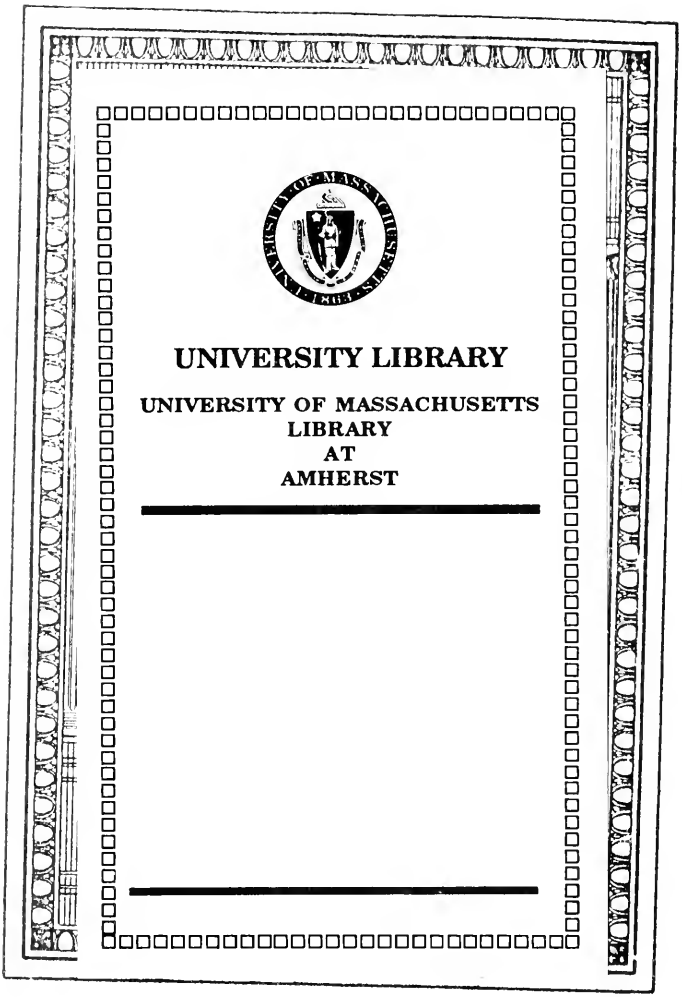

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BULLETIN

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NUTTALL ORNITHOLOGICAL CLUB.

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DOOR-YARD BIRDS OF THE FAR NORTH.

BY E. W. NELSON.

DEPRIVED by confining duties of the opportunity for frequent excursions, I have passed many pleasant hours in the companionship of my feathered friends, that, happily, in place of requiring to be sought out, appear to become the seekers and find me. Before we proceed, however, let me introduce the surroundings. The locality is St. Michael's, Alaska, which, thanks to its 63° of north latitude and relative geographical position, enjoys a sub-arctic climate, if enjoyment can be extracted from gloomy skies and a barren, gale-swept coast. The Redoubt, as it is familiarly termed here, is built about twenty feet above high-tide mark upon a small point of St. Michael's Island extending into a narrow bay three miles wide, which makes in from Norton Sound, and separates this part of the island from the mainland. About a dozen, low, one-story houses, mainly ranged in the form of a imperfect parallelogram some thirty-five by fifty yards in diameter, with the breaks between the houses closed by a high board fence, and the remainder of the buildings scattered irregularly outside, go to complete the metropolis of Northern Alaska. On the land side, extending to within a few feet of the houses, is the perennially wet land so eminently characteristic of Arctic countries. Fortunately, however, owing to the more fertile character of the soil in the

immediate vicinity of the houses, the sponge-like mosses, covering all the surrounding country, have retreated fifty or sixty yards and given place to a belt of luxuriant grasses, which, in turn, makes way in places in favor of dense patches of weeds. From the north-eastern to the southern side the sea approaches to within thirty yards, the grassy slope ending abruptly at a beach formed of dark, angular fragments of basalt: this, with a hard-trodden court-yard, absolutely bare of vegetation, and a small kitchen-garden, completes the immediate surroundings. On distant hillsides a few patches of dark green show where small groups of hardy alders have secured a foothold, beyond which, excepting a few dwarf willows, not a bush raises its head for many miles.

To all appearances, not a very tempting locality for birds, would be one's decision at first sight: but a closer acquaintance will prove the contrary. Some cheerless morning in May, on the border line between winter and spring, as we walk about the buildings, we are greeted by the sharp *tsip, tsip*, of the Tree Sparrow which has arrived over-night and now holds possession of the weed patches, whence it makes foraging expeditions into the yard, ready to skurry back to its stronghold upon the least alarm. As the weather becomes milder, their number is augmented, and, in company with the plump, rosy-breasted little Redpoll, they are seen every where, from the top of the wind-vane to the kitchen window, whence they peep in from the sundial. As the snow decreases the Tree Sparrows slowly retire, pre-empting summer houses in the alder bushes, where they hold possession by right of numbers: they are not, however, too conservative to share their haunts with inoffensive strangers. The Redpolls also now seek more congenial haunts, and are soon lost to view. Meanwhile the Savanna Sparrows have arrived and enliven the borders of the numerous muddy spots surrounding the place, running in and out, mouse-like, among the dead grass, as they playfully pursue each other. At the first alarm they dive into the cover of standing weeds and grass only to reappear, a moment later, on the further side. As the season advances, the males mount the woodpile or other conspicuous object to pour forth their weak, unmusical notes, which they at times also utter from the ground.

Gambel's Finch now makes its appearance, and, capturing the

woodpile from its smaller relative, proceeds to favor us with its sweetly modulated song. A little earlier than this the familiar form of the Barn Swallow has taken its place in the scene, and, as it circles about, utters its chuckling notes as though fairly bubbling over with delight at reaching home once more after spending the winter in a distant southern clime. Pleasant sunshiny days follow, and we human animals sit and bask in the grateful rays upon the veranda, watching, with careless eye, the passage overhead of various water-fowl; while the occasional appearance of a Gyrfalcon, a Goshawk, of other bird of prey lends further interest to the view.

On fine evenings our ear is greeted by the clear Thrush-like whistle of the Fox-colored Sparrow, generally from the top of the cross surmounting the roof of the Russian church just back of the houses.

As June arrives we obtain a glimpse of one or two Black-capped and Yellow Warblers as they investigate the insect preserve in the garden, after which we must seek amusement in the struggles of the Swallows to master unwieldy feathers, or to carry off straws, one end of which is embedded in the ground, varied by numerous hand-to-hand conflicts between the pugnacious little males as they roll about on the ground and pummel each other heartily, sometimes for half an hour together; the object of all this battling, in the form of some charming female, stands close by, looking on as complacently as a lady of olden time upon the tournament, and it need not be said that the victor receives the homage, now, as then. All obstacles are finally overcome and in various snug nooks under the eaves the birds hover with pride over their treasure-filled nests. At the same time a pair of Savanna Sparrows keep watch and ward over their egg-laden nest, neatly hidden on the sloping bank close under the ice-house.

Spring passes into summer and from the middle of July until well into August the smaller birds make the Redoubt a general rendezvous. The Redpolls return in family parties, the roseate flush of youth worn from the parental breast by the cares of family life, all being now clad in dull brown. Like neglected children, who, if they have no costly garments, are determined to enjoy themselves and make merry, so these little plebians stuff themselves to repletion with the good things of the garden and

weed patches, chirping and frolicing as merrily as though adorned with the most brilliant hues. They invest the Redoubt, flitting from place to place: one moment see-sawing on a tall weed, the next, hopping carelessly along the walk before you or peering from the eaves with an odd expression of lilliputian gravity. In return for this good-natured familiarity they are prime favorites with all. They do not, however, come unattended, for, in the yard, or outside of it, wherever a bare spot of ground is seen, are congregated parties of young Lapland Longspurs, which are nearly as careless of our presence as the Redpolls: they are, however, more sedate and business-like, and appear solely intent upon gormandizing. They run from place to place with their bills pointing downward, their eyes intently scanning every inch of ground, oblivious to their surroundings until a passing footstep starts them away to a short distance, where they resume their search for food. They have none of the pretty confiding ways of the Redpoll and consequently awaken but little interest.

The young Yellow Wagtails (*Budytes flava*) are also now numerous, searching, with a jaunty air, damp spots in and near the yard for insects, their tails constantly oscillating as though their owners were trying to maintain an ever changing equipoise. When the tide goes down they gather along high-water mark to feast upon the fare there provided. Flitting from rock to rock, or picking their way daintily from place to place, they afford a pleasing picture, until, their hunger satisfied, they rise, and, uttering a sharp metallic note, pass one after the other to their haunts upon the bare hillside, where they remain until the calls of appetite allure them back again.

The garden, meanwhile, has been the centre of attraction for various species of Warblers which revel among the insects found in the lettuce and turnip beds. The Black-capped Flycatcher is the most numerous though at times the Black-capped Warbler is about equally common. A Yellow Warbler at times enlivens the place, like a ray of sunshine: peering into the crevices of the fences, with an occasional foray among the spiders and other insects along the eaves of the houses, are seen the young of the Golden-crowned and the Kennicott's Warblers. From the wet paths leading away from the houses, or, at times, even from the yard itself, are started stray Water Wagtails (*Siurus nævius*) and Titlarks.

Golden-crowned Sparrows (*Zonotrichia coronata*) and Gambel's Finches claim their share of attention as they levy their tax upon the garden or flit from fence to fence, diving into the shelter of the weed patches on the first suspicious occurrence. The Fox-colored Sparrows return to take a short, though timid farewell before seeking winter quarters, followed by the Tree Sparrow.

A stray Robin shows itself once or twice during the summer, but a single visit to the garden appears sufficient, and the solitary voyageur is seen no more. A few Olive-backed Thrushes flit silently about for a day or two, and, if we are fortunate, we catch a glimpse of a rare visitant from Asia in the form of the Wheat-ear (*Saxicola œnanthe*) as it skulks around the end of the house and hastens to take shelter in the crevices among the rocks along the beach. I fear my thoughts are animated by a spirit of destruction, when such a visitant as this or Kennicott's Warbler is seen, which generally results in a tragedy in which the hapless little wanderer plays the part of victim. A few White-bellied Swallows fraternize with the Barn Swallows for a short time before leaving, the latter being now busily engaged in preparing their young for the long journey before them.

At times a pair of Black-breasted Turnstones are caught investigating the wet places about the houses, while the Semipalmated Sandpiper is quite numerous. Adventurous individuals of the latter even pass under the fence to explore the yard after a rain-storm. Once I even caught a Golden Plover making itself free within the fence, but as I stepped out of the house it hastily retreated.

The August moon rises, fills, and is on the wane; the air becomes chilly; one by one the sprightly forms, which, until now, have surrounded us with joyous life, slip away, so imperceptibly, however, that scarcely is one missed until we awake to the fact that of all the goodly company only a few stragglers remain. We may now look for a visit from one or two solitary Downy Woodpeckers, which, clinging pensively to the side of a log house, are evidently ruminating upon the strange phenomenon of barkless trees ranged in a series one over the other at right angles to the position in which experience has proven all properly conducted trees should extend. With a parting tap to make sure his eyes have not been deceived, he relinquishes his hold and departs for the interior where primitive nature still holds undisputed sway.

During September we are visited by various birds of prey. Every autumn brings one or two Hawk Owls to perch upon the top of the flag-staff or wind-vane, while young Goshawks and Gyrfalcons circle about, frequently alighting for a short time upon the fence or any convenient post. More rarely, a Pigeon Hawk appears for a moment, only to vanish as quickly. Several times during the evening, I have surprised a Short-eared Owl perched upon the fence or hovering over the yard, probably attracted by the mice which gather about the buildings at this season. One fall, in October, a Great Horned Owl for several successive evenings converted the woodpile into a lookout station, but was careful to decamp before a gun could be brought into requisition.

As winter sets in a small party of Black-capped Titmice may appear for a day or two and, less often, the Hudsonian Titmouse may be seen. Both climb about the old log houses or examine the weed patches, all the while cheerily uttering their familiar *dee-dee-dee*, and, in the end hurrying off as though they had not a moment to spare. Then follows a long blank, broken only by a stray party of Redpolls from their winter quarters in the interior; or, as may happen, a Ptarmigan perches upon the roof of one of the buildings for a few moments, gazing with astonishment on the mixture of dogs and men below: then, probably remembering a pressing engagement elsewhere, it precipitately departs. Once a Ptarmigan, more philsophically inclined or more foolish than the average, came whirring along and dropped into the centre of the yard amidst forty or fifty Eskimo dogs. Several persons who saw the performance stated that, as the birds feet touched the ground, there was a wild rush of dogs, a few feathers floated upward, and the dogs walked innocently away casting back regretful glances to make sure the gods were not to provide another heaven-sent gift for their delectation.

ON THE FINGERS OF BIRDS.

BY J. A. JEFFRIES.

THE anterior limb or wing of birds is homologous with the anterior limb of reptiles, batrachians and mammals. Hence it is

but natural to compare it part for part with the limbs of these animals.

If we take an adult bird we find two ossicles at the distal end of the forearm; these are called the ulno-carpal and radio-carpal bones. Next we have a compound bone made up of shafts, representing as many metacarpals. These in turn are capped by finger points, of the formulas 1, 2, 1, (e. g., *Passeres*), 2, 3, 1 (e. g., Ducks), or 2, 2, 1 (e. g., Coot).

The two carpel bones have, as a rule, been simply referred to the first row; while those of the second were considered to be anchylos with the metacarpals. Whether the metacarpals are the I–III or the II–IV has been a mooted question, Rolleston, Huxley, and Gegenbaur holding the first view and Owen, Wyman, Morse, and Coues holding the second view.

The first study of the development of the carpus was made by Gegenbaur, who showed that the carpals were joined to the metacarpals, and that the three metacarpals were at first separate. Next Dr. Morse studied the carpus and tarsus of small birds in their normal condition. By this means he demonstrated the existence in the embryo of the radiale, ulnare, and 2d, 3d, and 4th carpals of his determination, also in some cases the intermedium (*Dendræca æstiva*), and the centrale (*Tyrannus carolinensis*).

About the same time Rosenberg studied the carpus of the chick in a systematic way, longitudinal and transverse sections being made of the wing in various stages of development. The result is that he has shown that the carpus is represented by the radiale, intermedio-ulnare, and two carpal bones supposed to be the 1st–2nd and 3rd–4th. Also that the metacarpus is represented by four long bones, the fourth one being on the ulnal side. These he considers to be the first four.*

Very good sections can be obtained by soaking the wing in a 2%-5% solution of chromic acid and then in alcohol of increasing density till 95 % is reached. The wing thus treated should be imbedded in paraffine or some similar substance, then cut in the thinnest possible sections and mounted in balsam or a glycerine compound. It is not necessary to stain the object, though this is an advantage. A wing can be made perfectly transparent for

* I, however, find what seems to be a discrete 1st carpal in the Redstart; Morse has done the same of other birds.

gross examination by soaking in a solution of glycerine and ammonia carmine. By this means I have obtained specimens that have shown all the bones distinctly.

With this knowledge of the carpus and the light thrown by the new specimen of the *Archæopteryx* it would seem possible to decide the homologies of the fingers in the class of birds. The questions to be solved are: (1) Are the fingers homologous throughout the class? (2) Are they the I–IV or the II–V?

The only author known to me who considers that the fingers among living birds are not homologous is Dr. Coues. This distinguished ornithologist says (Key, p. 30): "The forefinger hand-bone sticks out a little from the side of the principal one, and bears on its end one finger-bone (sometimes two), which is commonly, but wrongly, called the bird's 'thumb'. For although on the extreme border of the hand, it is *homological* with the forefinger; birds have no thumb (exc. *Archæopteryx*, *Struthio*, *Rhea*); and no little finger." The mistake concerning the *Archæopteryx* was natural and is merely taken from Owen's memoir on the first fossil found. It has since, however, been shown that it had only three fingers. But why the Ostrich and Rhea should be included is hard to understand, since these have hand bones like all flying birds.*

Among the birds with undeveloped hands the "index" finger is the most constant, those on either side aborting before this. The genus *Dromæus* is a good example of this.

When the hand is developed it is of precisely the same form in all birds.

On the second question, which is virtually whether the first finger of birds is the first of the series or the second, much has been written; all, however, with the idea that two were lost.

Owen, Coues, and Morse have at separate times held that birds have no thumb, while Nitzsch, Meckel, Huxley, Gegenbaur and Rosenberg claim that birds have a thumb.

The arguments used against the existence of the thumb are as follows: (1) The first fossil remains of *Archæopteryx longicauda* show the remains of a detached finger, which Owen supposed to be a first digit placed on the radial side of the "thumb." Of this, however, he expresses some doubt.† (2) In Todd's

* See Selenka, Bronn's Thier-Reichs, Vögel, p. 75; D'Alton, Die Skelete d. Strauss-artigen Vögel, p. 17; Owen, Anat. of the Vertebrates, Vol. II., p. 73.

† Owen, "On the *Archæopteryx*." Phil. Trans., 1864, Vol. CLIII.

Cyclopedia Owen cites Nitzsch as authority when stating that the claws at the radial side of the wing are supported by phalanges. (3) The argument from analogy to the foot is brought forward in the following words by Morse: "If we compare the leg and wing of *Spizella* we shall see that in this early stage there are but three metatarsals and three metacarpals, and it seems reasonable to compare them together.

"As the first toe appears much later and is reduced to two phalanges, and has its two metatarsals also greatly reduced, and as at the stage just cited the first toe is represented only by a few granules, it seems natural to infer that in the wing the first finger never makes its appearance." Again Morse refers to the law of the reduction of digits. According to this law first the first and then the fifth digits are lost.

If we examine these arguments it will be found that they can not now be held. First, the last remains of an *Archæopteryx* described by Vogt show no traces of the supposed thumb of Owen, though the specimen was very much better than Owen's. The second argument, like the first, is without ground, and is not mentioned in Owen's Anatomy. The spurs found on the radial edge of the wings of certain birds are just like those found on the tarsus of the cock and others of the same order. The bone within, if any, is a special development for support. These spurs are not to be confounded with the claws developed on the last phalanges of the first and second fingers of many birds.

In following the analogy of the hand to the foot among birds we must not forget the great diversity in their formations. Again, if we force the analogy at all, it becomes an argument in favor of the existence of I digit. In the hand we have four metacarpals developed, in the foot we have four, or more probably five; the last, however, very rudimentary (a mere spot), even in the embryo. Thus it seems more natural to omit the development of the little finger than the thumb.

In considering the law of progressive reduction it must be borne in mind that this is the law as worked out among walking limbs, principally mammalian. Hence, with our present knowledge of the action of physical forces on life, it is a doubtful question whether the same laws would hold true for an organ used for such an utterly different purpose as the wing of a bird. In a walking limb the objects to be gained are: (1) The strongest

possible means of support down its long axis, i. e., a post. (2) Ease of flexion combined with rigidity when extended. This problem has been successfully worked out by the horse and other Ruminants. In the wing of a bird the object is very different: here no direct support is required but the power to resist a force applied along the whole of the hæmal surface. With this is combined the requisite that the wing should close in such a way as to oppose little resistance to the air in the advance of a bird through it.

Again this law is an absolute failure when applied to the leg of a bird, since the little toe is aborted but not the thumb. It may not be out of place here to mention the greater tendency of the radial side to produce digits, as shown by the extra toes in dogs, cats and hens. On the other hand the anatomists who consider the first digit of a bird to be the first of the series have not brought forward any particular argument, but have taken it to be a matter of course. Yet there are facts that seem to point this way. (1) There are no signs of any metacarpals developed radiad of the "thumb." This, of course, is of value only in so far as it seems to imply that there never was any. (2) If we study the myology of the hand we find several long muscles to the I and II fingers. These are the extensor metacarpi radialis longus, * and extensor carpi radialis to the first metacarpal, the extensor pollicis longus and the extensor indicis proprius. The last two muscles are so named from their similarity to these muscles in man. At all events, long, separate muscles to the digits are characteristic of the I, II, and V digits. Thus finding them in birds seems to imply that the first and second fingers are the I, II of the series.

Very marked characteristics of a bird's arm are that the flexor muscles are numerous, the pronators and supinators performing this function, and that all the long finger muscles are brought up to the radial sides of the fingers so as to act as adductors. This means a strong application of force to the radial side of the wing, hence correspondingly strong bones. Now, unless the thumb was lost before the modifications for flight were brought about, this application of force to the radial side points to the development of the thumb and index.

* Rüdinger considers this to be a muscle of the thumb, not the carpus. Nat. Verhand. v. d. Hollandsche Maadschappy d. Wetenschappen te Haarlem. II. Verzameling, 25 deel, 1868.

The only other parts, of any constancy, in the limbs besides the bones and muscles are the nerves. And here again we find facts that point towards the existence of the thumb. In man and some mammals the I, II and radial side of the III fingers are supplied by the radial nerve while the ulnal supplies the rest. This also is the case in birds, a small branch from the ulnal running down the posterior face of the pinion to the III finger.

Thus, since the arguments drawn from the *Archæopteryx* must be discarded, none remain to prove the non-existence of the thumb. On the other hand, all the facts of myology point to its existence, while the nerves, though not so constant, point the same way. Analogy to the foot also points this way, there being two joints in the thumb and three in the index, the same number that are the rule in the foot for the first and second toes. Also where there are two and three joints respectively in the finger there are often claws on the end, thus pointing to unugual phalanges.

So it seems safe to say that the structural evidence of the forearm and hand points to the existence of the I, II, III, and IV fingers in the class of birds.

NOTES ON A FEW BIRDS OBSERVED AT FORT HAMILTON, LONG ISLAND, N. Y.

BY DE L. BERRIER.

ABOUT the 20th of September, 1877, great numbers of the Red-headed Woodpecker (*Melanerpes erythrocephalus*), made their appearance about Fort Hamilton. They outnumbered the "High-holes," usually so common at that time of the year, and attracted the attention of the local gunners. Up to this time I had looked upon the Red-head as a scarce bird with us, having seen it only a few times before. As long ago as 1844, Giraud noticed that this bird had become much less abundant in the Eastern States than formerly. Dr. Coues, in "Birds of the North West," says it is now rare in New England. The conclusion is that either the bird is becoming extirpated in these regions, or else it is taking the advice

of a late prominent politician. However, in the fall of 1877 it was very common here for about ten days. It was also abundant in the adjacent parts of New York and New Jersey. Thus, at Tarrytown, an acquaintance of mine took a hundred and four specimens, and my friend Gerard Hardenberg, Esq., found it very plentiful about New Brunswick and Princeton. Unless I am mistaken, it was recorded in considerable numbers from the south side of Long Island in the winter of 1877 and 1878. In the fall of 1878 I saw only two or three individuals of this species, and during the last autumn I shot but one.

The fall of 1878 was also remarkable for the unusal number of Red-bellied Nuthatches (*Sitta canadensis*), White-bellied Nuthatches (*Sitta carolinensis*), Brown Creepers (*Certhia familiaris*), and Chickadees (*Parus atricapillus*). Excepting the first-named, which had hitherto been rather scarce, the rest had always been regular fall visitants, but never in such hosts as came that autumn. The little fellows were everywhere, — about the trees, on the fences, climbing the sides of the houses, and running about the shutters. They remained with us through the winter and first half of the spring. I may here remark that I shot a Red-bellied Nuthatch at Fort Hamilton, July 20, 1877, in full breeding plumage (see Brewster's "First Plumages," this Bulletin, Vol. III, pp. 20, 21). What this bird was doing on Long Island in mid-summer I can not imagine, as its southern breeding limit is far north of here. During the past autumn and winter *I have seen not one Red-bellied Nuthatch, or Chickadee*, and only two or three White-bellied Nuthatches. Why such a common bird as the Black-capped Tit should have been wanting I cannot imagine. It would be interesting to know whether this species wintered in unusual abundance north of Long Island.

In the fall of 1879 the Water Thrush (*Siurus nævius*) was the characteristic bird of this neighborhood. Fort Hamilton is hardly the locality where one would look for the Water Thrush. Almost every pond in the township of New Utrecht has been drained, on account of the malaria that formerly prevailed, and there are no streams. Nevertheless from the middle of August to the latter part of September Water Thrushes were very abundant. They were found in dry woods, in pastures and orchards, and in yards and gardens. In fact, I found them more plenty away from than about moist ground. Heretofore the Water Thrush had been

rather scarce both in spring and autumn. About the middle of the present month, May 1880, I noticed it in considerable numbers.

What occasions these erratic movements of the birds? The supposition that a variation in the supply of food is the cause seems hardly probable, for it appears incredible that the food of the Chickadee and Nuthatches should have been so scant last fall as to cause these birds to avoid this locality in their migrations. I say it is incredible because their kind of food is shared by many other birds that were abundant. As for the character of the season influencing their travels, unless it can be shown that they wintered north of Long Island in unusual numbers, I do not think it can be taken as a reasonable explanation, for the birds mentioned above are regular migrants whatever the character of the seasons may be.

In closing I may remark that there are three common birds that are always rare about Fort Hamilton, viz.: The Hairy Woodpecker (*Picus villosus*), the Downy Woodpecker (*Picus pubescens*), and the Purple Martin (*Progne purpurea*). Now I expect that some readers of this article will conclude that its author is either afflicted with blindness, or else is a very careless observer. I beg leave to say that neither conclusion is correct. The statement regarding the scarcity of the species just named, is the result of four years' careful observation of the birds of this locality. Mr. Geo. H. Coues has, indeed, given both the Hairy and Downy Woodpeckers as common about the Naval Hospital, Brooklyn (this Bull., Vol. IV., p. 31). The Hospital is scarcely a dozen miles from Fort Hamilton, nevertheless I must stand to my statement, and am willing to take my oath upon a copy of Dr. Coues's "Key to North American Birds," as to its validity. In this vicinity I have met with the Downy Woodpecker only two or three times, and with the Hairy Woodpecker not at all. It is true that the woods have been pretty nearly cleared away from this part of the island, still a sufficient amount of woodland remains, and certainly the orchards should furnish ample accommodations. The case of the Purple Martin is equally curious. This bird is common enough at the eastern end of the island, yet here I have only seen a few individuals.

ON BIRDS OBSERVED IN SUMPTER, LEVY, AND HILLSBORO' COUNTIES, FLORIDA.

BY W. E. D. SCOTT.

My purpose in the following pages is to give additional notes on the distribution and habits of certain birds that do not seem to have come commonly under the notice of ornithologists collecting in Florida during the fall, winter, and early spring months. The data which follow were collected during two visits to Florida, and at the several points to be presently indicated. The first of these visits occurred in 1876 and covered a period extending from January 1 to the end of the following March. The observations then made were confined to the interior, the precise location being at Panasofkee Lake in Sumpter County. Here a large region was carefully studied and particularly the bird fauna of this lake,—a small body of water, about eight miles long and four broad in its widest part. Its greatest depth is, so far as ascertained, about fifteen feet, but the general depth is much less, being not more than three or four feet. The general characteristics of the region are those common to many parts of the State,—rolling sandhills wooded with pine, "hummocks," some of great extent, and wet open grass lands or marshes. These last give rise to certain small streams supplying the lake, which in its turn has a large outlet leading into the Withlacoochee River, forming one of the main branches of that river. The lake is bounded by "saw-grasses" and cypress swamps; the latter are very extensive about the outlet of the lake and along the river above-mentioned.

Late in October, 1879, I again visited Florida, and spent from November 1 until April 5 on the Gulf Coast. The interval from the 1st of November until the 25th of January was passed at a point some three miles north of the mouth of the Withlacoochee River. Here the Gulf is dotted for a distance of three or four miles from the shore with innumerable islands, mostly low and of very limited area. The main land, as it approaches the Gulf, is heavily wooded with pine, interspersed here and there with small hummocks. The pine forests end generally very abruptly in large salt marshes reaching to the Gulf.

Late in January I left this point and went to Clearwater, fifty miles south, a region entirely different from that just described. Here the main land terminates in high bluffs. About two miles from the main land long islands extend parallel to it, forming interior bays like those of New Jersey and at many points along the coast of the States to the southward. These islands are generally narrow, high, and at points heavily wooded. With this brief glance at these three regions the remarks on the birds characterizing them will be more intelligible.

It is not in the scope of the present paper to mention all the species occurring, and it will be only necessary to say that the commoner small land species were met with at each point. It may be well, however, to use as a standard for comparison Mr. Allen's list,* and notice only such species as apparently differ in general distribution or did not come under his observation or that of the gentlemen referred to by him.

In January, 1879, the Long-billed Marsh Wren (*Telmatodytes palustris*) was abundant in the salt marshes at the mouth of the Withlacoochee River..

At Ocala, in the interior, on November 1, 1879, two Tit Larks (*Anthus lodovicianus*) were noticed and the species was common at Clearwater during February.

The Golden-crowned Thrush (*Siurus auricapillus*) I met with once at Clearwater in February and the Water Thrush (*Siurus nævius*) was not uncommon in February in the damp, dark, mangrove islands in the same locality. It seemed peculiar to meet this species on these small islands that were overflowed with salt water each high tide. The Purple Martin (*Progne subis*) was common about Clearwater February 22, and on March 6 I noted a pair breeding in a hollow in a decayed mangrove close to the water. I found also several pairs breeding inland during the same month.

Of the Finches recorded in Mr. Allen's list I did not find either the Snowbird (*Junco hyemalis*), or the Fox-colored Sparrow (*Passerella iliaca*). Both the Sharp-tailed and Seaside Finches (*Ammodromus caudacutus* and *A. maritimus*) were found commonly, but though I took many specimens of *A. maritimus* none were in the peculiar plumage (*A. maritimus*

* Mammals and Winter Birds of East Florida, etc. Bull. Mus. Comp. Zoölogy Vol. II, pp. 161–450, April, 1871.

nigrescens) obtained by Mr. Maynard. The Yellow-winged Sparrow (*Coturniculus passerinus*) was common throughout February and March at Clearwater, and on March 25 I obtained a single Henslow's Sparrow (*C. henslowi*) at the same locality. In the same region Bachman's Finch (*Peucæa æstivalis*) was abundant.

Several specimens of Chuck-will's-widow (*Antrostomus carolinensis*) were noted or taken during the month of February at Clearwater.

The Ivory-billed Woodpecker (*Campephilus principalis*) was taken at both Panasofkee Lake and at the mouth of the Withlacoochee River and was noted at Clearwater. It was most common at the second locality but seems a rare bird at all the points indicated. A female taken on January 20, 1880, was incubating. The nest seems to be not uncommonly made in the trunk of the palmetto, from observations made at the mouth of the Withlacoochee where these trees are particularly abundant and large. I noticed an old nest, evidently of this species, that was not more than fifteen feet from the ground.

The Parrakeet (*Conurus carolinensis*) is becoming yearly more rare. It was very abundant at Panasofkee Lake, but very few were noted at the mouth of the Withlacoochee, and only a single bird at Clearwater, though it was not uncommon in the interior twelve miles north of the latter locality.

About February 1, 1876, I first noticed the Everglade Kite (*Rostrhamus sociabilis*) at Panasofkee Lake, and shortly this species became abundant at this point. Frequently pairs were observed together and the bird was commonly met with in parties of from six to ten. On one occasion I noticed nineteen associated together, fishing in the shallow water of a bay that made off from one side of the lake. Many of the birds were in the brown plumage, though the dark blue plumage was frequently met with. Their food at this point apparently consists of a kind of large fresh-water snail, which is very abundant, and the local name of "Snail Hawk" is particularly applicable to the bird as I have met with it. They fish over the shallow water, reminding one of Gulls in their motions, and having secured a snail by diving they immediately carry it to the nearest available perch, when the animal is dexterously taken from the shell without injury to the latter. At many points where a particularly conven-

ient tree or stub rises out of the saw-grass the ground is literally heaped with the empty shells of these unfortunate snails. The birds were especially numerous throughout the month of March but had not, I think, nested before my departure, March 25, as they were still associated in flocks or companies.

During January and February, 1876, I many times noted individuals of the Mississippi Kite (*Ictinia mississippiensis*), but as they were very wary I was unable to obtain specimens. The Swallow-tailed Kite (*Nauclerus furcatus*) I found common at Panasofkee Lake during the last week of February and throughout March. These three species, met with so commonly at the point indicated, I did not even see on the coast, though certain regions visited some ten miles inland seemed admirably adapted for at least the two latter. *R. sociabilis*, it may be well to remark, impresses me as eminently an aquatic species. I found it always in the immediate vicinity of the lake and generally most common about certain bays where the water was shallow and the snails particularly abundant. Although there were extensive marshes along the river, and although at points where it widened out the water was shallow and the snails present (at a point hardly two miles from the lake), this species was never there observed by me hunting over the land at any point, nor even along the river.

The Duck Hawk (*Falco peregrinus*) was a rather common species during the first two months of my stay at Panasofkee Lake and was noted, though not so commonly, in March. The last observation on this species was on March 24, when a pair were seen. As observed here, this Hawk preyed almost exclusively on the Coot (*Fulica americana*) which occurred in enormous flocks on both lake and river.

At all three points I found the White-headed Eagle (*Haliaëtus leucocephalus*) a common bird and this was particularly the case on the coast. A pair at the mouth of the Withlacoochee River began to repair an old nest early in November, 1879, and must have laid early in December, as the young were obtained almost fully fledged the 22d of January. At Clearwater Harbor two sets, one of two and one of three almost fully fledged young, were obtained February 5 and 6. Four Eagle's nests were in sight from the house where I stayed at this place, within the radius of a mile and a half, all of them inhabited. In the immediate neigh-

borhood were at least seven or eight other pairs of Eagles breeding.

Audubon's Caracara (*Polyborus brasiliensis*) was not observed at any of the localities visited.

The Barred Owl (*Strix nebulosa alleni*), which was very abundant at Panasofkee Lake, was rather a rare bird at the points visited on the coast, but the Screech Owl (*Scops asio floridana*), which I did not find in the interior, was abundant at both locations on the Gulf Coast. The specimens obtained are most of them in the gray or mottled plumage, though two are in the red plumage. In size they are like the Acadian Owl (*Nyctale acadica*) as found in New Jersey, a trifle smaller if anything.

The Black-breasted Plover (*Squartarola helvetica*) was very common in November, December, and January at the mouth of the Withlacoochee River, and remained common at Clearwater until late in March. The Golden Plover (*Charadrius virginicus*) was not met with. In January I several times saw the Wilson's Plover (*Ægialitis wilsonia*), but it was not common. On my arrival at Clearwater, 30th January, it was abundant in small flocks of from four to a dozen. They were very unsuspicious and easily taken. My assistant, Mr. James Henry Devereux, procured many nests with eggs of this species on the shores of Old Tampa Bay in April and early May. He says that they breed very abundantly at this point but their eggs and young are so diligently sought after and destroyed by the common hog that very few escape. This is also the case with the Willet (*Totanus semipalmatus*) and other ground-nesting species.

Both the Semipalmated and Piping Plovers (*Ægialitis semipalmata* and *Æ. meloda*), were met with at the mouth of the Withlacoochee River in December and January; the former very abundantly and the latter rarely. The former was also common at Clearwater in February. The Oystercatcher (*Hæmatopus palliatus*) was not uncommon during my stay at the mouth of the river, but was rather more numerous during late December and January. It was common at Clearwater, where Mr. Devereux obtained a set of eggs. At all points where it was met with it was very shy. During November, December, and January, the Turnstone (*Strepsilas interpres*) was an abundant bird at the mouth of the Withlacoochee River, and it was also common at Clearwater during the first part of February.

The Red-breasted Snipe (*Macrorhamphus griseus*) was a common bird during my stay on the Gulf Coast and was also met with at Panasofkee Lake, though not commonly. At this latter place most of the individuals obtained were the variety *scolopaceus*, but on the Gulf the commoner form (variety *griseus*) obtained, almost to the exclusion of the other. A curious habit of this species was noted at the mouth of the Withlacoochee, where I saw the birds alight in very deep water and swim about for considerable time. This occurred in every instance after a flock had been fired at, and I thought at first that the birds had been wounded, but after observing the occurrence a number of times and on watching the birds while in the water I concluded that such was not the case. Those I noted were generally solitary individuals, but twice I saw three and once four alight in the water, swim lightly and gracefully about, and when disturbed rise easily and fly away. These observations were all made at one point. This was an oyster reef at some distance from any other land. At low tide it was bare and would become covered at this time with hosts of *Grallæ*. A single point remained half-submerged at high water and this was covered with this species and *Strepsilas interpres*. The area thus crowded by birds was but a few square yards and the birds on it at high water were generally asleep, as was plainly to be seen with a field glass. I think the birds simply alighted in the water to wait till such a time as the disturbing element would allow of their returning to this favorite resting point.

The Great Marbled Godwit (*Limosa fedoa*) and the Long-billed Curlew (*Numenius longirostris*) were common on the Gulf Coast at both points visited, and I was told by trustworthy hunters that both species remained the year round, though very much more abundant in winter. Other species of *Numenius* I did not meet with. It seems hardly necessary to record the abundance of the Willet (*Totanus semipalmatus*), which was very common and conspicuous on the Gulf Coast, assumed its full plumage late in February, and was not found breeding till April. These later observations were made at Clearwater. The Red-breasted Sandpiper (*Tringa canutus*) was common at Clearwater in February, as was also the Dunlin (*Tringa alpina americana*). A single record of *Tringa bonapartii* was made at Clearwater in February.

At Panasofkee Lake, one of the most numerous and conspicuous species was the Courlan or Crying Bird (*Aramus pictus*), where its principal food seemed to be the species of snail on which the Everglade Kite preyed, but I did not observe this species at the mouth of the Withlacoochee River and it is unknown to the hunters about Clearwater. There are numerous fresh-water lakes and ponds in the country about Clearwater, notably among which is Lake Butler, a very considerable sheet of water, but frequent visits to such places confirm me in the belief that the Courlan does not obtain in this region now. It is very rapidly becoming exterminated where it was once so abundant. While travelling on the Oclawaha in the winter of 1875-76 I saw it in countless numbers, but going over the same ground in the winter of 1879-80 I observed less than ten individuals.

At Clearwater and just south of it, and particularly at points on Old Tampa Bay, I found the Reddish Egret (*Ardea rufa*) abundant. While most common in the dark plumage, many were noted and some obtained in the white plumage, the so-called *Ardea pealii*. They began breeding in March and were breeding commonly in April, Mr. Devereux obtaining numerous sets of their eggs, varying from four to six in number. This gentleman found young in both plumages in the same nest where the parents were both blue birds.

I was struck during the *early* part of the breeding season, with the coloration about the bill and face in some of the Herons, and not finding descriptions of the same conditions I append the following: *Ardea cærulea*. In this species, in both plumages, I have, in a very large series collected at the three points visited, noted that the iris is light straw color. But a series of twelve individuals collected at Clearwater in a little lake where they had just begun to breed, the date being 20th March, 1880, the iris was deep lead color and in one case brown or hazel. These are the only individuals of this species that I have taken at just this period, viz., at the beginning of the breeding season, but this is apparently the coloration of the part in question at that season.

On March 15, at the lower end of Old Tampa Bay, I made the following notes with regard to the coloration of the lores, face, and eyes of the Louisiana Heron (*Ardea leucogastra leucocoprymna*). The notes are from twelve individuals freshly killed, and the nesting season had advanced as far as the completion of

the nest, for only in one nest out of fifty just finished was a single egg found. The specimens, as in the last case, were both males and females: "Lores and base of bill, deep, dark blue with no trace of orange or any shade of yellow. *No yellow on bill or face* at any point. The iris, in nine cases, deep bright red; in the other three, red, with a tinge of yellowish. Later in the season, about April 1st, some females show yellowish about the bill and have yellow irides, but the males are still as above described." *

I found the Yellow-crowned Night Heron (*Nyctiardea violacea*) not uncommon at Clearwater, and also secured a series of the species at Panasofkee Lake. Mr. Devereux found the Least Bittern (*Ardetta exilis*) breeding very commonly at Clearwater early in April.

The most common small Tern noted on the Gulf Coast throughout the winter was Forster's Tern (*Sterna forsteri*), and until early spring all obtained were in the "*havelli*" stage. They were abundant during my stay at the mouth of the Withlacoochee River, and were noted daily at Clearwater, where early in February I obtained individuals in full plumage. Mr. Devereux obtained the Least Tern (*Sterna superciliaris*) breeding very commonly in May.

All the Ducks noted by Mr. Allen were obtained, and, in addition, a single specimen of the Ring-necked Duck (*Fuligula collaris*) at Panasofkee Lake, where I noted the species on two occasions. At the mouth of Withlacoochee River, in January, I observed a single Buffle-headed Duck (*Clangula albeola*), a male in full plumage.

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* [These observations are of special interest as giving the first account of the coloration of the face and bill in this species in the breeding season based on Florida examples. Mr. C. B. Cory has observed the same conditions among the Louisiana Herons met with by him at the Bahama Islands (see Birds of the Bahama Islands, 1880, pp. 168, 169, plate, and "Oologist," Vol. V, p. 79, Dec., 1880), and finding no account of similar features in relation to this species as observed elsewhere has made this seasonal phase of coloration in these parts the basis of a new species, named by him *Ardea cyanirostris*. — J. A. ALLEN.]

INSECTIVOROUS BIRDS IN THEIR RELATION TO MAN.

BY J. A. ALLEN.

DOUBTLESS many ornithologists who have attentively examined the contents of birds' stomachs have suspected that were the truth known it would be found that the insectivorous species are not to so great an extent the ally of man in his contest with voracious insect hordes as is generally believed. The community at large fails to recognize in this connection two important facts, namely: that there are beneficial insects as well as injurious ones, and that birds are indiscriminate in their captures. Were it an established fact that birds, in so far as they are insectivorous, are the friends of man, the notion that birds are useful in proportion to the number of insects they destroy could hardly have a firmer hold. On all sides the cry is raised "Protect the birds," while their actual rôle in relation to the insect world has scarcely received a serious thought. "Birds destroy insects, therefore they are an invaluable aid to man in his unequal struggle with these insidious foes," is a natural and general conclusion. That there are rapacious and parasitic insects, that these are the great natural check upon the undue increase of the plant-eating species, and that birds are useful only in proportion to the number of the latter they destroy as compared with the former, are facts that are generally ignored.

As above stated, it has not escaped the notice of those ornithologists who have a smattering of entomological knowledge that insectivorous birds may do much harm as well as great good, and that the popular and almost universal demand for their protection, while perhaps harmless, is at least based on ignorance of the real state of the case. I well recall being pained years ago by finding, with the cutworms and caterpillars, a conspicuous proportion of "lady bugs," rapacious ground beetles, and other predaceous insects in the stomachs of Thrushes, and of ichneumons with the soft aphides and caterpillars in those of Warblers. As an enthusiastic lover of birds, I feared the results to which a critical study of the food of insectivorous birds might lead; and

I have compared notes with other bird-lovers who share the same misgiving, based on their own casual study of the subject. But whatever the final outcome of such investigation, sentiment should of course give way to truth. Whether insectivorous birds, considered from the utilitarian side, are beneficial in their relation to agriculture, or positively (at least in many cases) injurious, or merely hold a neutral place, it is far too early yet to decide, for thorough investigation of the subject can be considered as having merely begun. The fact that they destroy large numbers of noxious insects is established beyond question; whether they do not at the same time devour so large a proportion of beneficial ones as to fully or more than offset the good they accomplish in the destruction of the former may be considered as an open question, which years of careful observation can alone decide. From investigations now in progress, notably in this country at the hands of Professor S. A. Forbes of Normal, Illinois, it is to be hoped that the data for an intelligent judgment in the matter will be soon reached. To Professor Forbes is due the credit of not only first directing attention to the subject, but of first instituting systematic research respecting the relation of birds to predaceous and parasitic insects. In addition to his own observations he has published a translation* of M. Édouard Perris's memoir on this subject, published in 1873 in the "Bulletin mensuel de la Société d'Acclimatation."† M. Perris, after many years of careful observation, expressed himself as "convinced that the current ideas respecting the utility of birds are prompted by impulse rather than reflection," and, he adds, "I believe that, if more attention had been paid to the rôle played by insectivorous birds and to the mode of life of the insects which injure us, very different conclusions would have been reached." After reviewing the subject at length, and presenting in detail his long array of facts, he formulates his deductions, calling attention to the fact that birds are scattered here and there in pairs "while insects invade *en masse* the trees which they attack, the products of the soil of which they are the enemies"; that while birds destroy enormous numbers of insects, these insects are in great part innoxious, while some are eminently useful. "The species really noxious are so few compared with the whole mass, that birds are really of little service. They

* American Entomologist, new series, Vol. I, 1880, pp. 69-72, 96-100.

