of this species was procured by him in California. Dr. Heermann writes to Professor Baird in regard to it: "I procured it on the eastern slope of the Rocky Mountains, on the Sweet-Water, which goes through the South Pass mentioned by Fremont. There being no large trees bordering that stream, this Hawk had chosen a good-sized willow in which to construct its nest. Externally it was made up of large twigs, and lined with the inner bark of cotton-wood and some tufts of buffalo hair. The young had left the nest some time before, and I found a single egg, which was carefully preserved. The old birds and a young one were shot the same day, still frequenting the vicinity in which incubation had taken place. I do not recollect ever having seen this species in California."

NAUCLERUS FURCATUS. — Since the portion which relates to the Swallow-tailed Hawk has been printed, I have learned, by letter from Maxcy Gregg, Esq. of Columbia, South Carolina, some additional facts in regard to the geographical distribution of this Hawk, which appear worth giving. He informs me that it is a rare bird in the vicinity of Columbia, but thinks that it may be found breeding some ten or twenty miles below that place, on the Congaree. He also states, that at the confluence of the Ocmulgee and Oconee rivers, in Georgia, these birds are very numerous in the spring. He adds: "I may here mention, that I once in the end of July saw many of these Hawks sailing about near the top of the Balsam Mountain, — one of the loftiest and wildest mountains in North Carolina (about latitude 35° 15' N., longitude 82° 50' W.). I was told by a mountaineer, who was a great hunter and very observant, that they are seen in that vicinity every summer. The circumstance attracted my attention, because I had never seen the Swallow-tailed Hawk in any other part of the mountains, from South Carolina to Virginia, although I had rambled a good deal through that region."

CIRCUS HUDSONICUS. — Mr. Peter Reid, of Lake P. O., Washington County, N. Y., communicates to the Smithsonian Institution the following observations in regard to the nesting of the Marsh Hawk. It should be stated, that they do not correspond with the facts noticed in connection with the eggs of this species obtained in Maine by Dr. Dixon. There was no difference noticed in the progress made in their incubation, or if there was any, it was slight, and escaped observation. Mr. Reid writes: "I have recently visited Fort Edward in this county, where the Marsh Hawks were extremely numerous last summer, and where there are some wintering at this time (February, 1857). My friend informed me that these Hawks nested in great numbers on the flats near the river. Three pairs nested in his cornfield, whose presence he regarded as so beneficial, that he avoided disturbing the nests. By working in close contact with them, the birds became quite tame, and he was enabled to observe with care their economy during the breeding period. He says that on the first egg or eggs being laid, one of the parent birds constantly occupies the nest, and at intervals of two or more days an additional egg is laid; and that in one of the nests he observed that the young that first appeared had left it before the exit of the last two from the eggs, whose age likewise differed some two or three days. His statements, sufficient of themselves to those who know the man, were corroborated by others. In the three nests referred to as found in his cornfield, there were eleven, twelve, and thirteen eggs." The largest number I have ever met with is six eggs in a nest.

AQUILA CHRYSÆTOS. — This bird is not given by Dr. Heermann in his notes on the birds of California in the Journal of the Philadelphia Academy. I therefore inferred (see page 45) that it was not met with by him, or it would have been included. He writes that in this I was in error, and that he did see this species three distinct times, but always in the high mountainous portions of the country.

HALLÆTUS PELAGICUS. — The Northern Sea-Eagle, the largest and most powerful of the family, is a native of the extreme northwestern coast of North America. It has been omitted in the preceding pages, as I was not aware that any description of the eggs had been published. Since then Mr. Cassin has given, in his interesting papers on the Ornithology of the United States and British and Russian America, the following translation of the account by Pallas of the nesting and eggs of this Eagle: —

"In the highest rocks overhanging the sea, this bird constructs a nest of two cells in diameter, composed of twigs of trees, gathered from a great distance, and strewed with grass in the centre, in which are one or two eggs, in form, magnitude, and whiteness very like those of a Swan. The young are hatched in the beginning of June, and have an entirely woolly covering. While Steller was cautiously looking at a nest from a precipice, the parent Eagles darted at him with such impetuosity as nearly to throw him headlong. The female having been wounded, both flew away, nor did they return to their nest for two days. But, as if lamenting, they often sat on an opposite precipice."