† Republished here from the Mém. de la Soc. roy. des Sciences de Liége.

may even injure us. . . . . especially by killing so many carnivorous or parasitic insects, which render us the greatest service." Reasons are also assigned why so many of the really noxious ones escape capture, either through their minuteness, their habits, or through special means of concealment or protection.

As Professor Forbes observes, the question of the food of birds is almost entirely a question for entomologists and botanists, although it has hitherto been left almost wholly to ornithologists, who have not usually the special knowledge requisite for its investigation even had they the desire to pursue this branch of inquiry. For this reason he hopes the attention of our economic entomologists will be turned in this direction, and has accordingly laid M. Perris's paper before them.

Professor Forbes has undertaken the investigation of the food of the Thrushes and of the Bluebird. His examination has thus far been preliminary or on too limited a scale to give conclusive results, yet yielding deductions that go far to show how greatly such studies are likely to revolutionize current opinion respecting the utility of birds as destroyers of noxious insects. His report on the food of the Thrush family (*Turdidæ*) * is based on the examination of the stomachs of fifty-one Robins, thirty-seven Catbirds, twenty-eight Brown Thrushes, eleven Wood Thrushes, eighteen Hermit Thrushes, eight "Alice's Thrushes," six "Swainson's Thrushes," and one Wilson's Thrush, shot in Illinois in various months from March to September. While the number of specimens is small, Professor Forbes claims that no equal number "has been previously studied with *equal care*," and gives his results "as hypotheses, more or less probable, but requiring verification by further study." A rigid examination of the food elements in these examples "determines the hitherto unexpected fact that the family is inordinately destructive to predaceous beetles (*Harpalinæ*), seven per cent. of the food of the 150 specimens consisting of these highly beneficial insects. When we remember that one predaceous insect must destroy many times its own bulk of other insects during its life, we see the importance of this fact in respect to the economical value of these birds. . . . Of the 150 Thrushes examined, forty-six per cent. had taken *Carabidæ*

* The Food of Birds. Trans. Illinois State Hort. Soc., Vol. XIII, 1879 (1880), pp. 120-172. — The Food-habits of Thrushes. Amer. Entomologist, new ser., Vol. I, pp. 12, 13, Jan., 1880.

[predaceous beetles], while of 194 birds of other families in whose stomachs insects were found, less than five *per cent.* had eaten these Coleoptera. The worst sinner in this respect was the Hermit Thrush. . . . Curiously, the ratio of *Carabidæ* continued undiminished during the fruit season, when the total of insect food fell away very rapidly. For example, the Cat-birds ate in May, June, and July eighty-seven *per cent.*, sixty-four *per cent.*, and eighteen *per cent.*, respectively, of insect food, while the *Carabidæ* for those months averaged seven *per cent.*, six *per cent.*, and ten *per cent.*, the corresponding fruit record standing nothing, thirty *per cent.*, and seventy-one *per cent.* . . . The absence of all, or nearly all, the specially protected genera is noticeable (unless the obscure color of many is reckoned a special protection)." * The full details of the observations made upon this family † show certain specific differences of food: that while the different species of this group agree in many particulars as regards food, that the differences are so marked that it is usually possible to "determine the species by the contents of three or four stomachs."

During April, the eleven Robins examined were found to have "apparently done very much more harm than good . . . . eating predaceous beetles which would probably have destroyed many more noxious insects than were found in their own stomachs." In May the balance was found in favor of the four specimens examined: in June, in respect to five specimens, the balance was in the other direction, but probably turned favorably through the large amount of insect food procured for their young. The July record left "the scale trembling in the balance." The final conclusion respecting forty-one Robins is that they had, taken together, "certainly done, just previous to their demise, fully as much harm as good, as far as we can judge from the contents of their stomachs." With respect to the Catbird it was found that there was "an unexpected balance of about seven per cent. of injurious insects with which to pay for twenty-seven per cent. of fruit." for the three months of May, June, and July. With regard to the economic value of the Brown Thrush, Mr. Forbes thus sums the evidence: "so far as it can be supposed to be indicated by the stomachs of these twenty-eight individuals, I conclude that

* Amer. Ent., l. c. p. 13.

† Trans. Illinois State Hort. Soc., . c.

in April it gains a credit of about twenty-two per cent.: that in May, chiefly through the excess of predaceous beetles, this drops to about six per cent.; that in June it falls away to zero, and in July to minus thirty per cent., thus just about wiping out the credits of the previous months." The Hermit Thrush is counted a "public enemy" on the score of his excessive destruction of predaceous beetles. The Swainson's Thrush (under which name we include "the Alice Thrush") has a better record and is regarded as worthy of "what little encouragement and protection we can give it during its brief stay." On the whole the Thrush family, so far as our knowledge of their food extends, cannot be awarded "any great economical value."

Professor Forbes's showing for the "beautiful and beloved" Bluebird is certainly a surprise and a shock to our notions of its innocence and hitherto supposed high degree of usefulness. His detailed report,* based on an examination of eighty-six specimens, shows that the species preys largely upon predaceous beetles and ichneumons, the latter including special enemies of the cutworms and grasshoppers. In view of the many uncertainties that enter into the problem of the relation of carnivorous and parasitic insects to those which form their natural prey — whether or not their increase is sufficiently rapid to keep up their due proportion to these and also to furnish a surplus for destruction by birds — Professor Forbes believes that (as he rather obscurely puts it) while "the *probabilities* seem to be against the Bluebird," "the *certainties* are, as yet, in its favor." Taking into account, he adds in conclusion, "the certainty of the evil consequences of the destruction of the Bluebird, and the uncertainty of the possible good, I believe that, notwithstanding the apparent balance against the species, even the most radical economist, the most indifferent to the beauty and pleasure of the natural world, would have no present justification for throttling the song of the Bluebird in his garden with the hope of increasing thereby his annual store of hay and cabbage."

In respect to the general subject of the economic relation of insectivorous birds to insects, and to the results already attained through his detailed studies, Professor Forbes judiciously admits that the observations thus far made are far too few to settle the question, but that they indicate that the time has come for hesitation,

* Amer. Entomol., new ser., Vol. I, pp. 215-218, 231-234, Sept. and Oct., 1880.

for impartial study, and for a cautious balancing of the evidence; for those who are least prepared to understand their own ignorance to give attention to some of the conditions of the problem. What the final outcome will be it is quite too early to predict; what seems most probable is that while some insect-destroying birds may doubtless prove to be demonstrably beneficial to a greater or less extent, many others will prove to hold merely a neutral position, while a few may be found to be to a slight degree injurious. It is certainly time to abandon the ground that because certain birds subsist largely upon insects they are necessarily beneficial. It seems not improbable that the rôle of insectivorous birds, considering the class collectively, will prove to be in no way economically important, and that it will be safe to leave nature to adjust her own balance between birds and insects; that undue interference, either in the way of protection or of proscription, will tend rather to harm than to good But birds are to be considered not merely with regard to dollars and cents—to the production of grain and fruits; they have their æsthetic relation, and, sentiment aside, we may long and wisely hesitate before outlawing even the few species that may seem to somewhat overbalance their services by indulgences which to some degree militate against man's material interests. So much do they contribute to our higher enjoyment, to such a degree is their presence a pleasure, and their influence ennobling, it would be an aspersion upon our civilization to even suppose that the time will soon come when public sentiment will demand for trifling cause the extirpation of creatures so thoroughly endowed with beauty, and with attributes that touch so deeply our inner life. While we may well look forward with deep interest to the results of thorough research in this direction, there seems little reason for anxiety, even on the part of those who would least welcome an unfavorable showing for their cherished favorites of the bird world.

REMARKS ON THE PRESENT STATE OF THE SYSTEMA AVIUM.

BY P. L. SCLATER.*

It will be generally allowed, I believe, by all ornithologists that the Systema Avium is not at present in a very satisfactory state. The Cuvierian arrangement and its modifications have been broken down by the criticisms of modern inquirers; but no other system has arisen to take its place, or, at all events, has secured general adoption. The subject being, as will be universally allowed, one of the utmost importance, I have thought it possible that my brother workers might like to hear what my views are upon the question.

Up to 1873, as regards general arrangements, I had acquiesced, more or less, in the modified Cuvierian system employed by G. R. Gray in his well-known works. I had, however, long before quite come to the conclusion that the true Passeres were the most highly developed order of birds, and should be placed at the head of the series, and that the Fissirostres and Scansores, which in Gray's system merely figure as subdivisions of the Passeres, should stand as separate orders. I had also made up my mind that, as regards the subdivisions of the Passeres, Müller's discoveries as to the form of the larynx and the arrangement of its muscles could not be passed over. Accordingly, in the catalogue of my collection of American birds, published in 1862, I arranged the three first orders of birds (as I then considered them), to which my collection was restricted, as follows: —

Ordo PASSERES.

Sectio *Oscines*.

i. Turdidæ.
ii. Cinclidæ.
iii. Sylviidæ.
iv. Paridæ.
v. Certhiidæ.
vi. Troglodytidæ.
vii. Motacillidæ.
viii. Mniotiltidæ.
ix. Hirundinidæ.
x. Vireonidæ.
xi. Laniidæ.
xii. Ampelidæ.
xiii. Cœrebidæ.
xiv. Tanagridæ.
xv. Fringillidæ.
xvi. Alaudidæ.
xvii. Icteridæ.
xviii. Corvidæ.

* From the "Ibis," 4th ser., Vol. IV, No. 15, pp. 340-350, July, 1880.

As comparatively few American readers of the Bulletin have ready access to the "Ibis" it has been deemed expedient to lay before them, in view of its high importance, Dr. Sclater's memoir here reprinted.—EDS.

Sectio *Trachophonæ*.

xix. Dendrocolaptidæ.	xxii. Tyrannidæ.
xx. Pteroptochidæ.	xxiii. Cotingidæ.
xxi. Formicariidæ.	xxiv. Phytotomidæ

Ordo FISSIROSTRES.

i. Momotidæ.	vi. Trogonidæ.
ii. Todidæ.	vii. Caprimulgidæ.
iii. Alcedinidæ.	viii. Cypselidæ.
iv. Galbulidæ.	ix. Trochilidæ.
v. Bucconidæ.	

Ordo SCANSORES.

i. Cuculidæ.	iv. Picidæ.
ii. Rhamphastidæ.	v. Psittacidæ.
iii. Capitonidæ.	

This arrangement of the three first orders of birds I employed until 1872, allowing the Accipitres to succeed, and the remaining orders to follow, according to the Grayian system. But in 1872 it was necessary to decide what arrangement should be employed for the remaining orders in the list of Neotropical birds ('Nomenclator Avium Neotropicalium') which I was then preparing together with Mr. Salvin.* In the mean time the famous investigations of Prof. Huxley on the bones of the palate in the class of birds had taken place, and an entirely new arrangement of the class, consequent upon these investigations, had been promulgated. Having long entertained serious doubts as to the validity of the Grayian system, especially as to the groups associated together in the orders Grallæ and Anseres, I was pleased to find an alternative which had the sanction of high authority. Prof. Huxley had commenced his "Systema"† with the lowest and most reptilian birds, and had ended it with the highest and most specialized. But it seemed to me that, by exactly reversing this arrangment, I should obtain a scheme which would not very far deviate from that which I had already employed as to the first three orders, and would offer many improvements on the Grayian system in the remainder. In the introduction to the 'Nomenclator,' accordingly, I gave the subjoined scheme as that which I proposed to employ for the general arrangement of living birds, dividing them into 21 orders, as follows: —

* [The arrangement adopted in the 'Nomenclator' is entirely Mr. Sclater's. I was forced to desert my colleague when I visited Central America in 1873-4, a portion only of this work having been then printed and the Introduction unwritten.—O. S.]

† P. Z. S. 1867, p. 456

Subordo I. AVES CARINATÆ.

Series *Ægithognathina.*	Series *Desmognathina.*	Series *Schizognathina.*	Series *Dromæognathina.*
1. Passeres.	4. Coccyges.	11. Columbæ.	19. Crypturi.
2. Cypseli.	5. Psittaci.	12. Gallinæ.	
3. Pici.	6. Striges.	13. Opisthocomi.	
	7. Accipitres.	14. Grues.	
	8. Steganopodes.	15. Limicolæ.	
	9. Herodiones.	16. Gaviæ.	
	10. Anseres.	17. Pygopodes.	
		18. Impennes.	

Subordo II. AVES RATITÆ.,
20. Apteryges.
21. Struthiones.

I will now proceed to make a few remarks upon each of these orders, and to state where I think there are improvements still to be effected in the arrangement. It must, however, be always recollected that, although a linear system is an absolute necessity for practical use, it can never be a perfectly natural one. It will always be found, in any linear arrangement, that certain groups are nearly equally related to other groups at quite different parts of the series, and that it is a question of no little difficulty with which of these to place them: but we must, nevertheless, do our best to make the most natural linear arrangement that is possible for practical use.

1. PASSERES.

After eliminating the Scansores and Fissirostres of the Cuvierian system, the remainder of the Insessores constitute a tolerably homogenous group, which, it is now generally acknowledged, form one of the main divisions of the Class of Birds. They are the Passerinæ of Nitzsch,* the Oscines of Sundevall's 'Tentamen,'† the Coracomorphæ of Huxley: but I see no reason why we should not retain for them the old Linnean name of Passeres.

There are still several forms regarding which their collocation in the Passeres thus understood is a matter of dispute. These are mainly as follows:—

1. *Upupa*. Sundevall places *Upupa* near the Larks, at the commencement of his second series of Oscines (the "Oscines

* 'Obs. de Avium arteria carotide communi.' Halæ, 1829.

† In Sundevall's former arrangement (Orn. Syst. 1836) they were denominated *Volucres*, and divided into two main groups, *Passeres* and *Oscines*.

scutelliplantares"), with which it agrees in the structure of the plantar scutes ('Tentamen,' p. 55). Nitzsch associates *Upupa* with *Buceros* and *Alcedo* in his family Lipoglossæ of the Picariæ. There can be no longer any question, I think, that the latter view is correct, and that *Upupa* is more nearly allied to the Bucerotidæ than to any other group. Some of the thin-billed Bucerotidæ of the genus *Toccus* even resemble *Upupa* in habit and external appearance. The palate of *Upupa* at once shows that it is no Passerine bird.* Next to the Upupidæ must come also the small African group Irrisoridæ, as was first suggested by Strickland, and has been amply shown by Dr. Murie in his excellent dissertation on the Upupidæ and their relationships.†

2. *Eurylæmus*. The Eurylæmidæ were placed by Gray and most of the older authors near the Kingfishers and Motmots, *i. e.* outside the Passeres, as now restricted. Mr. Wallace, I believe, first started the idea that they are the representatives of the Cotingidæ in the Old World, and has thus arranged them in his 'Geographical Distribution.'‡ There is now no doubt that the Eurylæmidæ are truly Passerine, as I pointed out in this Journal in 1872, from an examination of the sternum,§ and as Mr. Garrod subsequently confirmed from the form of the palate.‖ although they are singularly divergent from all other known Passeres in having the *flexor hallucis longus* connected by a vinculum with the *flexor digitorum profundus*.

3. *Todus*, associated by Cabanis with *Todirostrum* in the Tyrannidæ, and by Sundevall with the Piprinæ, should be correctly placed, as I have already shown,¶ from its sternal charters, next to the Momotidæ, and has nothing to do with the true Passeres. The pterylosis confirms this view.††

4. *Eurvceros* was formerly referred by Gray to the Bucerotidæ, but at my suggestion, I believe, was removed in his last work ('Hand-list,' ii. p. 21) to a much more natural position among the Sturnidæ. A glance at its feet is sufficient to show that it is a laminiplantar Oscine. Mr. Sharpe has recently included *Eurvceros* in the heterogeneous assemblage which he has united

* *Cf.* Huxley, P. Z. S. 1867, p. 447.
† Ibis, 1873, p. 181.
‡ Vol. ii. p. 294.
§ Ibis, 1872, p. 177.
‖ P. Z. S. 1877, p. 449.
¶ Ibis, 1872, p. 177. See also Murie, Ibis, 1872, p. 410.
†† Nitzsch, Pterylogr. p. 89.

under the title of Prionopidæ. I fail to see that it has any connexion at all with the other genera placed in that group.

5. *Falculia*, also a laminiplantar Oscine, has been hitherto usually associated with the Hoopoes, to which it has no sort of relationship (*cf.* Murie, Ibis, 1873, p. 201). It is certainly either a Sturnine or a Corvine form; M. Milne-Edwards will probably soon tell us which.

The limits of the Passeres being now ascertained with tolerable certainty, the still more difficult question of the sub-division of the Order presents itself. On this subject Garrod's first memoir on the anatomy of the Passerine birds* gives us a summary of the latest information, not only as regards the lamented author's own elaborate investigations, but also as concerns the labours of previous authors. Garrod's proposed system for the arrangement of the Passeres is as follows: —

Passeres.	Acromyodi (Oscines).	Normales.	
		Abnormales.	*Menura*. *Atrichia*.
	Mesomyodi.	Heteromeri.	Pipridæ. Cotingidæ.
		Homœomeri.	Tracheophonæ. Haplophonæ.

In this scheme it will be observed that the Oligomyodæ, as, in accordance with Prof. Huxley's suggestion (P. Z. S. 1867, p. 471), the great American group of Passeres with only three pairs of singing-muscles was denominated in our 'Nomenclator,' are divided into two sections, and the Tracheophonæ are interposed between them. In consequence of the development of a femoral in the place of a sciatic artery, the Pipridæ and Cotingidæ (with the exception of *Rupicola*) are placed by themselves in a second primary division (*Heteromeri*) of non-Oscinine Passeres. But it seems to me that this arterial character, although no doubt of importance, is not as yet sufficiently understood and investigated to allow it to rank before the well-ascertained structure of the lower larynx. Again it is quite obvious that the Acromyodi abnormales (i. e. *Menura* and *Atrichia*), although they approach the true Oscines in their syringeal structure, are divergent from the rest of the Passeres by much more important osteological characters. For the present, therefore, I am disposed to uphold the system of the division of the Passeres em-

* P. Z. S. 1876, p. 506.

ployed in the 'Nomenclator' as still the most convenient to be adopted, and to place the Acromyodi abnormales of Garrod (which, being extra-American, were not included in the 'Nomenclator') at the end of the Passerine series under the name Pseudoscines. The arrangement would then come out as follows: —

i. Oscines.
ii. Oligomyodæ.
iii. Tracheophonæ.
iv. Pseudoscines { *a*. Atrichiidæ. *b*. Menuridæ.

We thus get the advantage of having what are certainly the most anomalous forms of Passerine birds yet known at the end of the series.

We must now approach the still more vexed question of the division of the Oscines into families. The difficulty here obviously arises from the fact that the Oscines are all very closely related to one another, and, in reality, form little more than one group, equivalent to other so-called families of birds. As, however, there are some 4700 species of Oscines known, it is absolutely necessary to subdivide them; and the task of doing this in the most convenient and natural way is not an easy one.

Sundevall, who has certainly devoted more time and attention to the external characters of the Passeres than any other naturalist of this century, in his last work ('Methodi Naturalis Avium disponendarum Tentamen,' Stockholm, 1872) divided his "Oscines laminiplantares" (which are equivalent to the Passeres here considered, with the exception of the Larks) into six "Cohortes," as follows: —

i. Cichlomorphæ	50 fam.	iv. Certhiomorphæ	3 fam.
ii. Conirostres	15 "	v. Cinnyrimorphæ	5 "
iii. Coliomorphæ	15 "	vi. Chelidomorphæ	1 "

Sundevall's characters are derived partly from the structure of the bill and partly from other points, and his six primary divisions seem to me to be very naturally conceived. On the other hand, Mr. Wallace's well-known arrangement of the Passeres, first proposed in this Journal,* and subsequently followed in his great work on distribution, is based entirely upon the

* Ibis, 1874, p. 406.

structure of the wing. Mr. Wallace's Formicaroid and Anomalous Passeres correspond nearly with what I call the Oligomyodæ, Tracheophonæ, and Pseudoscines, whilst the Oscines are distributed in his arrangement under three heads, as follows:—

Series A. TYPICAL OR TURDOID PASSERES.

Wing with 10 primaries, the first always more or less markedly reduced in size.

1. Turdidæ.
2. Sylviidæ.
3. Timaliidæ.
4. Cinclidæ.
5. Troglodytidæ.
6. Certhiidæ.
7. Paridæ.
8. Leiotrichidæ.
9. Phyllornithidæ.
10. Pycnonotidæ.
11. Oriolidæ.
12. Campephagidæ.
13. Dicruridæ.
14. Muscicapidæ.
15. Vireonidæ.
16. Pachycephalidæ.
17. Laniidæ.
18. Corvidæ.
19. Paradiseidæ.
20. Meliphagidæ.
21. Nectariniidæ.

Series B. TANAGROID PASSERES.

Wing with 9 primaries, the first of which is fully developed and usually very long.

1. Motacillidæ.
2. Mniotiltidæ.
3. Coerebidæ.
4. Drepanidæ.
5. Dacnidæ.
6. Ampelidæ.
7. Hirundinidæ.
8. Tanagridæ.
9. Fringillidæ.
10. Icteridæ.

Series C. STURNOID PASSERES.

Wing with 10 primaries, the first of which is rudimentary.

1. Ploceidæ.
2. Sturnidæ.
3. Artamidæ
4. Alaudidæ.

The objection to this arrangement is that it separates some very nearly allied forms far too widely. The "spurious primary" which Mr. Wallace relies upon to divide his Tanagroids and Sturnoids is not always even a *generic* character. In *Vireo*, for example, it varies in the different species, being present in some and absent in others. Mr. Wallace puts the Alaudidæ amongst his Sturnoids: but in some larks (*Calandrella* &c.) the spurious primary is altogether wanting. The Ploceidæ and Fringillidæ, which are barely distinguishable as families, fall under different heads, as do the Sturnidæ and Icteridæ. Yet there cannot be a doubt as to the intimate connexion of the two last-named families.

In my opinion Sundevall's groups of the Oscines are therefore far more naturally conceived; and in our 'Nomenclator' I have nearly followed them, using only the more familiar expressions ending in 'rostres,' throughout the divisions. Thus: —

Sundevall's	Cichlomorphæ	= Oscines dentirostres of the 'Nomenclator,'	
"	Conirostres	= Oscines conirostres	"
"	Coliormorphæ *	= Oscines cultrirostres	"
"	Cinnyrimorphæ	= Oscines tenuirostres	"
"	Chelidomorphæ	= Oscines latirostres	"

No species of Sundevall's "Certhiomorphæ" being found in the New World, I have not given that group any equivalent designation. But calling these "Oscines curvirostres," for uniformity's sake, and keeping the Larks apart on account of their peculiar *planta* I should propose to arrange the Oscines as follows: —

A. Laminiplantares.	1. Dentirostres.
	2. Latirostres.
	3. Curvirostres.
	4. Tenuirostres.
	5. Conirostres.
	6. Cultrirostres.
B. Scutiplantares.	(Alaudidæ).

These six groups may, I think, be separated without much difficulty. But when we come to attempt to subdivide them, there is room for endless varieties of opinion as to the nearest allies of many of the forms. It would, I fear, be impossible to discuss the best arrangement of the different subdivisions of these groups within the limits of this paper.

The second suborder of Passeres, the Oligomyodæ, are not nearly so numerous as the Oscines. It embraces, however, according to the present state of our knowledge, some 550 species, belonging to 8 families, most of which are restricted to the New World.

* Mr. Sharpe's "Coliomorphæ" (Cat. Birds, iii. pp. 3, 4) is quite a different group from that designated by Sundevall ('Tentamen,' p. 37) by the same name. Sundevall's Coliomorphæ is nearly equivalent to my "Oscines cultrirostres" (Sundevall's group includes *Irrisor*, on which point see above, p. 343), and consists of the following families (according to my nomenclature): — Icteridæ, Sturnidæ, Buphagidæ, Paradiseidæ, and Corvidæ. But Mr. Sharpe puts in his "Coliomorphæ" only the last two of these five families, and adds to them the Oriolidæ, Dicruridæ, and Prionopidæ. The first two of these belong to Sundevall's Cichlomorphæ (*i. e.* my Dentirostres); the last consists of a heterogeneous assemblage of genera, mostly also Dentirostres, but having, in my opinion, no sort of connexion together.

New World.	*Old World.*
Oxyrhamphidæ.	Pittidæ.
Tyrannidæ.	Philepittidæ.
Pipridæ.	
Cotingidæ.	Eurylæmidæ.
Phytotomidæ.	

Of these the Eurylæmidæ must be deemed, without doubt, the most aberrant, on account of the non-freedom of the flexor hallucis, above alluded to, which is unique in the order of Passeres.

The third suborder of Passeres, the Tracheophonæ, distinguished by the peculiar structure of the syrinx, first described by Johann Müller, is entirely confined to the New World. According to my views, the 500 species which it comprehends should be divided into three families, the last of which is peculiar among all the Passeres in having a double notch at the posterior margin of the sternum. They are: —

Sterni postici fissura unica	1. *Dendrocolaptidæ*.
	2. *Formicariidæ*.
Sterni postici fissuris duabus	3. *Pteroptochidæ*.

The fourth and last section of the Passeres, which I have proposed to call Pseudoscines, contains only the anomalous Australian forms *Atrichia* and *Menura*, which are each fully worthy of family rank. When some of the other obscure Australian forms (such as *Orthonyx*) have been further examined, it is very possible that additions will have to be made to this series.

2. CYPSELI sive MACROCHIRES.

It is now universally admitted that the *Cypseli*, although not Passerine, come near to that great Order in many particulars. Nitzsch in 1829,* first constituted the group, to contain the Cypselidæ and Trochilidæ, and called them "Macrochires," from the peculiar elongation of the bones of the manus. Sundevall, in 1836, adopted the term, and used the same limits. In his 'Pterylographie,' Nitzsch reduced the rank of the Macrochires to a family of his Picariæ — a group to which, however, he expressly states that he can assign no single peculiar pterylographic character. If we allow due value to palatal structure, we must keep the Macrochires and Pici apart from the rest of the Picariæ of

* 'Obs. de Avium arteria carotide communi.' Halæ, 1829.

Nitzsch, as Prof. Huxley has shown,* although he appears not to have fully realized the structure of the palate in the Trochilidæ.† In the 'Nomenclator' four families are assigned to the Order Macrochires — the Trochilidæ, Cypselidæ, Caprimulgidæ, and Steatornithidæ. Of these it is now quite certain, from Garrod's researches, that the last named must be removed to another situation, the palate being strongly desmognathous.‡ The best place, therefore, for *Steatornis*, according to my present opinion, is either as a family next to the Podargidæ, or, as the form presents so many strong peculiarities, as an independent order next to the Striges.

The Macrochires will therefore consist only of three families — the Trochilidæ, Cypselidæ, and Caprimulgidæ. No one, I believe, will now deny the close alliance of the first two of these families. As regards the Caprimulgidæ, they differ from the typical Macrochires not only in the lesser comparative development of the manus, but also in possessing cæca, and their position will require further consideration.

3. The Pici were first constituted a separate order by Sundevall in 1835,§ to consist of two families, the Picidæ and Iyngidæ. They are the exact equivalent of Prof. Huxley's Celeomorphæ. Garrod (P. Z. S. 1874, p. 123 *et alibi*) would associate with them the Rhamphastidæ and Capitonidæ, as "not in any point presenting family differences;" but if we follow Prof. Huxley in assigning a high value to the structure of the palate, it is quite evident that they should stand alone (*cf.* Huxley, P. Z. S. 1867, p. 468). There is no difficulty in distinguishing the Pici from all other birds — the structure of the tongue and of the feet is quite peculiar; and I think they must remain as an independent order or suborder.

[To be continued.]

* P. Z. S. 1867, p. 468.

† *Cf.* Parker, Trans. Linn. Soc. ser. 2, Zool. i. p. 110.

‡ *Cf.* Garrod, P. Z. S. 1873, p. 530.

§ K. Vet. Ak. Handl. 1835, p. 68.

WITH THE BIRDS ON A FLORIDA RIVER.

BY WILLIAM BREWSTER.

On the 19th of March, 1877, the writer, in company with a friend, took passage on a little freight steamer which at long and irregular intervals ascended the Wekiva River with supplies for the few settlers at its source. The "Fox" certainly bore a most inappropriate name, for her best speed was but little over four miles an hour. She was, in fact, an old flat-boat, square at each end, after the usual fashion of her kind, and equipped with a small engine, which, judging from its dilapidated appearance, had probably spent its best years in some saw-mill among the pineries. But from her light draught and low hull the rude craft was by no means ill-adapted to the navigation of a stream impeded by shallows and choked with fallen timber.

After spending a tedious day in the descent of the St. Johns River from Mellonville we entered the Wekiva just as the sun was setting and at once found ourselves surrounded by scenery of the most novel and beautiful character.

The short twilight of a Florida evening soon faded, however, and after a run of a few miles we were obliged to make fast to the bank, for the stream is too narrow and tortuous to be safely navigated in the night. Later, the moon rose and her rays streaming down between the tree tops cast a soft light on the narrow strip of water that stretched away into the gloom like a shining pathway. In-shore everything was in deep shadow, save where a stray beam rested on a glistening lily leaf or silvered the drooping frond of a palmetto. The night air, fragrant with the breath of forest flowers, stole gently by — so gently that scarce a leaf was stirred, and the stillness was only broken by the innumerable nocturnal voices that filled the woods.

At intervals a Courlan (*Aramus pictus*) sounded its harsh cry and the watchword, taken up by dozens of vigilant sentinals, was passed along the line of river thickets until it died in the distance. The hooting of the Barred Owls was almost incessant and the arches beneath the trees seemed to echo and prolong the hollow sound. Frequently two of them, after answering one another a

few times, would come together and their combined shrieks and whooping were absolutely indescribable. Such a meeting occurring in the middle of the night directly over the boat instantly brought us to our feet. It was their mating season, but we could not determine whether these outbursts were the love passages of the sexes or the rival performances of two males.

Everywhere by the marshy edges of the river arose a confused medley of Hyla voices, among which the tinkling note of the bell-frog was especially prominent, and underruning all was the low monotone of the crickets. These, with the occasional croak of a Heron, were the most characteristic sounds.

I was early astir next morning and rousing my friend we took our station in the bow to watch the day break. A dense fog hung over the narrow river, shrouding even the taller trees, and the light struggling into the eastern sky just touched the upper wreaths with delicate salmon while all below still lay in gloom. Insensibly the tint deepened and worked downward: the heavens grew more opaque: the stars faded, twinkled feebly, then disappeared and every moment the daylight grew. Almost perfect silence reigned. The Owls had ceased: the frogs and crickets were still: there was a solemn hush over everything: nature seemed to sleep on the eve of her awakening. The river eddied swiftly by and so perfect was the stillness that the swash of the water laving the foliage of a drooping branch on the further shore came distinctly to the ear.

But quickly all was changed. As we looked, the beams of the rising sun touched the crests of the cypresses and, working downward, the undergrowth felt the genial warmth and the whole forest became flooded with sunshine. Then, as if the spell were broken, the birds began and their various songs swelled into a full, glad chorus. From far and near came the reveille of Woodpeckers, apparently countless in numbers. A Vireo (*V. olivaceus*) sang cheerfully from a sweet-gum near the boat and dozens of Warblers could be heard in the surrounding cypresses while a Water Thrush warbled a few doubtful notes from the recesses of the swamp.

We had brought with us a small skiff and as the steamer was not to start for an hour or more we decided to push on ahead, and a few strokes carried us around the nearest bend. On either bank rose the column-like trunks of giant cypresses whose branch-

es in many places completely overarched. Between their stems appeared dismal pools choked with decaying logs and thickly sprinkled with those curious objects called "cypress knees" which reared their slimy heads above the stagnant water. The general desolation of the scene was greatly enhanced by long streamers of *Tillandsia* "moss" that hung from every limb and waved impressively in the light morning air.

These cypress swamps rarely afford any great variety of bird life but they are by no means entirely deserted. The sonorous whistle of the Redbird (*Cardinalis virginianus*), the *peto, peto* of the Tufted Titmouse, and the clear notes of the Carolina Wren enlivened the depths of the woods while in the tree tops Yellow-throated (*Dendræca dominica*) and Blue Yellow-backed Warblers sang incessantly. Turkey Buzzards wheeled and soared overhead while an occasional dead tree was thronged with the sable forms of the Black Vultures patiently waiting until the dead alligator beneath should become sufficiently decomposed to afford them a loathesome feast. More rarely a Swallow-tailed Kite glided by, lashing the air with its cleft tail as it turned in its course or spreading it to the utmost while it poised for a moment to inspect the ground beneath, then rising on motionless wing as buoyantly as a ball of thistle-down it would float off over the woods. Once six of these graceful creatures came in sight together, chasing one another and playing like so many Swallows. When at length they left us the scene seemed to lose something and we hurried on.

With the next bend the character of the scenery changed. The river became more winding, and frequently doubled so sharply on its course that we could see across the narrow strip of land that separated the successive reaches. The current glided swiftly between well defined banks or settled for a brief rest in pools where tall sedge lined the shore and water-lilies floated on the quiet surface. Willows and sweet gums took the places of the cypresses next the stream, while in the background palmettos reared their grotesque heads and hummocks of swamp oaks shut out the sky. Everywhere near the water there was a profusion of rank vegetation and where the eye could penetrate beyond it rested on a matted undergrowth of saw-palmetto. The greens were of that vivid shade seen only in the south and with the morning dew sparkling on every leaf, the scene was one of indescribable freshness and beauty.

A great change too was apparent in the abundance and variety of animal life. Butterflies floated about the openings, the reeds were tipped with slender dragon-flies and on a half-submerged log where the sun rested lay a long line of turtles, many of them of great size and brilliant coloring. Dozens of alligators were in sight, some floating in mid-stream, others basking along the shores while one hugh fellow monopolized a mud bank near at hand and turned his sunken eye on us with an expression of fierce but sleepy curiosity.

Birds of various species, especially aquatic kinds, were in great abundance. With every turn of the stream Wood Ducks and Hooded Mergansers rose before our boat or led their broods of ducklings among the water plants while an occasional Florida Gallinule peeped out from behind a lily leaf, then quietly drew back or perhaps pattered off, half running, half flying over the surface. Herons of several species were continually in sight. Now five or six Blue Egrets (*Ardea cærulea*) flapped heavily from the sedge and alighted on the surrounding trees, while a graceful Louisiana Heron, too intent on its morning meal to notice our approach, stalked through the shallows. Or a tall White Egret appeared on a distant point, its erect form and snowy plumage contrasting finely with the dark back-ground.

The Florida Cormorants and their curious relatives, the Water Turkies (*Plotus anhinga*), were also among the characteristic birds. The latter species interested me greatly. We usually saw them in the upper branches of the trees where they sat well out over the stream and craned their long, slender necks to obtain a better view of us. Sometimes one was perched on a snag not more than a yard or two above the water, intently watching the surface like a Kingfisher. But as we drew nearer it would drop into the river and just showing its snake-like head for a moment would sink again and be seen no more.

Woodpeckers were, as a rule, less numerous here than among the cypresses, but there were numbers of the Pileated and Red-bellied species, and we saw a single pair of the rare Ivory-bills. The latter swept across the stream, the male leading, and alighted against the trunk of a palmetto. They were very shy, restlessly swinging from tree to tree, and taking good care to keep beyond gun-range. Their motions were characterized by great energy and animation and the sound of their powerful blows on the

dead trunks rang through the woods, but the only note which I heard them utter was a comparatively feeble *hæc* that reminded me of the usual cry of the little Downy. Their great size and striking coloring harmonized well with the semi-tropical surroundings. Shortly afterwards a troop of Carolina Parroquets (*Conurus carolinensis*) came darting through the trees, each individual screaming as if determined to outdo his neighbor. Their pointed wings and long tails gave them a striking resemblance to Wild Pigeons, and their flight was scarcely less swift. The sound of their clamor reached us long after they were lost to sight.

Again the scene changed. The river broadened and the forest line retreated a little, leaving an expanse of low growth with occasional open spaces between. We were approaching the "prairies" of the Wekiva, as the settlers term the peculiar flooded meadows that form so marked a feature of this in common with most Florida rivers. With the altered surroundings were introduced two birds not previously seen, the Everglade Kite and the Purple Gallinule. Both were apparently rare but several other species before uncommon now became very numerous. Of the latter class was the Florida Courlan (*Aramus pictus* [Batr.] Coues) which from its unique and interesting habits deserves something more than a passing notice. They were especially abundant about the bayous that extended back from the main river and into one of these I would now take the reader.

We entered a narrow channel that wound among the willows until it apparently came to an abrupt end. But catching the gleam of water beyond we parted the tangled vines that formed a sort of natural curtain over the outlet and pushed our way through. Before us lay a nearly circular expanse of open water with a narrow margin of sedge and in the centre a floating island, composed entirely of "bonnets," as the immense leaves of the southern water-lily are called. Thickets skirted the shore, with here and there a stray palmetto, while at the further extremity stood a group of fine cypresses. A number of Coots (*Fulica americana*) were collected around the lily-island, some of them standing on the broad leaves, others paddling idly about or chasing one another. There were a few Herons scattered along in the sedge and an Osprey quietly sat on her nest near at hand.

But if our presence was a matter of indifference to the birds just mentioned we certainly were not ignored by the vigilant Courlans.

for any sudden noise, like the splash of a paddle in the water or the rapping of its handle against the boat, was sure to be instantly followed by a piercing *kur-r-ee-ow'*, *kurr-r-ee-ow'*, *kurr-ee-ow'*, *kr-ow*, *kr-ow*, from the nearest thicket; or perhaps several would cry out at once as Rails will do on similar occasions. For the most part the birds kept closely hidden but at length we discovered one feeding on the shore. His motions were precisely similar to those of a Rail, as he skirted the oozy brink, lifting and putting down his feet with careful deliberation. Occasionally he detected and seized a snail, which was quickly swallowed, the motion being invariably accompanied by a comical side shake of the bill, apparently expressive of satisfaction, though it was perhaps designed to remove any particles of mud that may have adhered to his unique food. Finally he spied us and walked up the inclined trunk of a fallen tree to its shattered end where he stood for a moment tilting his body and jerking up his tail. Then he uttered a hoarse rattling cry like the gasp of a person being strangled, at the same time shaking his head so violently that his neck seemed in imminent danger of dislocation. Just as we were nearly within gun-range he took wing, with a shriek that might have been heard for half-a-mile. His flight was nearly like a Heron's, the wings being moved slowly and occasionally held motionless during intervals of sailing.

Shortly afterwards another, his mate probably, was detected under a palmetto leaf near at hand. In the shadow her form was dimly outlined and she stood perfectly motionless, evidently relying upon concealment for protection, but her quick eye took in every suspicious movement and at length, conscious that she was seen, she ran rapidly for a few paces and launched into the air, following the course taken by the first. Her fate was, however, sealed and the plunge of her heavy body in the water succeeded the report of the gun. Carefully laying her on a thwart in the boat we paused to admire the soft brown plumage, spotted with white and glossed with iridescent green. The light was fading in her beautiful hazel eyes and bead-like drops of water rolled from her ruffled breast. She was exceedingly heavy and muscular and upon spreading her wings I was surprised at their great breadth.

The preceding account will, I trust, illustrate one phase of the Courlan's nature. But I cannot hope to do full justice to the sub-

ject within the limits of the present paper, for his character is a many-sided one. He is perfectly at home in the tops of the tallest trees where he walks among the twigs with all the ease of a Heron or stands motionless on some horizontal branch with one leg drawn up and the curved bill resting on his breast. These elevated perches are generally resorted to at daybreak. The people told us that when the country was first settled the "Limpkins," as they are called from their peculiar halting gait, were so tame that they could frequently be caught on their nests, but incessant persecution has had the usual result and they are now at all times among the most wary of birds.

But our morning had passed into noon. The sun poured down its scorching rays, the birds sought a deeper shade among the thickets, and quiet succeeded the former bustle and activity. A distant whistle caused us to hurry back into the river and as we passed out under the vines the steamer appeared around a bend below, puffing desperately as she struggled against the current. At her approach the Coots scurryed off over the lonely pool; the Osprey hurriedly launched out from her nest and the startled Herons disappeared over the tree-tops. The charm of the place was gone.

Recent Literature.

Coues's Third Instalment of American Ornithological Bibliography.*—The present instalment of Dr. Coues's "American Ornithological Bibliography" is by far the largest of the three, embracing upward of 500 pages, and completes his "Bibliography of Ornithology so far as America is concerned." The first instalment appeared in 1878, as an "Appendix" of 218 pages to this author's "Birds of the Colorado Valley" (see this Bulletin, Vol. IV, pp. 56, 57), and gave the titles of "Faunal Publications" relating to North America. The second instalment (about 100 pages) was published September, 1879, in the "Bulletin of the U. S. Geological and Geographical Survey of the Territories" (Vol. V, pp. 239–330), and embraced the titles of "Faunal publications" relating to the rest of America (noticed in this Bulletin, Vol. V, p. 40). The present

* Third Instalment of American Ornithological Bibliography. By Dr. Elliott Coues, U. S. A. Bull. U. S. Geol. and Geog. Surv. of the Territories, Vol. V, No. 4, 1879, pp. 521–1066. Published "Sept. 30, 1880."

third instalment consists of a selection of titles belonging to the "systematic" department of the general "Bibliography of Ornithology." Its exact scope and arrangement the author thus explains: "In this [systematic] department come the titles of all publications treating of particular species, genera, or families of Birds, systematically arranged *by Families*, in chronological order under each family, with alphabetization of authors' names under each date. The lot of titles herewith presented, however, are only those that relate to *American* species. Of those families which are exclusively American, as, for example, *Mniotiltidæ*, *Icteridæ*, *Tanagridæ*, *Trochilidæ*, etc., I give, of course, all the titles in my possession; but of those families which are more cosmopolitan, as the *Turdidæ* or *Fringillidæ*, I select only the titles relating to American species; and of extra-limital families no titles whatever are given. Such is the ostensible scope of the present instalment; but I actually give many titles relating to extra-limital species, when the close relationship of such species makes it desirable, or when the insertion of a few such additional titles enables me to present all that I possess of certain families."

The author further states: "The three instalments together represent a nearly complete Bibliography of Ornithology so far as *America* is concerned. They are published in this manner in advance of the whole work for several reasons — among others, both to render immediately available certain departments of the Bibliography which are practically completed, and to invite criticisms and suggestions for the bettering of the work. . . . In only one particular would I deprecate criticism at present — and this is respecting the *arrangement* of the titles; for the scheme of the work cannot be fairly appreciated until the whole is published, including the several contemplated Indexes." The author states that it is not his intention to print any more of the work at present, the American departments being the only ones sufficiently perfected to warrant their leaving his hands, but meanwhile he is preparing manuscript for the rest "as rapidly and as continuously as possible." *

In respect to the grouping of the species and genera of the *Passeres* into families, it is almost to be regretted that the author decided to follow the quite unnatural and now antiquated arrangement of Gray's "Handlist of Birds." The reasons for this procedure are stated to be the absolute necessity for "some fixed standard" for this grouping, and the indefinate limitations of the families in this order, and Gray's system being a well-known one has been selected. The other families present fewer difficulties, "being sufficiently nearly agreed upon by ornithologists." For the Passerine families "the titles have been assorted strictly and exactly according to the composition and sequence of those groups" in the Grayian system.

In reference to the character of the work, it is enough to say that it is fully up to the high standard of excellence of the previous instalments

* Subsequently to this decision, however, and while the "Third Instalment" was passing through the press, the author so far departed from the plan here announced as to print a "Fourth Instalment," presently to be noticed.

already fully noticed in this Bulletin. Its utility no working ornithologist can fail to highly appreciate, while it will form an enduring monument to the author's patience, industry, and thoroughness of research.—J. A. A.

Coues's Fourth Instalment of Ornithological Bibliography.* — This "Fourth Instalment" is of the same character as the first two, and attempts to do for British Birds what those did for American Birds. It accordingly is intended to include "the titles of all publications treating of British Birds as such, exclusively, or indiscriminately and collectively." "In order to fall within the scope of this fourth instalment," says the author, "a publication must relate to British Birds as such. Secondly, it must relate to British Birds exclusively. Thirdly, it must relate to birds of more than one species, genus, or family." "This instalment," the author further states, "like those which have preceded it, is to be considered in the light of published proof-sheets, to be cancelled on the final appearance of the whole work." The titles here given fill upward of a hundred pages, yet the author believes that they include not more than one-half of the number really belonging here, and urges that defects and omissions be kindly brought to his notice. As it is, being accurate as far as it goes, it will prove of great usefulness, and is entitled to the cordial welcome it will doubtless receive.—J. A. A.

Harvie-Brown on the Capercaillie in Scotland.† — As already noticed in the pages of the Bulletin, (Vol. V, pp. 110, 111), Mr. Harvie-Brown published last year an exhaustive little work on the Capercaillie in Scotland, giving a history of its extinction and subsequent introduction and dispersion. The present paper is a continuation of the Appendix of that work, giving an account of its extension in 1879, with a few additional references to early records of its presence in Scotland and Wales.—J. A. A.

Steere on the Birds of Ann Arbor, Michigan.‡ — This briefly annotated list of 111 species is good as far as it goes, but is obviously very imperfect, including less than half of the species that undoubtedly occur there. The author himself thus speaks of it: "This does not pretend to be a complete list of the birds found about Ann Arbor: but, with the exception of a few, given upon the authority of labeled specimens in the Museum, it is the result of about three years' collecting and observation in this vicinity" (p. 7).—J. A. A.

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* Fourth Instalment of Ornithological Bibliography: being a list of Faunal Publications relating to British Birds. By Dr. Elliott Coues, U. S. A. Proc. U. S. Nat. Mus., Vol. II, pp. 350-470. Published "May 31, 1880."

† The Capercaillie in Scotland. By J. A. Harvie-Brown, F. R. S. Scottish Naturalist, July, 1880. Author's reprint, pp. 1-7.

‡ A List of the Mammals and Birds of Ann Arbor and Vicinity. By Professor J. B. Steere. 8vo, 8 pp. 1880.

MINOR ORNITHOLOGICAL PAPERS.*— "The Oölogist,"† volumes IV and V (March, 1878—Dec. 1880), contains, among other short papers and interesting notes relating to the nesting habits of birds, the following (Nos. 55-70): —

55. *Nesting of the White-rumped Shrike (Collurio excubitoroides).* By D. H. Eaton, Oölogist, IV, pp. 2, 3, March, 1878.— An original account, based on the finding of several nests: locality not stated.

56. *Nesting of the Horned Lark (Eremophila cornuta) in Central New York.* By Fred. J. Davis. *Ibid.*, IV, p. 9, April, 1878.—Nest, with three young birds and one egg, found 15th of April.

57. *Nesting of the Large-billed Water Thrush (Siurus ludovicianus).* By Adolphe B. Covert. *Ibid.*, IV, pp. 10, 11, April, 1878.— Description of nest and eggs: locality not stated, but doubtless Michigan.

58. *The Sharp-tailed Finch—Ammodromus caudacutus—its Nest and Eggs.* By T. M. Brewer. *Ibid.*, IV, pp. 41, 42, Jan. 1879. — General account of its geographical distribution, nesting habits, etc.

59. *Nesting of the Sharp-tailed Finch (Ammodromus caudacutus).* By G. S. Smith. *Ibid.*, IV, pp. 66, 67, April, 1879.— Account of nesting habits, with special reference to the salt marshes near Boston.

60. *Increase of Some Species in Certain Localities.* By Fred J. Davis. *Ibid.*, V, p. 5, July, 1879.—Scarlet Tanager, Crow Blackbird, Great-crested Flycatcher, Green Heron, and Pine Grosbeak referred to: locality (apparently) Central New York.

61. *Rhynchops nigra in the Bay of Fundy.* By Geo. A. Boardman. *Ibid.* V, p. 13, August, 1879. — Visit of a "large flock" of these birds to this locality "a few weeks since".

62. *Breeding of Podilymbus podiceps at St. Clair Flats, Mich.* By W. H. Collins. *Ibid.*, V, p. 19, Sept. 1879.— Description of nest and eggs.

* Continued from Vol. V, p. 181.

† The Oologist: A Monthly Journal devoted to the Study of Birds and their Eggs. Edited by S. L. Willard. Volume IV [March, 1878—August, 1879.] Utica, N. Y. Published at No. 27 Oneida Street. 8vo. pp. 100. Two colored plates; woodcuts in the text.

"The Oologist," a monthly sheet of eight octavo pages, made its first appearance in March, 1875, under the management and at the place of publication above-named. In the issue for November, 1879 (Vol. V, No. 5) the announcement was made that the journal "has been transferred to Jos. M. Wade, of Rockville, Conn., from which place it will be issued in the future." Beginning as a boys' magazine, with the original articles mostly unsigned or pseudonymous, its character has steadily improved, and though devoted, as its name implies, to the oölogical phase of ornithology, contains many notes of permanent scientific value, duly endorsed by the name of the writer. Under its new management (Jos. M. Wade, editor, S. L. Willard, Assistant editor) we look for still further improvement, and bespeak for it the general patronage it so well merits.

63. *Mexican Turkey* (*Meleagris Mexicana, Gould*). By V. M. Firor. *Ibid.*, V, p. 34, Nov., 1879.— The Wild Turkey of Virginia and Florida ("*M. mexicana*"!) compared with reference to the origin of the domestic Turkey.

64. *The Great Gray Owl.* (*Syrnium Cinereum.* By Wm. Couper. *Ibid.*, V, p. 54, Sept. 1880.— Capture of young birds in the downy plumage in Canada.

65. *The Season of 1880.* By J. M. W[hipple]. *Ibid.*, pp., 57, 58.— Interesting notes on the nesting of various species of Hawks, Owls, and Warblers, etc.: locality (doubtless Norwich, Connecticut) not given.

66. *The Birds on a Farm.* By Henry Hales. *Ibid.*, V, pp. 73, 74, Dec. 1880.— Statistics of the nesting of birds on a farm of twenty-eight acres; 600 to 700 young birds believed to have been reared.

67. *November Notes.* By J. M. W[hipple]. *Ibid.*, V, pp. 77, 78, Dec. 1880.— Relating to various species of birds observed near Norwich, Conn.

68. *Bird Notes.* By G. L. [i. e. S.] Smith. *Ibid.*, V, pp. 78, 79, Dec. 1880.— Records the capture of Red Crossbills at Rugby, Tenn., July 27 and August 7, 1880, with notes on the nesting of various species. The same title covers notes furnished by Fred. T. Jenks, one of which relates to the capture of the Cape May Warbler at Auburn, N. Y.

69. *Bird Notes from Michigan.* — By Allan Herbert. *Ibid.* V, p. 79, Dec. 1880.— Relates to the presence of the Bohemian Waxwing in the winter of 1879-80, and to various other species, with dates of the taking of the eggs of 7 species.

70. *A New Heron.* By C. Alger Hawes. *Ibid.*, V, p. 79, Dec. 1880.— A description of *Ardea cyanirostris*, Cory. Cf. this Bulletin. Vol. V, p. 107, and Vol. VI, p. 21.

The last half of volume XIII (Nov. 1879—Jan. 1880) and volume XIV (Feb.—July, 1880) of "Forest and Stream" contain the following (Nos. 71-100): —

71. *The Northern Waxwing in Minnesota.* By T. S. Roberts. Forest and Stream, XIII, pp. 907, 985.—On the presence of this species near Minneapolis in winter, and on their food at that season.

72. *The Potato Bug Bird Identified.* *Ibid.*, XIII, p. 907. — This title covers a communication signed "M" from Pembina, D. T., one from T. S. Roberts, of Minneapolis, Minn., and another from Prof. S. A. Forbes, of Normal, Ill., all affirming the Rose-breasted Grosbeak (*Goniaphea ludoviciana*) to be the only species they have observed either feeding upon the potato beetle or in whose stomach they have found the remains of this insect. These writers all speak of this bird as regularly frequenting potato fields to feed upon this destructive pest. See further on the same subject F. E. L. Beal, op. cit. p. 1005.

73. *Winter Birds of Wyoming Lakes.* By A. Lakes. *Ibid.*, XIII, p. 907. — Refers to the great scarcity of winter birds around Como, Wyoming, with notes on the few species observed.

74. *The Migratory Quail.* *Ibid.*, XIII, p. 927. — This title covers five letters relating to the introduction of this species to different localities. Mr. Horace P. Tobey notes the probable return of coveys of this species to North Falmouth, Mass., after a winter's sojourn at the South.

75. *The Origin of the Turkey.* By Elliott Coues. *Ibid.*, XIII, p. 947. —Commentary on early mistakes respecting its supposed origin, with extracts from a paper by E. T. Bennett (Gardens and Menagerie of the Zoölogical Society Delineated, Vol. II, 1831, p. 209) on its introduction into Europe.

76. *Mexican Bird Notes.* By A. W. Butler. *Ibid.*, XIII, p. 984.—Interesting notes on a few species observed near the city of Mexico.

77. *List of Birds taken near Pembina, Dakota.* By William L. Abbott. *Ibid.*, XIII, pp. 984, 985.—Notes on 67 species observed in July, 1879.

78. *Winter in Connecticut.* Editorial [G. B. Grinnell]. *Ibid.*, XIII, p. 1005.—Records the occurrence of *Colaptes auratus* and *Dendræca palmarum* near New Haven in January, 1880.

79. *The Birds of Chester County, Penn.* By B. Harry Warren. *Ibid.*, XIII, pp. 1024, 1025, and Vol. XIV, pp. 6, 25.—A valuable, briefly annotated list of 218 species.

80. *Notes on Some Birds breeding in Colorado.* By Herman W. Nash. *Ibid.*, XIV, p. 6. — Notes on 28 species observed near Pueblo.

81. *Brief Notes from Long Island.* By George Lawrence Nicholas. *Ibid.*, XIV, p. 44.—Notes on 17 species observed near Shinnecock Bay.

82. *Ravens and Crows.* By S. B. Buckley. *Ibid.*, XIV, p. 44.—Mostly about the distribution of these species in Texas, and on some traits of the Crow.

83. *Passerculus princeps in New Jersey.* By William L. Abbott. *Ibid.*, XIV, p. 44.—One shot and one or two others seen on Seven Mile Beach, December 30, 1879.

84. *Description of a New Species of Bird of the Family Turdidæ from the Island of Dominica, W. I.* By Geo. N. Lawrence. *Ibid.*, XIV, p. 165.—Description of *Margarops dominicensis* (= *M. herminieri*, Lawr., nec Lafr.). Cf. Proc. U. S. Nat. Mus., Vol. I, p. 52.

85. *Linnean Society.* *Ibid.*, XIV, p. 184.—Report of a meeting held March 6, 1880, containing abstracts of papers read, relating in part to birds, and including notes on the breeding habits of *Dendræca coronata*, *D. striata*, and *D. maculosa*, and of excentricities in the nesting of *Sayornis fuscus*.

85. *Letters on the Sparrows.* By Elliott Coues and others. *Ibid.*, XIV, p. 204.—Seven letters respecting *Passer domesticus*, six of them detailing its objectionable traits, the other in its defence.

86. *Falco sacer near Montreal.* By H. G. V[ennor]. *Ibid.*, XIV, p. 204.—Notice of three specimens brought into the Montreal market.

87. *Spring Notes from Minneapolis, Minn.* By Thos. S. Roberts. *Ibid.*, XIV, pp. 224, 328, 428, 429. — An admirable record of the arrival

of birds at the locality named during March, April, and May, 1880, including such collateral phenomena as thermometrical readings, the development of vegetation, etc. It is a model of what such a record should be, and too many of its kind cannot be made public.

88. *Unusual Nesting Places* [*of the Robin and Chipping Sparrow*]. By Seym. Ingersoll. *Ibid.*, XIV, p. 224.

89. *Spring Notes.* By Seym. Ingersoll. *Ibid.*, XIV, p. 224.—On the arrival of birds at Cleveland, Ohio, February 10 to April 3, 1880.

90. *Nesting Pigeons.* By. M. *Ibid.*, XIV, pp. 231, 232.—On the nesting and netting of Wild Pigeons at Shelby, Mich. "This roost was thirty miles long, varying in width from one to five miles."

91. *The food of our Thrushes.* Editorial [G. B. Grinnell]. *Ibid.*, XIV, p. 244.—Review and abstract of Prof. S. A. Forbes's very important paper on this subject in "Trans. Ill. State Hort. Soc.," Vol. XIII.

92. *Spring Field Notes.* By H. E. Chubb. *Ibid.*, XIV, p. 307.—Record of first arrival of birds at Cleveland, Ohio, February 12 to May 4, 1880.

93. [*Vernal Migration of birds to Nova Scotia.*] By J. Matthew Jones. *Ibid.*, XIV, p. 307.—Notes on the arrival of various species in the spring of 1880.

94. *Spring notes for April.* By Seym. R. Ingersoll. *Ibid.*, XIV, p. 348.—Arrival of birds at Cleveland, Ohio.

95. *Woodcock carrying their Young.* By B., with lengthy editorial comment. *Ibid.*, XIV, p. 368.

96. *Cape May Warbler* (*D*[*endræca*] *Tigrina.*) By J. N. *Ibid.*, XIV, p. 389.—Record of its capture at Quebec, Canada.

97. *Linnean Society.* Editorial. *Ibid.*, XIV, pp. 389-390.—Record of meeting held May 15, 1880, with abstracts of papers read, including one by S. D. Osborne on the *Fringillidæ* which breed on Long Island, and of others on birds by H. B. Bailey, L. S. Foster, Franklin Benner, and others.

98. *Woodcock carrying their Young.* *Ibid.*, XIV, p. 468.—Two interesting communications, one anonymous [*i. e.* H. W. Henshaw], the other by F. C. Fowler.

99. *Breeding of the Shorelark in Winter.* By Chas. Linden. *Ibid.*, XIV, p. 489.—*Eremophila "cornuta"* with half-fledged young the middle of February at Buffalo, N. Y.

100. *Northern Range of the Blue Grosbeak.* By Wm. Couper. *Ibid.*, XIV, p. 509.—On its capture at Bic, on the northern shore of the St. Lawrence River.

In addition to the above, these two volumes of "Forest and Stream" contain many ornithological communications of interest which are either anonymous, pseudonymous, or signed with initials, which for this reason are here omitted. It is merely mistaken modesty, or pure whim, that leads contributors of natural history notes to withold their names, especially

in face of repeated protests on the part of the editor and of other contributors, thereby detracting greatly from the value of their contributions to those who would otherwise gladly make use of them.

The "American Naturalist," volumes XII (1878), XIII (1879), and XIV (1880) contain the following (Nos. 101-131) ornithological papers and notes.

101. *The Night Herons and their Exodus.* By Samuel Lockwood. American Naturalist, Vol. XII, pp. 23-35, Jan. 1878.—An interesting popular account of experiences with "*Nyctiardea gardeni* Baird."

102. *Variations in the Nests of the same Species of Birds.* By T. M. Brewer. *Ibid.*, XII, pp. 35-40, Jan. 1878.—Remarks on departures from the normal style of architecture in various species.

103. *Peculiar Feathers of the young Ruddy Duck.* By Elliott Coues. *Ibid.*, XII, pp. 123, 124, Feb. 1878.—Account of the downy tip of the retrix, with figure.

104. *The Home of the Harpy-Eagle.* By Felix L. Oswald. *Ibid.*, XII, pp. 146-157, March, 1878.—Detailed account of the habits of "*Harpyia destructor*" as observed near Tehuantepec, Mexico, with a sketch of the country.

105. *The Prairie Dog, Owl, and Rattlesnake.* By S. W. Williston. *Ibid.*, XII, pp. 203-208, April, 1878.—Brief account of *Speotyto cunicularia hypogæa* at pp. 206, 207.

106. *Methods of Labeling in Oölogical Collections.* By W. H. Ballou. *Ibid.*, XII, pp. 306-308, figg. 1-2, May, 1878.—Advocates the use of triangular slips of paper attached to the egg by the smaller end, on which should be inscribed the number or other legend.

107. *The Robin's Food.* By David Alexander Lyle. *Ibid.*, XII, pp. 448-453, June, 1878.—Account of a nestling reared in a cage and of the food given it, etc.

108. *Notes on Three Rare Birds of Minnesota.* By W. L. Tiffany. *Ibid.*, XII, pp. 470-472, June, 1878.—*Ampelis garrulus*, *Hesperiphona vespertina*, and *Coturniculus lecontii*.

109. *Remarks upon Albinism in several of our Birds.* By W. J. Hoffman. *Ibid.*, XII, pp. 474-476, June, 1878. Description of albinism in 8 species.

110. *The Ineligibility of the European House Sparrow in America.* By Elliott Coues. *Ibid.* XII, pp. 499-505, Aug. 1878.—The original place of publication of this well-known arraignment of *Passer domesticus*.

111. *Some New Points in the Construction of the Tongues of Woodpeckers.* By Josua Lindahl. *Ibid.*, XIII, pp. 43, 44, Jan. 1879.—Relates to *Picus tridactylus*, *P. martius*, and *P. viridis* of Europe.

112. *Camptolæmus labradorius.* By W. H. Gregg. *Ibid.*, XIII, p. 128, Feb. 1879.—Record of the capture of a specimen at Elmyra, N. Y., Dec. 12, 1878.

113. *Rob: A Bird History.* By Samuel Lockwood. *Ibid.*, XIII, pp. 359-366, June, 1879.— Biography of a caged Robin.

114. *To Prevent Grease from Injuring the Plumage of Birds.* By A. H. Stevens. *Ibid.*, XIII, p. 456, July, 1879.—By the use of spunk as an absorbent.

115. *Does the Snowy Owl Breed in the United States?* By W. H. Ballou. *Ibid.*, XIII, p. 524, Aug. 1879.— Record of young taken in the "North Woods" of New York.

116. *Notes on the Thrushes of Washington Territory.* By S. K. Lum. *Ibid.*, XIII, pp. 629-632, Oct. 1879.— Notes at some length on the Varied Thrush and other species.

117. *Swallows [Cotile riparia] Feeding on Bayberries.* By James Allinson. *Ibid.*, XIII, p. 706, Nov. 1879. (See below, No. 117.)

118. *Sketch of North American Ornithology in 1879.* By Elliot Coues. *Ibid.*, XIV, pp. 20-25.

119. *The White Bellied Swallow (Iridoprocne bicolor).* By S. Lockwood. With a note by E. C[oues]. *Ibid.*, XIV, p. 54, Jan. 1880.— Feeding on bayberries. The *Cotile riparia* observed feeding on bayberries by Mr. Allinson (see No. 115) believed to be an erroneous identification of *I. bicolor.*

120. *The Convolutions of the Trachea in the Sandhill and Whooping Cranes.* By Thomas S. Roberts. *Ibid.*, XIV, pp. 108-114, 2 figg. Feb., 1880.—(Reviewed in this Bulletin, Vol. V, p. 179, *q. v.*)

121. *Domestication of Certain Ruminants and Aquatic Birds.* By A. E. Brown and J. D. Caton. *Ibid.*, XIV, pp. 393-398.— Reference to the domestication of *Bernicla canadensis, B. sandvicensis, Anser cærulescens,* and *Grus canadensis.* pp. 396-398.

122. *List of the Birds of the Willamette Valley, Oregon.* By O. B. Johnson. *Ibid.*, XIV, pp. 485-491, 635-646. Annotated list of 140 species.

123. *Another Black Robin.* By S. Lockwood. *Ibid.*, XIV, p. 521, July, 1880.

124. *Occurrence of the Bohemian Waxwing in Western Washington Territory.* By J. K. Lum. *Ibid.*, XIV, p. 54, July, 1880.—Many flocks seen, one numbering about 200. Their first observed appearance in this section.

125. *Rose-breasted Grosbeak and Colorado Potato Beetle.* By Richard E. Kunze. *Ibid.*, XIV, pp. 521, 522, July, 1880. On the ability of the bird to eat these poisonous insects with impunity.

126. *Theory of Bird Migrations.* By Wm. Hosea Ballou. *Ibid.*, XIV, p. 527, July, 1880.— Spring migrations held to depend, as to time, on a continuous hot southerly wind lasting through at least sixty hours.

127. *Notes on the Fish Hawks.* By Elisha Slade. *Ibid.*, XIV, pp. 528, 529, July, 1880.—A common summer resident in the vicinity of Somerset, Mass.

128. *English Birds compared with American.* By H. D. Minot. *Ibid.*, XIV, pp. 561-565, Aug. 1880.—Comparison of powers of song, etc., of some of the more noted English song-birds with those of the United States.

129. *Notes on the Wintering of the Robin [in Western Iowa].* By J. E. Todd. *Ibid.*, XIV, p. 602, Aug. 1880.—Has reference to W. H. Ballou's "Theory of Bird Migrations," (see above, No. 124).

130. *Some Noteworthy Birds.* By Samuel Lockwood. *Ibid.*, XIV, pp. 715-719, Oct. 1880.—Chiefly in reference to a captive *Mergulus alle*.

131. *The Sand-hill Crane.* By J. D. Caton. *Ibid.*, XIV, pp. 773-776, Nov. 1880.—On the habits in confinement of "*Grus americanus*," i. e. *G. canadensis*. These birds are described as "of the regulation blue of the species," and the reference (p. 776) to a ten-year old bird, which even Audubon "would have despaired of ever seeing . . . . turn into a white *Grus canadensis*," seems to show that the writer had fully confounded, or rather transposed, the names of our two larger species of *Grus*.

The "American Entomologist," New Series, Vol. I, 1880.* contains the following papers and notes (Nos. 132-140) relating to the food of birds.

132. *The Food-habits of Thrushes.* By S. A. Forbes. American Entomologist, New Ser., I, pp. 12, 13.—Abstract of observations made upon this family, published in detail in Trans. Illinois State Hort. Soc., Vol. XIII, 1879, pp. 120-172.

133. *Tipula Eggs in the Stomachs of Catbirds.* By S. A. F[orbes], with editorial comment (by C. V. Riley). *Ibid.*, p. 24.

134. *Birds vs. Insects.* By Edouard Perris. *Ibid.*, pp. 69-72, 99-100. —An abridged translation, with prefatory note, by S. A. F[orbes], from "Bull. men. de la Soc. d'acclimitation," Nos. 8-12, X, 1873, of M. Perris's memoir "Les Oiseaux et les Insectes," published originally in the "Mémoires" of the Royal Society of Sciences of Liége. Concludes that Birds, as insect destroyers, "are really of little service."

135. *Larvæ from Stomach of Bluebird. Ibid.*, p. 201.—Editorial remarks on specimens transmitted by S. A. F[orbes] of Normal, Ill.

136. *Cutworms from Stomach of Robin. Ibid.*, p. 201.—Editorial comment and determination of specimens sent by S. A. F[orbes] of Normal, Ill.

137. *Ichneumon from Stomach of Bluebird.* By S. A. Forbes, with editorial comment. *Ibid.*, p. 203.

138. *Bluebirds feeding on parasitic and predaceous Insects.* By S. A. Forbes, with editorial comment. *Ibid.*, pp. 204, 205.

139. *The food of the Bluebird (Sialia sialis, L.).* By S. A. Forbes. *Ibid.*, pp. 215-218, 231-234.—Detailed report of the examination of the stomachs of 86 Bluebirds, with results rather unfavorable to its usefulness as a destroyer of insects.

140. *Destruction of Birds of Prey.* By A. S. Fuller. *Ibid.*, pp., 244, 245.—In favor of their protection as useful birds.

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* We regret to see the announcement that the publication of this excellent journal is to be suspended at the close of the present volume.

General Notes.

Capture of the Hudsonian Titmouse in Rhode Island. — November 1, 1880, my friend Mr. Thomas Adcock brought to me a Hudsonian Titmouse (*Parus hudsonicus*) which he had just killed in Smithfield, R. I., near the northwestern limit of the city of Providence. I obtained it of him for my cabinet. Its identity was not suspected by Mr. Adcock till he picked it up. It was in company with two other Chickadees, but he was unable to obtain either of them, and could not determine whether they were of the same species as the one taken. — Frederic T. Jencks, *Providence, R. I.*

A Second Occurrence of the Hudsonian Titmouse (*Parus hudsonicus*) in Massachusetts. — On the morning of October 7, 1880, while hunting Woodcock in Concord I satisfactorily identified a specimen of this northern Titmouse. I was crossing an opening when a familiar and emphatic *tchip, tchee-day, day*, greeted me from an isolated red cedar near at hand. Upon closely examining the tree I soon spied the author of the sound hopping about near the top. The next moment he flew and pitched into a thicket of low birches on the edge of the neighboring woodland. Here I several times got very near him — *too* near in fact to use the heavy charges with which I was alone supplied: but I so plainly saw his light brown cap and chestnut sides that I scarcely regretted it, when at length he somehow gave me the slip and disappeared. The preceeding night had been sharp and frosty and the wood edges were alive with migratory Warblers, Thrushes, and Sparrows. Although specimens of the Hudsonian Titmouse have lately been taken in Connecticut and Rhode Island, I believe my former Concord record has until now remained the only definite one for Massachusetts. — William Brewster, *Cambridge, Mass.*

The Great Carolina Wren (*Thryothorus ludovicianus*) in New Hampshire. — While collecting in a thick piece of woods at Rye Beach, N. H., my attention was attracted by a loud clear note which I failed to recognize. After following the sound for some time the bird, enticed by the imitation of its note, showed itself for a moment and was secured. It proved to be the Great Carolina Wren. While picking it up another was heard scolding in the neighboring thicket, but upon my nearer approach it vanished in the bushes, scarcely allowing me a momentary glimpse. This happened August 7, and is, I believe, the most northern appearance of this bird on record. — Henry M. Spelman, *Cambridge, Mass.*

Swainson's Warbler (*Helonæa swainsoni*) in Texas.—The range of this rare species has been very materially extended by its discovery in

Navarro Co., Texas, by a correspondent of the National Museum, Mr. J. Douglas Ogilby, who has kindly forwarded me the following particulars, with permission to send the same for publication in the Bulletin.

"I shot the specimen on a small lake or rather pond in the Trinity River bottom, and surrounded everywhere with dense timber. When I first saw it it was sitting on a branch close down to the mud on the edge of the lake, and on being disturbed only flew a few yards to another similar resting place. It was very tame, and from the thickness of the undergrowth of the place I could only shoot from a few yards distant from it, so that it was frightfully cut up by the shot. The head, however, was perfect, and at once on lifting it I was struck by the curious, sharply-ridged bill. It was a male, and measured, total length, 5.65; wing, 2.72; tail, 2.18; tarsus, 0.72; middle toe, 0.66; bill, 0.64. The upper parts were brownish-green, tinged with reddish on head and wings; below light greenish-yellow, tinged with ashy on sides; bill dark brown above, light at base; legs and feet flesh-color; irides brown; graduation of quills, 3, 2, 1-4-5. It was in company or at least in the same clump of bushes, with some Prothonotaries. — Robert Ridgway, *Washington, D.C.*

Notes on the Habits of the Cliff Swallow (*Petrochelidon lunifrons*). — Within my collecting grounds is a locality where numbers of these birds have nested for many years. This is a shed, open only on one side, where the birds have attached their nests to the sleepers of the loft. In the spring of 1878 they returned about the usual time and soon began repairing old nests or constructing new ones. One day, while watching them, I noticed one bird remained in her half-finished nest, and did not appear to be much engaged. Soon a neighbor, owning a nest a few feet away, arrived with a fresh pellet of clay and, adjusting it in a satisfactory manner, flew away for more. No sooner was she out of sight than the quiet bird repaired to the neighbor's nest, appropriated the fresh clay and moulded it to her own nest! When the plundered bird returned, no notice was taken of the theft, which was repeated as soon as she was again out of sight. I saw these movements repeated numerous times, but was called away, and when I again returned both nests were completed.

In the same place a nest remained undisturbed, and was occupied by probably the same pair of birds for several seasons. This spring they returned to the old nest, and all appeared prosperous, until one day I noticed a number of Swallows engaged in walling up the entrance of this old nest. This, and the outline of a new nest over the old, was soon completed. I then broke open the closed nest and found within the dead body of a Swallow. This bird had probably died a natural death, and the friends being unable to remove the body, and knowing it would soon become offensive, adopted this method of sealing it up. — F. H. Knowlton, *Brandon, Vt.*

Another Capture of the Loggerhead Shrike in Massachusetts. — Although the Loggerhead Shrike is now known to breed regularly at certain points in the northern New England States, the records of its

occurrence in Massachusetts are not as yet sufficiently numerous to render additional captures entirely devoid of interest.

I have lately examined a fine specimen in the possession of Mr. Arthur Smith, shot by that gentleman in Brookline, Mass., in February, 1879. It is a young male, with the under parts finely vermiculated with rusty. The rump is scarcely lighter than the back and the specimen is otherwise nearly as typical of var. *ludovicianus* as are average specimens from Florida.— WILLIAM BREWSTER. *Cambridge, Mass.*

A THIRD CAPTURE OF THE PHILADELPHIA VIREO (*Vireo philadelphicus*) IN MASSACHUSETTS. — In the collection of Mr. Charles B. Cory I have lately seen a Philadelphia Vireo which was taken in Brookline, Mass., by Mr. Arthur Smith. Upon asking Mr. Smith about it he told me that he shot it late in September, in second-growth oak woodland when it was quite alone.

This makes the third Massachusetts record, and all these specimens have been taken in the same month — September. The species should be carefully looked for in the spring, but it is probable that, as with the Connecticut Warbler and several other birds, the vernal migration is made by a more westerly route. — WILLIAM BREWSTER, *Cambridge, Mass.*

OCCURRENCE OF VIREO PHILADELPHICUS IN MERCER COUNTY, NEW JERSEY. — On September 21, 1876, I took an adult male of this species in an orchard in Princeton, and on the 28th of the same month I saw two others in the same orchard together, one of which I obtained. This proved also an adult male. These are the only instances that have come under my observation during six years at this point. — W. E. D. SCOTT, *Princeton, N. J.*

THE RED CROSSBILL (*Loxia curvirostra americana*) IN TENNESSEE. — The morning of August 7, 1880, found the writer collecting in the woods near Rugby on the Cumberland Plateau in East Tennessee. Coming to a clearing, I observed, among other birds, two which at first I did not recognize. The "clearings" of that section differ from those in other parts of the country. Lumber being comparatively valueless in that region, the settlers kill the trees by girdling, leaving them standing. In time all but the largest limbs fall, and the trunks become rotten and filled with vermin; thus they are the resort of Woodpeckers for both feeding and breeding purposes. It was in such a locality, and on the top of one of the largest trunks, that I saw a small bird, whose plumage I could not distinguish against the sky, hopping up and down and around the trunk, seemingly extracting insects from the decayed knot-holes. Supposing it to be a species of Nuthatch, I shot it, when I was greatly astonished to pick up a Red Crossbill. The report of my gun revealed the whereabouts of four more, the remainder of the flock. Observation of their habits showed me they kept near the tops or broken ends of the limbs, hopping about and crawling under them after the manner of Woodpeckers. As I

shot another, the rest rose high in the air and, with an irregular, undulating flight, disappeared. My specimens proved to be in good plumage.

I subsequently saw two more in a barn-yard some four miles from the first locality. I was informed that they had been frequently seen thereabouts of late, but the natives were unable to identify them. I shot one of them,—a fine male, whose upper tail-coverts were of an unusually brilliant red. I find entered in my notebook that on August 13 I saw two more while on a deer hunt fourteen miles from the other places. Of course, under the circumstances, I was unable to shoot them. This would seem to show that the first flock was not an accidental occurrence.

The Tennessee Plateau is a comparatively level section of country about one hundred miles long and forty miles wide, with an average elevation of two thousand feet above the adjacent region. Its forests consist almost entirely of white oaks, interspersed with chestnuts, and occasionally a pine. This, with the above statements, indicate that the habits of my birds differ materially from those of others of this erratic species.

In respect to external characters, Mr. J. A. Allen, after having compared my birds with a large series of New England specimens and with examples of var. *mexicana* from Colorado, writes me that the Tennessee specimens present no essential difference in average measurement, but that the bill is considerably larger than in average New England examples, but much smaller than that of *mexicana*. The plumage of the males is much brighter than in northern specimens. The Tennessee birds he regards as almost exactly intermediate between the Red Crossbills of Northern New England and those of Colorado. — G. S. Smith, *Boston, Mass.*

Description of the nest and eggs of Coturniculus henslowi obtained near Falls Church, Va. — Nest rather rude and irregularly shaped, composed externally of coarse grass, lined with exceedingly fine grass-tops circularly disposed and well finished but without any horsehair; no other material than grass was used in its construction. The nest is about four inches in diameter, about two inches in height, and two inches inside diameter; it was placed in the center of a large clump of wild clover (*Trifolium agrarium*) and rested directly on the ground without any appearance of a cavity. The clover had grown up about a foot or more in height and completely surrounded the nest, which was only discovered by parting it. The female was secured as she flew from the nest. The eggs, four in number, are much blotched and speckled all over with a mixture of madder-brown and sepia, the color becoming more confluent on the larger end; there are also a few dashes and dots of very dark sepia, almost black, scattered among the spots. One of the eggs has a number of large blotches of a lighter tint than the spots scattered all over it so as to almost form a ground tint for the spots. The ground color is a delicate greenish-white. The measurements, in hundredths of inches, are as follows: .75 x .60, .75 x .58, 75 x .56, .75 x .60. These eggs, taken June 3, contained large embryos within four or five days of hatching. As I took full-fledged young last year on the 12th of July, they undoubtedly raise two broods in a season.

The above described nest and eggs were taken in the locality where Mr. Ridgway found the birds last year (see this Bulletin, Vol. IV, p. 238). They are more or less common in all suitable places, probably a dozen pairs breeding in this and the adjoining meadows.

Since writing the above, two fully fledged young birds have been taken (June 6) in the same place. The birds have been also seen and heard singing at Ball's Cross Roads in Virginia, about two miles nearer the District than the other locality. Besides the characteristic note of *tee-wick*, they have quite a song, which may fairly be represented by the syllables *sis-r-r-rit-srit-srit*, with the accent on the first and last parts. This song is often uttered while the bird takes a short flight upward; it then drops down again into the tangled weeds and grasses where it is almost impossible to follow it. — PIERRE LOUIS JOUY. *Washington, D.C.*

THE LARK FINCH ON LONG ISLAND, N. Y. — On August 20, 1879, I took a specimen of *Chondestes grammica* at Layville, Long Island, the first, I believe, for this State. Strange to say, it was shot in a low, wet salt-meadow. Most of the other eastern specimens have also been taken near the coast. — CHARLES EARLE. *New York City.*

THE GOLDEN EAGLE IN NEW BRUNSWICK. — When out Snipe shooting October 16 (1880), a big Blue Heron flew up and almost immediately dropped to the ground. Instantly a large bird came like a meteor and struck the Heron with full force and in their excitement I got a fine specimen of the Golden Eagle (*Aquila chrysaëtus*), a species not often occurring with us. — GEORGE A. BOARDMAN. *Milltown, N. B.*

THE BALD EAGLE (*Haliaëtus leucocephalus*) AS A HUNTER. — In view of the rather unenviable reputation that the Bald Eagle has obtained at the hands of most of the later ornithological writers,* the following extracts from a letter from Mr. John W. Baker of Brooklyn, N. Y., may be of interest. His observations were made during the winter and spring of 1879 at Fruit Cove on the St. John's River, in Florida, fifteen or twenty miles south of Jacksonville.

"The particular Eagle of which I write (for I am sure it was always the same bird) usually made two trips daily to the river in front of the house where I lived, once in the morning, and again towards evening. I think it safe to assert that he did not miss a day during my entire stay of some four or five months, giving me, therefore, ample opportunity of noting the manner in which he secured his prey.

"As soon as he reached the river he invariably alighted on the topmost branch of a tree in the immediate neighborhood of where the largest body of Coots [*Fulica americana*] was feeding, where he sat some minutes, apparently resting and preparing himself for battle. At the first sight of

* See, however, Vol. V, p. 57, of this Bulletin, where its habits at Cobb's Island, Va., as described by Mr. Wm. Brewster, seem to agree very closely with Mr. Baker's observations.

the Eagle the Coots all huddled together, remaining so during his rest, swimming about aimlessly and casting uneasy glances up in the direction of their enemy. The moment the Eagle lifted himself from his perch, the Coots seemed to press towards a common centre until they were packed so closely together that they had the appearance of a large black mantle upon the water; they remained in this position until the Eagle made his first swoop, when they arose as one bird, making a great noise with their wings, and disturbance with their feet which continued to touch the water for the first fifty or one hundred feet of their flight. This seemed to disconcert the Eagle who would rise in the air only to renew his attack with great vigor.

"These maneuvres were kept up, the Eagle repeating his attack with marvelous rapidity, until, in the excitement and hurry of flight, three or four Coots got separated from the main body; this circumstance the Eagle was quick to discover and take advantage of; it was now easy work to single out his victim, but usually long and hard to finally secure it. I have never seen him leave the field of battle, however, without a trophy of his prowess, though I have seen him so baffled in his first attempts to separate the birds, that he was compelled to seek his tree again to rest.

"On one occasion, after separating his bird from the flock, he spent some minutes in its capture — the Coot eluding him by diving; this frequent rebuff seemed to provoke the Eagle to such an extent that he finally followed it under the water — remaining some seconds — so long, indeed, that I thought him drowned; he finally appeared, however, with the bird in his talons, but so weak and exhausted that he could scarcely raise himself above the water, and for the first thirty or forty yards of his flight his wings broke the surface of the water; very slowly he made his way to the nearest tree, where he alighted, on the lowest limb, to recover his spent strength.

"One more incident: I had crept up on a small batch of Coots and discharged one barrel of my gun at them, killing one, and was about to start out for a boat to pick it up, when I was startled by an Eagle swooping down upon my dead bird; he had it in his talons before I could get my gun to shoulder, but I quickly discharged the contents of the other barrel at him, which had the effect of making him drop my bird and go screaming away; thinking he might return, I began to reload my gun, and had barely finished one barrel, when, sure enough, he made another attempt to steal my game; in my haste I fired before he was within range, or I might have added him to my bag. I got my Coot.

"I have also seen him chase the Fish Hawk, and force him to drop his fish which he immediately secured for himself.

"This, I think, will cover the extent of my own observations, though I am credibly informed that he has been seen to capture squirrels, rabbits, and even chickens."

This last statement is confirmed by an account given me last spring by a resident in Nassau Co., Florida, on the St. Mary's River, who complain-

ed of the Eagles' carrying off poultry and young pigs, boldly venturing near the houses for the purpose.— CHARLES F. BATCHELDER, *Cambridge, Mass.*

BREEDING OF THE WILD PIGEON IN CONFINEMENT.— Of late years the Wild Pigeon has been trapped and kept in confinement for use in trap-shooting to a considerable extent, but instances of these captives having bred and raised their young is, I believe, quite unusual.

The following "clipping" from the Hartford, Conn., "Courant" of August 5, 1880, on this subject, credited to the New Haven "Palladium," which has kindly been sent me by Mr. J. A. Stannis, may be worthy of note:

"Sherman Potter, the veteran pigeon shooter of Fair Haven, has a pair of wild pigeons which he has trained in the capacity of stool pigeons and flights. This season, to the surprise of Potter and everyone else, they hatched one young one, which has grown to full size, and recently hatched another which is now two-thirds grown. This is an unusual occurrence for wild pigeons to raise their young in captivity. Potter is delighted, and is about to enter into the business of raising these birds on a grand scale, as they find a ready market at $5 apiece in Fair Haven, to be used as stool pigeons and flights."— RUTHVEN DEANE, *Chicago, Ill.*

EVIDENCE OF THE FORMER EXISTENCE OF THE WILD TURKEY AT MOUNT DESERT ISLAND, MAINE.—Last summer (August 14, 1880), while searching in an old Indian shell-heap on the east side of Mount Desert Island, Maine, I found a portion of the tarsus of a Wild Turkey (*Meleagris gallopavo*). This is interesting as showing the former range of this bird, which is now extinct in New England.

In Jeffries Wyman's account of the Indian shell-heaps of New England, he does not mention finding the bones of the Wild Turkey farther north than Eagle Hill in Ipswich, Massachusetts.— C. W. TOWNSEND, *Boston, Mass.*

RECENT OCCURRENCE OF BAIRD'S SANDPIPER (*Tringa bairdi*) IN MAINE. — So far as I am aware, we have but four recorded instances * of the capture of this Sandpiper in New England, but the following facts will seem to indicate that in certain localities, at least, it may be something more than a mere accidental visitor. On the evening of Sept. 4, 1880, while returning from a trip up Lake Umbagog (Oxford Co., Maine), and just as we were entering the mouth of Cambridge River, the guide called my attention to a flock of small Waders sitting on a mud-flat. I made out two of the number to be Ring-necked Plovers, but in the fading light it was difficult to distinguish colors, and as the remaining six looked unfamiliar I picked out one that stood a little apart and shot it. The others disap-

* Long Island, Boston Harbor, Aug. 27, 1870. *Brewster*, Am. Nat., VI, May, 1872, 306.— Lake Umbagog, Upton, Maine, Sept. 1, 1875. *Brewster*, Bull. Nutt. Orn. Club, I, April, 1876, 19.—Scarborough Beach, Maine, Sept. 9, 1875. *Brown*, Bull. Nutt. Orn. Club, II, January, 1877, 28.— Swampscott, Mass., Aug. 27, 1876. *Brewer*, Bull. Nutt. Orn. Club, III, July, 1878, 140.

peared in the gloom and I picked up a specimen of *Tringa bairdi*. Early the next morning I again visited the spot but there were only six Ring-necks on the flat. On a neighboring mud-bar, however, I shortly found two Baird's Sandpipers feeding in company with an *Ereunetes* and all three were quickly secured. The Baird's Sandpipers proved to be a male and female, both birds of the year. They were so fat that their skins were preserved with the greatest difficulty. Whether they represented a part of the flock seen the evening before can of course only be a matter of conjecture. I have, however, good reasons for suspecting that the Baird's Sandpiper regularly occurs at Umbagog in small numbers during the autumnal migration. In view of its known distribution in the West it would be more likely to be found on interior ponds and marshes than along our sea-coast, where it is apparently a very rare species.

The specimens above mentioned were very tame and I watched them for some time before disturbing them. Their motions were slow and sedate and their attitudes crouching. They kept up a low conversational twitter while feeding, and when flushed, flew in that swift, erratic way characteristic of most of the smaller Waders. The peculiar coloring of the upper parts gave them a striped appearance which should serve to distinguish them from any other eastern Sandpiper except *Tryngites rufescens*— WILLIAM BREWSTER. *Cambridge, Mass.*

OCCURRENCE OF BAIRD'S SANDPIPER (*Tringa bairdi*) ON THE NEW HAMPSHIRE COAST. — While out on the marsh at Rye Beach, N. H., August 26, my attention was called by my companion to a "Large Peep," as he called it. Upon shooting the bird we found it to be a *Tringa bairdi*. The same afternoon I obtained another specimen of this bird which was running along the beach in company with a large flock of Peeps. Both birds were very tame and allowed a quite near approach. This is the first record of this bird for New Hampshire. — HENRY M. SPELMAN. *Cambridge, Mass.*

NOTE ON TRYNGITES RUFESCENS IN TEXAS. — The Buff-breasted Sandpiper is mentioned by Mr. Dresser and Dr. Merrill as occurring on the Rio Grande in Texas, but Mr. Sennett and Mr. McCauley did not note it. Professor Snow calls it rare in Kansas, and Dr. Coues did not meet with it in Dakota while with the Northern Boundary Survey. My experience is that it is a bird whose occurrence is not to be relied upon in Cooke County, Texas.