This Eagle has been found on the remote coasts of Russian North America, the

opposite shores of Asia, and the Japan Islands. Of its habits little is positively known, and the notices by Pallas, the Russian naturalist, are the only reliable ones that have been published. The account of the eggs quoted above is quite indefinite, and probably not exactly correct. The eggs of Swans, for the most part, are not white, and of a more elliptical shape than those of the Raptorial family.

HALIETUS LEUCOCEPHALUS. — In a recent paper by Mr. Cassin, published in the "United States Magazine," New York, while speaking of the doubts existing among naturalists as to the reality of the Bird of Washington (*Haliaetus washingtonii*), he mentions that, in his opinion, "there are two species of White-headed Eagles inhabiting the States on the Atlantic sea-board. They appear to be constantly different in size, and we are not without suspicion that one is the Northern and the other a Southern bird. The larger has the bill much shorter, and very much as represented in Mr. Audubon's plate of the Washington Eagle; and, in fact, is in all respects that bird, except that it has not the large scales in front of the tarsus continued without interruption to the toes, as represented in the plate to which we allude." If Mr. Cassin's conjectures should prove to be well founded, the egg represented in the plate may belong to the more southern species. I am informed by Dr. Heermann that it was obtained in Maryland, and not in California, as stated (page 52). It is marked on the shell, February, 1856.

HALIETUS GRŒNLANDICUS. — In the preceding pages, the *Haliaetus albicilla*, or Sea-Eagle of Europe, is given as a bird of Greenland, and therefore entitled to a place among North American species. Its claims to be so regarded would seem to be somewhat problematical, inasmuch as it is now stated by Mr. Cassin that there is a Sea-Eagle in Greenland not identical with the European variety. It is also distinct from the White-headed Eagle, which it closely resembles. It therefore remains to be ascertained whether the *H. albicilla* is entitled to a place in the North American Fauna, or whether the Greenland bird, *H. grœnlandicus*, is the sole occupant of that region.

III. FAMILY STRIGIDÆ.				SYRNINÆ.			
	PAGE.	PLATE.	FIGURE.		PAGE.	PLATE.	FIGURE.
POLYBORUS				SYRNIUM			
<i>tharus</i>	58	II	18, 19	<i>cinereum</i>	71	*	*
MORPHNUS				<i>nebulosum</i>	72	IV	44
<i>unicinctus</i>	60	II	20, 21	NYCTALE			
STRIGINÆ.				<i>richardsoni</i>	73	*	*
				<i>acadica</i>	74	IV	45
STRIX				<i>albifrons</i>	†	†	†
<i>pratincola</i>	62	IV	38	ATHENINÆ.			
BUBONINÆ.				ATHENE			
BUBO				<i>hypugæa</i>	75	IV	46
<i>virginianus</i>	64	IV	39	GLAUCIDIUM			
SCOPS				<i>infuscatum</i>	79	*	*
<i>asio</i>	65	IV	40	NICTEININÆ.			
<i>m'callii</i>	66	IV	41	NYCTEA			
OTUS				<i>nivea</i>	79	*	*
<i>wilsonianus</i>	67	IV	42	SURNIA			
BRACHYOTUS				<i>ulula</i>	80	*	*
<i>cassini</i>	68	IV	43				

II. ORDER INSESSORES.

I. TRIBE FISSIROSTRES.

I. FAMILY CAPRIMULGIDÆ.				COTYLE			
	PAGE.	PLATE.	FIGURE.		PAGE.	PLATE.	FIGURE.
ANTROSTOMUS				<i>riparia</i>	105	IV	49
<i>carolinensis</i>	82	V	56	<i>scrippensis</i>	106	IV	50
<i>rociiferus</i>	84	V	57	CYPSELINÆ.			
<i>nuttallii</i>	86	V	58	CYPSELUS			
CHORDEILES				<i>melanolucius</i>	†	†	†
<i>virginianus</i>	87	V	59-61	ACANTHYLIS			
<i>texensis</i>	90	V	62	<i>pelasgia</i>	108	IV	51
<i>henryi</i>	†	†	†	<i>rauxii</i>	†	†	†
II. FAMILY HIRUNDINIDÆ.				<i>saxatilis</i>	†	†	†
HIRUNDO				III. FAMILY HALCYONIDÆ.			
<i>rufa</i>	91	V	63-67	CERYLE			
<i>lunifrons</i>	91	V	68-73	<i>alcyon</i>	110	IV	52
<i>bicolor</i>	100	IV	47	<i>americana</i>	111	IV	53
<i>thalassina</i>	102	V	74				
PROGNE							
<i>purpurca</i>	103	IV	47				
<i>chalybea</i>	†	†	†				

* Not illustrated.