On April 23, 1877, I saw a flock here and noted no more until April 29, 1880, when I saw two or three flocks of some half-dozen each, near Gainsville. Not having my gun, I returned next day and scoured the same locality without finding a single *Tryngites*. Thinking they were certainly on the large prairie west of Gainesville, I rode over that for half a day without seeing a Buff-breast, and gave up the search. On May 3, in riding through the same prairie where I saw the species in question, I came upon a flock of seven and, as before, was without my gun. I procured one and shot four with the first barrel and one with the second; following the remaining two I secured them, and no more have been seen since.

I noted a habit of strutting and similar maneuvering in these birds which I have never seen in Bartram's Tattler. My attention was first attracted by the white lining of the wing as the bird lay on one side stretching the wing straight up in the air; on approaching nearer I saw several others near by acting in the same ludicrous manner. One would raise the feathers and strut up to another as though they were going to fight, and I think they did sometimes strike at each other as game cocks do. Another would run up to one of its companions and stand on tip-toe with both wings raised high in the air as if challenging a contest; after standing still for an instant it would then drop its wings and go to feeding as quietly as before. I regretted that I had such a limited opportunity for making notes upon this truly interesting species.

Dr. Merrill says that the same dates and localities apply to *T. rufescens* as to *Actiturus bartramius*. The latter, however, arrives in Cooke County as early as March 27, which is about four weeks earlier than I have noted the Buff-breasts. Both species are very tame and mingle freely together while feeding.

Mr. A. Hall, of East Rockport, Ohio, informs me that he met with a small flock of these birds in riding over the prairies in Nebraska, May 18, 1880, associated with *A. bartramius*. They were very tame, allowing so near an approach that they might have been easily killed with stones. The several specimens obtained were all females. He adds that he observed no strutting or fighting, such as I had described to him as seen by me in Texas. — G. H. RAGSDALE, *Gainesville, Texas.*

A Second Massachusetts Specimen of the Clapper Rail (*Rallus longirostris*). — Mr. Arthur Smith has shown me a fine specimen of the Clapper Rail which he shot late in October, 1879, at Gurnet Point, Plymouth, Massachusetts. It is a dark colored example in full fall plumage. It was killed on a salt marsh where another large Rail supposed to be of the same species was seen at the same time. After the expunging of the old-time records the Clapper Rail was first reinstated as a bird of Massachusetts by Mr. H. A. Purdie in this Bulletin for January, 1877. A year later Dr. Brewer published* a notice of what would at first reading seem to be a second specimen, for no reference is made to Mr. Purdie's previous record and the date of capture is given as May, 1876; but upon looking up the bird in the "New England Collection" of the Boston Society I find it to be the same as that upon which Mr. Purdie based his data.

Oddly enough Dr. Brewer apparently makes a similar blunder with *Rallus elegans* when he gives a specimen (l. c.) as "shot in Nahant in the spring of 1876," with the remark that there is "no previous record for New England, except West Haven, Conn." The latter statement is obviously incorrect, for the presence of the King Rail in Massachusetts had been made known by Mr. Purdie† a year previously, and, if I am not

* "Notes on certain species of New England Birds with Additions to his Catalogue of the Birds of New England. By T. M. Brewer." Proc. of the Boston Soc. of Nat. Hist., Vol. XIX, Feb. 6, 1878.

† Bull. Nutt. Orn. Club, Vol. II, Jan., 1877, p. 22.

greatly mistaken, Dr. Brewer's specimen and the bird taken by Welch "at Nahant, *Nov. 21, 1875*," are identical. — WILLIAM BREWSTER. *Cambridge, Mass.*

NOTES ON THE BREEDING HABITS OF THE CASPIAN TERN. — When collecting at Cobb's Island, Virginia, in company with Mr. S. D. Osborne, during the past season, we were fortunate in securing two sets of the eggs of the Caspian Tern (*Sterna caspia*), and as our observation of their habits agrees so closely with Mr. Ridgway's account given in the last number of this Bulletin (Vol. V, pp. 221-223) I cannot refrain from confirming it by some additional evidence. Our first nest was taken, June 2, on what is known as Wreck Island, and we only became aware of our promixity to it by the repeated swooping down towards us of the parents, they uttering at each plunge their hoarse, barking cry four or five times in rapid succession. The nest was a mere hollow scooped in the sand somewhat back from the ridge of the beach, without lining save a few fragments of dried sedge stalks, and contained two eggs. The day previous, June 1, we had spent on the northern end of Cobb's Island, fully ten miles from this locality, and there we first saw a pair of this species, whose actions were entirely similar, but no nest rewarded our search at this time. Determined to secure, if possible, another set, we visited this locality again June 3, and were rewarded by finding their nest similarly situated as our first, and containing also two eggs. This number, I believe, with Mr. Ridgway, is their full complement. One of the parent birds was secured and its skin preserved. Two pairs were thus breeding at the same time, separated by ten miles of beach, over which we had passed repeatedly during our stay; and we saw them at no other place or time. This is the more remarkable as we were anxious to find a breeding colony of Royal Terns (*Sterna regia*), and their large size would undoubtedly have attracted our notice. Hence it seems probable that they always breed singly. The two sets varied but little in coloration or style of marking, much less than is usual among the *Sternidæ*, those in my collection agreeing well with Mr. Ridgway's description, being oval in shape (not pointed at the smaller end), their clayey ground color washed with olive and marked with irregular spots and small blotches of dark brown and lavender. They are somewhat smaller than his specimens, measuring 2.70 x 1.85 inches and 2.65 x 1.80 inches, respectively, and are in no wise to be mistaken for any eggs of the Royal Tern that I have seen. — R. F. PEARSALL, *New York City.*

LIST OF OCCURRENCES OF NORTH AMERICAN BIRDS IN EUROPE. — I regret that through an oversight I find it necessary to ask the insertion here of the following errata and addenda to my paper on this subject in the last volume of the Bulletin and to apologise to Mr. Saunders and to the readers of the Bulletin therefor:

Errata.— Page 143, line 33, of Vol. V, after "Vaud" insert "Switzerland"; page 212, line 16, *leave out* "where the locality is misstated"; same page, line 18, after "Harbor" insert "Saunders, l. c."; same page,

line 20, for "Wexford" read "Mayo." Also, in connection with my remarks on Wilson's Petrel at page 218, line 29, Mr. Saunders has called my attention to the occurrence, as recorded by him (Bull. Soc. zool. de France, 1877, p. 205, and Zoöl. Record, 1877, Aves, p. 58), of a fine specimen of this species at Malaga, Spain, killed there on 7 August, 1873, and still in his possession.

Professor Reinhardt, of Copenhagen, has sent me a paper by him in "Meddelelser fra den Naturhistorische Forening i Kjobenhavn, 1881," on the alleged occurrence as recorded by me at page 72, Vol. V of the Bulletin, of four specimens of the American White-winged Crossbill in Denmark (Nos. 1 to 4 of my List), in which he points out that my correspondent, Herr A. Benzon, had been in error in communicating them to me and that he appears to have confused them with *L. bifasciata*, the Russian and Siberian species, to which they doubtless belonged. He also states a doubt that exists whether the record of No. 2 does not rest on a confusion with No. 1; that Nos. 1 and 3 are still in the University Museum, Copenhagen, but that No. 4 seems to have been lost many years ago. All four are thus to be deleted.

Addenda.—To the record of *Actiturus bartramius*, p. 149, add:

Great Britain. 7. One, a male, killed in Lincolnshire, purchased in Leadenhall market, and obtained in the flesh by Mr. J. E. Harting, who carefully enquired into and is satisfied of its authenticity as a British-killed specimen. Harting, Zoöl., 1880, p. 508. **October, 1880.**

To the record of *Numenius borealis* (p. 210) add:

Great Britain. 6. One, a male, Forest of Birse, Kincardineshire. Harvie-Brown, Zoöl., 1880, p. 485. **21 Sep., 1880.**

I would desire, in conclusion, to point out that by removal from the list of the Cedar Bird (footnote, p. 141) and of the American Swan, (as to which latter McGillivray's probable mistake, p. 212, was only pointed out to me by Professor Newton after the first part of the paper had appeared in the Bulletin,) the number of species of North American Birds now recorded as having visited Europe is reduced from sixty-nine, as mentioned in the introduction (Bull., V, p. 66), to sixty-seven.

I would only add that I shall still be glad to receive any further corrections or additions which may add to the accuracy and consequent value of the List. —J. J. Dalgleish, 8 *Athole Crescent, Edinburgh, Scotland.*

Errata.—Vol. V, page iii, line 9, for FOREIGN MEMBERS read FOREIGN HONORARY MEMBERS. Same page, for Dr. Philip Luteley read Dr. Philip Lutley Sclater.

BULLETIN

OF THE

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NOTES ON SOME BIRDS FROM ARIZONA AND NEW MEXICO, WITH A DESCRIPTION OF A SUPPOSED NEW WHIP-POOR-WILL.

BY WILLIAM BREWSTER.

At different times during the past year Mr. F. Stephens has sent me small collections of birds made at various points in southern Arizona and just within the western boundaries of New Mexico. As many of the species are as yet but little known, I take an early opportunity of announcing the capture of these additional specimens, and of presenting some brief but interesting field-notes which have been kindly furnished by Mr. Stephens. A critical study of one or two of the rarer species has suggested some original comments which are also offered in this connection; but certain developments affecting the genus *Polioptila*, which have been unavoidedly crowded out, will be found elsewhere in the present number of the Bulletin.

1. **Harporhynchus bendirei.** *Coues.* ARIZONA THRASHER. — Mr. Stephens sends me two specimens of this interesting Thrasher, both males, and both from the neighborhood of Tucson, where the bird seems to be common but very locally distributed. These specimens are in freshly-assumed, perfect spring plumage, a condition which does not appear to have been previously examined, the original types in the Smithsonian collection being in "worn summer dress," and the three individuals taken

by Mr. Henshaw in 1874, in fall feathering. My birds have the breast-spotting decidedly more distinct than in *H. palmeri* but the color of the arrow-heads is not darker than that of the back.

After reading all that has been written on the subject and carefully comparing *bendirei* with *cinereus*, I am inclined to differ from my friend Mr. Henshaw and to agree with Dr. Coues, in considering *bendirei* a distinct species. Its close relationship to *cinereus* is evident enough, in spite of the very different coloring of the two birds. But Mr. Henshaw's statement that "the wide separation of the two forms in question, and the fact that the Cape Saint Lucas bird is restricted to the coast, while the Bendire's Thrush inhabits the dry, almost waterless, plains of the interior, will sufficiently account for the discrepancies between them," seems to me rather to concern the original derivation of the Arizona form than to affect its specific standing. The very character of the distribution of the two birds favors the assumption that they are distinct. So far as we know, the Arizona Thrashers are confined to a very limited area, and if, as the evidence goes to show, their colony is *absolutely* cut off from the equally restricted one of *cinereus*, there can, of course, be no intergradation between the two, and the well-marked characters of *bendirei* must entitle it to specific rank.

2. **Harporhynchus lecontei** (*Lawr.*) *Bp.* LECONTE'S THRASHER. — A fine adult male taken near Phœnix, Feb. 21, 1880, is in the present collection and brings the number of known specimens up to five. The species is apparently a very rare one in Arizona. Mr. Stephens has seen only two individuals during several years' experience. He writes: "I took this specimen ten miles north-west of Phœnix. The locality was a brushy desert with large cacti. At the time, it was singing in a similar manner to *H. palmeri*, only very sweetly. I should consider them excellent songsters. They do not mock other birds and the song is unlike that of *H. redivivus*. A short time afterwards I saw two other Thrushes, one of which was *lecontei*. They were flitting through the brush and on shooting I got the wrong one, an *H. palmeri*. The latter was abundant in the locality and *H. bendirei* common."

In the "Key to North American Birds" Dr. Coues reduced Leconte's Thrasher to a variety of *H. redivivus*, and this arrangement, also followed in his later works, has been generally

endorsed by such ornithologists as Ridgway, Henshaw, and others who have since had occasion to notice the bird. But although I dislike to differ from such an array of authority I cannot for a moment believe that *lecontei* should be associated with *redivivus*.

Even if we admit (as I am however by no means prepared to do) that the radical color-differences which exist between them are explainable by climatic modification, there still remain certain *structural* characters which cannot be similarly disposed of.

In the first place, the bill of *lecontei* is very much shorter, slenderer, and narrower than that of *redivivus*. The inferior convexity of the lower mandible is evenly rounded, whereas in *redivivus* it is laterally compressed, forming a quite sharp ridge or angle which is apparent to the eye as well as upon gently passing the finger along the bill below. A corresponding difference is also somewhat similarly shown by the upper mandibles; that of *lecontei* having a nearly perfect convexity beyond its basal third, while in *redivivus* the greater width of the bill gives the sides of the maxilla a decided slope or inclination, the lateral outlines of which are actually concave to the very tip.

Furthermore, in *lecontei* the cutting edges of the maxilla are decidedly recurved or rounded to within a short distance of the tip, and when the bill is closed the edges of the opposite mandibles nearly meet, those of the upper only slightly overlapping; but in *redivivus* these edges are not recurved beyond their basal fifth, being, on the contrary, nearly as sharp as a knife-blade, while they decidedly overlap the lower mandible.

Leconte's Thrasher otherwise differs in having the tail very much shorter and more rounded; the soles of the feet smoother; and the rictal bristles much more abbreviated and fewer in number.

On the whole I regard the affinities of this Thrasher as closer to *H. curvirostris palmeri* than to any other known form.

Despite the fact that *palmeri* is obsoletely spotted below, their coloring is much more nearly alike than is that of *lecontei* and *redivivus*. And in form and proportions, as well as in the general shape and character of the bill, they are strikingly similar. Indeed, were it not for the fact that the habitats of the two overlap it might be difficult to argue their specific distinctness. But the occurrence of *lecontei* at Phœnix, in actual company with *palmeri*, as observed by Mr. Stephens, effectually precludes any

surmises looking to a nearer relationship than that of allied species.

I subjoin the measurements of the present specimen of *lecontei*, for comparison with some taken from specimens in my collection of *H. curvirostris*, *H. curvirostris palmeri* and *H. redivivus*.

Harporhynchus lecontei. ♀ (No. 5232). "Length, 10.50; extent, 12.20"; wing, 3.90; tarsus, 1.25; tail, 4.57; bill (chord of culmen), 1.35; bill from nostrils, .98; width below posterior angle of nostril, .21.

H. curvirostris. (No. 564, Texas.) "Length, 11.00; extent, 13.25"; wing, 4.05; tarsus, 1.28; tail, 4.07; bill (chord), 1.27; from nostril, .91; width below nostril, .23.

H. curvirostris palmeri. (No. 4988, Arizona.) "Length, 11.06; extent, 13.30"; wing, 4.12; tarsus, 1.40; tail, 4.30; bill (chord) 1.37; from nostril, 1.10; width below nostril, .25.

H. redivivus. (Nos. 566, Saticoy, Cala; 4182 and 4183, San Bernardino Co., Cala.) "Length,—, 12.20, 12.00; extent,—, 13.20, 13.10"; wing, 4.10, 4.16, 4.15; tarsus, 1.47, 1.40, 1.47; tail, 5. (worn), 5.17, 5.07; bill (chord), 1.70, 1.66, 1.75; from nostril, 1.30, 1.25, 1.35; width below nostril, .30, .26, .27.

3. **Cardellina rubrifrons**. (*Girard*) *Scl.* RED-FACED WARBLER. — A young male obtained at Fort Bayard, New Mexico, July 16, 1876, extends the range of the species considerably to the eastward of Camp Apache and Mt. Graham in Arizona, where it was found by Mr. Henshaw in 1874. This evidence is important from its bearing upon the original record by Girard in 1841, when it was included among the famous "Sixteen Species" alleged to have been procured in Texas. Mr. Stephen's specimen was taken "in a cañon, among high mountains."

4. **Pyranga hepatica**. *Swainson*. HEPATIC TANAGER. — There are four specimens of this Tanager in the collection. The birds themselves offer nothing worthy of mention, but some notes which accompany them are of much interest. Under date of May 30, 1880, Mr. Stephens writes: "The species is rather common here (Chiracahua Mountains). They keep mostly among the pines (but sometimes in oaks) and several haunt the vicinity of the house, where I can hear them singing at all times of the day. The song is loud and clear, but short. I have found no nests but a female, taken May 26, had laid all but her last egg."

This description of the song, is, so far as I can remember, the first that has been given. Mr. Henshaw, writing of his experience

with the species at Camp Apache in 1874, says, "with the exception of the call-notes used by both sexes, and which resemble the syllables *chuck, chuck*, several times repeated, they were perfectly silent and neither here nor elsewhere did I ever hear any song." This was probably due to the lateness of the season, Mr. Henshaw's observations being made in July and August.

5. **Cardinalis virginianus igneus** (*Baird*) *Coues*. SAINT LUCAS CARDINAL.—A single adult male of this well marked race is in the collection, from the San Pedro River. I mention it in the present connection chiefly for the purpose of calling attention to some interesting specimens collected by Mr. N. C. Brown, in Kendall Co., Texas, during the spring of 1880. These birds are nearly intermediate between *cardinalis* and *igneus*, their tails being much longer than in the eastern species, while the bills are larger and more swollen; the red of the crest clearer, and the black on the forehead reduced to the narrowest possible line.

6. **Icterus parisorum**, *Bonap.* SCOTT'S ORIOLE.—Mr. Stephens sends me three males of this Oriole. They were taken in the Chiracahua Mountains, not far from the locality where Mr. Henshaw met with the species in 1874. The accompanying notes describe them as "active, restless, and very sweet singers." They were rather uncommon and no females were seen. The adult plumage is apparently not perfected before the second year, as two of the present examples lack the black hood and back, and are otherwise dull-colored, although taken late in the spring.

7. **Antrostomus vociferus arizonæ**, *var. nov.* STEPHENS'S WHIP-POOR-WILL.

CH. SP. Similis *A. vocifero;* sed major; alis longioribus; rictus setis longioribus; loris, striga superciliari, gulæ phalerisque lunatis fulvis; albo in cauda contractiori.

♂ (No 5238, author's collection), Chiracahua Mountains, Arizona, May 22, 1880. Generally similar to *A. vociferus* but much larger; with the rictal bristles considerably longer; the gular crescent and a pretty well defined superciliary stripe, ochraceous; the lores and auriculars tawny ochraceous. The white of the tail barely tipping the outer web of the lateral feathers and on the others confined to a narrow apical space;* the under tail-coverts nearly without barring.

* On the inner web of the outer pair of feathers this space measures 1.11 inches in depth; of the second pair, 1.50; of the third, 1.55.

Dimensions. "Length, 10.20; stretch, 19.40" (collector's measurements); wing, 6.65; tail, 4.45; tarsus, .73; longest rictal bristle, 1.80.

Habitat. Chiracahua Mountains, Arizona.

The differential characters presented by this specimen, are, in my opinion, well worthy of varietal recognition. My collection embraces a very good suite of eastern specimens of *vociferus*, and among them I find no decided approaches to the Arizona bird. The white on the tail, although somewhat variable in extent, is never limited to so small an area, and the rictal bristles are invariably much shorter. Nor have I seen any eastern males with the gular collar uniformly ochraceous, even autumnal examples having the white largely predominating over this space. The difference in size also is very considerable. Taking the wing as the best exponent of this, the wing of *arizonæ* gives 6.65, while seven males of *vociferus* measure respectively 5.80; 5.80; 5.83; 5.96; 6.20; 6.21; 6.40.

I am indebted to my friend Mr Ridgway, for an opportunity of examining a male and female of the Mexican species *A. macromystax*, from the collection of the National Museum. These specimens differ so widely from my *arizonæ* that a comparison between them and the latter, is scarcely necessary. *Arizonæ* has the white of the tail deepest on the inner feathers and decreasing in extent towards the outer pair, precisely as with *vociferus*; while in *macromystax* the white areas decrease very rapidly inwards, the third pair of rectrices being barely tipped with that color. Furthermore, *macromystax* has the bill longer and much more compressed; the nostrils larger and more prominent; the rictal bristles thicker; the feet and tarsi stouter, and *dull orange* in color; the general plumage much darker; the under parts with broad but sparsely scattered blotches of fulvous white; and the decided abdominal zone of light color wanting.

With the pair of *A. macromystax* Mr. Ridgway also sends me four examples of *vociferus*, from Mexico and Gautemala. Only one of these bears any date (Tehuantepec City, Nov. 2, 1869), but two of the others are apparently winter specimens also, and as all three agree perfectly with my autumnal specimens of *vociferus* taken in New England, I regard them as winter visitors from the eastern United States. The fourth, however, (No. 74,355, National Museum) from Guanajuato, Mexico, shows an

approach to the type of *arizonæ*, in its large size (wing 6.50), in the great length of the rictal bristles, and in the decided tawny-ochraceous of the lores and auriculars. The gular-crescent is however mixed with white, and the white areas of the tail are nearly as extended as in typical *vociferus*. It is possible that this bird represents the form characteristic of Northern Mexico but in the absence of more satisfactory data regarding its history, the characters which it presents have no direct bearing on the case in hand. Specimens intermediate between *vociferus* and *arizonæ* are of course to be expected and the Guanajuato example is simply one of these.

The most western point within the United States from which the Whip-poor-will has been previously announced is the valley of the Lower Rio Grande in Texas, where both Merrill and Sennett found it in small numbers.

The distribution of the Arizona form must be exceedingly local. Mr. Stephens has never before met with it, and Mr. Henshaw failed to detect it during his very thorough explorations. Dr. Coues, however, probably heard it at Fort Whipple* in 1865, but no specimens were actually obtained there.

In the Chiracahua Mountains it is apparently not uncommon, to judge from the following notes which accompanied my specimen. "I have heard several of these Whip-poor-wills singing at one time and am told that they were heard here last year. I hear *A. nuttalli* every evening. They keep high up the mountain sides, while *A. vociferus* affects the lower part of the cañons. This is the only locality east of the Missouri River where I have found the latter species."

In a recent letter Mr. Stephens adds: "I heard the first Whip-poor-will about the middle of May. By June 1, they were as common as I ever knew them to be in the East. Sometimes I could hear three or four whistling at once. They were very restless and rather shy, so I got only the specimen I sent you, and a female shot in the daytime. The latter flew off her nest, which, as usual, was only a very slight depression in the ground, but in this case was overhung by a rock. The single egg (now before me) is plain white, with *very* faint brownish spots, *so* faint that one would hardly notice them. She would have laid no more. This was on July 4, 1880. The people in the cañon said they

* Ibis, 1865, 538.

were not as plenty in 1879 as they were last summer. I heard the males until August, at which time I left the Chiracahua Mountains. I have not heard of the species elsewhere in Arizona."

8. **Picus stricklandi**. *Malherbe*. STRICKLAND'S WOODPECKER.—The only record of the occurrence of this Woodpecker within the United States is that by Mr. Henshaw, who found it abundant in the Chiracahua Mountains, Arizona, in August, 1874. An adult male and female, kindly presented to me by Mr. Stephens, were taken April 6, 1880, in precisely the same locality. The latter gentleman writes that the species "is at least as common here as any other Woodpecker. I hear or see them daily and could get as many as I had time to prepare. In the next range of mountains, seventy-five miles to the northwest, I am positive they never come, for I lived there a year and collected much of the time without finding them."

9. **Callipepla squamata**. (*Vig.*) *Gray*. SCALED QUAIL.—A fine male and female of this species, taken respectively March 13 and April 2, 1880, on the Rio San Pedro, Arizona, differ so materially from Texas specimens as to strongly suggest varietal distinctness. Although in remarkably fresh plumage, their general coloring is very pale and bleached. There is not the slightest trace of the usual rusty chestnut patch on the abdomen, that part being nearly concolor with the lower portion of the breast. The yellowish-rusty of the anal region and crissum is very light in tint, and the blueish cast on the breast is barely appreciable. The bill, also, is shorter and slenderer than in either of my Texas examples.

In the absence of a larger suite of specimens, I cannot decide as to the stability of these differences, but should they prove sufficiently constant to entitle the Arizona form to varietal separation I would suggest the name *pallida* as an appropriate one. So far as I can learn, most of the specimens actually examined by ornithologists, have come from localities considerably to the eastward of that represented by the present examples.

Some additional species in the collection do not seem to call for any special elaboration and I accordingly give them with the accompanying localities and dates, in the following list.

10. **Harporhynchus crissalis**. *Henry*. RED-VENTED THRASHER.—♂, Tucson, Arizona, Feb. 28, 1880.

11. **Dendrœca graciæ**, *Coues*. GRACE'S WARBLER.—♂, Chiracahua Mountains, Arizona, April 6, 1880.

12. **Setophaga picta**. *Swain.* PAINTED REDSTART.—♂ and ♀. Chiracahua Mountains, April 7, 1880.

13. **Pipilo aberti**. *Baird.* ABERT'S TOWHEE.—♂, Big Sandy Creek, Arizona, Feb. 7, 1880.

14. **Aphelocoma sordida arizonæ**. *Ridg.* ARIZONA JAY.—Three specimens, two ♂, one ♀, Chiracahua Mountains, taken April 6-7, 1880.

15. **Empidonax fulvifrons pallescens**. *Coues.* BUFF-BREASTED FLYCATCHER.—♂. Chiracahua Mountains, April, 12, 1880.

16. **Centurus uropygialis**. *Baird.* GILA WOODPECKER.—♂, Tucson, March 8, 1880.

17. **Colaptes chrysoides** (*Malh.*) *Baird.* MALHERBE'S FLICKER.—♂, Tucson, March 7, 1880.

REMARKS ON THE PRESENT STATE OF THE SYSTEMA AVIUM.

BY P. L. SCLATER.*

[Concluded from p. 37.]

4. COCCYGES.

THE remaining families of Nitzsch's Picariæ (*i.e.* the Coccygomorphæ of Huxley) stand associated together in our 'Nomenclator' under the name Coccyges, given to them by Sundevall in 1835 (K. Vet.-Ac. Handl. 1835. p. 69), and are divided according to the structure of their feet nearly after the plan suggested by Prof Huxley (P. Z. S. 1867. p. 466). I fear, however, that this is not likely to be a permanent arrangement. Although we may not at once go to the length of following Prof. Garrod in separating the whole class of Birds into "Homalogonatæ" and "Anomalogonatæ," there can, I think, be no question that some weight must, in future, be allowed to the presence or absence of the ambiens muscle, and that it must be allowed that the Cuculidæ and Musophagidæ, in possessing this character and in other respects, stand *per se* among the Picariæ of Nitzsch, and show much affinity with the Gallinæ. I believe therefore that it will

* From the "Ibis," 4th Ser., Vol. IV, pp. 399-411, Oct., 1880.

be better for the future to restrict the term Coccyges to these two families. The question then is, what shall we do with the remaining groups of the order? The arrangement of them by the structure of the feet, according to Prof. Huxley's scheme, although very simple, is not quite natural. *Leptosoma*, for instance (as I believe I first showed in 1865*), although the outer toe is more or less reversed, must certainly come near the Rollers (Coraciidæ); and *Colius* would now appear to be nearly related to the same group,† although its foot-structure is by no means similar. There seem in fact to be several different categories combined in the order Coccyges thus considered. First we have the Lipoglossæ of Nitzsch, consisting of the four families Alcedinidæ, Bucerotidæ, Upupidæ, and Irrisoridæ.‡ These all belong to the Piciformes of Garrod,§ and all the best authorities are pretty well agreed as to their consanguinity. Along with these must come the Cuculinæ calopteræ or Todidæ of Nitzsch, containing also four families, which, to my mind, are also closely related—namely the Meropidæ, Coraciidæ, Momotidæ, and Todidæ. The two last-named groups are united by Garrod into one family.‖ They all four have twelve tail-feathers, a naked oil-gland, and cæca. But to these must be added, as aberrant appendages (which sadly mar the uniformity of the group), the Leptosomidæ and Podargidæ and, as it would appear from Prof. Garrod's researches, the Coliidæ. *Leptosoma*, as stated above, is clearly more allied to the Rollers than to any other form. *Podargus* cannot be left with the Caprimulgidæ, looking to the conformation of its palatal bones,¶ and comes in best here, whereas *Nyctibius* belongs truly to the Caprimulgidæ.†† After Garrod's exhaustive disquisition on *Steatornis*,§§ we can no longer complain that its structure is unknown; but it becomes still more difficult, owing to its numerous peculiarities, to arrange this most extraordinary bird in a satisfactory place in the series. It must certainly be either put in here or placed as a separate order next to the Striges. Perhaps the former plan is for the present the most convenient.

* P. Z. S. 1865, p. 682. Mr. Sharpe, in making the Leptosominæ merely a subfamily of Coraciidæ (Ibis, 1871, p. 285), appears to have entirely overlooked the structure of the feet.

† *Cf.* Garrod, P. Z. S. 1876, p. 416.

‡ Pterylography, p. 102.

§ P. Z. S. 1874, p. 117.

‖ See P. Z. S. 1870, p. 101.

¶ Huxley, P. Z. S. 1867, p. 445.

†† Huxley, *l. c.* p. 454.

§§ P. Z. S. 1873, p. 526.

With these additions the Anisodactylæ, as we have called them in our 'Nomenclator,' will consist of the following twelve families:—

1. Coliidæ.
2. Alcedinidæ.
3. Bucerotidæ.
4. Upupidæ.
5. Irrisoridæ.
6. Meropidæ.
7. Momotidæ.
8. Todidæ.
9. Coraciidæ.
10. Leptosomidæ.
11. Podargidæ.
12. Steatornithidæ.

The Heterodactylæ, which follow next in the 'Nomenclator,' consist of the single family Trogonidæ, the only form of the whole class of birds in which the fourth or outer digit is reversed instead of the second. The pterylosis of *Trogon* is also quite different from that of the other Zygodactylæ, being purely passerine, except as regards its long aftershaft.*

The true Zygodactylæ in the 'Nomenclator' consist of four families besides the Cuckoos, namely the Galbulidæ, Bucconidæ, Rhamphastidæ, and Capitonidæ. To these must be added the Indicatoridæ, which do not occur in the New World. *Indicator* has now been conclusively shown to have nothing to do with either the Cuckoos (as supposed by the older authors) or with the Woodpeckers (as believed by Blyth†), but must form a family of itself, allied to the Capitonidæ.‡

Lastly, I would now propose to place together in one group, under the restricted title of "Coccyges," the two families Cuculidæ and Musophagidæ. I am not yet prepared to remove them to the neighborhood of the Gallinæ altogether, but (as above stated) am ready to allow that Prof. Garrod has shown good reasons for separating them from the rest of the Zygodactylæ.

Moreover, on the whole, I have come to the conclusion that, looking to the successful assaults that have been made on Prof. Huxley's views as to the nature of the palate in the Pici and in the Trochilidæ, it will be a better arrangement to sink the Pici and Cypseli to the rank of suborders and to revive the term Picariæ for the whole of the three groups denominated in the

* Nitzsch, Pterylogr. p. 93.

† J. A. S. B. xi. p. 167 (1842).

‡ *Cf.* Sclater, Ibis, 1870, p. 176. For the species of *Indicator* consult Sharpe in Rowley's Orn. Misc. i. p. 192, and P. Z. S. 1878, p. 793.

'Nomenclator' Pici, Cypseli, and Coccyges. The order Picariæ may then be divided into the following six suborders: —

	Families.		Families.
1. Pici	2	4. Heterodactylæ	1
2. Cypseli	2	5. Zygodactylæ	5
3. Anisodactylæ	12	6. Coccyges	2

The Picariæ thus considered embrace altogether about 1600 species of birds referable, as shown above, to twenty-four families.

5. PSITTACI.

The Parrots (*Psittaci*), annexed by Cuvier and his disciples to the Zygodactylæ, are now generally allowed to form one of the primary divisions of the Carinatæ, as was first, I believe, suggested by Nitzsch in 1829.* The affinities of this ancient group to other orders appear to be somewhat remote, but their most natural position seems to be between the Picariæ and the Accipitres. The best mode of subdividing this order has long been a matter of discussion. Dr. Finsch's mode of grouping, as well as those adopted by previous writers, being not very satisfactory. But a flood of light has been thrown upon this subject by Garrod's excellent memoir on the anatomy of the Psittacidæ,† and I think we may safely base our arrangement upon the results of his observations. This, indeed, I have already done in the last edition of the 'List of Vertebrated Animals living in the Zoological Society's Gardens' (1879), where I have arranged the Psittaci upon the following plan, of which the details are taken from Garrod's investigations: —

A. Left carotid normal.
  A'. Orbital ring complete . . . . . 1. *Cacatuidæ*.
  B'. Orbital ring incomplete.
    A''. Sternal keel aborted . . . 2. *Stringopidæ*.
    B''. Sternal keel developed . . 3. *Palæornithidæ*.
B. Left carotid superficial . . . . . 4. *Psittacidæ*.

All the New-World Parrots belong to the last family.

6. STRIGES.

That the Owls, with so many peculiarties in their organization,‡ should constitute an order separate from the Accipitres I think there is little doubt. There is no known intermediate form, un-

* Obs. de Avium art. carotide communi.

† P. Z. S. 1874, p. 586.

‡ *Cf.* Nitzsch, Pterylogr. p. 67.

less it may be said that *Pandion* approximates rather to the Striges in the absence of the aftershaft. In a previous paper in this Journal* I have given my reasons for dividing them into two families (Strigidæ and Asionidæ), which Prof. Newton† and Mr. Sharpe‡ likewise agree to.

7. Accipitres.

The Accipitres, which follow naturally next to the Striges, are primarily divisible, as shown by Prof. Huxley,§ into three families, which I have termed Falconidæ, Cathartidæ, and Serpentariidæ. Garrod goes much further than Prof Huxley in distinguishing the two latter groups from the former.‖ The Cathartidæ he holds to be much more nearly allied to the Storks than to the Falconidæ, and *Serpentarius* (sive *Gypogeranus*) he places, along with *Cariama*, among the Bustards. These two forms come in therefore in quite different parts of his "Systema." I confess I am not quite able to go so far as this, though I freely allow that the Cathartidæ (as already pointed out by Nitzsch, Pterylogr. p. 50) are in many respects very different from the rest of the Accipitres, and that the resemblance of *Serpentarius* and *Cariama* is most remarkable. But on the latter point Burmeister,¶ no mean authority, has come to quite an opposite conclusion to Garrod. At any rate I see no justification for the course Mr. Sharpe has adopted (without stating any reasons) of placing *Cariama* among the Accipitres, still less for treating it as merely a genus of the subfamily Polyborinæ!

8. Steganopodes.

Although it is very easy to point out the defects in the arrangement of the remaining orders of birds (the Gallinæ, Grallatores, and Natatores) adopted by Cuvier and his disciples, it is by no means easy to suggest a better one. Let us first consider some of the weak points of the ordinary system. In the first place it is evident that the "*digiti palmati*," by which the Natatores are ordinarily characterized,†† is a very slight and super-

* Ibis, 1879, p. 351.
† Newton's Yarrell, i. p. 148.
‡ Cat. Birds, ii. p. 289.
§ P. Z. S. 1867, p. 462.
‖ Ibid. 1874, p. 117.
¶ "Beiträge z. Naturgeschichte des Seriema," Abh. nat. Ges. z. Halle, i. p. 11.
†† Even by Sundevall, who says "Nullo alio charactere opus est!" (Tentamen, p. 134).

ficial character, and one of which no trace is to be found in the osteology. No one will now-a-days deny that the Gulls (*Gaviæ*), though their feet are webbed, are so intimately allied to the Waders (*Limicolæ*) that it is most unnatural to put the two groups far apart. Again, to divorce the Flamingoes from the Herons simply because of their webbed feet, seems by no means satisfactory. Nor is it easy to find any point of resemblance between the true Anseres and other Natatores, except the one single character of palmatipedism. Under these impressions I have thought it better to follow Prof. Huxley's plan of associating together the three great groups of Grallatores and Natatores that resemble the Accipitres in the formation of the palate. It appears to me that the great "Gallino-gralline" series runs off much more smoothly when these excrescences are removed, and that at the same time the three Desmognathous groups, even leaving the palatal conformation out of consideration, show much affinity *inter se*.

Acting on these ideas I placed the Steganopodes, Herodiones, and Anseres in the 'Nomenclator' immediately after the Accipitres, putting the Steganopodes first, amongst which the Fregatidæ show some sort of (at least superficial) resemblance to the birds of prey. I divided them into the following five families, which may, I think, be readily diagnosed:—

1. Fregatidæ.
2. Phaethontidæ.
3. Pelecanidæ.
4. Phalacrocoracidæ.
5. Plotidæ.

9. HERODIONES.

The Herodiones (Pelargomorphæ of Huxley) come very naturally, I think, between the Pelicans and the Ducks. In the 'Nomenclator' they are divided into four families—Ardeidæ, Ciconiidæ, Plataleidæ, and Phœnicopteridæ. I have, however, lately come to the conclusion that the last-named group should not be included in the Herodiones, although, as Nitzsch has told us, the pterylosis is completely Stork-like, and occupies a middle place between *Ciconia* and *Tantalus*. Prof. Huxley says "the genus *Phœnicopterus* is so completely intermixed between the Anserine birds on the one side and the Storks and Herons on the other, that it can be ranged with neither of these groups, but must stand as a division by itself." In this opinion I am not

quite disposed to agree, and propose to use Nitzsch's appropriate term "Odontoglossæ" to designate the order.

The family Plataleidæ, I may here remark, should include the Spoonbills and Ibises, as Nitzsch, who first constituted the group under the title Hemiglottides,* has shown. It is a common but very obvious error, well exposed by Garrod,† to unite the Ibises with *Tantalus*. But *Tantalus* is a true Stork, and has nothing to do with *Ibis*. The Plataleidæ differ from all the other Herodiones in being "shizorhinal,"‡ in which respect they deviate towards the Limicolæ. But their pterylosis is that of the Storks, "even to the smallest details."§

10. Anseres.

The Anseres, if considered as limited to the single family Anatidæ, constitute a rather isolated group which can be very easily defined. Following Parker‖ and Huxley¶ in the 'Nomenclator' I associated the Palamedeidæ with the Anseres. But after the recent investigation of Prof Garrod** it would seem impossible to deny that the peculiarities of this group are such as to necessitate their recognition as a separate order, which I propose to call Palamedeæ. Nitzsch has long ago shown that the pterylosis of *Palamedea* is abnormal in showing scarcely any appearances of spaces between the feather-tracts (Pterylogr. pp. 16, 121); but in the Anatidæ, also, the spaces are very narrow.

The best position for the Palamedeæ appears to me to be just before the Anseres, which I commence with the genus *Anseranas*.††

11. Columbæ.

We now enter upon the great Schizognathous series of Prof. Huxley, which, I think it must be allowed, runs on much more smoothly after the removal of the five preceding groups. The Columbæ are Passerine in many respects (especially as regards the state in which the young are excluded from the egg, which

* Pterylography, p. 133 (Engl. tr.).
† P. Z. S. 1875, p. 301.
‡ Garrod, P. Z. S. 1873, p. 37.
§ Nitzsch, Pterylogr. p. 133.
‖ P. Z. S. 1863, p. 511.
¶ P. Z. S. 1867, p. 460.
** P. Z. S. 1876, p. 189.
†† See P. Z. S. 1880, p. 497.

has caused Sundevall to place them at the end of his division Psilopædes*), and, no doubt, belong to a new line of departure from the Passeres towards the Gallinæ. It is very hard to have to mar the symmetry of the Columbine group by adding to it the Pteroclidæ. Yet there can be no doubt that in most respects the Sand-Grouse are more truly Pigeons than Grouse, and that the only way to escape from the dilemma is to recognize the Pterocletes as a separate order, as Prof. Huxley has proposed to do,† intermediate between the Columbæ and Gallinæ.

As regards the divisions of the Columbæ into families I have recognized two in the last edition of the 'List of Animals'—Carpophagidæ and Columbidæ. To these should have been added a third (Gouridæ) for the Crown Pigeons, in which the tarsi have a very peculiar conformation, and perhaps a fourth (Didunculidæ) for *Didunculus*.

The Dodos must be held to belong to quite a separate section of the order.

12. GALLINÆ, and 13. OPISTHOCOMI.

As regards the true Gallinæ, which we now come to, we cannot do better than adhere to Prof. Huxley's excellent division of them into Peristoropodes and Alectoropodes. In the former section I have recognized two families, Cracidæ and Megapodiidæ: in the latter two also, Tetraonidæ and Phasianidæ. Whether the Meleagrinæ and Numidinæ should stand as subfamilies of the Tetraonidæ (as arranged in the 'List of Animals' for 1879), or as separate families, is, I think, not quite certain. The Turnicidæ, there treated as only a family of the Gallinæ, as also *Opisthocomus*, must, I think, after Prof. Huxley's elaborate discussion of the subject,‡ be definitely constituted as separate orders, Hemipodii and Opisthocomi—the former leading off towards the Crypturi, the latter most nearly allied to the Cracidæ, and also showing manifest signs of alliance with the Coccyges among the Picariæ.

14. GERANOMORPHÆ.

In the 'Nomenclator' I have placed the Rails next after the Gallinæ, to which they show manifest symptoms of relationship.

* Tentamen p. 97.
† P. Z. S. 1868, p. 254.
‡ P. Z. S. 1868, p. 311.

under Prof. Huxley's title Geranomorphæ,* and divided them into two suborders, for which I have used Nitzsch's names Fulicariæ and Alectorides. In the last edition of the 'List of Animals' (1879) I have added the Bustards and Cranes and considered these suborders as orders, which is perhaps the most natural plan, although *Aramus* is certainly intermediate between the two groups. After Prof. Garrod's investigations, however,† we must, I think, allow that *Aramus* is essentially more nearly allied to the Gruidæ.

The families of these two orders will therefore accordingly stand somewhat as follows: —

Fulicariæ.	Alectorides.
Rallidæ.	Aramidæ.
Heliornithidæ.	Eurypygidæ.
	Gruidæ.
	—
	Psophiidæ.
	Cariamidæ.
	Otidæ.

By placing the Otidæ last we obtain a more gentle transition to the Limicolæ through *Œdicnemus*.

15. Limicolæ.

The Limicolæ or Scolopacinæ of Nitzsch (Charadriomorphæ of Huxley) form a very natural group with but small pterylographic differences. They also exhibit a characteristic form of skeleton and a well-marked type of schizognathous palate. In the 'Nomenclator' I have assigned the following families to this order: —

1. Œdicnemidæ.	4. Chionididæ.
2. Parridæ.	5. Thinocoridæ.
3. Charadriidæ.	6. Scolopacidæ.

Prof Garrod‡ would exclude *Œdicnemus* (as being holorhinal) entirely from this order, and associate it with the Bustards (*Otis*). But if we give in to this principle we should have to place the Plataleidæ among the Limicolæ, which I cannot agree to.

* P. Z. S. 1867, p. 457.
† P. Z. S. 1876, p. 275.
‡ P. Z. S. 1873, p. 37.

16. GAVIÆ.

In the 'Nomenclator' I have made the Gaviæ to include the Petrels (Procellariidæ) as well as the Gulls (Laridæ). But I now think it better to restrict the term Gaviæ to the latter group, the Longipennes of Nitzsch, which, not only as regards their osteology, but also in respect of their pterylosis, come very near to the Limicolæ.*

The Gaviæ will therefore consist of the single family Laridæ, while the Procellariidæ will constitute the order "Tubinares" (Nitzsch). The propriety of this separation is confirmed by what Prof. Garrod has stated (P. Z. S. 1879, p. 37) as to the form of the nasal bone in these two groups.

17. PYGOPODES, and 18. IMPENNES.

The Pygopodes of Illiger combine the two families Colymbidæ and Alcidæ, which are also closely allied pterylographically. They seem to form a natural transition between the Gaviæ and the Impennes. Nitzsch (Pterylogr. p. 151) has associated them with the latter group; but the Penguins are very distinct not only in their osteology, but also in their pterylosis, as admitted by Nitzsch himself, and have full claims to constitute an order *per se*.

19. CRYPTURI.

Under this term (of Illiger) I have placed in the 'Nomenclator' the Tinamidæ, which, as Mr. Parker has shown (Trans. Zool. Soc. v. p. 149), have a completely struthious palate, and in other respects come at the bottom of the series, and are nearest of all Carinate birds to the Ratitæ. In so doing I make, of course, no claim to originality, but have simply followed Prof. Huxley, who first located the Tinamous in their position under the title "Dromæognathæ."†

20. APTERYGES, and 21. STRUTHIONES.

In the table given in the 'Nomenclator' (p. iv) I have recognized only two orders of Ratite birds—Apteryges and Struthiones. But there is no doubt, I think, that the Casuaries have full claim

* *Cf.* Nitzsch, Pterylogr. p. 141; and Huxley, P. Z. S. 1867, p. 458.

† P. Z. S. 1867, p. 125.

to ordinal rank, and should likewise stand as an independent order. Their very peculiar pterylosis, apart from their marked osteological differences from *Struthio* and *Rhea*, would alone entitle them to this distinction. I would therefore propose to designate them Casuarii, the simple Latin plural being, in my opinion, a better term for the group than any name which would be a fresh burden on the memory.

Amending the "Systema" according to the suggestions above made, we shall find it come out in two subclasses and twenty-six orders, somewhat as in the following table, where I have added to the name of each order about the number of species known to belong to it, basing my calculations mainly on the figures given in the second volume of Mr. Wallace's 'Geographical Distribution.'

Orders of existing Birds.

Subclass Carinatæ (10.121 species).

I. Passeres	5700	XIII. Gallinæ	320
II. Picariæ	1600	XIV. Opisthocomi	1
III. Psittaci	406	XV. Hemipodii	24
IV. Striges	180	XVI. Fulicariæ	150
V. Accipitres	330	XVII. Alectorides	60
VI. Steganopodes	60	XVIII. Limicolæ	250
VII. Herodiones	130	XIX. Gaviæ	130
VIII. Odontog'ossæ	8	XX. Tubinares	100
IX. Palamedeæ	3	XXI. Pygopodes	65
X. Anseres	180	XXII. Impennes	20
XI. Columbæ	355	XXIII. Crypturi	40
XII. Pterocletes	15		

Subclass Ratitæ (18 Species).

XXIV. Apteryges	4
XXV. Casuarii	10
XXVI. Struthiones	4

In concluding these somewhat desultory remarks I must beg my fellow workers not to suppose that I claim any originality for the system above given. It having been a necessity for me to employ *some* system in certain pieces of work (such as the 'Nomenclator' and the various catalogues of animals in the Zoological Society's Gardens), I have endeavored to frame one that is free from certain objections which are patent in the systems usually

followed. It will be seen at once, by those who care to examine the references above given, that I have borrowed freely from the labours of Nitzsch, Huxley, Sundevall, Parker, and Garrod—authors who have lately shed a flood of light upon one of the most difficult zoological problems of the day, the best arrangement of the class of birds. My system is, in fact, that of Prof. Huxley's reversed, *i. e.* beginning at the top instead of the bottom, with slight alterations and emendations extracted from the works of the other authors above mentioned.

DESCRIPTION OF A NEW SPECIES OF THE FAMILY *PROCELLARIIDÆ*.

BY CHARLES B. CORY.

Puffinus borealis. Above brownish-ash, the feathers of the back becoming pale at the tips, those on the nape and sides of the neck narrowly tipped with white; on the sides of the neck and head the ash and white gradually mingling as in *P. kuhlii*. Tips of the upper tail coverts, white. Under eyelid, white, showing clearly in contrast with the ashy gray of the head. The first three primaries are light ash on the inner webs. Wings and tail brownish-gray. Under parts, white, slightly touched with ash on the flanks, lining of wings white. Under tail coverts white, the longest tinged with ash near the ends, which extend nearly to the tips of the longest tail feathers. Outside of foot greenish-black, inside and webs dull orange, bill pale yellowish at the base shading into greenish-black but again becoming pale near the tip.

Length, 20.50 inches; wing, 14.50; bill (straight line to tip), 2.25; depth at base, .75; tail, 6.50; tarsus, 2.20.

The type specimen of this Shearwater was killed near Chatham Island, Cape Cod, Mass., on the 11th of October last. Being unacquainted with it I showed it to some fishermen and requested them to procure any birds they might meet with resembling it. During the afternoon one of the boats returned bringing a number of birds of this species. The men stated that they had met with a flock a short distance from shore and had shot several and knocked others down with their oars. According to their statement, after firing the first shot, the birds flew about them in a dazed manner often passing within a few feet of the boat.

FIELD NOTES ON THE BIRDS OF SAN JUAN COUNTY, COLORADO.

BY FRANK M. DREW.

IN the southwestern portion of Colorado, and lying wholly within the Rio Colorado basin, is the little county of San Juan. With the exception of Baker's Park and tributary gulches, San Juan is composed of mountain peaks, fully one-third of the county being above timber-line. (For a good description of the Park and adjacent country, see F. B. Rhoda's account in Hayden's Report for 1874.) The average elevation of the Park is 9,500 feet; the lowest part of the county is at the extreme southern end, in the Animas Cañon. Here it is about 8,500 feet, and for a short distance up this narrow gorge runs a tongue of vegetation entirely different from the characteristic flora of San Juan. This different growth is composed of pines, poplars, and scrub oak and maple bushes. The flora of the county is essentially western and boreal.

The peaks are the homes of such sub-arctic mammals as *Lagomys princeps*, *Arctomys flaviventer*, *Lepus americanus bairdi*, all in great abundance, as well as *Erethizon epixanthus*, *Ovis montana*, *Felis concolor*, *Neotoma cinerea*, and others. But one reptile — a snake — was seen; neither batrachians nor fishes were found. Owing to the peculiar topographical position of the county, the list becomes of a little more interest than a mere faunal paper, as it is composed of those birds which range to, or above 10,000 feet. My observations extend from June, 1879 to January, 1881. The nomenclature is, in the main, that of Dr. Coues; that is, in so far as I have been able to keep up with recent revisions.

1. **Turdus migratorius propinquus**. *Ridg.* WESTERN ROBIN. — Very common; breeds, the nest being placed indifferently two feet from the ground in bushes, or twenty-five feet up in trees. One nest which I found was curiously placed in some willow bushes in much the same manner as the nest of a Red-winged Blackbird, being supported entirely by the sides. How the bird made a start is a puzzle to me. If climatic changes have caused such a marked hoariness — a bleached color — in *Parus atricapillus septentrionalis*, why has climatic variation bleached the *white* out of the robin's tail and left it nearly or quite black? The birds are found here from April until the last of November and occasionally rear two broods.

2. **Turdus aonalaschkæ auduboni**, *Ridg.* AUDUBON'S THRUSH. — Common; breeds. In June its clear, sweet notes can be heard from nearly every dark glen or secluded part of the woods. I found a nest with three eggs in the latter part of June. The nest was placed in a spruce bush about three feet from the ground. Not noticed after Sept. 13.

3. **Myiadestes townsendi**, *Cab.* TOWNSEND'S SOLITAIRE.—Rather common, and breeds. A nest taken by Mr. T. M. Trippe, July 9, at an elevation of 10,500 feet, was placed in a little cranny in a bank, and contained four eggs in which incubation had just begun. In fall the Solitaire comes out of the woods and can be found around houses, or in low bushes near water. They seem to prefer a low perch to an elevated one, as I have often seen them leave the latter for the former. I have never seen more than four together. A quartette, probably young birds, which I saw one rainy day in October, kept up a low soliloquy which sounded much like the noise a Robin makes when talking to himself. One of them essayed a song and succeeded in producing a warble somewhat like a Robin's song. Of their love song I have only heard fragments, but sweet ones.

4. **Oroscoptes montanus**, *Baird.* MOUNTAIN MOCKING BIRD.— Rare. Appears in May and lingers until October. It seems just a trifle out of place up here, and clings closely to the few dry bushy hillsides and sandbanks.

5. **Sialia arctica**, *Sw.* ARCTIC BLUEBIRD. — Abundant from April to December. The only peculiarity I have noticed in the bird, is an occasional low *chuck* — exactly like that of a Blackbird — from the female when the nest is approached. Very wary and much on the ground.

6. **Cinclus mexicanus**, *Sw.* AMERICAN DIPPER. — Abundant: resident: breeds. The Dipper is my prime favorite: always cheery and confiding. June 19 I found a nest with four young birds in it: close by was another just building. The female did the nest building, while her lord attended to the young brood. He fed them at the door which was placed in the front, and out of which the young voided their excrement. When the old bird went for nest material she would fly to a rock in the stream near a moss-patch, and after bobbing up and down a few times, leisurely hop ashore and proceed to snatch up bits of moss. Once I noticed her pulling fibrous shreds from weed stalks, which she dipped in the water before taking to the nest. At the nest, which was about half finished, she went inside and began pushing the moss into the roof and sides: raising the roof here, and pushing out the sides there, until all was satisfactory. Nest-making progressed very fast and in a week's time she had two white eggs in it; these I left until incubation commenced in hopes of getting more. The young birds, when adrift for themselves, skulk under the banks, with only occasional excursions into the water, until winter comes on when old and young flock to the river, it being more free from ice. They are the very embodiment of a mountain torrent,—bustling, and energetic; and their song is like chrystallized spray. Sweet, sparkling, and vivacious, taken with its surroundings, I do not know of any bird-song which surpasses it. They sing

the year round, and as charmingly in January as in the month of roses and home. They are somewhat exclusive, as you will find but one pair in a place. They have four or five young at a brood; in some cases, I think, they remain mated through the winter.

In descriptions of the bird no one seems to have noticed the bronzed head and neck of both sexes in spring. The whole head is beautifully bronzed from pink and purplish reflections.

Has any one seen a Dipper perching? I was surprised one day, while walking along the river, to see an Ouzel fly up from the water into a bush where he hopped around quite as unconcernedly as any orthodox percher.

7. **Regulus calendula.** *Licht.* RUBY-CROWNED KINGLET. — Very abundant from April to October; breeds from 7,500 feet to 10,500 feet. A nest, which I took July 5, was placed in the uppermost branches of a spruce — about 30 feet from the ground — in one of those dark masses where the cones grow thickest, and where it would be impossible to see your hat, were it there. The nest was very loosely placed among the outer twigs, being partially pensile, and was composed of bits of fine bark externally, and within of silk-weed shreds, moss, spider's silk, and feathers; all matted together in a compact manner, and lined with wool. It contained four young and an addled egg, the latter measuring .014 × .012 mm.; white.

Following is a description of the nestling plumage. Top of head dark, almost blackish. Back and rump a light tint of olive-green. Beneath a dirty rusty white, darkest on fore-breast. Lores lighter than rest of head. Primaries and secondaries black, edged on inner margin with white; this white is only on basal half of second primary, but gradually extends until it reaches the tip on the last secondary. Outer edge of second primary white. On the basal third of third primary, the yellow edging of the outer margins of the wing feathers begins and, slightly widening, rapidly extends so as to conspicuously color the secondaries and tertials. The outer webs of the latter have quite a wide whitish band which is edged with greenish-yellow. Greater wing-coverts with a terminal band of dirty white. Tail feathers black; outer pair completely so, rest with greenish-yellow margin. Tarsi marbled light and dark. Toes, above flesh color, below yellow. Bill dark above, below flesh colored, pink at base. Measurements of one example:— Length, .088; extent, .162; wing, .052; tarsus, .02; tail, .027 mm.

8. **Regulus satrapa.** *Licht.* GOLDEN-CRESTED KINGLET. — Rare: a single bird found in September, 1879.

9. **Lophophanes inornatus.** *Bd.* PLAIN TITMOUSE. — Not uncommon in September, and doubtless breeds.

10. **Parus atricapillus septentrionalis.** *Allen.* LONG-TAILED CHICKADEE. — A very common resident; breeds.

11. **Parus montanus.** *Gamb.* MOUNTAIN CHICKADEE. — Fully as abundant as the foregoing; ranges from the Park to the summits of the loftiest peaks. The only difference I have noticed between this bird and its congeners is that *chick-a-dee-dee* is uttered in a sharper, more wiry tone; the young (?) birds frequently utter a sharp, disagreeable squeak.

12. **Certhia familiaris**. *Linn.* BROWN CREEPER. — An abundant resident; breeds.

13. **Telmatodytes palustris**, *Cab.* LONG-BILLED MARSH WREN. — Rare; breeds?; found in September.

14. **Salpinctes obsoletus**. *Cab.* ROCK WREN. — Not rare; but nowhere common. A splendid songster. Breeds; ranges to timber-line, and remains until October.

15. **Eremophila alpestris chrysolæma**. *Coues.* SOUTHWESTERN LARK. —Not common. Breeds on the higher peaks. In October small flocks of Larks descend into Baker's Park; a few remain all winter, but the most go lower down.

16. **Anthus ludovicianus**. *Licht.* BROWN LARK. — Common; nests above timber-line, where in September both old and young may be found busily gleaning their food on the shores of sub-arctic lakes. In October they begin to descend and soon disappear.

There is a great deal of variation in color in the Brown Lark. Some birds have not the least trace of a spotting on the breast, while others are heavily spotted. Several nests, found at timber-line in July, were placed under the shelter of projecting stones. They were empty at the time, the young having just vacated them.

17. **Dendrœca auduboni**. *Bd.* AUDUBON'S WARBLER.—Abundant; breeds. A nest before me, taken June 26, is composed of soft, silky weed-fibres, which, by their color, give a silvery-gray appearance to the nest. Within it is well lined with feathers and cow-hairs, the latter predominating. The nest contained four eggs in which incubation had begun. Color white, with a faint bluish tinge; at the larger end, shell markings of lilac, and surface lines and blotches of rich brown and brownish black, form a wreath. Average size: — .019 × .013 mm. The nest was loosely placed among the needles on a horizontal spruce bough, about three feet from the ground.

Their song is a pleasant little melody, in parts very similar to the song of *D. æstiva*. Remain from May until October.

The bird's tongue is finely cleft.

18. **Geothlypis macgillivrayi**. *Baird.* MACGILLIVRAY'S WARBLER. —Breeds. One specimen obtained, though I judge it is not uncommon; only shy.

19. **Myiodioctes pusillus**. *Bp.* GREEN BLACK-CAPPED FLYCATCHING WARBLER. — Of this little beauty I know nothing save that it nests here, and becomes common in August and September.

20. **Pyranga ludoviciana**. *Bp.* LOUISIANA TANAGER. — I found two which had wandered up into Baker's Park, above the range of the pines.

21. **Iridoprocne bicolor**. *Coues.* WHITE-BELLIED SWALLOW. — Rare; breeds; remains until September.

22. **Tachycineta thalassina**. *Cab.* VIOLET GREEN SWALLOW. — Very abundant; graceful on the wing, they cut but a sorry figure on the ground. Nests both in hollow trees and among the cliffs. In a tree which contained a small hollow with two openings, one six inches above and to one

side of the other. I found two of the Violet Green's nests. No. 1 had built her nest on a level with the lower opening. No. 2 had filled the space over the first one's head with twigs, and was just finishing her own nest when I came on the scene. In the lower nest I found four fresh, white eggs. Just before a rain storm they love to huddle together on dead trees, like Cedarbirds, when numbers can be killed at a single shot. They leave early in autumn.

23. **Ampelis garrulus**. *Linn.* BOHEMIAN WAXWING.—Small flocks seen in November.

24. **Vireo gilvus swainsoni**. *Coues.* WESTERN WARBLING VIREO.—Found, but apparently rare.

I saw several other Vireos which I could not secure. I think I saw and heard, *V. solitarius plumbeus;* it is very common at 8,000 feet, and, so far as I could judge from a number of specimens, is only a variety of *solitarius*.

25. **Lanius borealis**. *Vieill.* GREAT NORTHERN SHRIKE. — Rare; a fall and winter visitant. Lives by foraging on the little troops of Titmice.

26. **Lanius ludovicianus excubitoroides**. *Coues.* WHITE-RUMPED SHRIKE.—Not common; breeds?

Some ornithologists discredit the "hovering," and singing of this Shrike. In southern Illinois, where they are numerous and resident, I have seen one hover over a mouse's nest for a few minutes, then dart down and seize a new-born mouse which went to adorn a hedge near by. Soon he was back again, hovering as before, but this time a Meadow Lark so bothered him that he left. When hovering he was at times twenty feet high, and again, just above the weed-tops.

He has quite a variety of notes: some resemble a Blue Jay's, others the whistle of a Cardinal Grosbeak, while others are quite original, and not unmusical. I have also heard them sing here, but in either place, they only sing during the winter, from October to March.

A Shrike I shot here in April, 1880, is typical *ludovicianus*, excepting that the bill is black, and the wing, instead of being black, is of a ruddy brown color.

27. **Pinicola enucleator**. *Cab.* PINE GROSBEAK. — Rather common in late summer, and through the winter. I think they breed, as I found them the first week in August. A sweet warbler. At one of our camps in the Animas Cañon I often heard them singing at daybreak. During severe storms in winter they come down into the willow bushes along the streams.

28. **Carpodacus cassini**. *Baird.* CASSIN'S PURPLE FINCH. — Not common. Of the several I have taken all have been males. In June they have a Vireo-like warble: strong, clear and sweet. Not seen after November 1.

29. **Loxia leucoptera**. *Gm.* WHITE-WINGED CROSSBILL.—Rare. One, from Baker's Park, in the collection of Dr. R. H. Brown of Silverton.

30. **Leucosticte tephrocotis**, — var. **australis** of Allen. I am some-

what puzzled to know just what disposal to make of this bird. It agrees with *australis* in having the "red of the abdomen extended to the breast," and the "throat soft, umber brown," but it has grayish lores, and a grayish bordering posteriorly to a black pileum. It is excluded from true *tephrocotis* by having gray below the lores.

I found the Gray-crown rather common above timber-line in June; in August they were in swarms on the summit. The young were just out of the nest, Aug. 17, and kept up an incessant clamor, like young Chimney Swifts. The wind was very high at the time, and often while standing in a lode drift, the noise would go rushing by sounding like the distant jingle of sleigh bells. The only note I heard from the old birds was a thick-toned chirp; in June they have a canary-like *peyt-e-weet*. The young birds are nearly unicolor, much like the color of the adult's neck, but darker. They breed on ledges in the face of inaccessible cliffs. When they come down in winter they are very tame and confiding.

31. **Ægiothus linaria**, *Cab.* RED-POLL LINNET.—These cheery little fellows know nothing of thermometers, and are as jolly with the mercury — 30° as if it were June.

32. **Astragalinus tristis**, *Cab.* YELLOWBIRD. — Obtained a single bird, a male in full breeding plumage, in July, 1879.

33 **Astragalinus psaltria**. *Coues.* ARKANSAS GOLDFINCH. — I found several in the willow bushes along the Rio Animas in October. Doubtless breeds.

34. **Chrysomitris pinus**, *Bp.* PINE FINCH.—Common; breeds. One of the cheeriest of our few winter residents.

35. **Pocœcetes gramineus**, *Bd.* GRASS FINCH.—Common in the grassy valley near the headwaters of the Rio Dolores, and seen in flocks in Baker's Park. Breeds.

36. **Melospiza lincolni**, *Bd.* LINCOLN'S FINCH. — Very common; breeds. Frequenting marshy places, they skulk through the underbrush like a sprite; more like a mouse in action than a bird. In June they have a pretty wildsome song, the latter part of which reminds me of a Chewink's (*Pipilo erythropthalmus*). At any time of the day, in June and July, you can hear the little performers pouring out their songs from their perches on the topmost branches of the dwarfed willows.

37. **Junco hyemalis aikeni**, *Ridg.* WHITE-WINGED SNOWBIRD. — Rare; not noticed until after two or three severe snow-storms in October. They are easily recognized by being heavier-built than their allies, as well as by the white wing-bands, though the latter are variable.

38. **Junco oregonus**, *Scl.* OREGON SNOWBIRD. — Common. First appearing at timber-line in September, stragglers come down and mix with flocks of *caniceps*, but by October they have taken full possession. When the severe winter weather begins they pass lower down.

39. **Junco oregonus annectens**, *Bd.* BAIRD'S SNOWBIRD. — Occasionally seen in flocks of the foregoing.

40. **Junco cinereus caniceps**, *Coues.* RED-BACKED SNOWBIRD. — Very abundant. The only Snowbird which breeds here, raising two.

perhaps three broods in a season. June 26 I found large young out of the nest; July 25 I obtained a nest with three eggs; and on September 25 I heard young birds crying for food. They are our commonest summer bird, taking the place around the door of the Chippy in the East. The breasts of the nestlings are spotted, but they soon show traces of the chestnut dorsal patch. A curious prolonged, grating *tsip* is the only note of the young birds. They leave just as *oregonus* becomes plentiful — November 1. There is a great difference between the eggs of the nest spoken of above and those of a clutch taken in June in New Mexico. Both nests are the ordinary "Ground Sparrow" affair. The ground color is the same in all the eggs, i.e. a bluish-white, but while the New Mexico eggs are very faintly dotted with brown — scarcely noticeable — the Colorado eggs are everywhere dotted with reddish spots, tending to form a wreath around the larger end. I would hesitate to believe the two clutches to be of *canicaps* had I not shot the birds.

41. **Spizella montana**, *Ridg.* TREE SPARROW. — A rare migratory visitant in spring and fall.

42. **Spizella socialis**, *Bp.* CHIPPING SPARROW. — Rare; not nearly as common as the following.

43. **Spizella socialis arizonæ**, *Coues.* ARIZONA CHIPPING SPARROW. —Common: breeds.

[*To be concluded.*]

CRITICAL NOTES ON A PETREL NEW TO NORTH AMERICA.

BY WILLIAM BREWSTER.

SOME months since, while passing the natural history store of W. J. Knowlton, Tremont St., Boston, my attention was attracted by a mounted Petrel, which, with spread wings, hung conspicuously displayed in the window. I saw at once that it was a species new to me and, upon entering, was greatly astonished to learn that it had been received only a short time before *in the flesh*, and in a comparatively fresh condition. Further inquiries elicited the information that it had been mounted for Mr. E. H. Woodman of Concord, N. H., and upon writing to that gentleman, I was very kindly put in possession of the following particulars. The bird had been sent him by a client, Mr. Nathan F. Smith, who conducts a large farm at Mt. Morris, Livingston Co.,

New York. One of the laborers while ploughing an old cornfield, noticed it running in a freshly-turned furrow and despatched it with a stick. It was apparently exhausted, for it made no attempt to escape. This was early in April, 1880, probably not far from the fifth of the month, as I find its reception recorded on Mr. Knowlton's books as April 10. A letter afterwards received from Mr. Smith confirms all of these facts, but adds nothing of interest, save that the farm "comprises what are known as flats, lying along the Genesee River, about forty miles south of Lake Ontario."

So much for the details of its capture; resting as they do on the testimony of three different persons, who, at the time, were not aware of the importance of the case, there can be no doubt as to their entire authenticity. The specimen itself, through Mr. Woodman's generosity, has recently come into my possession and to a consideration of its relationship I now invite the reader's attention.

In Dr. Coues's invaluable monograph of the Petrels* ("Critical Review of the Family Procellariidæ: Part iv; — Embracing the Estrelateæ and the Prioneæ"), under the head of *Estrelata mollis* (p. 151), occurs the following paragraph: —

"There is a specimen, No. 15,706, in the Smithsonian Museum from the Antarctic Ocean, by Mr. T. R. Peale, which, with the size and general appearance of *mollis* differs as follows: The under surfaces of the wings are, except just along the edges, purely and uninterruptedly white; as much so as in *Cookii*. The inner vanes of all the primaries, instead of being simply duller and grayer than the outer, have trenchantly defined pure white areas; these white spaces occupy the whole of the webs at the base; as they extend more towards the apex they become less wide, leaving a narrow space of dark color along the inside of the shafts; apically they terminate with an acutely pointed outline, which stretches towards the tips of the feather, and is bounded internally and externally by dark colored portions of the feather. The general pattern is exactly that seen in the primaries of most *Lari*; and the definition of the two colored areas is as strict. In other respects the bird is like quite a young *mollis*, being dark colored both above and below; but the tint of the clouding below is more intensely sooty than in any specimen of typical *mollis* I

* Proc. Phil. Acad., May, 1866.

have seen: and there is this peculiarity in addition, that the under tail coverts remain pure white."

This specimen had been previously described by Peale (Zoöl. U. S. Expl. Exped., 1848, p. 299) under the name of *Procellaria gularis*, but Dr. Coues, after expressing his doubts as to its probable relationship, provisionally referred it to *Æ. mollis*,* and there the matter has rested, the type, up to the present time remaining unique.

The above description proved so nearly satisfactory that upon first reading it I felt little doubt as to the relationship of the bird in hand: but all uncertainty on this point has since been removed, for through the kind offices of Mr. Ridgway, the Smithsonian specimen "No. 15,706" is now before me. A comparison of the two at once establishes their perfect specific identity. The differences that obtain are just those which would be expected when the relative ages of the specimens are considered. Peale's example is a young bird, apparently in its first year; while mine, if not an adult, is certainly much older and probably in nearly mature plumage. Generally speaking, it may be said to differ from the type in having the predominating areas above pure cinereous instead of plumbeous; the crown and forehead much mixed with white; the lores and a conspicuous superciliary stripe pure white, unmingled with darker color; the transocular faciæ, though equally dark, much more restricted; and the white areas below,† considerably more extended and of a purer character.

Of the stages in *Æ. mollis*, Dr. Coues says: "the older the bird the clearer and purer is the cinereous and the more trenchantly defined are the boundaries of the several differently colored areas: the difference in this respect being especially notable in the forehead and sides of the breast. Young birds are all over of a pretty uniform deep brownish ash or fuliginous cinereous; inclining to smoky brown on the wings and tail."

And now a word as to the relationship which these interesting specimens bear to *Æ. mollis*. Of the latter I have only a single specimen, an adult, kindly furnished by my friend Mr. Allen, from the collection of the Cambridge Museum of Comparative Zoölogy. But the testimony which it affords, taken in connection

* Upon looking more closely into the earlier history of the case I find that this arrangement was first instituted by Cassin, who, in the second edition of the U. S. Expl. Ex., places Peale's specimen under *Procellaria mollis*.

† The type of *gularis* has a pure white throat and light breast.

with the excellent description of *mollis* given by Dr. Coues, is quite sufficient. The peculiar marking of the primaries in *gularis*, now confirmed by this second specimen, would alone be conclusive, but in addition, I find certain structural differences which were apparently overlooked by Dr. Coues. The tail of *gularis* is shorter and much less decidedly rounded than is that of *mollis*. This difference is best shown by the graduation of the rectrices. For *mollis* Dr. Coues gives the graduation as 1.30 (the specimen before me measures 1.05, but the bird is in a moulting state and the tail not fully developed), while in the two specimens of *gularis*, it is respectively only .60 and .90. Furthermore, *gularis* has the central pair of rectrices broader and more evenly rounded at the tips than are those of *mollis*.

These characters, although of undoubted specific value, will by no means warrant generic separation, the general shape and proportions of the two birds being strikingly similar, and the bill and feet — in this family the most important of all the generic characters — absolutely identical. Accordingly, while I follow Dr. Coues in referring Peale's bird to the genus *Æstrelata*, I do not hesitate to reinstate it as a perfectly valid species.

In view of the fact that both the previous descriptions are founded on a young bird, and that one of them (Peale's) is too superficial to be available in nice determinations, while the other, by Dr. Coues, is only incidental in character, I take the present opportunity to redescribe the species as follows: —

Æstrelata gularis, (*Peale*), *Brewster*. PEALE'S PETREL.

Ch. sp. similis *Æ. mollis* sed tectricibus caudæ inferioribus candidis: alis subtus fere ex toto candidis; duabus tertiis partibus pogonii interni abrupte albis; cauda breviori ac minus conspicue curvata; rectricibus mediis latioribus.

Adult (?) plumage. No. 5224, author's collection, Mt. Morris, Livingston Co., New York, April, 1880. Upper parts, including the tail coverts and exposed surface of rectrices, pure cinereous, which deepens to plumbeous only on the occiput, rump and wings, the latter having the middle and greater coverts of the same tint as the back. The feathers of the back (but not those of the rump or occiput), with the greater and middle wing-coverts, broadly tipped with ashy-white, giving these parts a scaled appearance. The throat, jugulum, upper part of breast, and under tail-coverts, pure, silky white. The cinereous of the upper parts comes down along the sides of the neck, encroaching more and more and deepening in tint as it extends backward, until it throws across the abdomen a broad band

of nearly pure plumbeous. Around this colored tract there is nowhere a definite line of demarcation: the cinereous of the neck fades imperceptibly into the white of the throat, and the edges of the abdominal bar become mingled with white, until the dark color is entirely lost along the sides under the wings, and at the beginning of the under tail coverts; while forward, on the lower part of the breast, and over the ventral region generally, the feathers are spotted, barred, or finely vermiculated, in varying shades of color. The sides of the head backward to behind the eye (where the band of color already described begins), are essentially white, but the feathers immediately below the eye are obscurely banded, and there is a narrow but distinct transocular fascia of a dark color, which barely interrupts a broad and pure white superciliary-line passing from the bill to a short distance behind the eye. The forehead and crown are much mixed with white. On the forehead the white forms a broad edging to the feathers and extending more narrowly around their tips confines the plumbeous ashy to triangular central patches; but towards the crown it becomes restricted to the edges alone and when the occiput is reached, gives way entirely to the uniform plumbeous of that part.

The peculiar color and marking of the wings, alike in both specimens, has already been so well treated by Dr. Coues that I will save repeating these details by referring the reader to his description, previously quoted in the present article. But in this connection it is necessary to call attention to two points which are not there noticed. The first is, that the *secondaries*, as well as the primaries, have the white areas on their inner webs. The second, that each successive primary, beginning with the first, is lighter and more plumbeous than the preceding one: but with the first *secondary*, the color abruptly darkens again, becoming on the exposed portion nearly black, and continuing uniformly so to the tertials, which are of an equally dark cast.

The bill is black: the tarsus, obscure flesh-color with a bluish tinge. The basal third of toes, with contained webs, pale yellowish: the terminal portion, black.

Dimensions. Bill (chord of culmen), 1.03 inches. Height at base, .46: width, .42. Tarsus, 1.37. Outer toe and claw, 1.65: middle, 1.70: inner, 1.43. Wing, 9.88. Tail, 3.95; the graduation of the rectrices, .90.

Young (♂) No. 15,706, National Museum. Antartic Ocean, lat. 68° S., long. 95° W., March 21. (Peale's type of *Procellaria gularis*). Above cinereous-brown, inclining to black on the tips of the secondaries and tertials; below, sooty-plumbeous; throat and under tail-coverts white, transocular faciæ broad and dark. Otherwise generally similar to the adult (as represented by specimen No. 5224).

Dimensions. Bill (chord of culmen), 1.05. Height at base, 50; width .45. Tarsus, 1.35. Outer toe and claw, 1.65; middle do., 1.65; inner do., 1.36. Wing, 9.80. Tail, 3.90; graduation of the rectrices, .60.

But before leaving the subject it becomes necessary to consider a Petrel which was unknown when Dr. Coues investigated the

family. This is *Æstrelata defilippiana*, described* by Drs. Giglioli and Salvadori from four specimens taken off the coast of Peru in lat. 18° 4′ S., long. 79° 35′ W.

In comparing their supposed species with *Æ. gularis* "as described by Coues" the joint author's remark; "But our species differs . . . . in its smaller dimensions and slighter make (*Æ. gularis* being in size and make similar to *Æ. mollis*), in the cinereous coloration of its upper, and the pure white of its lower parts, while *Æ. gularis* would be dark-colored above and below having only the tail-coverts white." *Æ. defilippiana* also "has a bill relatively, and in some specimens, absolutely longer."

But these color-differences lose much of their significance when it is remembered that the bird "described by Coues" was the *young* of *gularis*. My more mature specimen agrees very closely with their description save that it is not "*subtus omnino pure alba*" (this is afterwards slightly qualified by "*lateribus pectoris vix cinereo-tinctis*").— and it is by no means improbable that the *fully* adult *gularis* will be found to have the under parts wholly white.†

The discrepancy in size is less easily reconciled. The birds examined by Drs. Giglioli and Salvadori are all apparently smaller than either of the known examples of *gularis*. But still the largest of the former approaches suspiciously close to the smaller of the two latter:— *Æ. defilippiana*, wing, 9.45; *Æ. gularis*, do., 9.80:—and furthermore, in respect to individual size, the Petrels are notoriously variable. Nor can a comparison of measurements taken by different persons always be relied upon. Different methods give widely divergent results.‡ Scarcely two

* "On some new Procellariidæ collected during a voyage around the world in 1865–68 by H. I. M.'s S. 'Magenta.' By Henry Hillyer Giglioli, Sc. D., C. M. Z. S., Naturalist to the expedition, and Thomas Salvadori, M. D., C. M. Z. S., Assistant in the Royal Zoological Museum of Turin," Ibis 1869 pp. 63–65.

Rowley also gives a superb figure of the bird in his Ornithological Miscellany (Vol. I; p. 255, pl. xxxiii) but adds nothing new to an account taken from the text of the Ibis article.

† In speaking of the young of *Æ. mollis* Dr. Coues says: "The whole under parts are not notably different from the back, though, however, the dark color only occupies the tips of the feathers; their basal moiety remaining white." This statement is significant in this connection, for upon examining my specimen, I find that the plumbeous color below, and also on certain parts of the head and neck, is mainly confined to the tips of the feathers, their concealed portions being snowy-white.

‡ Since writing the above I find a curiously apropos illustration of this. In Peale's original description of the type specimen the "wing from the carpal joint" is given as "ten and a half inches" while my measurement of the same bird made it 9.80, a difference of nearly three quarters of an inch.

ornithologists of my acquaintance measure either the tail or the tarsus from precisely the same relative points. We are not told that *Æ. defilippiana* was actually compared with *Æ. mollis* and if extraneous data were alone made use of there is surely room for a doubt in this connection. Again in respect to the bills there is nothing to show whether the *chord* or the *arc* was measured. If the latter (they simply say "*rostr. a fronte*") the apparent discrepancy would be pretty satisfactorily explained.

In summing up the matter, it is perhaps enough to say that *Æstrelata gularis* finds its nearest known affine in *Æ. defilippiana*. To go further than this would be hazardous under the present conditions of the case, but the relationship of the two birds is so extremely close that larger suites of specimens may confidently be expected to bridge over the slight differences which now separate them. In such an event *defilippiana*, Giglioli and Salvadori, 1869, will of course give place to *gularis*, Peale, 1848.

In concluding, I quote in full all that Peale has handed down to us relating to the life history of the species which he had the honor to discover and describe. It is, so far as I know, the only account that has ever been written.

"This bird was found amidst icebergs, bufleting the storms and fogs of the Antartic regions. We saw but few of them, and obtained but a single specimen, on the 21st of March, while the Ship Peacock was enveloped in a fog, latitude 68° S., longitude 95° W. of Greenwich. Their flight was easy and not very rapid. They were silent, and alighted on the water to examine some slips of paper and chips purposely thrown from the boat." *

SOME OBSERVATIONS ON THE MIGRATION OF BIRDS.

BY W. E. D. SCOTT.

WHILE showing some friends the astronomical observatory and accessories connected with the College of New Jersey at Princeton, on the night of October 19, 1886, after looking at a number of objects through the nine-and-one-half inch equatorial, we were

* U. S. Expl. Exp., Zoölogy, p. 410. (Edition of 1858).

shown the moon, then a few days past its full phase. While viewing this object my attention was at once arrested by numbers of small birds more or less plainly seen passing across the field of observation. They were in many cases very clearly defined against the bright background: the movements of the wings were plainly to be seen, as well as the entire action of flight. In the same way the shape of the head and the tail were conspicuous, when the bird was well focused. As the moon had not been very long above the horizon the direction of observation was consequently toward the east, and the majority of the birds observed were flying almost at right angles to the direction in which the glass was pointed.

Here then was opportunity for the determination of two points — the kind of birds that were flying and the general direction in which they were moving. Respecting the first, it was comparatively easy to decide as to what families the species belonged. This point was gained by observing the general shape of the birds, their relative size, the motion of their wings, and their manner of flying; that is whether the flight was direct or undulating, by continuous strokes of the wings or by an intermittent motion of those members.

Most of the birds seen were the smaller land birds, among which were plainly recognized Warblers, Finches, Woodpeckers, and Blackbirds; the relative numbers being in the order of kinds above named. Among the Finches I would particularly mention *Chrysomitris tristis*, which has a very characteristic flight; and the Blackbirds were conspicuous by the peculiar shape of the tail, from which characteristic I feel most positive in my identification of *Quiscalus purpureus*. I mention such details to explain just how observations were made and conclusions arrived at.

In regard to the second point, with rare exceptions the birds were found to be flying from northwest to southeast. I do not mean that this was absolutely the direction but that it was the approximate and general one.

It is not within the scope of the present paper to do more than give details on two other points, namely, the estimated number of birds passing through a given space during a given time and the height at which the birds were most abundant. For the basis of the first of these points it was necessary to note, first, how many birds passed through the field of observation per minute,

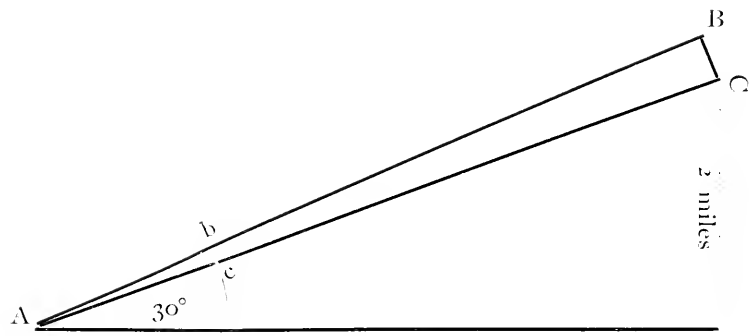
and, second, how near or how far distant from the glass the birds would have to be in order to be seen at all, that is to be in focus.

The height of the moon above the horizon in degrees and the two limits of the area of observation — that is how near or how far the birds noted were from the glass — supply the data for determining how high the birds seen were flying, and this, combined with the number noted as passing per minute through the field of observation, gives the basis for computing how many birds were passing through a square mile in a given time.

In this connection it may be well to specify how the two limits of observation were defined. The inferior limit, that is the nearest point where objects could be seen with distinctness, was easily determined by the power of the glass; this is about one mile distant. The superior limit, or the most distant point, is provisionally assumed to be not more than about four miles away, on the hypothesis that the birds would not fly at a greater height than ten thousand feet. It may appear, as future observations are made, that this last limit is not correct but the reasons for assuming such a height as the superior limit are sufficient to warrant its use in this case, for birds were observed on this same night at a late hour when the height of the moon above the horizon would make the point at which the birds were noted almost at this great elevation, viz., ten thousand feet.

I am greatly indebted to Professor Charles A. Young for assistance in these observations, and with his aid have arrived at the conclusion that the average number of birds passing through the field of observation per minute was four and one half. Professor Young has also kindly assisted me with the details of the problem in regard to the limits and area of the field; and the following diagram and computations are from his study of the matter.

Moon's altitude = 30°: moon's semidiameter = 15′ 05.″ The area of observation is a flat triangle = B. A. C. From this must be deducted the small triangle b. A. c. the area within a mile of the glass. The flight of the birds is thought to be nearly at right angles to the field of observation.



Area of triangle B. A. C. = 0.07020 miles.
Area of triangle b. A. c. = 0.00439 miles.
Therefore b. B. C. c = 0.06581 = $\frac{1}{15.2}$ mile.
Distance from A to B = four miles.
Number of birds seen per minute = $4\frac{1}{2}$.
Number of birds per square mile per minute = 68.

[Mr. Scott's novel and important observations definitely establish on a scientific basis several points in relation to the migration of birds that have heretofore rested almost wholly on conjecture and probability.

We have, first, the fact that the nearest birds seen through the telescope must have been at least one mile above the earth, and may have ranged in elevation from one mile to four miles. It has been held that birds when migrating may fly at a sufficient height to be able to distinguish such prominent features of the landscape as coast lines, the principal water courses, and mountain chains over a wide area. Of this, thanks to Mr. Scott, we now have proof. It therefore follows that during clear nights birds are not without guidance during their long migratory journeys, while the state of bewilderment they exhibit during dark nights and thick weather becomes explainable on the ground of their inability to discern their usual landmarks,—points that have been assumed as probable but heretofore not actually proven.

These observations further indicate that many of our smaller birds migrate not only at night but at a considerable elevation,—far beyond recognition by ordinary means of observation. A promising field is here opened up, in which it is to be hoped investigation will be further pushed, not only by Mr. Scott but by others who may have opportunity therefor.—J. A. ALLEN.]

ON THE AFFINITIES OF CERTAIN *POLIOPTILÆ*. WITH A DESCRIPTION OF A NEW SPECIES.

BY WILLIAM BREWSTER.

In a collection of Arizona birds, elsewhere considered in the present number of the Bulletin, is a small series of Gnatcatchers, which brings to light some very interesting developments affecting the relationship of certain members of the genus *Polioptila*. As the matter seems of sufficient importance to merit special treatment, I present it separately in the following paper:

Polioptila plumbea, *Baird*, et **melanura** *Lawr.*

It has been somewhere suggested that *P. plumbea* might after all be only a geographical race of *P. cærulea*, but the specific distinctness of the former from *P. melanura* seems never to have been questioned.* The fact that their distribution was the same has effectually precluded any suspicions of varietal affinity, and the real secret, singularly enough, has eluded the few ornithologists who have paid any attention to the subject.

But thanks to the exertions of Mr. Stephens, who it seems has for some time suspected their identity, I now have before me a perfect connecting series between the two supposed species.

A brief consideration of five of the specimens, all of which were taken near Tucson during the spring of 1880, will present the case as fully as is desirable.

The first (No. 4980, author's collection) ♂, March 3, is typical of the state known as *P. plumbea*, the black on the head being restricted to a short stripe on each side of the crown, which, beginning nearly above the anterior margin of the eye, extends backward to a short distance behind it, and is bounded below by a superciliary line of ashy-white.

In the second (No. 4982) ♂, March 4, the black stripe broadens, encroaching on the superciliary line, and meeting its fellow across the top of the head between the eyes, in a narrow but decided band of black, but leaving the anterior portion of the forehead ashy.

The third (No. 4983) ♂, March 5, has the whole crown essentially black, but traces of the superciliary line remain, and in addition to an ill-defined frontal-band of ashy, there are occasional feathers of that color scattered among the darker ones.

* Cooper hinted such a suspicion (Birds of Cal., I, p. 38) but his suggestion has been generally ignored.

The fourth (No. 4981) ♂, March 3, presents the same general extension of this black area, but its boundaries are everywhere well defined, and the frontal-band is almost entirely obliterated, while the black is quite uniform and nowhere mixed with ashy. Singularly enough, in view of its generally more mature condition, this specimen has a light superciliary stripe, nearly as broad and quite as well defined as in No. 4980, while the lores are clear ashy-white.

The fifth and last (No. 4984) ♂, Feb. 21, is typical *melanura*, with the forehead, crown, and occiput, clear, shining black, the superciliary line entirely wanting, and the lores only just touched with ashy.

The above evidence apparently goes to show that *plumbea* is simply the immature stage of *melanura*. At least this is the natural inference, and in view of the fact already stated, that both birds are known to occupy the same area, I do not see that any other is legitimate.

The tail markings of the above-described specimens are quite uniform, but I reserve further consideration of this supposed character for another and more apropos connection. At just what age the black cap is perfected I am at present unable to state, but there are good reasons for supposing that the immature condition is prolonged through the second season. None of the present birds seem to be in a moulting condition; even the particolored ones having the plumage remarkably fresh and clean.