† Eggs unknown.

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EXPLANATION OF PLATES.

PLATE I.

Figure.	Species.	Collected by	Obtained in	In Cabinet of
1.	<i>Cathartes aura</i> ,	John Bachman,	South Carolina,	T. M. Brewer.
2.	do.	Dr. C. Kollock,	Cheraw, S. C.,	do.
3.	<i>Cathartes atratus</i> ,	J. J. Audubon,	Galveston, Tex.,	do.
4.	do.	Dr. C. Kollock,	Cheraw, S. C.,	do.
5.	<i>Astur atricapillus</i> ,	Rufus K. Winslow,	Northern Ohio,	do.
6.	<i>Buteo montanus</i> ,	E. Samuels,	California,	Smithsonian Institution.
7.	<i>Buteo calurus</i> ,	do.	do.	do.
8.	<i>Buteo pennsylvanicus</i> ,	John Krider,	New Jersey,	T. M. Brewer.
9.	do.	Dr. J. Trudeau,	Pennsylvania,	do.
10.	do.	Gustavus Wurdemann,	Florida,	Smithsonian Institution.

PLATE II.

11.	<i>Falco anatum</i> ,	Uncertain,	Greenland,	T. M. Brewer.
12.	<i>Hierofalco sacer</i> ,	do.	do.	Philadelphia Academy.
13.	<i>Tinnunculus sparverius</i> ,	J. J. Audubon,	Nebraska,	T. M. Brewer.
14.	do.	T. M. Brewer,	Maryland,	do.
15.	do.	do.	do.	do.
15 a.	do.	A. Hopkins,	Massachusetts,	do.
16.	<i>Buteo borealis</i> ,	Dr. Henry Wheatland,	do.	do.
17.	do.	C. S. Paine,	Vermont,	do.
17 a.	do.	Augustus Fowler,	Massachusetts,	A. Fowler.
18.	<i>Polyborus tharus</i> ,	Dr. Berlandier,	Matamoras,	Smithsonian Institution.
19.	do.	do.	do.	do.
20.	<i>Morphnus unicinctus</i> ,	do.	do.	do.
21.	do.	do.	do.	do.

PLATE III.

22.	<i>Hypotriorchis femoralis</i> ,	N. H. Bishop,	Pampas, S. A.,	T. M. Brewer.
23.	<i>Accipiter fuscus</i> ,	H. R. Storer,	Massachusetts,	do.
24.	do.	J. Krider,	New Jersey,	do.
25.	<i>Buteo lineatus</i> ,	do.	do.	do.
26.	<i>Archibuteo ferrugineus</i> ,	Dr. A. L. Heermann,	California,	Dr. A. L. Heermann.
27.	<i>Buteo insignatus</i> ,	E. Samuels,	do.	Smithsonian Institution.
28.	<i>Archibuteo sancti-johannis</i> ,	J. Krider,	New Jersey,	J. Krider.
29.	<i>Archibuteo lagopus</i> ,	F. H. Storer,	Labrador,	F. H. Storer.
30.	<i>Buteo swainsoni</i> ,	Dr. A. L. Heermann,	Rocky Mountains,	Dr. A. L. Heermann.

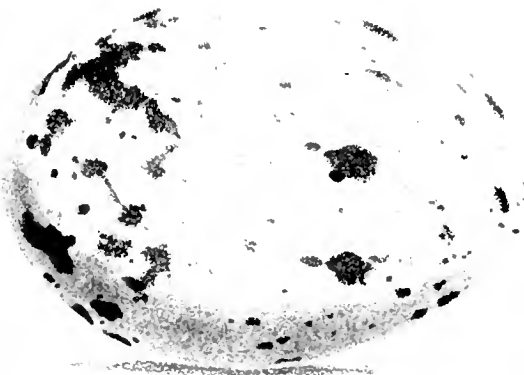
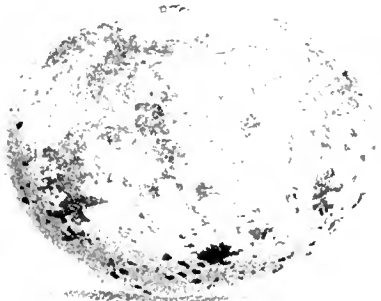
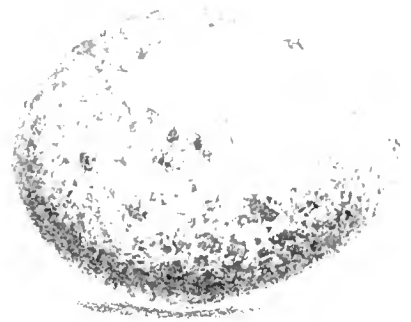
Figure.	Species.	Collected by	Obtained in	In Cabinet of
31.	<i>Circus hudsonicus</i> ,	Dr. R. Dixon,	Maine,	T. M. Brewer.
32.	do.	do.	do.	do.
33.	<i>Pandion carolinensis</i> ,	J. Krider,	New Jersey,	do.
34.	do.	do.	do.	do.
35.	<i>Hypotriorchis columbarius</i> ,	T. M. Brewer,	Grand Menan,	do.

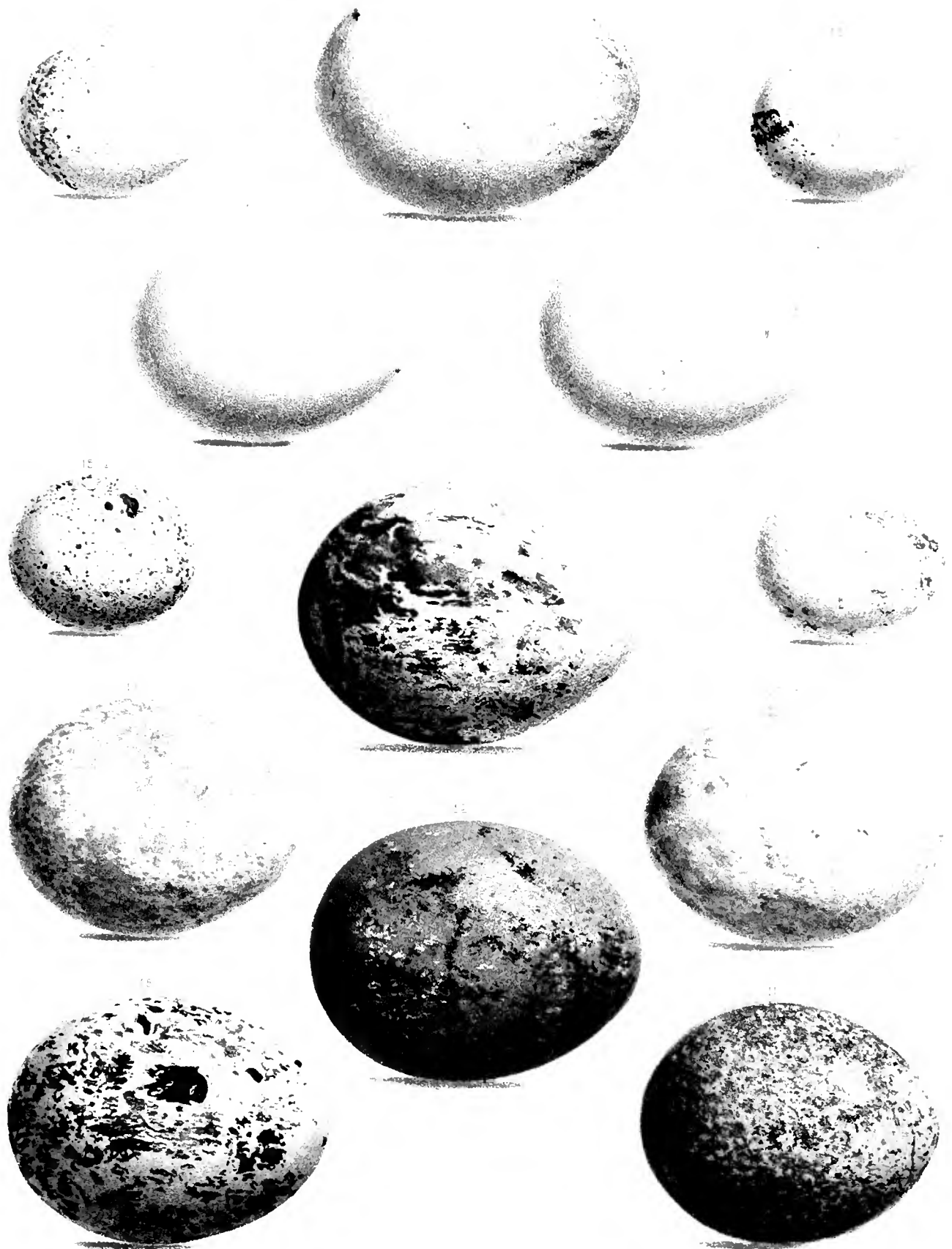
PLATE IV.