The specific identity of the Black-capped and Plumbeous Gnatcatchers being conceded, it only remains to determine what name the species shall bear. This part of the problem is fortunately involved in no obscurity, *plumbea*, Baird, 1854, plainly antedating *melanura*, Lawrence, 1856. It is to be regretted that we can make up for the loss of the more appropriate specific title only by retaining its English version, which has hitherto passed current for the adult stage only. The species may then stand as follows.

Polioptila plumbea, *Baird*. BLACK-CAPPED GNATCATCHER.

Polioptila plumbea, BD., Pr. Phila. Acad., 1854, 118; B. N. A., 1858, 382; Atlas, 1860, pl. 33, f. 1; Ives's Rep. pt. v, 1861, 6; Rev. Am. B., 1864, 74.—HENRY, Pr. Phila. Acad., 1859, 107.—COUES, Ibis, 1865, 538; Proc. Phila. Acad., 1866, 66; Key, 1872, 79.—COOPER, Am. Nat. III, 1869, 474, 479; B. Cal., I, 1870, 37, fig.—HENSH., List B. Ariz., 1875, 155.

Culicivora atricapilla, LAWRENCE, An. N. Y. Lyc., V., Sept. 1851, 124 (not of Swainson).—BD., Stansbury's Rep., 1852, 328.—CASSIN, Illust., I, 1854, pl. xxvii.

Culicivora mexicana, CASSIN, Illust., I, 1854, 164, *a*.

Polioptila melanura, LAWR., Ann. N. Y. Lyc., VI, 1856, 168.—BD., Pr. Phila. Acad., 1859, 304, (Cape Saint Lucas); Rev. A. B., 1864, 68.—DRESSER, Ibis, 1865, 485 (Texas).—COUES, Pr. Phila. Acad., 1866, 66, (Arizona).—HENSH., List B. Ariz., 1875, 155.

Lead-colored Flycatcher, COOP., l. c.

Lead-colored Gnatcatcher: Arizona Gnatcatcher, B. B. & R., l. c.

Black-capped Gnatcatcher of authors generally.

HABITAT.—Southern region of Texas and Arizona: westward to Fort Mohave and Fort Yuma. Cape Saint Lucas?*

Polioptila californica, sp. nov. CALIFORNIA BLACK-CAPPED GNATCATCHER.

Culicivora atricapilla, HEERM., Journ. Phil. Acad., II, 1853, 262 (Fort Yuma and San Diego, Cala.).

Polioptila melanura, BAIRD, B. N. A. 1858, 382.—BAIRD, Rev. Am. Bds., 1864, 68.—HEERM., P. R. R. R., X, 1859, 39 (South'n Cala.), COOP., Am. Nat., III, 1869, 184, 474-479; B. Cal., I, 1870, 37, fig.—COUES, Key, 1872, 79, fig. 20.—B. B. and R., N. A. B., I, 1874, 81, pl. 6, fig. 7.

Polioptila plumbea? It is probable that some of the California citations are based on this new species but I have not been able to verify any of them.

CH. SP. Similis *P. plumbeæ*; sed colore in toto, præsertim subtus, multo nigriori: tectricibus caudæ inferioribus ac abdomine fulvis; limbo albo in rectricibus restrictiori; rostro tarsisque longioribus ac gracilioribus.

♂ (No. 1489, author's collection) Riverside, San Bernardino Co., California. March 28, 1878. Coll. F. Stephens. Whole top of head from bill to occiput, deep, shining black. Wings dusky-brown; the primaries edged with grayish-white, the secondaries and tertials, with light brown. Rest of upper surface plumbeous-ashy. Tail glossy-black; the external half of the outer webs of the outer pair of rectrices, dull brownish-white; the white passing narrowly across the end of the feather and at its extremity nearly touching the shaft, but basally, diverging more and more until at the tail coverts it is confined to a scarcely appreciable edging; no light color on any of the other rectrices. Throat and upper parts of breast, with sides of head, neck, and body, dull but decided ash, with a faint wash of brownish-fulvous on the tips of the feathers. Along the central portions of the body beneath this wash becomes clear fulvous, which is deepest in tint on the abdomen, crissum, and under tail-coverts. Lining of wings very pale pearl-gray.

* I have not seen any specimens from this locality but Prof. Baird tells us ("Notes on a collection of Birds made by John Xantus at Cape St. Lucas, Lower California") that "the single specimen of this species sent in by Mr. Xantus has the tail feathers more broadly edged and tipped with white, and the gray of the back lighter and clearer than in specimens in the Smithsonian collection from the Gila region." This would indicate that true *plumbea* is the species found there, a fact which is strictly in accord with the marked affinity of the fauna to that of the Gila region in Arizona.

Dimensions. Length, 4.50; extent, 6.10; wing, 1.84; tail, 1.80; tarsus, .73; bill, (culmen), .50; from nostril, .30.

♀ (No. 7192, National Museum) Fort Yuma. Similar to the ♂ but with the crown deep plumbeous; the abdomen and crissum pale *chestnut;* the external webs of second pair of rectrices margined with white.

Young ♂* (No. 2149, Coll. of R. Ridgway) Saticoy, Cala., Nov. 24, 1872. Coll. J. G. Cooper. Similar to the ♀ but with the plumbeous of the crown clearer; the brownish wash beneath confined to the abdomen and crissum, the white of tail restricted to outer pair of rectrices and a narrow tipping on the second pair.

Four specimens examined.

Upon comparing the California bird with *P. plumbea* as represented by my Arizona specimens, the following differences appear. The ash of the upper parts is decidedly plumbeous instead of bluish; the throat, breast and sides dull ashy instead of ashy-white; the abdomen, crissum and under tail-coverts fulvous, in some specimens pale chestnut; the light edging of the tail feathers confined to the outer pair of rectrices (with sometimes a slight tipping on the second pair) and on these restricted to the extreme tips and a narrow margin along the outer web; the lining of the wings pearl-ash instead of white and the secondaries and tertials edged with light brown. There is no pure white anywhere on the bird, and the general aspect beneath is nearly as dark as in the Cat-bird.

The proportions also apparently differ. The bill and tarsi are longer and more slender than those of *P. plumbea* but the wings and tail, especially the latter, are generally shorter than in the specimens of *plumbea* which my collection embraces.

These differences, which characterize all stages alike, are so decided and constant that I believe them to be of specific value. In view of the general law that Pacific coast birds tend to darker coloring than their affines from the interior it is of course not impossible that a gradual transition will eventually be found to exist between these closely allied Gnatcatchers. Cooper, however, found both species in winter at Fort Mohave, where each preserved its distinctive characters,† and my Fort Yuma specimen of *cali-*

* It would be indeed remarkable if this species has no immature stage corresponding to that of *P. plumbea.* But putting aside some doubtful California citations, there is nothing to show that any such specimens have ever been taken. Mr. Stephens writes me that he has examined numerous California examples, but among them has found no spring males without the full black cap.

† Birds of Cal., I, 1870, 37.

fornica is quite as typical as are those from Riverside and San Diego. I have accordingly taken what, under the present conditions of the case, seems to be the more likely alternative.

The above described form, although known to ornithologists for more than a quarter of a century, and during that time more or less numerously represented in collections, has either passed unnoticed or been unwittingly used to aggravate the confusion respecting the points elucidated under the head of *P. plumbea*. All the early descriptions unmistakably relate to the more eastern species. Baird's *plumbea* was based on an Arizona specimen: the originals of Cassin's plate and description of "*Culicivora mexicana*" were apparently from Ringgold Barracks, Texas: and Lawrence's type specimen of *P. melanura* came from the same locality. The first, and probably only distinctive description of the California bird, occurs in Birds N. Am., 1858, 382, where Prof. Baird, under the head of *Polioptila melanura*, calls attention to some of the differences already detailed. Both of his specimens, which are before me, are typical of the California form, but Lawrence's name *melanura* is scarcely eligible for the new species, in view of its long application to *P. plumbea*.

In this connection I wish to express my obligation to Mr. Ridgway for the valuable assistance which he has given me. Indeed, his share in the discovery is by no means a small one. The Arizona series was forwarded to him for comparison with the Smithsonian specimens and during his examination the difference between the former and the California birds first came out. This difference, to be sure, had already been noted in my study of the material embraced in my own collection, but as my only California specimen was in rather poor condition, it is very doubtful if I should have attached the proper importance to the peculiarities which it presented. Nor is this the only instance which has come under my notice, where the fruits of Mr. Ridgway's well known critical talents have been generously placed at the disposal of others.

Polioptila nigriceps. BAIRD.

During my study of the North American *Polioptilæ*, I had occasion to look up the three forms of this genus which are peculiar to Mexico and Central America. All of these are white beneath and otherwise closely related to *P. plumbea*: hence I was not greatly

surprised to find that this supposed distinctness, *inter se*, apparently rests upon pretty much the same general grounds as has that of *P. plumbea* and *P. melanura*. The latest information regarding them appeared in Godman and Salvin's "Biologia Centrali-Americana," Part II, November, 1879, where their differential characters are set forth as follows:

Polioptila nigriceps. "*P. cærulea* similis, sed pileo toto cum loris et superciliis nitenti-nigris."

Polioptila bilineata. "*P. nigricipiti* affinis, sed loris et superciliis albis, striga postoculari tantum nigra, capiti nigro conjuncta."

Polioptila albiloris. "*P. nigricipiti* affinis, sed loris (nec superciliis) albis distinguenda."

If, by the above, we are to understand that *P. nigriceps* differs from *P. cærulea only* in having "the whole pileum, with the lores and upper eyelids, shining black" it is of course separable from *P. plumbea* by the different coloring of the tail feathers, which would be like those of *P. cærulea*. But in view of the age-variations which occur in *P. plumbea*, we are certainly warranted in entertaining a suspicion that *bilineata* and *albiloris* are only the immature stages of *P. nigriceps*.

The condition known as *P. bilineata* is almost exactly reproduced, relatively, by my specimen No. 4981, which has the lores and upper eyelids ashy-white; while that called *albiloris* is very nearly duplicated by No. 4983 in which the lores remain ashy-white while the black of the crown encroaches on the white of the eyelids.

The English ornithologists are evidently in some perplexity regarding these allied forms, for in some general remarks which follow the specific matter they observe: "Having thus given some account of the three forms of black-headed *Polioptilæ* found in Central America (*P. nigriceps* with the lores wholly black, *P. albiloris* with the lores white, and *P. bilineata* with both lores and superciliaries white) it remains to consider the position of certain specimens which seem to have intermediate characters connecting two or all of these forms together. These birds were obtained, with a female of the true *P. bilineata*, near La Union in San Salvador, and have the lores black, with a few white feathers intermingled. . . . Putting *P. albiloris* aside, and observing the distribution of *P. nigriceps* and *P. bilineata*, we find the curious fact that the ranges of these

two forms actually cross one another, and that the area where *P. bilineata* comes into contact with the northern section of *P. nigriceps* corresponds more or less to that occupied by *P. albiloris*, at once suggesting the supposition that *P. albiloris* is not a true species at all, but due to the intermingling of *P. bilineata* and *P. nigriceps*, and, further, that technically these last named birds are not true species either."

The authors next endeavor to explain this geographical muddle by some curious conjectures which exactly reverse the accepted workings of the theory of evolution as understood on this side of the Atlantic. *P. nigriceps* and *P. bilineata* are supposed to have been originally distinct species, which having extended their respective ranges to a point of meeting, where a hybrid race, *P. albilora*, was produced, crossed each other's path, and in their further extension apart, *resumed* their distinctive characters.

A simpler solution than this must surely be found to exist, and to the ornithologist who next takes up the investigation, I offer the preceding analogy, in the hope that it may at least have some bearing on what seems to me a parallel case.

Recent Literature.

Vogt on the Second Fossil Archæopteryx.* — This specimen was found by M. Haeberlein in the same slates as the first. As described by Professor Vogt, it shows several structural peculiarities which were not visible in the first specimen. Of the head, which was not preserved in the first example, Professor Vogt only says that the upper jaw had two small teeth at its end (i. e. in premaxillæ?), and that the entire skull is strongly reptilian in its appearance. The position of the teeth in the *Archæopteryx* is thus exactly the opposite of their position in the *Odontornithes*, where teeth were absent only in the end of the upper jaw. The cervical vertebræ were not very numerous and were provided with ribs. The dorsal vertebræ were ten in number, and their ribs lacked uncinate processes. One of the points of great interest is the thoracic arch,

* L'Archæopteryx macroura. — Un intermédiaire entre les oiseaux et les reptiles. Par M. C. Vogt. La Revue Scientifique, 2e Sér., 9e Année, No. 11, 13 Sept. 1879, pp. 241-248, figg. 18-21. There is a translation of this piece, supplemented by a photograph of the slab, in the "Ibis" for October, 1880, pp. 434-456.

which is composed of only a pair of coracoids united in the median line, and a pair of scapulæ placed over the ribs parallel to the back bone and at right angles to the coracoids. No sternum, so characteristic of birds, and no clavicles were present. The "clavicles" of Professor Owen are considered by Professor Vogt to be the pubes anchylosed as in the Ostrich. The arm is as one would expect till we come to the carpus, where only the radio-carpal is developed: the metacarpals were free and three in number. They bore fingers of 2, 3, and 3 phalanges respectively, the distal phalanx in each case incased by a claw. In describing the manus of birds Professor Vogt makes the following statement. "In the latter [birds] the pollex — sometimes wanting, as in *Eudyptes* — is placed at the base of the metacarpus and directly on the carpus; its single segment sometimes bears a spur or a nail; the metacarpus is formed by two bones that coalesce at their extremities, but sometimes still separate, as in *Eudyptes*. This characteristic metacarpus bears two digits — one, the longest, with two phalanges; the other, often rudimentary, with one phalanx."* Now on studying the manus of an embryo chick any one will at once see its strong resemblance to Vogt's figure of the manus in the *Archæopteryx*. The only differences are in the proportions of the parts, the number of the phalanges in the III digit and the remains of the IV metacarpus in the chick.

In considering the genetic relations of the *Archæopteryx* Professor Vogt says that it "doubtless forms a bond of union between Reptiles and *Odontornithes*," but that the development of the wing prevents the origin of flying birds from the Dinosaurs. Yet he seems to consider the *Apteryges* and *Struthiones* to be derived from the Dinosaurs, not modified from flying birds. These conclusions Professor Vogt sums up in the following words. "A second consequence of this view would be the polyphytetic origin of the class of birds. The Dinosaurs would lead to the *Ratitæ*, the *Archæopteryx* to the birds that fly."† Allowing this view to be true, it would be very difficult to explain the strange likeness in the structure of the wing of the Ostriches and flying birds. The flying birds have the arm and wrist joints so articulated as to allow adduction and abduction, not flexion and extension, of the fingers, and in accordance with this the morphological flexor and extensor muscles are brought round to the radial edge of the index. The same is true of the muscles in the *Apteryges* and *Struthiones* judging from the works of Owen, Schoepss, Rüdinger and

* Vogt, l. c. p. 244, and p. 444 of "Ibis," from which the text is taken. The original is as follows:

"La main de l'Archæopteryx ne se laisse pas comparer à celle d'un Oiseau. Chez ceux-ci, le pouce, tusant quelquefois défaut, comme chez l'Eudyte, est placé à la base du métacarpe et immédiatement sur le carpe; son seul segment porte quelquefois un éperon ou un ongle; le métacarpe est formé de deux os soudés aux deux extrémités, quelquefois encore séparés, comme chez l'Eudyte; ce métacarpe characteristique porte deux doigts: un, plus allongé, à deux phalanges; un autre, souvent rudimentaire, à une phalange."

† Vogt, l. c., p. 247.

Macalister. Again it is hard to see why Ostriches, which never flew, should have hand bones so much like those of keeled birds; or to explain the struthious nature of the skull and pelvis of the *Crypturi*, or of the sternum of *Notornis*. But this question of relations between the carinate and ratitate birds does not, of course, touch the descent of birds from the Dinosaurs provided we allow flying birds to be derived from the struthious ones.

Arguing from the fact that no contour feathers are present save on the tibia Professor Vogt thinks that the body was naked. In this case an *Archæopteryx* must have been a strange sight when flying, its reptilian head stretched out to balance the long tail with its row of rectrices on each side. From what Professor Vogt has discovered by a cursory examination there can be no doubt that much of great interest will be learned when this fossil is properly worked out from the matrix. — J. A. JEFFRIES.

NEHRLING'S ORNITHOLOGICAL OBSERVATIONS IN TEXAS.* — These observations consist of a running commentary on the more common birds met with by Dr. Nehrling in March, April, and May, 1879, in Lee and Fayette Counties, Texas. It is apparently the first of a series of papers on the birds of Texas, consisting of interesting field-notes on birds observed in various parts of the State by this well-known German ornithologist, with, incidentally, notes on the mammals, the plants, and the general character of the country.

It may be here added that Dr. Nehrling has also in the journal already cited (Jahrgang V, No. 12, Dec. 1880, pp. 214-223) published a detailed account of the Bluebird (Der Blauvogel oder Hüttensänger, *Sialia Wilsonii*, Swains.) with a colored plate of a family group of old and young.—J. A. A.

SHUFELDT'S OSTEOLOGICAL MEMOIRS. — With notably few exceptions the anatomy of birds has received little attention at the hands of American ornithologists. Aside from Dr. Coues's elaborate memoir on the osteology and myology of *Colymbus torquatus*, the same author's briefer accounts of the osteology of the *Sphenicidæ* and *Laridæ*, and Morse's admirable researches on the carpus and tarsus, the anatomy of birds has been but lightly touched by American writers. It, therefore, gives us pleasure to note the energy with which Dr. Shufeldt has entered upon this new field, the two memoirs here noticed being, we have reason to hope, but the forerunners of others, some of which we are advised are well advanced in preparation. The readers of the Bulletin have already been apprised of Dr. Shufeldt's work upon the osteology of the Burrowing Owl,† through the publication of the plates which

* Ornithologische Beobachtungen aus Texas. I. Von H. Nehrling. Monatsschrift des Deutschen Vereins zum Schutze der Vogelwelt, V Jahrgang, No. 7, Juli 1880, pp. 122-130.

† Osteology of Speotyto Cunicularia var. Hypogæa. By R. W. Shufeldt, [First Lieutenant and] Assistant Surgeon, U. S. Army. Bull. U. S. Geol. and Geogr. Surv. Territories, Vol. VI, No. 1, Feb. 11, 1881, pp. 87-117, pll. i-iii.

illustrate it in the number of this Bulletin for July, 1880. The thirty pages of text now accompanying the plates give a detailed description of the osteology of the bird in question, setting forth with minuteness and clearness the osseus structure of this rather specialized type of the order *Striges*. The second memoir, in a nearly equal number of pages and one plate, describes in a similar manner the osteology of the Horned Lark.* In point of detail and comparison of special points of structure with other forms there is little further to be desired. The well-executed plates represent the skeleton of each species as a whole, and also the principal bones in detail. As memoirs of descriptive osteology these papers merit high praise, and may well be welcomed as valuable contributions in a little worked field.—J. A. A.

Forbes on the Food of Birds, Insects, and Fishes. — In the last number of this Bulletin we gave some account of Professor Forbes's investigations of the food of various insectivorous birds, with a somewhat extended summary of the results attained. We have now a further report of his studies,† about seventy pages of which relate to birds. Of the remainder, fifteen pages are devoted to introductory remarks on the general subject, forty-eight to fishes, and twelve to insects. The species of birds investigated are, as before, the Thrushes and the Bluebird, and the results given cover not only the observations previously reported but those of the season of 1880, the present report being based on the examination of more than twice the number of specimens forming the basis of the earlier reports. The general showing seems to be favorable to the Thrush family, not excepting even the Robin, respecting which Professor Forbes expresses his belief that while he is too valuable to exterminate he is not so precious that we need to hesitate to protect our fruits from excessive depredation. The Bluebird, however, still maintains a bad record, in consequence of its great predilection for predaceous insects. It is gratifying to observe that these important investigations are now conducted under the authorization of the Illinois State Legislature, and that a small appropriation ($350 *per annum*) is available for the prosecution of these researches and the publication of the results. The investigation of the food of predaceous insects is undertaken for the purpose of determining to what extent they are really beneficial, since some of the *Carabidæ* are known to feed in part upon vegetable substances, and therefore it has its bearing upon the question of the utility of insectivorous birds. — J. A. A.

* Osteology of Eremophila Alpestris. By R. W. Shufeldt, [First Lieutenant and] Assistant Surgeon, U. S. Army. Bull. U. S. Geol. and Geogr. Surv. Territories, Vol. VI, No. 1, Feb. 11, 1881, pp. 119-147, pl. iv.

† Studies of the Food of Birds, Insects and Fishes, made at the Illinois State Laboratory of Natural History, at Normal, Illinois. Illinois State Laboratory of Natural History, Bulletin, No. 3, November, 1880, 8vo. pp., 1-160.

REICHENOW AND SCHALOW'S RECORD OF THE LITERATURE OF ORNITHOLOGY FOR 1879.* — Although the compilers of this excellent report regret its late appearance, in consequence of unanticipated delays in printing, their promptness is still commendable. The report appears to be very carefully and satisfactorily prepared, the annotations being sufficiently full and explicit.

REICHENOW AND SCHALOW'S COMPENDIUM OF NEWLY DESCRIBED GENERA AND SPECIES OF BIRDS.† The authors of the "Compendium" are placing ornithologists under a debt of gratitude in promptly bringing together the diagnoses of the new genera and species of current ornithological literature. The last installment apparently covers the first half of the year 1880, and the families from *Cuculidæ* upward through the *Oscines*. The "Compendium" gives full transcripts of the original diagnoses. — J. A. A.

CORY'S "BEAUTIFUL AND CURIOUS BIRDS OF THE WORLD." — In the Bulletin for October, 1880 (Vol. V, p. 236), Part I of Mr. Cory's beautiful work was noticed from advance sheets. This part was published shortly afterwards and early in February Part II appeared. The latter is of especial interest to North American students from the superb plate of the Great Auk (*Alca impennis*) which it contains. This figure, taken, we are told, from a specimen in the British Museum, represents an adult bird sitting on a bluff overlooking the sea, while on a rocky promontory in the background are grouped the erect forms of several others. The general execution of this plate is both spirited and artistic while the coloring is quite beyond criticism.

In the accompanying letter-press Mr. Cory gives some well chosen extracts from the principal accounts that have appeared relating to the habits of the species, and to the history of its supposed extinction. The statement respecting the number of the skins, eggs, and skeletons known to exist in the various museums and collections of the world, gives information of much interest. There are in all seventy-one or seven-two skins, of which Germany has twenty and Great Britain twenty-two. Of eggs there are sixty-five, forty-one of which are preserved in Great Britain alone. Nine complete skeletons, besides a great number of detached bones, complete the list.

In addition to the plate of the Great Auk, Part II contains equally beautiful representations of the King Bird of Paradise (*Cicinnurus regius*) and an Apteryx (*Apteryx australis*). If, as we have every reason to believe will be the case, the author carries through this work in the way in which

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* Zoologischer Jahresbericht für 1879. Herausgegeben von der Zoologischen Station zu Neapel. Redigirt von Prof. J. Victor Carus (W. Engelmann, Leipzig). 5. Aves. Bd. II, pp. 1108-1161. Referenten Dr. Ant. Reichenow und H. Schalow.

† Compendium der neu beschriebenen Gattungen und Arten. Von Anton Reichenow und Hermann Schalow. Journal für Ornithologie, 1879, pp. 308-329, 420-437, 1880, pp. 97-102, 194-209, 314-324.

it has been begun it can scarcely fail to take the highest rank among the few publications of its kind which this country has produced. — W. B.

Minor Ornithological Papers.—141. *Food of the Great Blue Heron.* By Wm. P. Neild. *Forest and Stream*, XV, p. 7. — Large snakes and fish.

142. *A Captive Woodcock.* Editorial. *Ibid.*, XV, p. 27.—Account of a caged specimen kept for some weeks in confinement and fed on earthworms.

143. *Mocking Bird in Canada.* *Ibid.*, XV, p. 67.—Record of its appearance at Strathroy, Canada, on the authority of L. H. Smith, in the Strathroy "Age."

144. *Kingbirds catch Fish.* By Milton P. Pierce. *Ibid.*, XV, p. 85.—Kingbirds catchings minnows.

145. *Crows as Fruit Thieves.* By F. C. Brown[e]. *Ibid.*, XV, p. 85. —Destruction of ripe apples by these birds.

146. *An unlucky Crow.* Editorial, on the authority of George C. Cole. *Ibid.*, XV, p. 85. — Crow caught by a Goshawk.

147. *Owls.* By S. B. Buckley. *Ibid.*, XV, p. 104. — "Screech Owls" inhabiting a Wren-box, and capture of a Snowy Owl (*Nyctea nivea*) near Austin, Texas.

148. *Another Captive [Wood] Cock.* By A. E. Godeffroy. *Ibid.*, XV, p. 148.

149. *Breeding Quail in Confinement* (title covering a communication by Dr. Bradley Hull, and two pseudonymous ones. *Ibid.*, XV, p. 166. — Accounts of attempts to raise Quails in confinement. See also *Tame Quail*, *Ibid.*, XV, p. 186.

150. *European Ruff in Massachusetts.* Editorial. *Ibid.*, XV, p. 186. — Its capture at Chatham, Mass., Sept. 11, 1880, with references to previously recorded New England captures of this species.

151. *More Quail Bred in Confinement.* By B. F. Conklin. *Ibid.*, XV, p. 206.—Eggs hatched under bantam hens, and the young successfully reared.

152. *Death of the Woodcock Dick.* By F. P. Magoun. *Ibid.*, XV, p. 286. — Further history of the captive specimen previously recorded, (l. c., XV, p. 27; see above No. 142).

153. *Our Waterfowl.* Editorial [G. B. Grinnell]. *Ibid.*, XV, pp. 285, 286, 306, 307, 327, 345, 365, 385, 406, 425, 465. A popular general account of North American *Anatidæ*.

154. *Late Stay of Swallows.* By F. C. Browne. *Ibid.*, XV, p. 307.— "One or two thousand" White-bellied Swallows (*Tachycineta bicolor*) at Clark's Island, Plymouth, Mass., Oct. 13, 1880.

155. *Trigger and Reel on Martha's Vineyard.* By E. A. D. *Ibid.*, XV, pp. 306, 307.— Contains the following important reference to *Cupidonia cupido* (p. 306): "In no other part of Massachusetts, and I know not if in any of the Eastern States besides, can be found the gamy and toothsome prairie chicken, which abound[s] here in quite large numbers and retain[s]

the primitive purity of its Western fellow. . . . However, they are quite abundant and extremely tame, and being well protected during the greater part of the year by a special law, they are allowed to breed in security, and their ranks are but slightly thinned during the 'off months.'"

156. *Another Captive Woodcock.* By H. R. *Ibid.*, XV, p. 426. — A specimen "picked up in the street" in Montreal alive.

157. *Canvas Backs in Rhode Island.* By Fred'k Skinner. *Ibid.*, XV, p. 417. — Two killed at Point Judith early in November.

158. *The Wavy of Winnipeg the Snow Goose.* By H. *Ibid.*, XV, p. 466.—Ross's Goose not known to occur in the Province of Winnipeg.

159. *Domestication of the Ostrich.* By E. B. Biggar. *Ibid.*, XV, pp. 505, 506, xvi, pp. 6, 7. An original account of Ostrich-rearing in South Africa.

160. *Report of the Commissioners of Fisheries and Game, of the State of Maine, for* 1880. Augusta, 1880, 8vo, pp. 1-54. [E. M. Stillwell and Everett Smith, Commissioners.]—Contains ten pages (pp. 33-43) devoted to the game birds of the State, including six pages relating to the introduction of the European Quail.

General Notes.

Abundance of the Hermit Thrush in winter near Washington, D. C. —During the winter of 1879-80, the Hermit Thrush was commonly distributed throughout the woods of the District of Columbia as well as those of Alexandria County, Virginia. As the occurrence of this species in winter is not recorded in the lists of District birds, I, at that time, considered its appearance as exceptional and due to the unusual mildness of the season.

The present winter, however, has been one of remarkable severity in this part of the country, the rivers having frozen in November, while the ground has been covered with snow, from nine to twelve inches deep, since December 20. On the 1st of January, while hunting for birds among the wooded hills which border the Virginia shore of the Potomac, I again met with this species. These hills are very wild and steep, densely covered with a growth of young trees, and intersected by numerous deep ravines, through which streams of water work their way to the river. In these secluded places numbers of birds had sought shelter from the cold, which, during the night, had been intense, the thermometer registering a temperature of fourteen degrees below zero. The first Thrush noticed was shot about ten o'clock in a clump of saplings a few yards from the river's bank. In the course of the day seven other individuals were observed. They frequented the most sheltered and tangled portions of the ravines, principally near the summits of the hills. They were silent and

solitary, and so tame that they frequently permitted an approach to within five or six yards before leaving their perch.

My brother obtained another specimen in the same locality on the 4th and reported them more numerous than on the 1st. I observed three more individuals in the woods bordering on Rock Creek on the 9th, a few hours after a snow storm.—GEORGE SHOEMAKER. *Georgetown, D. C.*

THE HUDSONIAN TITMOUSE IN MASSACHUSETTS.—December 31, 1880, I shot a Hudsonian Titmouse (*Parus hudsonicus*) in my garden at Cambridge. It was very tame and, in company with one Black-capped Titmouse, was hopping about on a low pear-tree when secured. The thermometer had been in the neighborhood of zero for several days and the Black-capped Titmice unusually numerous. This is, I believe, the third appearance of the Hudsonian Titmouse in Massachusetts.—HENRY M. SPELMAN. *Cambridge, Mass.*

ON THE RANGE OF *Lophophanes atrocristatus* IN TEXAS.—In looking over Mr. Sennett's "Notes on the Ornithology of the Lower Rio Grande" I was surprised to find that this species ranged westward up the Rio Grande only to Fort Clark, about three degrees west of Fort Brown. It also recalled to my mind that, so far as my own observations have extended, the longitudinal range of the Black-crested Tit becomes still more contracted as I traced it north, the bird being seen only in a narrow strip of cross timber in Young Co., Texas in about lat. 33° N. From Fort Griffin, which is forty miles west of Graham, in Young County, I traveled westward one hundred miles and did not see a single specimen. To the east of Graham there was a decided strip of neutral land on which I did not observe either *L. atrocristatus* or *L. bicolor*. I estimate approximately the width of this space at thirty miles. This trip was made in October, 1878. The eastern boundary of the range of this species runs from Graham southwest to Austin, Texas. This bird was not seen on the head of the Red River by Lieut. McCauley, but it ranges nearly if not quite to Red River in long. 100° W.—G. H. RAGSDALE, *Gainesville, Texas.*

THE CONNECTICUT WARBLER (*Oporornis agilis*)—A CORRECTION.—In a small collection of birds kindly sent to me for examination, by Mr. George Woolsey, is the specimen recorded as *Oporornis agilis* in Vol. V, p. 117, of this Bulletin. The specimen proves to be a female *Geothlypis philadelphia*. The bird was taken May 12, 1880, and the correction of the error becomes the more important from this fact, since it leaves *Oporornis agilis* without a spring record for southern New England.—J. A. ALLEN. *Cambridge, Mass.*

STRANGE NESTING HABITS OF A PAIR OF CHATS.—I think the following extracts from a letter lately received from Mr. C. W. Beckham of Washington, D. C., may be of interest to the readers of the Bulletin. The locality is near Ilchester, Howard Co., Maryland.

"About the first week in May, 1876, a pair of Chats [*Icteria virens*] began building in a Wren box attached to one of the pillars of the south piazza which partly fronts towards a small ravine. They seemed to be very little disturbed by the occasional presence of members of the family, but appeared to be considerably annoyed by the belligerent attentions of a pair of Wrens (*Troglodytes aëdon*) who had taken up their quarters in another box on an adjacent pillar, and who were inclined to be very quarrelsome with their strange neighbors.

"They — the Chats — had been at work nearly a week, when a violent wind-storm blew the box down and thus rudely upset their domestic plans. The box was replaced in hopes that they would try it again, but their perseverance was not equal to the occasion, and they never returned. In view of the generally shy and secretive nature of the Chat, this incident of abnormal nidification seems rather curious."—CHARLES F. BATCHELDER, *Cambridge, Mass.*

SONG OF THE WHITE-BELLIED SWALLOW (*Iridoprocne bicolor*).—I have seen no account of the song of this species, nor, indeed, was I aware of its musical powers until the past summer. May 24, at an elevation of 8000 feet, I found a little colony just beginning house-keeping in a cotton-wood grove on an island in the San Antonio River, Colorado. When at rest they uttered a peculiar chirrupy warble, bearing resemblance to a Sparrow's song in some respects, and strikingly like a Robin's in some of the half whistles.

The species breeds as high as 10,000 feet, and, I believe, always in trees. — F. M. DREW, *Howardsville, Colorado.*

THE WHITE-BELLIED SWALLOW (*Tachycineta bicolor*) ON THE NEW JERSEY COAST IN NOVEMBER. — Mr. Gerard R. Hardenbergh of New Brunswick, New Jersey, tells me of the great abundance of the White-bellied Swallow at Squam Beach, New Jersey, on November 16, 1880. The Swallows had been abundant for the previous two days, though the temperature was unusually low for the time of year. They were feeding on the bayberry (*Myrica cerifera*) in such numbers that Mr. Hardenbergh secured fifteen birds at a single shot. The birds were brought to me, and at least three quarters are in immature plumage. — W. E. D. SCOTT, *Princeton, New Jersey.*

A NEW BIRD (*Plectrophanes pictus*) FOR SOUTH CAROLINA. — In the town of Chester, S. C., while walking, on December 1, 1880, through a stubble field overgrown with short grass, my attention was arrested by the undulating flight and peculiar chirping notes of a small bird, some thirty or forty feet in the air, flying towards me. When within about twenty yards of the place where I stood, it suddenly darted to the ground; and, when approached, ran nimbly off through the grass, stopping occasionally to watch my movements, and, finally, when too closely pressed took wing, continuing its flight, only, however, for a few yards. After being flushed several times, and apparently growing less shy, it allowed me to advance

within five or six feet. As I was without a gun, my only resort was a stone; and, much to my surprise, the bird stood, with parted bill and drooping wings, inquisitively watching my movements, while I deliberately threw the stone and knocked it over. This accidental acquisition thus added a new bird — the Painted Lark Bunting — to the fauna of the Carolinas. — LEVERETT M. LOOMIS. *Chester, S. C.*

THE IPSWICH SPARROW (*Passerculus princeps*) AT SQUAM BEACH, NEW JERSEY. — Mr. Gerard R. Hardenbergh secured on Nov. 16, 1880, a female of this species which he sent to me with other birds. — W. E. D. SCOTT, *Princeton, New Jersey.*

NOTE ON THE FIELD SPARROW (*Spizella pusilla*). — On the morning of the 8th of May, 1880, while gathering wild flowers on the banks of a running brook in a meadow I found a nest of the Field Sparrow (*Spizella pusilla*) containing four eggs. I had almost trodden upon the nest and my first impression of its location was the fluttering at my feet of the female bird as she left her charge at my too near approach. On the morning of the 12th the nest contained six eggs and as one of them was much warmer than the others I presumed it had just been laid. I visited the nest frequently and on the morning of the 19th five birds were hatched and the sixth egg chipped. Supposing the bird to have commenced setting immediately after laying the last egg the period of incubation could not have exceeded seven days — one hundred and sixty-eight hours. Continuing my visits at irregular intervals I noticed the rapidity of growth in the nestlings. The nest was not large enough to contain them all; on the 24th one of the little birds was sitting just outside but close to the nest, and on the afternoon of the 25th I found the nest empty. Reclining on the grass awhile I soon heard a faint chirp somewhat resembling the noise of young crickets, and in a few seconds several of them, and as the parents appeared with food for the little ones a hurried fluttering from various places within the space of a square rod revealed the presence of the family. The next day the young birds could fly two or three rods at a time and procure a portion of their food. Sixteen days from the commencement of incubation the young seemed to be able to take care of themselves. The adult birds appeared to become familiar in some degree with my visits and exhibited less uneasiness towards the close than at the beginning, and the male occasionally sung his richly musical strain, which resembles a combination of some of the notes of the Song Sparrow (*Melospiza melodia*) and the Grass Finch (*Poecetes gramineus*).

The mean temperature of the air during incubation week — from May 12 to 19 — was 57.61°: the extremes, 46° on the 14th and 88° on the 17th; rainfall, 0.21 inches on the 13th. The mean temperature from the 19th to the 25th was 68.14°: the extremes, 52° on the 19th and 88° on the 25th; rainfall, 0.23 inches on the 23d. — ELISHA SLADE. *Somerset, Mass.*

BELL'S FINCH (*Poospiza belli nevadensis*) *in New Mexico.* — I have found Bell's Finch to be quite common in the vicinity of San Marcial,

New Mexico, during fall and winter. I met with them in small flocks on the hill-sides bordering the barren plains, where a few stunted bunches of grass, scattered weeds, the tree cactus, and thorny bushes occasionally dotted the ground. The birds were very active, running about with tail steadily erected at an angle of 45°, in an odd, easy, graceful manner which readily attracted attention. When startled they flew to the top of a bush, but quickly dropped again to the ground. I thought, as I saw them running so swiftly, stopping now and then to pick up food or occasionally to scratch the ground, that they were busily engaged in catching a small kind of beetle I had noticed, but in dissecting four that I shot December 2 and 3, 1880, I found in their stomachs only small seeds and coarse gravel. The measurements of the birds shot are as follows: —

♂ Length, 6.20; extent, 9.50; wing, 3.00; tail, 2.60; tarsus, .80; bill, .40.
♂ Length, 6.50; extent, 9.50; wing, 3.00; tail, 3.00; tarsus, .80; bill, .40.
♂ Length, 6.50; extent, 9.75; wing, 3.10; tail, 3.00; tarsus, .80; bill, .40.
♀ Length, 6.00; extent, 9.00; wing, 2.75; tail, 2.65; tarsus, .80; bill, .40.

Iris, dark brown; bill, dusky, the base of the lower mandible pale blue. Legs, dark-reddish brown; feet and claws black. — N. S. Goss, *Neosho Falls, Kansas.*

Peculiar Nidification of the Bobolink. — During the haying season of 1854, I found in a meadow where I was at work a nest of the Bobolink (*Dolichonyx oryzivorus*) occupying the space between four stalks of a growing narrow dock (*Rumex crispus*). This nest was suspended from four points of its circumference, 90° apart, to the four stalks of the plant which grew from the same root. The bottom of the nest was about six inches above the ground. It was constructed entirely of vegetable material and consisted of two distinctly separate parts. A hemispherical cup, in one piece of coarse but neatly woven cloth, very strong and very light, was fastened to the living, growing supports by strong fibres passing around each stalk above and below a joint and firmly woven into the rim of the cup with some of the longer strings interlacing the sides. Loops passed through the bottom of the cup were attached to diagonal supports. The edge or rim of this cup was about half an inch thick at the points of bearing and about one-fourth of an inch in the quadrants. The texture just below the rim was closely woven and strongly wrought, varying from one-eighth to one-sixteenth of an inch in thickness, growing thinner gradually from the edge, and a small space in the lowest part was of open work evidently designed to secure good and certain drainage.

In this hanging basket was an elaborate lining of very soft blades of grass between which and the cup was an elastic padding. The woven cup was about five inches in diameter and five inches deep, the padding about half an inch thick, and the lining about the same thickness. The whole structure, dock and nest, swayed in every passing breeze but the nest was so strongly fastened to the stalks and the plant so securely held by the nest that it would have required a hurricane or tornado to have blown it away.

Twenty-two years afterwards, on the 28th of June, 1876, while mowing in the same meadow I found a similar nest of the Bobolink suspended from four stalks of the same species of plant growing in very nearly the same spot. The two specimens of very unusual and original nidification bore a remarkably strong resemblance and only differed to an appreciable extent in the method of hanging. In the former case — that of 1854 — the stalks grew naturally at the angles of a square: in the latter — that of 1876 — the stalks naturally grew at the angle of a trapezium and were drawn by the ingenious builders to the angles of a square at the points of fastening. The stalk which had to be drawn the farthest from its natural position was stoutly woven into the side of the cup, the weaving material completely covering two joints and the space between them, while in each of the others only one joint was covered and attached simply to the rim. The bottom of this nest was eight inches above the ground and the leaves of the plant overhung the structure forming a very pretty canopy.

From the fact that these two nests were found in the same field and in very nearly if not precisely the same spot and upon the same species of plant, it is probable that the avian architects of 1876 were lineal descendants of the builders of 1854. In these productions of the skill of Bobolinks we have evidences of systematic, consecutive thought; of plans well laid and equally well executed. — ELISHA SLADE. *Somerset, Mass.*

SOUTHERN RANGE OF THE RAVEN ON THE ATLANTIC COAST OF THE UNITED STATES. — In July, 1880, I found the Raven to be an inhabitant of Cobb's, Bone, and Mockhorn Islands, off the coast of Eastern Virginia, above Cape Charles. Solitary individuals were observed on one or the other of these islands almost every day during my stay of two weeks, at one time teased by Red-winged Blackbirds, at another by Black-headed Gulls, and again by Terns, as the Raven happened to approach their breeding grounds. Neither the Common Crow nor the Fish Crow were seen by me on these islands, though they were abundant along the shore of the mainland. As has been my experience elsewhere, the inhabitants did not distinguish the Raven from its smaller congeners, but by the islanders it was simply known as the "Crow." The species was easily recognized by its characteristic flight and peculiar notes, both of which are quite distinct from those of the Crows.—ROBERT RIDGWAY. *Washington, D. C.*

THE WHITE-NECKED RAVEN (*Corvus cryptoleucus*) IN NEW MEXICO.— Last fall while collecting birds in New Mexico I first noticed a pair of White-necked Ravens at Galisteo: from there on I saw the birds often, but nowhere in numbers until I reached San Marcial (on the Rio Grande, the then terminus of the railroad so rapidly being completed by the A. T. & S. Fe R. R. Co. to Guaymas and El Paso) where I was surprised to find them abundant and, in company with *C. corax*, flocking about the camping grounds of the graders and other workmen to pick up (as soon as the men were away) the scattered grains where the horses were fed, and from the offal around the tents. I counted one morning at sunrise over a hundred, and with them at least thirty Ravens.

These birds, in the dry atmosphere of the sterile plains, take the place of the Vultures, the great scavengers of the lower, more moist, and fertile portions of our country, and are therefore looked upon as friends, and not being hunted or disturbed are quite bold and easy of approach, and I had no difficulty in shooting all the specimens I wanted. I noticed, however, before I left, they began to keep well out of gunshot.

The following are the measurements of a pair of mounted birds in my collection shot at San Marcial, November 28 and 30, 1880.

♂ Length, 21.00; extent, 43.00; wing, 14.25; tail, 8.50; tarsus, 2.35; bill, 2.10.

♀ Length, 19.75; extent, 41.00; wing, 13.60; tail, 8.00; tarsus, 2.30; bill, 2.20.

Iris very dark brown; bill, legs, feet and claws, black.

The males are nearly as large as the females of *C. corax*, but readily distinguishable from that species by their more slender build; and in flight their wings appear less rounded.—N. S. Goss, *Neosho Falls, Kansas.*

Remarkable Persistency in Nesting of the Western Yellow-bellied Flycatcher. — A pair of these birds (*Empidonax difficilis*) have been in the habit of nesting every year in the shed covering my tanks, which are in the woods some distance back of my house. The birds appeared as usual about the middle of last April and commenced building about the 28th of the month. On the 15th of May the nest contained four eggs and I took it. The birds lost no time bewailing their loss but immediately commenced another nest, but on a different beam from the first one. By the 28th of the month they had this nest finished and four eggs in it. I took this one also. Next day the birds commenced again, on yet another beam. On the 5th of June this third nest was finished and on the 10th contained *five* eggs, this being the only time that I ever found five eggs in a nest of these birds. Both for the sake of such an unusual set and to see how long the birds would keep on nesting I took this also. Not a bit discouraged, the birds began a fourth nest, and on the 22nd this nest contained four more eggs. I took these thinking the birds would go somewhere else this time. But, no; they started a fifth nest which, on the 6th of July, had four eggs in it, making five nests and twenty-one eggs by the same pair of birds in a little over two months. On taking this nest the birds left and I do not know whether they built again or not. Probably not, as they generally leave the country about that time.