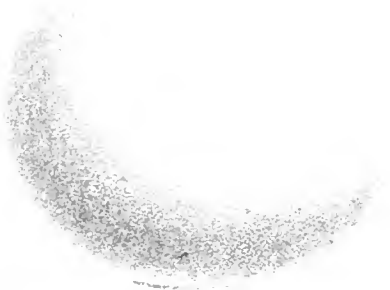
36.	<i>Circus hudsonicus</i> ,	J. J. Audubon,	Louisiana,	T. M. Brewer.
37.	<i>Haliaetus leucocephalus</i> ,	Dr. A. L. Heermann,	Maryland,	Dr. A. L. Heermann.
38.	<i>Strix pratineola</i> ,	J. H. Clark,	New Mexico,	Smithsonian Institution.
39.	<i>Bubo virginianus</i> ,	Dr. Berlandier,	Matamoras,	do.
40.	<i>Scops asio</i> ,	J. J. Audubon,	New York,	T. M. Brewer.
41.	<i>Scops m'callii</i> ,	Dr. Berlandier,	Matamoras,	Smithsonian Institution.
42.	<i>Otus wilsonianus</i> ,	A. Wilson,	New Jersey,	T. M. Brewer.
43.	<i>Brachyotus cassinii</i> ,	J. Eliot Cabot,	Grand Menan,	do.
44.	<i>Syrnium nebulosum</i> ,	William Hopkins,	New York,	do.
45.	<i>Nyctale acadica</i> ,	Rufus K. Winslow,	Ohio,	do.
46.	<i>Athene hypugæa</i> ,	E. S. Holden,	California,	do.
47.	<i>Hirundo bicolor</i> ,	T. M. Brewer,	Massachusetts,	do.
48.	<i>Progne purpurea</i> ,	Zadoc Thompson,	Vermont,	do.
49.	<i>Cotyle riparia</i> ,	T. M. Brewer,	Massachusetts,	do.
50.	<i>Cotyle serripennis</i> ,	do.	Pennsylvania,	do.
51.	<i>Acanthylis pelagius</i> ,	do.	Massachusetts,	do.
52.	<i>Alcedo aleyon</i> ,	do.	New Hampshire,	do.
53.	<i>Alcedo americana</i> ,	Dr. Berlandier,	Matamoras,	Smithsonian Institution.

PLATE V.

54.	<i>Accipiter fuscus</i> ,	Dr. H. R. Storer,	Massachusetts.	T. M. Brewer.
55.	<i>Accipiter cooperii</i> ,	A. D. Curtis,	South Carolina,	do.
56.	<i>Antrostomus carolinensis</i> ,	Dr. H. Bryant,	Florida,	do.
57.	<i>Antrostomus vociferus</i> ,	T. M. Brewer,	Massachusetts,	do.
58.	<i>Antrostomus Nuttallii</i> ,	Dr. Berlandier,	Matamoras,	Smithsonian Institution.
59.	<i>Chordeiles virginianus</i> ,	T. M. Brewer,	Massachusetts,	T. M. Brewer.
60.	do.	do.	New Hampshire,	do.
61.	do.	C. S. Paine,	Vermont,	do.
62.	<i>Chordeiles texensis</i> ,	Dr. Berlandier,	Matamoras,	Smithsonian Institution.
63.	<i>Hirundo rufa</i> ,	T. M. Brewer,	Massachusetts,	T. M. Brewer.
64.	do.	do.	do.	do.
65.	do.	do.	do.	do.
66.	do.	do.	do.	do.
67.	do.	do.	do.	do.
68.	<i>Hirundo lunifrons</i> ,	do.	Pennsylvania,	do.
69.	do.	do.	Vermont,	do.
70.	do.	do.	Nova Scotia,	do.
71.	do.	do.	Massachusetts,	do.
72.	do.	do.	New Hampshire,	do.
73.	do.	do.	Maine,	do.
74.	<i>Hirundo thalassina</i> ,	Dr. Webb,	New Mexico,	do.







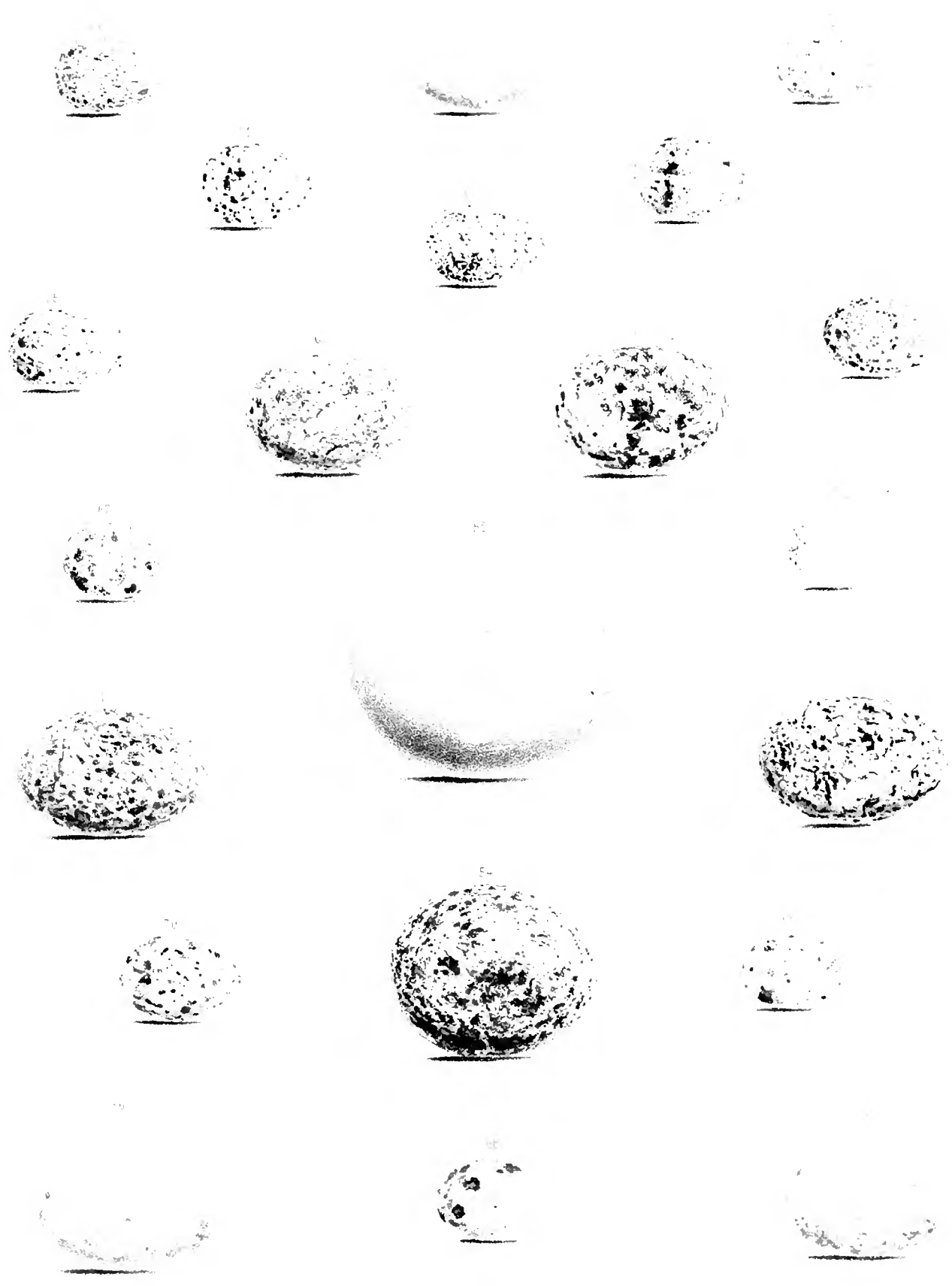


PLATE 10

COLOGY OF NORTH AMERICA