This same persistency was shown at the same time by a pair of Black Pewees (*Sayornis nigricans*) which built twice under the eaves of the house, once under a bridge close by, and a fourth time under the eaves of the house. This last time they hatched out the brood, as I neglected to take the nest until too late to save the eggs.—Joseph Mailliard, *Nicasio, Marin Co., Cal.*

Notes on the Black-backed Three-toed Woodpecker and Canada Jay. — On the 9th of May last while crossing the high open pine

plains bordering the Black River, Cheboygan County, my attention was attracted by the peculiar cry of a Woodpecker on a tree near the road, which at a glance I saw was a new bird to me; being secured it proved to be *Picoides arcticus*. Five specimens were taken at this time, two males and three females. Again on the 14th of August, on the pine plains along the Sturgeon River, I shot a female of this species which showed conclusive evidence of having bred in the vicinity. Others were seen at this time but not secured.

August 10, 1880, while encamped on the Sturgeon River, a flock of eight or ten Canada Jays were seen early one morning about camp: one adult male and one young male of the present season were taken. Although I have passed five summers collecting through the northern part of the state, this is the first time I have met with *Perisoreus canadensis*. — CHAS. W. GUNN, *Grand Rapids, Mich.*

CAPTURE OF THE RED-BELLIED WOODPECKER (*Centurus carolinus*) IN EASTERN MASSACHUSETTS. — A female of this species was taken by Mr. William Adair in a chestnut grove in Newton, November 25, 1880. The male was seen and wounded but was not secured. — GORDON PLUMMER, *Boston, Mass.*

NOVEL NESTING-SITES OF WOODPECKERS (*Colaptes auratus* AND *Melanerpes erythrocephalus*.)—Having often wondered where the above-named birds breed when seen on the open prairies forty or fifty miles from any timber the whole summer, I promised some farmer boys a suitable reward if they would find their nests anywhere outside of hollow trees and was most agreeably rewarded in being shown two nests of the Golden-winged Woodpecker and one of the Red-headed in rather queer quarters. One nest of the former was in an old wagon hub, about two feet from the ground, and hidden by a rank growth of weeds. The other was in a hollow formed by two large willow-sticks that formed part of a hay roof over a cattle-shed. The nest of the Red-head was in the angle formed by the shares of an upturned plow. In no instance was there any attempt at nest-building, the newly-hatched young ones resting on some dirt and rubbish. — G. S. AGERSBORG, *Vermillion, Dakota.*

AN UNACCOUNTABLE MIGRATION OF THE RED-HEADED WOODPECKER. — Ordinarily this species (*Melanerpes erythrocephalus*) is decidedly the most numerous of the Woodpeckers in Southeastern Illinois, while during the winter season it is often so excessively common in the sheltered bottom-lands as to outnumber all other species together, and, in fact, is voted a decided nuisance by the hunter, sportsman, or collector, on account of its well known habit of following any one carrying a gun, and annoying him by its continued chatter; at intervals sweeping before him and thus diverting attention. Being at this season always semi-gregarious, while they are of all Woodpeckers the most restless and sportive, the annoyance which they thus cause is really no trifling matter.

In the early part of October, 1879, I paid my usual yearly visit to my old home, and scarcely had arrived at the house ere my father informed me, as a bit of news which he was well aware would both interest and surprise me, that the Red-headed Woodpeckers had all migrated: that for a number of nights preceding he had heard overhead their well-known notes as they winged their way to some more or less distant region; in short, that the woods which had been their home "knew them now no more." The following day I began collecting, and though some eight miles of woodland were traversed only three specimens of this species were observed, these being young individuals and in all probability of one brood, since they were sporting together among some large black-gum trees. My stay was prolonged to the end of the month, and though I was in the woods almost every day, my excursions radiating in every direction from the town, these three lingering individuals seen the first day were all that were met with, even the same clump of gums having become entirely deserted.

This wholesale migration of a single species, when all other members of the family remained in their normal abundance, is to me wholly inexplicable. It has never occurred before, to my knowledge, in that particular region; and my father, who has lived there upwards of forty years (he can remember when the Parakeets flew in large flocks, and were a nuisance to the farmer) cannot call to mind another instance. Whether or not they have since returned, I do not know, but in all probability their absence was but temporary.

In connection with this matter, a list of the Woodpeckers found in the vicinity of Mount Carmel, arranged according to their relative abundance, may not be out of place.

1. **Melanerpes erythrocephalus**. "Red-head"; "Black Woodpecker". Usually most numerous in winter, when however, less generally distributed, being mainly confined to the sheltered bottoms.

2. **Centurus carolinus**. "Checkered Woodpecker"; "Woodchuck"; "Chuck."

3. **Colaptes auratus**. "Flicker"; "Yellow Hammer." [In the fall of 1879, I shot upwards of thirty specimens of this species in order to find, if possible, an individual inclining to the "*hybridus*" style, but succeeded in securing only one which departed in the least from typical *auratus*,* this one having merely a very slight red suffusion at the ends of the black cheek-patches. In addition to these thirty-odd specimens, I have handled probably a hundred and fifty more shot in the same localities

* Two adult males obtained the same day (Oct. 20, are remarkable for very small size and certain peculiarities of coloration, which, however, do not tend in the least towards *mexicanus*. These two specimens compared with two from Florida in my collection measure as follows: —

		Wing.	Tail.	Tarsus.	Bill.
♂ ad.	Gilson Co. Ind. Oct. 20, 1879.	5.80	4.35	1.20	1.10
♂ "	" " " " " "	6.20	4.50	1.25	1.10
♂ "	Miami, Florida, Feb. 17, 1871.	5.55	4.45	1.32	1.10
♀ "	" " " " "	5.80	4.70	1.30	1.05

(mostly by myself), and have never seen another aberrant specimen. Therefore, I estimate that of every two hundred specimens occurring in that part of the country, about one hundred and ninety-nine would be true *auratus*.]

4. **Picus pubescens**. "Little Sapsucker"; "Little Guinea Woodpecker."

5. **Picus villosus**. "Big Sapsucker"; "Big Guinea Woodpecker."

6. **Hylotomus pileatus**. "Woodcock"; "Black Woodcock"; "Log-cock." In some localities ranks as fourth or fifth in abundance.

7. **Sphyropicus varius**. "Sapsucker." Rarely distinguished by the people, but sometimes, from its note, called "Squealing Sapsucker." This species is unknown in summer, and is the only one of the family that is regularly migratory.— Robert Ridgway, *Washington, D. C.*

Breeding of the Wild Pigeon in confinement.— Seeing Mr. Deane's note in the last number of the Bulletin, I forward my experience, thinking it may prove of interest. During the spring of 1877, the Society purchased three pairs of trapped birds, which were placed in one of the outer aviaries. Early in March, 1878, I noticed that they were mating, and procuring some twigs, I wove three rough platforms and fastened them up in convenient places: at the same time throwing a further supply of building material on the floor. Within twenty-four hours two of the platforms were selected: the male carrying the material whilst the female busied herself in placing it. A single egg was soon laid in each nest and incubation commenced. On March 16 there was quite a heavy fall of snow, and on the next morning I was unable to see the birds on their nests on account of the accumulation of the snow piled on the platforms around them. Within a couple of days it had all disappeared and for the next four or five nights a self-registering thermometer, hanging in the aviary, marked from 14° to 19°. In spite of these drawbacks both of the eggs were hatched and the young ones reared. They have since continued breeding regularly and now I have twenty birds: having lost one old male and several eggs, from falling through their illy-contrived nests.— Frank J. Thompson, *Zoölogical Garden, Cincinnati, O.*

Large Eagles.—An immense adult Bald Eagle (*Haliaëtus leucocephalus*) was lately sent from North Carolina to Mr. Newton Dexter of this city, the spread of whose wings measured 8 feet. It is well known that the young Bald Eagle is larger than the adult, and Mr. Dexter and myself were discussing that point only a few days previously while examining a large Golden Eagle which had been sent in to me to mount.

I bought in November last a young female Bald Eagle, shot in New Shoreham, which measured 7 feet 3 inches, the greatest spread of wing of any I ever had. Mr. Dexter has killed dozens of Eagles and says this is the largest he ever saw.—Frederic T. Jencks. *Providence, R. I.*

Eagles attempting the rescue of a wounded companion.—Having noticed a number of times mention of the fact that Gulls and other

large birds have been known to come to the rescue of a wounded companion, and believing that this same trait has never been noticed in the Eagle, I note the following account as witnessed by Paul Scheuring (Nov. 6, 1880). While hunting on the marshes of Green Bay, he discovered four large Eagles (*Haliaëtus leucocephalus*) circling around not far distant; he immediately paddled towards them and succeeded in wounding one to such an extent that it could not fly, but lay fluttering on the water. Before he could reach it the other three Eagles had flown to the assistance of the fallen bird. Catching hold of its wings the noble birds did their best to carry it off, but not being able to raise it they only managed to drag it a considerable distance, which showed their friendly intentions just as well as if they had succeeded in flying off with it.

After seeing that they could not render their wounded companion any assistance, they flew away with a wild scream, leaving the poor bird to the mercy of Mr. Scheuring, who quickly dispatched it by holding it under the water until it was quite dead. — Saml. W. Willard. *West De Pere, Wisc.*

Richardson's Owl in Rhode Island.— A specimen of Richardson's Owl (*Nyctale tengmalmi richardsoni*) was obtained this winter near this city. Its capture was ascertained by Mr. Newton Dexter, who saw the bird in the possession of a young lady whose brother shot it.— Frederic T. Jencks. *Providence, R. I.*

The Avocet (*Recurvirostra americana*) in Massachusetts. — A bird of this interesting species was shot October 19, 1880, near Lake Cochituate in the town of Natick, Middlesex County, by a local gunner. Mr. Paul S. Roberts, in whose possession I first saw it, secured and mounted the specimen. The plumage is immature, being that of "*R. occidentalis*," of authors (figured in Vigor's Zoöl. Voy. of Blossom, pl. xii; Gray's Gen. of Birds, III, pl. civ; Cassin's Ill., pl. xl). My record is the third authentic one for New England, and the first for Massachusetts.*

We are indebted to Mr. E. J. Smith of Natick for knowledge of this capture, he writing the fact to Mr. C. J. Maynard, who kindly gave me the information. — H. A. Purdie. *Newton, Mass.*

The Whistling Swan in Massachusetts. — On the morning of the 16th of October, 1880, about 8 A.M., I observed a flock of Swans (*Cygnus americanus*, Sharp.) on their autumnal migration. The flock contained five individuals and probably belonged to one family. They were flying in a nearly due south course, in the typical triangle of 60°, at an elevation of about one third of a mile and with a velocity of about fifty miles per hour. They did not pass directly overhead but a little to the west of my place of observation, and for a few seconds their position was such that the downward motion of the left wing of each bird cast a shadow upon the

* See Merriam, Trans. Conn. Acad., Vol. IV, 1877, p. 103; Brown, Bull. N. O. C., IV, 1879, p. 108; Boardman, *Ibid.*, V, 1880, p. 241.

lower part of the body. The alternate shade and light thus produced upon the pure white of the breast and abdomen seen against the October blue of the sky presented a remarkably interesting view of a living panorama. Occasionally the clear, shrill whistle of the leader was sounded, and in the quiet air of the morning was heard at a distance of more than a mile. — ELISHA SLADE. *Somerset, Mass.*

THE HARLEQUIN DUCK AND THE GLOSSY AND WOOD IBISES IN SOUTHERN ILLINOIS.— In looking over the additions I made last year to my collection of birds, I find there are three that may be of interest to the readers of the Bulletin. The first I will mention is the Harlequin Duck (*Histrionicus torquatus*), a specimen of which was shot by Mr. Sybold, in a small lake in Illinois (Marion County), seven miles from St. Louis. The bird was in company with a flock of the Lesser Scaup Duck (*Fuligula affinis*).

The second species is the Glossy Ibis (*Plegadis falcinellus*), a fine male of which was shot by Mr. Sybold, February 27, 1880, at the small lake already mentioned. It was shot from a flock of three, flying northward, two of which fell but only one was secured.

The other species is the Wood Ibis (*Tantalus loculator*), which was very plentiful here last year. I counted about fifty of these birds at one place, namely, on an island in the lake already alluded to. They were resting on some high sycamores and could be seen at a long distance. About noon they circled about high in the air. They remained here throughout the month of August, but all disappeared about the 5th of September.— JULIUS HURTER. *St. Louis, Mo.*

THE WHITE-WINGED GULL (*Larus leucopterus*) IN MASSACHUSETTS.— Although this species has been included in various local lists of our birds as a rare winter visitor, there appears to be no very explicit record of its capture in this State, or at least no recent one. It may therefore be of interest to state that we procured an immature specimen off the Boston Milldam on the 31st of January, 1880. It was in company with another of the same species and from twenty to thirty Herring Gulls.—E. A. AND O. BANGS. *Boston, Mass.*

THE CASPIAN TERN IN CALIFORNIA.— The National Museum possesses two specimens of this bird from California. One of these was shot at Stockton, in December, 1880, by Mr. L. Belding, and is in immature plumage; the other came from Woodward's Gardens, San Francisco, and was obtained in exchange from another party. The label was inscribed "*Sterna regia*. Shore of California." This is also a winter specimen, but is in adult livery.— ROBERT RIDGWAY. *Washington, D. C.*

THE SHORT-TAILED TERN (*Hydrochelidon nigra*) IN NEW ENGLAND. — In former numbers of this Bulletin I have repeatedly insisted that the Short-tailed Tern is a much commoner New England species than writers have been willing to admit. This opinion has been greatly strengthened by the experiences of the past season (1880), for, in addition to a number of specimens which were received by the Boston taxidermists from various points along

the Massachusetts seaboard. I have the following specific reports from Nantucket and Rye Beach, N. H. At the former place Mr. H. S. Sweet saw no less than fifty individuals on August 22. They were flying over Miacomet Pond, and as they passed his point of observation on their way seaward, were accurately counted.

A flock seen at Rye Beach by my friend Mr. H. M. Spelman, on August 24, was nearly as large, the number of birds being estimated at about forty. They appeared on a small sheet of brackish water locally known as the "Eel Pond," where they stayed several days. They were very shy but Mr. Spelman succeeded in killing four specimens.

While it is not unlikely that their appearance in such large numbers is exceptional, there can no longer be any question that the Black Tern is of regular and not uncommon occurrence during August and September at most suitable points on the New England coast south of Portland, Maine. — WILLIAM BREWSTER. *Cambridge, Mass.*

NOTES ON LEACH'S PETREL (*Cymochorea leucorrhoa.*) — Under date of July 29, 1880, Mr. Manly Hardy of Brewer, Maine, gives me the following notes on Leach's Petrel. The facts regarding incubation, are I think, new, and go to show that, as with the Phalaropes, the female Petrels have strongly imbibed the spirit of the nineteenth century.

"I have lately had quite a number of Leach's Petrels taken on the nests and find some things which are not mentioned in such books as I have access to. In the first place, the males do most, if not all, of the incubating. In a number received the 1st of June, five out of six were males. Thinking that, like Pigeons, the males might perhaps all sit at the same time, I had another lot sent me about June 15, and again, of twelve specimens seven proved to be males. A careful examination showed that while the under plumage of the females was in every case perfect, each male had on the lower part of the breast a bare spot large enough to cover the egg.

"Some writers mention their ejecting oil when *irritated*. I find that either sex can eject at least one-eighth their bulk of very pure reddish oil, and that it is given forth equally freely when the bird is killed by chloroform. I think that it is probably intended to serve as food for the young." — WILLIAM BREWSTER, *Cambridge, Mass.*

BIRDS AND WINDOWS. — The library building of the Rochester University — across the street from us — has very clear windows opposite one another, and during the year, especially in the spring and autumn, many birds are killed by flying against them. The greater part are found on the north side. Most of the birds are small: but lately two Robins and one Golden-winged Woodpecker were found among them. Curiously enough there are no English Sparrows among the slain, they probably being sufficiently acquainted with windows to avoid them. — FREDERIC A. LUCAS, *Rochester, N. Y.*

NOTES ON BIRDS RARE OR ACCIDENTAL ON LONG ISLAND, N. Y. —

1. **Mimus polyglottus.** MOCKINGBIRD. Two specimens taken: a young bird, on October 1, 1880; an adult on October 2, 1880; both captured at Fort Hamilton.

2. **Polioptila cærulea**. Blue-gray Gnatcatcher. —I shot a young bird, October 11, 1879, at Fort Hamilton. It was skipping about in a row of honey-locusts, and was exceedingly active.

3. **Melospiza lincolni**. Lincoln's Sparrow. — An adult female was taken October 8, 1880, by my friend Mr. J. Dwight, Jr., while we were collecting at Fort Hamilton.

4. **Zonotrichia leucophrys**. White-crowned Sparrow.—Two specimens captured. The first, an adult female, was taken May 19, 1880; the second, a young bird, sex not ascertained, was shot October 19, 1880. Both were captured at Fort Hamilton.

5. **Stelgidopteryx serripenis**. Rough-winged Swallow. — I shot one at New Utrecht, April 19, 1878.

6. **Hylotomus pileatus**. Pileated Woodpecker.— Mr. J. Akhurst, of Brooklyn, informs me that at least three individuals of this species have been met with on Long Island. In 1842 or 1843 he saw one at what is now East New York, Kings County. Another was sent to him about thirty years ago from the eastern part of the Island; the third which he obtained two years ago, was captured near Jamaica, Queens County.

7. **Falco gyrfalco obsoletus**. Labrador Gyrfalcon.—Mr. J. Wallace, of New York, informs me that a fine specimen of this bird, killed in the fall two or three years ago, on the north shore of Long Island in Queen's County, passed through his hands. It is now in the collection of Mr. Geo. A. Boardman.

8. **Nauclerus forficatus**. Swallow-tailed Kite. — Mr. J. Akhurst tells me that about the year 1845, while collecting on the south shore of Long Island, he saw a bird of this species. He spent an entire day in endeavoring to secure it, but was unsuccessful. This I believe is its second and latest Long Island Record, the first being the capture of a specimen at Raynor South, in 1837, as recorded by Giraud in his "Birds of Long Island."

9. **Cathartes atratus**. Black Vulture.—An individual of this species was found dead on Coney Island Beach a few years ago. I have not the exact date, but Mr. Akhurst is my authority.

10. **Tringa maritima**. Purple Sandpiper.—I shot this bird on Swinburn Hospital Island, Lower New York Bay, Nov. 27, 1879. I had been sailing for Ducks, and the wind failing, had landed on the Island, when one of the men told me a Snipe was walking about on the stones of the "crib." It was very tame and evidently engrossed with its search for food, so it was easily secured.

11. **Tryngites rufescens**. Buff-breasted Sandpiper. — During a collecting visit I made to Montauk Point last summer, a specimen of this bird was shot there by a gentlemen on August 26, and kindly presented to me.—De L. Berier, *Fort Hamilton, Long Island, N. Y.*

Distribution of Birds as influenced by increase of Water Area. — Many of the readers of the Bulletin are doubtless cognizant of the fact that the city of Boston has been engaged for several years past in the construction of extensive works on Sudbury River in Framingham.

for reservoirs to contain an "additional water supply" for the city. These works were completed in 1879, and the three basins were speedily filled, embracing an aggregate area of some 600 acres, with a water line constantly varying with the varying quantities drawn for consumption, as well as from natural causes. This increase of water surface has had a noticeable effect in enlarging the Avi-fauna of the locality. Being favorably situated (rather too favorably, in one respect, one-half of my farm being now under water!) I have watched this accession to our visiting list with considerable interest and diligence, and make the following memoranda as a result.

A. Species that, so far as I can ascertain by enquiry and observation (residence of 27 years), are new to this vicinity.

1. *Anthus ludovicianus.* One obtained by self, Nov., 1879; several by others.
2. *Charadrius virginicus.* One obtained by self, Sept., 1880. Two only seen.
3. *Egialites semipalmata.* Two obtained by a friend, Oct., 1880.
4. *Ereunetes pusillus.* One obtained by self, Oct., 1880; several by others.
5. *Tringa minutilla.* Several obtained by friend, Aug., 1880.
6. *Tringa fuscicollis.* Three obtained by self, Oct., 1880. Three only seen.
7. *Calidris arenaria.* One obtained by self, Oct., 1880. One only seen.
8. *Totanus flavipes.* Several by a friend, Sept., 1880.
9. *Totanus melanoleucus.* Two obtained by self, June and Oct., 1880.
10. *Nyctiardea grisea nævia.* One obtained by self, Aug., 1880.
11. *Fulica americana.* One obtained by a friend, Sept., 1880.
12. *Fuligula ferina americana.* One obtained by a friend, Oct., 1879.
13. *Fuligula marila affinis.* One obtained by self, Oct., 1880; several by others.
14. *Erismatura rubida.* One obtained by a friend, Oct., 1879.

B. Species that have appeared in notably increased numbers.

1. *Siurus noveboracensis.* Ratio of increase, say 3.
2. *Ceryle alcyon.* Ratio of increase, say 3.
3. *Totanus solitarius.* Ratio of increase, say 5.
4. *Tringoides macularius.* Ratio of increase, say 10.
5. *Ardea virescens.* Ratio of increase, say 3.
6. *Ardea herodias.* Ratio of increase, say 2.
7. *Querquedula discors.* Ratio of increase, say 2.
8. *Querquedula carolinensis.* Ratio of increase, say 2.
9. *Podilymbus podiceps.* Ratio of increase, say 2.

NOTE. Several individuals of a species of *Larus* (*argentatus* without doubt) have been reported at sundry times to be about the basins; none were shot, and I have never seen them, but the authority is good. As *Larus* never appeared here "before the Flood," it has a fair claim for a place in List A. The omission is on the "strict construction" principle, because the examples were *seen* only.—F. C. BROWNE, *Framingham, Mass.*

Supplementary List of Birds of the Island of Santa Lucia, W. I.—A few months since I gave in this Bulletin (Vol. V, pp. 163-169) a list of the birds of Santa Lucia, numbering 56 species. Recently the Museum of Comparative Zoölogy has received another considerable lot, collected, as were the previous sendings, by Mr. John Semper. This last collection adds 12 species to the number previously recorded from the island, besides embracing quite large suites of the rarer species, including, among others, 10 examples of *Chrysotis bouqueti* and 8 of Mr. Lawrence's recently described *Chætura dominicana*. The additions to the previously published list are the following:

1. **Siurus nævius** (*Bodd.*).
2. **Chætura dominicana**. *Lawr.*
3. **Pandion haliaetus** (*Linn.*)
4. **Porzana carolina** (*Linn.*).
5. **Symphemia semipalmata** (*Gm.*).
6. **Numenius hudsonicus**. *Lath.*
7. **Querquedula discors** (*Linn.*).
8. **Fulix affinis** (*Eyt.*).
9. **Chroicocephalus atricilla** (*Linn.*).
10. **Sterna anglica**. *Mont.*
11. **Sterna fuliginosa**. *Gm.*
12. **Anous stolidus** (*Linn.*).

The collection also embraces *Tringa fuscicollis*, one of the two species previously given on Dr. Sclater's authority. — J. A. Allen, *Cambridge, Mass.*

Winter Birds of Fort Walla Walla, W. T. — Recent letters from Captain Charles Bendire, U. S. A., now at Fort Walla Walla, contain notes of interest on various species of birds observed during the past winter at that post, which I have his permission to make public.

While Fort Walla Walla corresponds in latitude (about 46° N.) with Northern Maine, its winter bird fauna seems to be comparable with that of Southern New Jersey. Captain Bendire enumerates as among the regular winter residents such species as the Meadow Lark (*Sturnella magna neglecta*), the Red-shafted Flicker (*Colaptes auratus mexicanus*), Brewer's Blackbird (*Scolecophagus cyanocephalus*), the Western Red-wing (*Agelæus phœniceus gubernator*), the Western White-crowned Sparrow (*Zonotrichia leucophrys intermedia*), the Oregon Snowbird (*Junco oregonus*), the Cinereous Song Sparrow (*Melospiza fasciata guttata*), etc., besides other species less distinctively southern in character.

Captain Bendire also refers to the capture of a Snowy Owl (*Nyctea nivea*) about December 1 (1880), which, he says, is the only "instance of its capture on this coast south of Alaska" known to him. He has also taken several examples of *Scops asio kennicotti*, and finds "*Æsalon sucklevi* and *richardsoni*" of not uncommon occurrence. In alluding to the predominance of the females, he says that out of ten specimens of these two forms taken only one proved on dissection to be a male. He also notes a similar prevalence of females among the Sharp-tailed Grouse. — J. A. Allen, *Cambridge, Mass.*

PICUMNUS LAWRENCII *Cory*.

BULLETIN

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DESCRIPTIONS OF FOUR NEW SPECIES OF HAITIAN BIRDS.

BY CHARLES B. CORY.

Picumnus lawrencii. (Plate I.)

♂ ad. Tail soft, composed of ten feathers. General plumage above olive-green. Forehead showing a tinge of black: top of the head bright yellow, cut by a band of red, again becoming yellow at the base. Under parts yellowish, palest on the throat, mottled and streaked with brown feathers; on the sides of the neck marked with dull white, nearly joining above, forming an imperfect collar. Wing-coverts and outer webs of primaries and secondaries, olive-green; inner webs brown, becoming pale on the edges. Bill, legs, and feet dark slate color. Iris reddish brown.

♀ ad. Differs from the male in wanting the red band on the head.

Length, 5.25; wing, 2.75; tail, 1.75; tarsus, .56; bill, .62.

Dr. Bryant refers to a *Picumnus* taken in Haiti (Proc. Boston Soc. Nat. Hist. Vol. XI, p. 96) but considers it to be *P. micromegus* of Sundevall (Consp. Avium Picin., 1866, p. 95); but that species came from Brazil and I cannot make his description agree with the Haitian bird. In all probability Dr. Bryant's specimen was the present species wrongly identified.

I have named it in honor of Mr. Geo. N. Lawrence of New York.

Phœnicophilus dominicensis.

♂ ad. Forehead and sides of the head black; a spot of white above and below the eye and on each side of the forehead; chin white, extending in two stripes down the sides of the throat to the breast, bordering the black of the head. The rest of the head, neck, and underparts grayish-plumbeous. Back, wing-coverts, tail and coverts, and outer edges of wing

feathers, bright yellowish-green. Inner webs of primaries and secondaries brown, pale on the edges. Legs and lower mandible dark slate color; upper mandible black. Iris reddish-brown.

Length, 7.00; wing, 3.50; tail, 3.00; tarsus, .90; bill, .72.

Authors have generally considered this bird to be the female of *P. palmarum*; but a careful examination of a large series of the latter species proved the sexual difference, if any, to be merely a slight variation in size.

Parra violacea.

♂ ad. Bill and comb pale orange; bare skin at the base of the lower mandible pale bluish-white. Head, neck, and upper breast, dark lustrous green, back and wing-coverts purple, shading into rich golden-brown near the rump; rump and tail coverts bright purple. Underparts dark purple, showing a tinge of dark rufous on the crissum. Most of the primaries and secondaries bright yellow, edged with brown; tail rufous brown; carpal spur pale orange; legs and feet dull olive; iris brown.

Length, 9.00; wing, 5.50; tail, 2.25; tarsus, 2.25; bill, 1.40.

A single specimen taken, possibly a straggler to the island but apparently differing from any known form.

Myiadestes montanus.

♂ ad. Upper parts and two central tail feathers slaty gray; primaries and secondaries brownish-black, showing white near the base of the inner webs; outer webs of primaries and terminal portion of the outer webs of secondaries edged with gray; throat, crissum, and belly near the vent, reddish-brown, intermediate between that of *M. solitarius* and *M. sibilans*, but approaching nearer the color of the former; rest of underparts pale gray. Outer tail feather white with black shaft, showing a dark tinge near the extremity of the outer web; second feather black, with the central portion of the terminal half white, the black narrowing to the extremity leaving the tip white; third feather showing a triangular patch of white at the tip; rest of tail feathers, except the two central ones, black. Bill black; legs and feet pale; iris brown.

Length, 7.00; wing, 3.35; tail, 3.38; tarsus, 1.00; bill, .38.

HABITS OF THE BLACK BRANT IN THE VICINITY OF ST. MICHAELS, ALASKA.

BY E. W. NELSON.

The long reign of ice and snow begins to yield to the mild influence of the rapidly lengthening days; the middle of May is reached, and the midnight sky over the northern horizon blushes with delicate rose tints, changing to purple toward the zenith. Fleecy clouds passing slowly across the horizon seem to quiver and glow with lovely hues only to fade to dull leaden again as they glide from the reach of fair Aurora. The land, so lately snow-bound, becomes dotted with pools of water and the constantly narrowing borders of the snow soon make room for the Waterfowl which, with eager accord, begin to arrive in abundance, some upon lagging wings, as if from far away, others making the air resound with joyous notes as they recognize some familiar pond where, for successive seasons, they have reared their young in safety, or, perhaps, a favorite feeding ground. At this time the White-fronted and Hutchins's Geese take precedence in numbers though, to be sure, they have been preceded for two weeks by the hardy Pintail Duck, the Common Swan and, lastly, that ornithological harlequin, the Sandhill Crane, whose loud rolling note is heard here and there as it stalks gravely along, dining upon the last year's berries of *Empetrum nigrum*, when, meeting a rival, or perchance one of the fair sex, he proceeds to execute a burlesque minuet.

A few days later, upon the mirror-like bosoms of myriads of tiny lakelets, the graceful Northern Phalaropes flit here and there or swim about in pretty companies. At length, about the 20th of May, the first Barn Swallow arrives and then we begin to look for the Black Brant, the "*Nimkée*," as it is called by the Russians, the "*Lük-lïg'-ü-nük*" of the Norton Sound Eskimo. Ere long the *avant-courier* is seen in the form of a small flock of ten or fifteen individuals which skim along close to the ice heading directly across Norton Sound to the vicinity of Cape Nome, whence their route leads along the low coast to Port Clarence where, I am told by the natives, some stop to breed; but the majority press on and seek the ice bordered northern shore

of Alaska and even beyond to unknown regions far to the north. Of this I am assured by Captain E. E. Smith, who tells me that while whaling in the autumn, to the eastward of Wrangel Land, in 70° N. latitude, he has seen flocks of these Geese coming from the north and steering straight for the coast of Alaska several hundred miles to the southward. The presence of this and other species of birds in that part of the Arctic Ocean argues favorably for the presence of a body of land to the northward of Alaska, but whether it is an eastern continuation of Wrangel Land or not is, of course, uncertain. However, let us return to a safer field. The following notes were mainly taken during the spring of 1880, for although I had seen the Brant plentiful the two preceding years, their extraordinary abundance the past spring was surprising, not only to the few white men here but to the natives as well.

The 22d of May a native came in bringing a lot of Geese and reporting plenty of Black Brant up the "Canal." For the benefit of the unfortunate few who have not been at St. Michaels I may explain that the "Canal" is a narrow and shallow tidal channel which separates St. Michael's Island from the main land and is bordered on either side by a stretch of low, flat land abundantly dotted with brackish ponds and intersected by numerous small tide creeks. As would be surmised, this forms a favorite haunt for various kinds of waterfowl.

Preparing the tent and other paraphernalia two of us, accompanied by a couple of natives, started out the next morning with a sled and team of five large dogs, driven tandem, just as the sun gilded the distant hill-tops and gave a still deeper tint to the purple haze enveloping their bases. The sharp, frosty air and the pleasurable excitement of the prospective hunt, after months of inactivity, causes an unusual elation of spirits and with merry jests we speed along until, in a short time, we approach a low, mound-like knoll rising in the midst of innumerable lakelets. A strange humming, for which we were at first unable to account, now becomes more distinct and we perceive its origin in the united notes of scores of flocks of Brant which are dispersed here and there over the half bare ground. Some sit along the edges of the snow banks or upon the ground, still sleeping, while others walk carelessly about or plume themselves in preparation for the work before them. Their low, harsh, gutteral *gr-r-r-r*,

gr-r-r-r rises in a faint monotonous matinal whose tone a week later may waken the weird silence in unknown lands about the Pole.

Reaching the knoll before mentioned, we pitch our tent and after tieing the dogs to keep them within bounds we separate to take positions for the morning flight. Each of the party is soon occupying as little space as possible behind some insignificant knoll or tuft of grass that now and then breaks the monotonous level. The sun rises slowly higher and higher, until, at length, the long narrow bands of fog hovering over the bare ground are routed. Now we have not long to wait, for, as usual at this season, the lakes, which are frozen over nightly, open under the rays of the sun between seven and nine in the morning and start the waterfowl upon their way. The notes which, until now, have been uttered in a low conversational tone, are raised and heard more distinctly and have a harsher intonation. The chorus swells and dies away like the sound of an æolian harp of one or two heavy bass strings and, as we lie close to the ground, the wind whispers among the dead plants in a low undertone as an accompaniment; but, while we lay dreaming, the sun has done its work: the lakes have opened, and, suddenly, a harsh *gr-r-r-r, gr-r-r-r, gr-r-r-r* causes us to spring up, but too late, for, gliding away to the northward, the first flock goes unscathed. After a few energetic remarks upon Geese in general and this flock in particular we resume our position but keep on the alert to do honor to the next party.

Soon, skimming along the horizon, flock after flock is seen as they rise and hurry by on either side. Fortune now favors us and a large flock makes directly for the ambush, their complicated and graceful evolutions leading us to almost forget why we are lying here upon our face in the bog with our teeth rattling a devil's tattoo in the raw wind. On they come, only a few feet above the ground, until, when twenty or thirty yards away, we suddenly rise upon one knee and strike terror into the hearts of the unsuspecting victims. In place of the admirable order before observed all is confusion and, seemingly in hope of mutual protection, the frightened birds crowd into a mass over the centre of the flock, uttering, the while, their ordinary note raised in alarm to a higher key. This is the sportsman's time and a double discharge as they are nearly overhead will often bring down from

four to ten birds. Scarcely have the reports died away when they once more glide along close to the ground; the alarm is forgotton; order is again restored, and the usual note is heard as they swiftly disappear in the distance. Thus they continue flying until one or two o'clock in the afternoon when, after a pause of three or four hours, they begin again and continue until after sundown.

The migration of this species in spring generally continues for a week to ten days from its first arrival, but during the spring of 1880 they were seen from the 20th of May until June 8th. Twice during the breeding season, in the spring of 1879, I saw single birds which each time circled mutely about overhead with all the appearance of a bird whose nest was not far away, but, if such was the case, I did not succeed in finding it. My native workman told me, at the time, that a few instances had occurred of single nests being found here. The mouth of the Yukon probably forms the extreme southern limit of this bird's occurrence in the breeding season.

With the exception of the Painted Goose, the Black Brant is the fattest of the spring Geese, and the natives smack their lips in anticipation when the first arrivals are announced. They also stand high in favor with the Russian residents along the coast who refer with pride to some big day they have had shooting "Nimkee," and wind up with the remark that they are "good eating, too." For my own part I admit a decided partiality for the Black Brant in spring; first, on account of its fatness and the consequent important addition it makes to our table, replacing for a time the other species of lean and sinewy Geese and Ducks; and, secondly, for the sport it affords, occurring, as it does, in far greater numbers than all the other species together. But, to be properly enjoyed upon the table, they must be eaten within three or four days of being killed, as after that time the fat begins to become fluid about the joints and is invested with a daily increasing flavor which by no means adds to the quality of the roast.

The flight of this species is peculiar among North American Geese and bears a close resemblance to that of the Eider and other species of heavy-bodied short-winged Sea Ducks. It has a parallel in the flight of the Emperor Goose except that the latter is a far heavier bird and, in consequence, the wing strokes are less rapid. In *B. nigricans* the strokes are short, energetic,

and repeated with great rapidity, carrying the bird with a velocity far greater than that attained by any other Goose with which I am acquainted, though probably its eastern prototype equals it in this respect.

But this is not the point upon which the mind rests when the birds are in view, for then the eye is held in involuntary admiration of the varied and graceful evolutions of the flocks which have a protean ability to change their form without ever breaking the array or causing confusion. They are very gregarious and two flocks almost invariably coalesce when they draw near each other. This frequently occurs until, as I have seen, it results in a single flock numbering between four hundred and five hundred birds. The usual size is considerably less, generally comprising from twenty to fifty or more, and it is rare to see less than ten or fifteen in a party. At times four or five individuals become detached and until they can unite with a stronger party they fly irregularly about as though bewildered, continually uttering their harsh notes, and hurry eagerly away to join the first flock that comes in view. The order of flight is invariably a single rank, the birds moving side by side in a line at right angles to their course so that the entire strength of a flock is to be seen at a glance along its front, which, at times, covers several hundred yards. There is barely room enough between the individuals to allow a free wing-stroke. Thus ranged the flock seems governed by a single impulse, which sends it gliding along parallel and close to the ground, then, apparently without reason, careering thirty or forty yards overhead only to descend to its former level as suddenly as it was left; now it sways to one side and then to the other, while at short intervals swift undulations seem to run from one end of the line to the other. These movements are repeatedly taking place; they are extremely interesting to observe but difficult, I fear, to convey an adequate idea of in words.

The entire flock, consisting of perhaps over a hundred birds arranged in single line, is hurrying on, straight as an arrow, toward its destination when, without warning, it suddenly makes a wide curving detour of several hundred yards, then resumes its original course only to frequently repeat the maneuvre, but always with such unison that the closest scrutiny fails to reveal the least break or irregularity in the line; nor does the front of the flock swerve, excepting an occasional slight obliquity which is corrected in a few seconds.

In addition to this horizontal movement is a still more interesting vertical one which often occurs at the same time as the other but generally by itself. A bird at either end of the flock rises or descends a few inches or several feet, as the case may be, and the movement is instantly followed in succession by every one of its companions till the extreme bird is reached and the entire flock is on the new level: or, it may be that a bird near the middle of the line changes its position when the motion extends in two directions at once. These latter changes are made so regularly and with such rapidity that the distance between the birds does not appear altered in the least, while a motion exactly like a graceful undulation runs the length of the flock lifting or depressing it to the level of the originator of the movement. These changes present to one's eye as the flocks approach, keeping close to the ground, the appearance of a series of regular and swift waving-motions such as pass along a pennant in a slight breeze.

The Black Brant never wings its way far up in the sky, as many other Geese have the habit of doing, but keeps, as a rule, between ten and thirty yards above the ground, with more flocks below these limits than above them.

Another idiosyncracy of this bird is its marked distaste for passing over low ranges of hills which may cross its path. A striking case of this is shown here where a low spur runs out from the distant hills in the form of a grass-covered ridge projecting several miles into the flat marshy land. This ridge is from fifty to two hundred feet above the surrounding country and bars the course of the Black Brant. So slight an obstacle as this is enough to cause at least ninety-five per cent of the flocks to turn abruptly from their path and pass along its base to round the end several miles beyond, and then continue their passage. In consequence of this habit it has been a regular practice for years for the hunters to occupy positions along the front of this ridge and deal destruction to the Brant, which still hold as pertinaciously as ever to their right of way.

The coast, from St. Michaels northward to about midway between Capes Darby and Norne, is hilly, and, in consequence, the Brant make straight across Norton Sound from this place to the vicinity of Cape Norne whence they follow the low coast-line to the north. As the Brant come from the south they make a "short cut" across the low country from the mouth of the Kus-

koquine River to the Yukon delta, and in descending the various mouths of the Yukon they invariably keep in the centre of the channel and fly low, generally within four or five yards of the ice which covers the river at the time. I can account for this dislike for flying over slight obstacles only by the supposition that by frequenting the sea coast and salt-marshes the birds have acquired a taste for keeping low even though at the expense of travelling longer distances. The same habit is shown in many Sea Ducks which have the custom of coasting low points rather than cross them.

Though I have made inquiry among the natives and a number of white men who have been as far along the coast as Point Barrow I have been unable to definitely locate the point of their greatest abundance in summer. In autumn very few Brant are seen here during their return to the south. Dall records a specimen killed at Unalaklik the 28th of September, 1867 — the latest date I have learned of its presence in Norton Sound in autumn. They generally pass south in September, between the 15th and the above date.

The fact of the much greater abundance of Brant here in spring is easily accounted for when we consider that at this season the country is but just becoming free of snow and, consequently, the migrants must advance slowly and cautiously as the country becomes habitable for them: in fall, on the contrary, the Brant, like the other waterfowl, remain on their breeding grounds until the sharp frosts in September bid them depart, when they pass down the coast, through Behring's Straits, and then straight across the sea, past the eastern Aleutian Islands into the Pacific Ocean, thus leaving the shores of Norton Sound out of their road, or only to be visited by a few stragglers. Through Dall* we learn that the Black Brant passes Fort Yukon in spring, though it is not seen there in fall. He also records it from the vicinity of Nulato in spring, probably as stragglers from either up or down the Yukon.

In the above-cited paper it is also stated that "this Goose is always lean, tough, and of disagreeable flavor," and that "it is also very shy," all of which requires confirmation, since my own experience, extending over three years, during each spring of which I have had abundant opportunity to try them in the field

* Dall and Bannister, Trans. Chicago Acad. Sci., I, 1869, p. 295.

and on the table, has convinced me of exactly the contrary. Previously in this paper I have noted the condition in which the Brant arrives and the estimation in which it is held here. As to its being shy, I have not seen a Goose or Duck during the migrations here which has such a contempt for the "human form divine." Several times I have exhausted my stock of cartridges during a morning's flight and on starting for camp to replenish have been invariably tantalized by numerous flocks passing on each side within range and in several cases within twenty yards. Of course not every flock will do this but at least half that came my way seemed supremely indifferent to my presence; and, in some instances, shouting and waving my hat caused only a slight deflection of their course. No doubt some of my readers will recall, with a smile, instances when they, too, have been caught without ammunition by wild fowl, and with what disregard they were afterwards treated, but this is not a similar case, since I have also walked along the same path at other times with plenty of cartridges which resulted in considerable damage to the Geese.

Mr. Bannister records the arrival of this species at St. Michaels the 12th of May (l. c.). It may occur thus early in exceptionally early seasons but the average dates are from the 18th to 22d of May for its arrival and about the first of June for its departure to the north.

FIELD NOTES ON THE BIRDS OF SAN JUAN COUNTY, COLORADO.

BY FRANK M. DREW.

[*Concluded from page 91.*]

44. **Spizella pallida**, *Bp.* CLAY-COLORED SPARROW.—Think I saw one in September.

45. **Zonotrichia leucophrys**, *Sw.* WHITE-CROWNED SPARROW.—Common; breeds in bushes. In June one may see the males near their homes, perched on rock, bush, or even on the ground, chanting the homely song until you fairly tire of it. I have never heard here their beautiful spring

song which they used to sing in Illinois. A nest I found in June was placed in a spruce bush, about three feet from the ground, and contained four fresh eggs. After getting the first brood off their bills, the White-crowns become scarce in the Park but numerous among the stunted bushes above timberline, where they raise a second brood; thus making a double migration in the breeding season, and keeping their love-song in fashion until late in the fall. In September they again become plentiful in the Park, and, haunting the roads, linger until October.

46. **Chondestes grammica**, *Bp.* LARK FINCH.—Common in the Park all summer. Though I found no nests, I am confident it breeds here.

47. **Pipilo maculatus arcticus**, *Coues.* ARCTIC TOWHEE.—Found in April; very shy; probably breeds.

48. **Pipilo chlorurus**, *Bd.* GREEN-TAILED TOWHEE.—Common from April to November. A sweet songster in the breeding season, but always very shy. Going up to a clump of bushes one day in May, a Green-tailed Finch fluttered out from the opposite side with wings trailing, feigning injury, at the same time uttering a sweet, complaining cry. The nest I could not find, though I searched every foot of the thicket.

49. **Sturnella magna neglecta**, *Allen.* WESTERN MEADOW LARK.—Rare. During the warm days of autumn, a few Larks straggle up from the Animas Park, where they are quite common. I can see no cause for their migrating the wrong way—3000 feet up—unless it is a scarcity of food.

50. **Scolecophagus cyanocephalus**, *Cab.* BLUE-HEADED GRACKLE.—In early summer I found Blackbirds rare, but in August and September they suddenly appeared in swarms. I have no idea where they breed, as I could not find a nest. In fall the flocks seem to have no particular place to go, nor even an individual mind. If two or three of a flock fly up, clucking as they go, they will be joined by another and another until the whole flock takes wing, making a racket like *Quiscalus purpureus*. In October they disappear.

51. **Corvus corax**, *Linn.* RAVEN.—Common in fall and early winter.

52. **Picicorvus columbianus**, *Bp.* CLARKE'S CROW.—A not uncommon resident. Keep high up until October, when they come around camp in search of food. They occasionally (?) breed as low down as 6500 feet, though I think but rarely, as I have found them most abundant between 12,000 and 13,000 feet in summer and fall. Its characteristic salute is a long, grating "*squa-a-a-a*," which sounds like the warning protest of a setting hen.

53. **Gymnocitta cyanocephala**, *Bp.* BLUE CROW; PINON JAY.—Very erratic; found only in flocks. The Piñon Jay ranges fully 6,000 feet higher than piñons grow in San Juan. How high up they breed is more than I can say. I found it in large flocks, in cottonwood groves, at 7000 feet, in May; and again, in flocks equally as large, from 10,000 to 13,000 feet, in October.

54. **Pica rustica hudsonica**, *Ridg.* MAGPIE.—A very rare resident. Probably nests near 11,000 feet.

55. **Cyanocitta stelleri macrolopha**, *Allen.* LONG-CRESTED JAY.—Very

common; breeds; partially resident. Only to be found at or above timber line in summer; in September they put in an appearance in the valley, and are then a fixture. All is told of them in saying they are as versatile as any of their cousins.

56. **Aphelocoma floridana woodhousei**, *Allen*. WOODHOUSE'S JAY.—Rare; but one found,—late in October.

57. **Perisoreus canadensis capitalis**, *Bd.* ROCKY MOUNTAIN JAY.—Resident. Quite abundant: in summer ranging from 10,000 feet to timberline. In autumn, when on his first tour of inspection around the house, he hops along in a curious sidling manner just like a school girl in a slow hurry. White-headed, grave and sedate, he seems a very paragon of propriety, and if you appear a suitable personage, he will be apt to give you a bit of advice. Becoming confidential, he sputters out a lot of nonsense in a manner which causes you to think him a veritable "Whiskey Jack." Yet, whenever he is disposed, a more bland, mind-his-own-business appearing bird will be hard to find, as also many small articles around camp after one of his visits, for his whimsical brain has a great fancy for anything which may be valuable to you, but perfectly useless to himself.

58. **Contopus borealis**, *Bd.* OLIVE-SIDED FLYCATCHER.—Not very common: breeds.

59. **Contopus richardsoni**, *Bd.* WESTERN WOOD PEWEE.—Common: breeds. Its unmusical notes can be heard from almost any aspen copse in summer.

60. **Empidonax trailli pusillus**, *Coues*. LITTLE WESTERN FLYCATCHER.—A nest of young and its owners were all I found.

61. **Empidonax flaviventris difficilis**, *Allen*. WESTERN YELLOW-BELLIED FLYCATCHER.—Quite common: breeds at 10,000 feet. The nests of *flaviventris* reported in 1878 quite upset differences of nesting etc., on which to base specific rank, yet there are differences between the two "races," quite noticible even in *Empidonaces*.

62. **Chordiles popetue henryi**, *Allen*. WESTERN NIGHT HAWK.—Straggles up from below in September.

63. **Nephœcetes niger borealis**, *Coues*. BLACK SWIFT.—Very common; breeds; hunts in large flocks. Remains until late in September, a young male of the year being taken in that month.

64. **Selasphorus platycercus**, *Rp.* BROAD-TAILED HUMMINGBIRD.—Exceedingly abundant; breeds, and "shrieches" clear through the love season. Ranges to the summit, where in countless basins watered by melting snow, primula, castilleia, caltha and other plants, form the flower gardens of the world.

65. **Selasphorus rufus**, *Sw.* RUFOUS-BACKED HUMMINGBIRD.—Rare: breeds.

66. **Hylotomus pileatus**, *Bd.* PILEATED WOODPECKER.—I have been told of "a great big Woodpecker" and from the description, think it to be this bird.

67. **Picus villosus harrisi**, *Allen*. HARRIS'S WOODPECKER.—Very abundant; much more so than the next; breeds. Ranges to timberline.

68. **Picus pubescens gairdneri**, *Coues.* GAIRDNER'S WOODPECKER.—Common; resident.

69. **Picoides americanus dorsalis**, *Bd.* STRIPED-BACKED WOODPECKER.—Formerly rare, but has become a not uncommon resident in the past two years.

70. **Sphyrapicus varius nuchalis**, *Bd.* NUCHAL WOODPECKER.—Rare, and very shy; breeds. Its taps cause a peculiar, rattling sound, quite different from the ordinary "rat-tap-tap" and several times led me long chases after a "rare bird" which I only knew by its supposed notes.

71. **Colaptes mexicanus**, *Sw.* RED-SHAFTED FLICKER.—Common from April to November; breeds.

72. **Otus vulgaris wilsonius**, *Allen.* LONG-EARED OWL.—But one found.

73. **Syrnium cinereum**, *Aud.* GREAT GRAY OWL.—One evening in February, just at dark, I saw a pair of large, gray, tuftless Owls which I think were of this species. Its "hoots" were different from those of *Bubo virginianus.*

74. **Circus cyaneus hudsonius**, *Schl.* MARSH HAWK.—A pair was found in September, at 14,000 feet.

75. **Accipiter fuscus**, *Gray.* SHARP-SHINNED HAWK.—Occasionally found; breeds?

76. **Accipter cooperi**, *Gray.* COOPER'S HAWK.—Occasionally met with.

77. **Astur atricapillus**, *Jard.* GOSHAWK.—A rare resident.

78. **Falco sparverius**, *Linn.* SPARROW HAWK.—Common. Abundant in fall near the summit, where they live on mice and grasshoppers. Breeds.

79. **Buteo borealis**, *Veill.* RED-TAILED HAWK.—Breeds. Was very common in September, in the grassy parks above timberline.

80. **Buteo borealis calurus**, *Ridg.* WESTERN RED-TAILED HAWK.—Breeds; resident?

81. **Aquila chrysaëtus**, *Linn.* GOLDEN EAGLE.—Not uncommon; resident.

82. **Cathartes aura**, *Ill.* TURKEY BUZZARD.—Seen in fall in considerable numbers.

83. **Zenaidura carolinensis**, *Bp.* CAROLINA DOVE.—Rare; breeds.

84. **Lagopus leucurus**, *Sw.* WHITE-TAILED PTARMIGAN.—Very common; breeds. They are only found above timberline in summer, where they feed on the leaves and flowers of *Caltha leptosepala.* During winter storms they descend to the valleys, hiding amongst the willows and eating willow buds. They are usually quiet during the day, but active and noisy in the evening, making a cackling like Prairie Chickens. Part of the usual description of the Ptarmigan is "tail always white." This, in so far as my observations extend, is not correct in regard to the first, or nestling, plumage, when the tail is like the back,—white, with grayish-brown blotches. They have from eight to ten young at a brood. A number I have taken this winter (1880) have the usual white plumage suffused with a delicate pink flush, enhancing their beauty wonderfully.

85. **Tetrao obscurus**, *Say*. DUSKY GROUSE.—Common; breeds. The Grouse, as it is called in contradistinction to the "Mountain Quail," or Ptarmigan, hugs the very border of timberline throughout the year; wandering above in fall after "hoppers," and coming down a little into the thick woods during severe winter weather. In summer their food consists of insects and berries, and at this time their flesh is excellent; but as soon as early frosts cut short this diet they feed on spruce needles, whence their flesh acquires a strong flavor.

86. **Ægialitis vociferus**, *Bp*. KILLDEER PLOVER.—Found in spring; breeds.

87. **Gallinago wilsoni**, *Bp*. WILSON'S SNIPE.—Found in spring and fall; breeds.

88. **Tringoides macularius**, *Gray*. SPOTTED SANDPIPER.—Common; breeds. The noisy "Peet-weet" is found on nearly every sandy flat in the river. Remains until late in August.

89. **Grus canadensis**, *Temm*. SANDHILL CRANE.—I saw a large flock pass over in September, at an elevation of 15,000 feet. They breed in the upper part of Animas Park, at 7000 feet. When on the ground the Sandhill is not an object of beauty, but a prettier vignette is not produced anywhere than you can find in autumn on the plains of Kansas, where you see hundreds of these Cranes high in air, their long bodies *en silhouette* against the sky, with fleecy clouds near by forming the boundaries of the enchanted circle.

90. **Anas bochas**, *Linn*. MALLARD.—Common.

91. **Chaulelasmus streperus**, *Gray*. GADWALL.—A small flock found in September.

92. **Querquedula discors**, *Steph*. BLUE-WINGED TEAL.—An autumnal visitant.

93. **Fuligula marila**, *Steph*. GREATER BLACKHEAD.—Seen in December.

94. **Fuligula affinis**, *Eyton*. LESSER BLACKHEAD.—Found occasionally in winter.

95. **Histrionicus minutus**, *Coues*. HARLEQUIN DUCK.—Common; said to breed.

Some of the following are accredited to the county by local observers, while the others may possibly range as high up as the pines, which just reach into San Juan. If they come at all, however, it is but rarely.

1. **Turdus swainsoni**, *Cab*. SWAINSON'S THRUSH.—"At 9200."

2. **Sitta canadensis aculeata**, *Allen*. SLENDER-BILLED NUTHATCH.—I found this Nuthatch very rare all through southern Colorado, from 6500 to 8000 feet. In June I found the bird in New Mexico, at 8000 feet. My experience with it coincides exactly with Mr. T. M. Trippe's account given in "Birds of the North-west," page 230. Its song gave me no clue to the author, and more than once I thought it was a Flicker's call.

3. **Dendrœca graciæ**, *Coues*. GRACE'S WARBLER.—A dainty little inhabitant of the pines up to 7500 feet, and perhaps higher. Common on the tributaries of the Rio San Juan.

4. **Loxia curvirostra americana,** *Coues.* COMMON CROSSBILL. — Scattered irregularly all through the pine woods. Breeds at 7500 feet.

5. **Xanthocephalus icterocephalus,** *Bd.* YELLOW-HEADED BLACKBIRD. — "At 9300 feet."

6. **Corvus americanus,** *Aud.* COMMON CROW. — "At 9300 feet." The Crows of Southwest Colorado have many a lesson to learn. Gun in hand, I have walked past within a few feet of half a dozen who merely honored me with an idle stare.

7. **Cypselus saxatilis,** *Ridg.* WHITE-THROATED SWIFT. — "At 10,000 feet: breeds."

8. **Ceryle alcyon,** *Boie.* BELTED KINGFISHER. — I have found it as high as 9500 feet. Breeds on all the lower rivers.

9. **Melanerpes torquatus,** *Bp.* LEWIS'S WOODPECKER. — Very common up to 7000 feet.

BREEDING OF THE ACADIAN OWL (*NYCTALE ACADICA*) IN MASSACHUSETTS.

BY WILLIAM BREWSTER.

So far as I can ascertain, the single egg of the Acadian Owl which is preserved in the National collection at Washington is the only authentic example known. It accordingly gives me unusual pleasure to announce the recent acquisition of a fine set of fully identified specimens taken by Mr. W. Perham at Tyngsboro, Mass., April 5, 1881. Mr. Perham is probably already known to some of the readers of the Bulletin as a remarkably successful collector of Hawks and Owls. He takes many eggs of the Mottled Owl by hanging up artificial nests in suitable places in the woods. These "nests" are made from sections of hollow trunks boarded up at the open ends, with entrance-holes cut in the sides, and the Owls apparently find them quite to their taste for they freely appropriate them, both as roosting and nesting places.

Sometime late in March of the present year a pair of Sawwhets took possession of one which was nailed against the trunk of an oak in an extensive piece of woodland. No nest was made, the eggs being simply laid on a few leaves which squirrels

had taken in during the winter. There were four eggs on April 4, and as the number was not increased the following day, Mr. Perham decided that the set was complete and accordingly took the parent birds with their clutch. He writes me that he made many unsuccessful attempts to catch the female on her eggs. She invariably flew out when he began to climb the tree, and he was at length obliged to shoot her. This behavior is strikingly different from that of the Mottled Owl under similar circumstances, for the setting female of the latter species can always be taken off her nest by the hand, and even when pulled out of the hole rarely makes any attempt to escape. The male Saw-whet was shot while sitting on a branch near the nesting-hole.

So much for the particulars of the capture; now a word as to the specimens themselves.

The eggs were sent to me unblown: the birds, in the flesh. Had there been any reason to doubt the truth of Mr. Perham's representations, this fact would have set the matter at rest. The belly of the female was bare and wrinkled, showing that incubation had begun, but among her ovaries I found two eggs developed to the size of large buck-shot, which upon being cut open yielded a small quantity of yellow *yelk*. From this I infer that two more eggs would have been added to the set, perhaps, as with the Cuckoos and some other birds, after those first laid were well along towards hatching. The plumage of both male and female is clear and unworn but their coloring is much paler than in autumnal examples.

The eggs were perfectly fresh. The yelk was yellow of about the usual tint. The four specimens measured respectively 1.21 × .95; 1.21 × .98; 1.25 × .96; 1.25 × .97. They are nearly elliptical in shape, one end being only slightly more pointed than the other. The texture of the shell is rather rough and chalky in appearance and there is not the slightest perceptible polish. Two of them are much soiled with a brownish stain which easily washes off, and which was perhaps caused by contact with damp and decaying vegetable matter in the nest; the other two are pure, dead white. The Smithsonian specimen is very much smaller than the present ones, measuring, according to Dr. Brewer (B. N. A., Vol. III, p. 47), only .95 × .88.

The above detailed facts may be regarded as furnishing the first positive evidence we have of the breeding of this Owl in

Massachusetts. In one of the early numbers of the Bulletin (Vol. II, No. 3, p. 84), however, Mr. Deane announced the occurrence near Boston of several young birds which were taken in June and July, and hence the present record will not be entirely unexpected. In this connection it is scarcely worth while to consider the supposed Saw-whet's egg which Minot mentions* as "found in a pine-wood near Boston, ... lying on the ground (not far from a tree in which a Saw-whet had previously been seen)." This record, with many similar ones by the same author, may simply be ignored as unworthy the attention of the careful student of ornithology.

SONGS OF THE WESTERN MEADOW LARK (*STURNELLA NEGLECTA*).

BY CHARLES N. ALLEN.

No. 1. (See next page.) The song which first called my attention to the Western Meadow Lark.

Nos. 2, 12, 23. Alike in time and form but somewhat unlike in melody.

No. 6. An odd melody, but a common one, usually followed by a short musical gurgle which I cannot reduce to musical characters.

No. 11. Finished by singing the last three notes an octave lower than the first part leads one to expect.

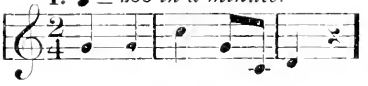
No. 20. One of four distinct and dissimilar melodies sung by one bird without leaving his perch.

No. 24. The singer passes from "G" to "D" with a sweep, as is often done on a violin.

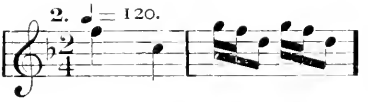
No. 25. A part of the Lark's soft song. This is very incomplete, but gives some idea of the song. It was caught by me in four detached portions, and I am not sure that I have them in the right order. The notes are correct, though their sequence may be wrong. All the other songs in this paper belong to the loud class. I am inclined to think that if the Meadow Lark's soft song were familiarly known, his reputation as a singer would

* Land and Game Birds of New England, p. 334.

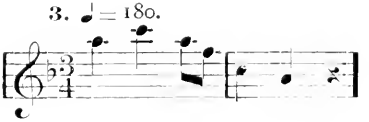
1. ♩ = 200 *in a minute.*



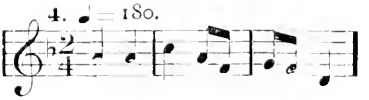
2. ♩ = 120.



3. ♩ = 180.



4. ♩ = 180.



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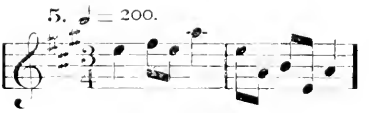
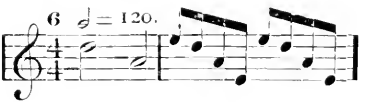
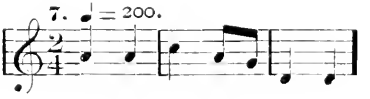


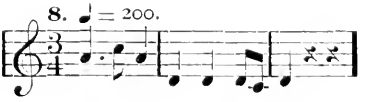
6 ♩ = 120.



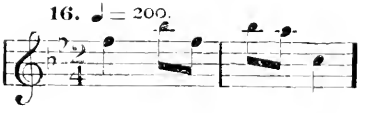
7. ♩ = 200.



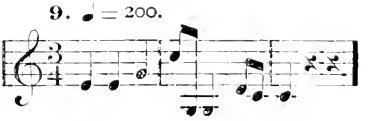
8. ♩ = 200.



16. ♩ = 200.



9. ♩ = 200.



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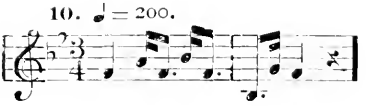

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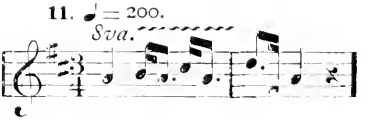

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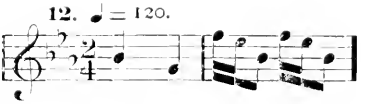

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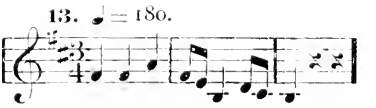

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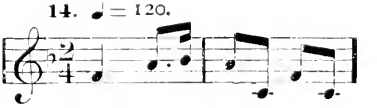

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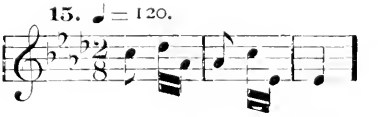

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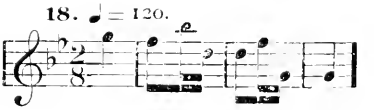
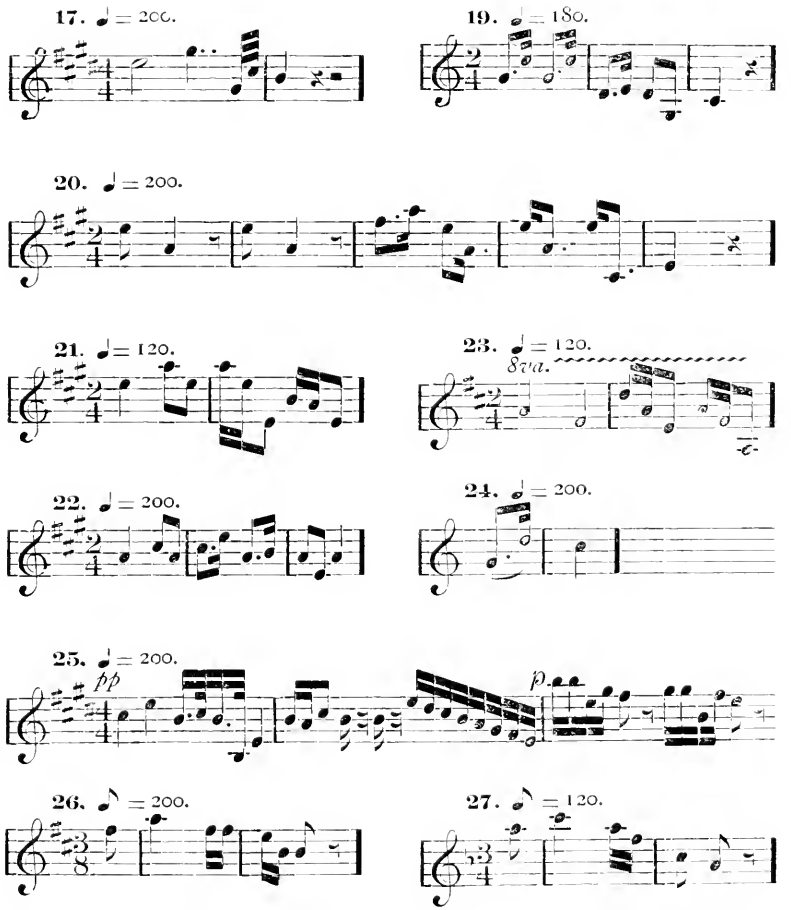




be materially enhanced. This imperfect part of the song is also in more regular time than I have heard save in the short, loud melodies, which are strikingly regular, and of which I will speak further on.

Regarding this *soft* song, I am not yet sure that the bird has more than one; but I suppose that he has, since his repertory of short, ringing melodies is so large. These latter are easily studied, because they are audible at such a distance as to enable one to avoid approaching so near as to alarm the singer. It is not so with the soft song, and to hear it well one must run the risk of

frightening the bird. One should not be more than fifty feet away, or he will fail to catch the beauties of this song, and even then all else should be silent. I have called this the soft song. I will call it rather the *piano* song, and those of the loud class, *forte* songs, so as to readily distinguish them. The piano song has tones very subdued and ineffably sweet and liquid. Often in the midst of soft warbles, runs, and trills, will be heard the music of one of the forte songs, only given in such a quiet way as to seem like an echo. Two or three times, also, in the course of his song, he introduces two antiphonal musical passages, the second being a sort of answer to the first, and completing it. The third bar of No. 25 is an example of this.

The piano song, whenever I have heard it, has always had one of the forte songs as a prelude, and fills the interval between each repetition of the latter. The moment the piano song is finished, a forte song is introduced, immediately followed again by the piano song, and this continues until there have been several repetitions of the pair of melodies, occupying, in their production, from three to five minutes. While the forte songs consume but three or four seconds, the piano songs last from 20 to 25 seconds.

The piano song has such length, contains so many notes, and is sung with such rapidity that it is very difficult to reduce it to musical characters. While my ear retains one passage, and my pencil is writing it, the bird sings the whole song, and has perchance flown away, leaving me with only a fragment. I hope to secure the entire melody (or several of them if they exist), by catching detached portions, and arranging them in their order. Melody, time, and pitch must all be grasped at once, and much practise can alone accomplish it. Were it only to hear the melody played upon piano or violin, the task of retaining it in memory long enough for transcription would be comparatively easy.

This paper contains twenty-five of the forte songs of the Western Meadow Lark. This number is probably only a small percentage of the melodies of this class contained in the bird's repertory. I have heard many other melodies which the want of pencil and paper, or obstacles of other kinds, prevented me from taking down. No. 26 I heard April 5, just at dark, while riding in one of the gulches of Green Mountain, and retained it in memory until I reached home.

All the forte songs have clear, ringing tones, which are audible

at a considerable distance. I have heard them when I was six or seven hundred feet away from the singer, quite as distinctly as I could hear a loud call of the ordinary human voice.

I know of no musical instrument whose quality of tone—*timbre*—is like that of *Sturnella neglecta*. I have thought that a combination of the tones of the Boehm flute and a good, glass dulcimer might represent it pretty accurately. It has qualities heard in the notes of the Bobolink, and of the Baltimore Oriole.

Many of the forte songs have a general similitude, but are sufficiently diverse to constitute distinct melodies; while others are decidedly unique and individual. Nos. 7 and 13, though in different keys, are very nearly alike. Many of them are melodies whose notes follow the simplest laws of musical progression, while others either introduce into the body of the song two or three notes which seem odd and out of place, or end in a note which the foregoing notes do not naturally lead us to expect. The note "E," in No. 23, is a case of the former kind, and "C," in No. 16, of the latter. I have noticed that very many songs begin with either two or three notes of equal length, but songs with other beginnings are common.

It was my good fortune in March, 1879, to watch and listen to a Western Lark about thirty feet distant, while he sang *four distinct melodies* without leaving his perch, changing from one to another without apparently observing any particular order. As regards variety in his songs, I do not know, further than this instance, what powers the bird has. I have often heard one bird sing two, and occasionally three melodies entirely dissimilar, save in quality of tone.

The *time* in which the forte songs are sung is quite regular. I have heard no passages which could be marked *accelerando* or *ritardando*. I have tried so to place the bars in these melodies as to indicate the correct rhythm, and think I have succeeded in doing so, since I have detected no error after hearing each song scores of times under favorable circumstances. No. 3, however, I have heard sung with another accent. (See No. 27.)

The quality of the bird's tones is so unique that I have had difficulty in determining *actual* pitch, and I am inclined to think that some of the songs are sung an octave higher than they are written. Still, many of the lower tones have a depth of sound which excites my wonder, knowing how small is the organ which

produces them. These tones have a trace of the quality of a rich, pure alto voice, when singing below "middle C." The *relative* pitch is generally correct; though a few of the songs may be out of the way a semitone or even a tone.

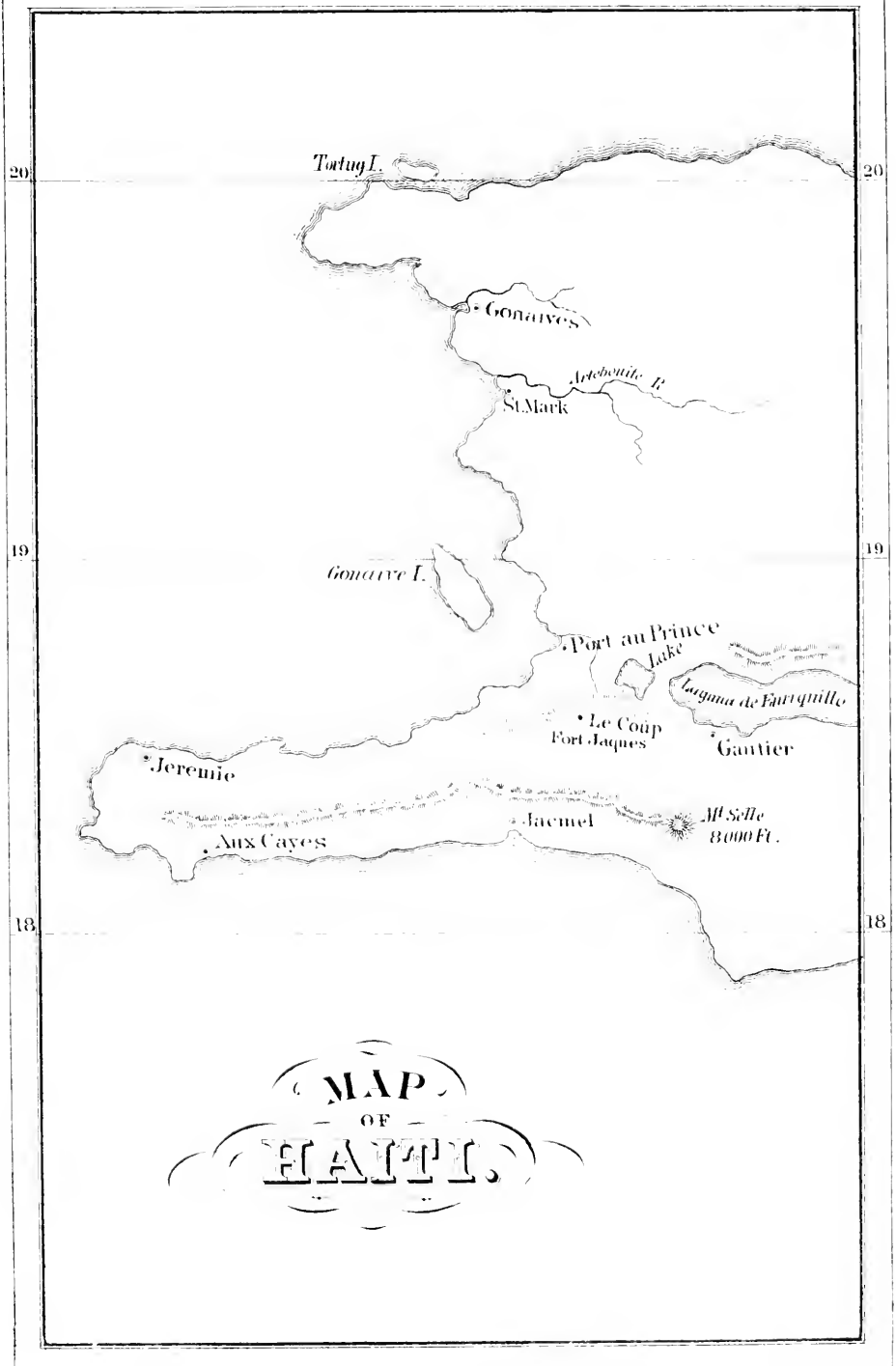
The *melodies* of these various forte songs are correct. Many years of familiarity with the study of music enables me to speak positively on this point. But the bird occasionally varies the melody in one or two notes. In No. 8, the lower "A" is sometimes changed to "B." Numbers 7 and 13, cited above, also furnish a case in point.

I am somewhat uncomfortably conscious that this paper sadly conflicts with some of the statements made in a most delightful article in the May number of "Harper's Monthly Magazine," 1878, entitled "Song Birds of the West." But may it not be that the eminent writer is not a musician?

He speaks of the *song* of the Western Lark; there are many very distinct songs, as this paper shows. I cannot apply the writer's syllables, "*tung*', *tung*', *tung*'-*ah* — *twil'lah*, *twil'lah*, *tung*'," to any of the bird's songs that I have heard, and get them to fit in any way. Even notes, the best representatives of musical sounds, give but a partial idea of these melodies: how much less will syllables accomplish it! While the songs of some *Oscines* seem to contain sounds which are accompanied by a kind of articulation (that of the "Shore Lark" being one), and can be partially represented by syllables, I have as yet heard nothing of the kind in any of the songs of the bird under consideration. They are sung in tones pure and simple, which have no more articulation or syllabication than those of the flute or violin. Then the first part of a song, supposing "*tung*', *tung*', *tung*'-*ah*" to indicate it, never has, in so far as I have heard, more than two notes in succession which are "alike in tone and accent:" nor have I been able to identify the "sort of half trill" in the second part; although I can, in some songs, detect the "rising inflection," and several songs end in a note similar to the first.

Regarding the piano song, I should have said above that it is by no means as frequently sung as the forte songs. A bird will repeat a forte song a score of times, leaving silent intervals between the repetitions, instead of filling them in, as he sometimes does, with the piano song.

I have frequently heard the bird sing a forte song while on the wing, sometimes repeating it twice before alighting.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Le Coup
Fort Jaques
Gantier
Jeremie
Jacmel
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18

MAP OF HAITI.

LIST OF THE BIRDS OF HAITI, TAKEN IN DIFFERENT PARTS OF THE ISLAND BETWEEN JANUARY 1 AND MARCH 12, 1881.

BY CHARLES B. CORY.

1. **Mimocichla ardesiaca** (*Vieill.*).– Abundant in the vicinity of Fort Jacques at an altitude of about 2500 feet above the level of the sea. Specimens were also taken near Port-au-Prince, but only on two or three occasions, and then in the thickest and most secluded localities. High up in the mountains we often observed it flying about in the open. Its note somewhat resembles that of our common Robin (*Turdus migratorius*). The food consists mainly of insects and berries.

The Haitian bird differs from specimens taken in Porto Rico in being somewhat smaller and having the bill more highly colored.

2. **Mimus orpheus dominicus**, (*Linn.*) Bryant. — An abundant resident species. Its habits, food, etc., appear to be identical with those of *M. polyglottus*.

3. **Myiadestes montanus**, *Cory*. (See *anteà*, p. 130.) — An apparently rare species frequenting the summits of the highest mountains. The natives call it "*Musician*," and have a variety of opinions concerning it. It is generally thought to be a spirit, which, if seen, would bring misfortune to the person who was so unfortunate as to meet with it. Others consider it to be an insect. We procured a single specimen in the neighborhood of Fort Jacques.

4. **Siurus auricapillus** (*Linn.*).— Common winter visitant.

5. **Siurus ludovicianus** (*Vieill.*).— Two specimens taken; very large, but otherwise identical with the northern bird.

6. **Mniotilta varia** (*Linn.*).— Common winter visitant.

7. **Parula americana** (*Linn.*). — Winter visitant; common in the vicinity of Gonaives and Port-au-Prince.

8. **Dendrœca tigrina** (*Gm.*).—Very abundant in February and March.

9. **Dendrœca cærulescens** (*Linn.*). — Abundant in February and March.

10. **Dendrœca coronata** (*Linn.*). — Common in winter.

11. **Dendrœca discolor** (*Vieill.*). — Winter visitant.

12. **Dendrœca palmarum** (*Gm.*). — Common winter visitant.

13. **Geothlypis trichas** (*Linn.*).— Common in winter.

14. **Setophaga ruticilla** (*Linn.*).— Very abundant in winter.

15. **Certhiola cluciæ**, *Hartl.*— Abundant in some localities among the mountains. At Petionville we observed it daily running about the trunks of the bananna trees. None were seen in the low land of the interior.

16. **Petrochelidon fulva** (*Linn.*).—A single specimen, taken February 10. At Gonaives several flocks were observed flying about the houses, but the next day none were seen and we did not meet with it again during our stay on the island.

17. **Vireo altiloquus barbatulus** (*Vieill.*) *Cab.*—Occasionally met with near the coast.

18. **Dulus dominicus** (*Linn.*).—A gregarious species, abundant among the mountains, usually in the vicinity of cocoanut trees. The food consists of insects and fruit in the season. The sexes are similar.

19. **Euphonia musica** (*Gm.*).—A single specimen in immature plumage taken at Le Coup (Petionville). As I believe the stage of plumage to be hitherto undescribed I give it in detail:

♂ juv. Forehead pale orange; top of the head grayish blue; back olive-green blotched with dark blue; rump brownish-orange; wings and tail black, some of the tertiaries and coverts edged with olive-green. Underparts olive-green, marked with brownish on the throat; dark orange, shaded with greenish, on the belly and crissum. Bill and feet black.

20. **Spindalis multicolor** (*Vieill.*).—Apparently rare. Two specimens, taken in March in full breeding plumage.

21. **Phœnicophilus palmarum** (*Linn.*).—Very abundant among the mountains. At Le Coup it was one of the most common species. None were observed at Jacmel on the south side of the mountains, where it seemed to be replaced by *P. dominicensis*. It resembles a Vireo in habits, and is very tame and unsuspicious. The note is a short sharp *chip*, usually uttered when in the act of taking flight. The food consists of fruit and insects of various species. The sexes are similar.

22. **Phœnicophilus dominicensis**, *Cory*. (See *anteà*, p. 129.)—Several specimens taken, all on the south coast, in the vicinity of Jacmel. None were observed elsewhere.

23. **Loxigilla violacea** (*Linn.*).—An abundant resident species although not often seen, on account of its retiring habits and the localities which it frequents being in many cases inaccessible.

24. **Phonipara bicolor** (*Linn.*).—Resident and common.

25. **Phonipara olivacea** (*Gm.*).—A rather common resident. Its note is a continuous trill, very soft and sweet. It also "chirps" in a manner much resembling *P. bicolor*. The female differs from the male in having the face-markings of a much paler yellow and smaller. The stomachs of two specimens dissected contained the remains of insects and one or two small berries.

26. **Chrysomitris dominicensis**, *Bryant*.—Several specimens taken in the mountains near Petionville.

27. **Icterus dominicensis** (*Linn.*).—A resident species, very abundant in the interior. They are gregarious, and during the months of February and March flocks of from ten to fifty individuals were seen every day at Petionville flying about among the orange-trees. The sexes are alike. Immature specimens have the throat blackish, head and back pale brown, and underparts greenish-yellow.

28. **Quiscalus ater**, *Baird.*—Common about the lakes and rivers of the interior.

29. **Corvus leucognaphalus?** *Daud.*—The state of confusion which exists at the present time regarding this genus is such that the identification of specimens without actual comparision has become well-nigh impossible. A large flock of Crows were met with in the vicinity of Gantier, and several specimens taken which differ somewhat from the description of *C. leucognaphalus;* but as further description of supposed new forms would only add to the general uncertainty, I provisionally refer it to this species.

30. **Pitangus gabbii**, *Lawr.*—A resident species, apparently not uncommon in the interior. Several specimens taken.

31. **Myiarchus stolidus** (*Gosse.*).—Resident and common throughout the island.

32. **Tyrannus dominicensis** (*Gm.*).—Several specimens taken.

33. **Tyrannus griseus** (*Vieill.*).—Resident and common.

34. **Lampornis aurulentus** (*Vieill.*).—Very abundant among the mountains at an elevation of one thousand feet and upwards. Although often observed hovering over some flower or perched upon a small twig within a few feet of the ground, it seemed as a rule to prefer the topmost branches of the tallest trees. One huge giant in particular seemed to be an especial favorite. It grew in a small valley upon the outskirts of Petionville and I rarely passed without observing a dozen or more of this pretty little species darting in and out among its topmost branches, appearing like flies in the distance.

35. **Mellisuga minima** (*Linn.*).—Although this little species is very abundant in some portions of Haiti, it is by no means an easy matter to procure specimens. Even after the bird is killed its extreme smallness and plain coloration render it a difficult object to find amongst the luxuriant tropical vegetation which everywhere covers the ground. I have often observed the male bird perched upon a twig singing merrily, turning his head from side to side as if greatly enjoying his own music. The song consists of a succession of "*tzweeps*" often continued for from one to two minutes without intermission, and may be distinctly heard at a distance of thirty yards.

36. **Sporadinus elegans** (*Vieill.*).—Apparently rare, as only four specimens were taken; two near Gantier, in the low country bordering the lake, and two in the vicinity of Le Coup.

37. **Cypselus phœnicobius** (*Gosse.*).—Abundant in the interior in and about Gantier near the lakes; specimens were also taken at Jacmel.

38. **Antrostomus carolinensis** (*Gm.*).—Several specimens taken; apparently does not differ from the northern bird.

39. **Picumnus lawrencii**, *Cory.* (See *antea*, p. 129, pl. I.)—Probably rare. Two specimens taken, a male and a female, the first at Jacmel and the other among the mountains near Petionville. Its habits resemble those of a Woodpecker, it climbing about the trunks of trees in search of its food. It has a short, sharp note, generally uttered while flying. The nest

is built in a hole in the trunk of a tree. I have placed this species in the genus *Picumnus* provisionally, as there are several slight points of difference which may admit of its generic separation.

40. **Centurus striatus** (*Bodd.*).—An abundant resident species, found everywhere among the mountains wherever large trees are to be found.

41. **Todus dominicensis**, *Lafr.*—Resident and very abundant. They are very pugnacious in disposition, constantly fighting among themselves. Sometimes two would meet in the air, lock their bills together and whirl round and round until they struck the ground, when, after a short battle, one would fly away the other following in pursuit. When suddenly surprised it often utters a peculiar noise resembling the snort of a pig.

42. **Ceryle alcyon** (*Linn.*).—Common winter visitant.

43. **Crotophaga ani**, *Linn.*—An abundant resident species, generally observed in flocks feeding in the fields or perched upon the branches of a bush, uttering from time to time a curious but not unmusical whistle. It is not particular as to food, insects, beetles, berries, or fruits being equally acceptable. An egg procured at Jacmel is of a greenish blue color, covered with a white chalky coating.

44. **Saurothera dominicensis**, *Lafr.*—The present species is known to the inhabitants as the "Lizard-catcher," and it is not inappropriately named. It waits quietly, standing perfectly motionless, until a lizard comes within its reach and then with surprising quickness darts upon and kills it. I have seen lizards four or five inches long killed in this way. It has a long loud call consisting of a series of quickly repeated cries somewhat resembling that of our Golden-winged Woodpecker (*Colaptes auratus*).

45. **Coccygus minor** (*Gm.*).—Several specimens taken.

46. **Chrysotis sallei**, *Scl.*—Abundant on the coast in summer but retiring to the interior during the winter. A single specimen was procured at Jerémie.

47. **Speotyto cunicularia dominicensis** (*Mol.*) *Baird.*—Resident and very abundant in the low scrub bordering the large lakes of the interior.

48. **Tinnunculus sparverius** var? (*Linn.*).—Not uncommon. Several specimens taken.

49. **Nisus fuscus** (*Gm.*).—A single specimen taken, representing a very pale stage of plumage.

50. **Chamæpelia passerina** (*Linn.*).—Abundant.

51. **Zenaidura carolinensis**, *Bonap.*—Very abundant in some localities. In the vicinity of Gantier it is constantly seen flying about among the low growth.

52. **Columba leucocephala**, *Linn.*—Abundant in the interior.

53. **Ortyx virginiana** (*Linn.*).—Introduced many years ago, according to the statement of the inhabitants. Common.

54. **Tringoides macularius** (*Linn.*).—Several specimens taken near Jacmel.

55. **Ardea rufa**, *Bodd.*—Several seen.

56. **Ardea cærulea**, *Linn.*—Two specimens taken.

57. **Ardea virescens**, *Linn.*—One specimen, taken near Port-au-Prince.

58. **Aramus scolopaceus giganteus** (*Gm.*) *Bp.*—Considered a great delicacy by the inhabitants who claim it is not uncommon. Two specimens taken.

59. **Parra violacea**, *Cory*. (See *anteà*, p. 130.)—A single specimen taken near Gantier. The natives seemed to know the bird and stated that it was not uncommon about the lakes of the interior.

60. **Gallinula galeata** (*Licht.*).—Common about Lake Enriquills near Gantier.

61. **Porphyrio martinica** (*Linn.*).—Several specimens taken at the lakes.

62. **Fulica americana**, *Gm.*—Common.

63. **Phœnicopterus ruber**, *Linn.*—One seen; probably common in some localities.

64. **Pelecanus fuscus**, *Linn.*—Abundant on the coast.

65. **Tachypetes aquilus** (*Linn.*).—Several specimens seen.

With the exception of the Water Birds, the foregoing list includes nearly all the species previously recorded from Haiti and Santo Domingo, besides a number new to the Island, and four new species.*

Dr. Bryant's list of the birds of Santo Domingo (Proc. Boston Soc. Nat. Hist., Vol. XI, p. 89) contains a number of species not observed by our party. Some of them are questionable, being in all probability wrongly identified. They are as follows: *Dendræca dominica*, *Temnotrogon rhodogaster*, *Corvus jamaicensis?* *Progne dominicensis*, *Saurothera vieillotii*, *Picus passerinus*, *Conurus chloropterus?* *Columba corensis*, *Geotrygon martinica*, *Numida meleagris?* *Ardea luce?* *Ardea candidissima*, *Ægialitis vociferus*, *Himantopus mexicanus?* *Querquedula discors*, *Podiceps dominicus*, *Sula fusca?* *Sula dactylatra?* *Anous stolidus*, *Sterna fuliginosa*, *Sterna regia*, *Sterna antillarum*, *Phaëton flavirostris*, *Puffinus obscurus*.

* Described in this number of the Bulletin, pp. 120, 130.

ON THE NUMBER OF PRIMARIES IN BIRDS.

BY J. AMORY JEFFRIES.

Little attention has been paid to the number of primaries in the different species of birds save in the *Oscines*, where the number has been supposed to vary from nine to ten. In 1840 Nitzsch, in his great work on the feather tracts of birds, showed that nearly all birds, except the nine-primaried species, had ten primaries. However, he showed that the Storks, Flamingoes, some species of *Colymbus*, *Alca torda*, and some species of *Uria* had eleven primaries. Later Sundevall* showed that the wing feathers are, like those of the rest of the body, in quincunx order. In treating of the primaries, he says that they vary from nine to eleven, the only cases of the last number being found in *Podiceps*, *Phœnicopterus*, *Anastomus*, *Tantalus*, *Ciconia*, *Musophaga*, and *Corythaix*. The first primary, when present, is inserted on the third phalanx of the II finger, at least in *Podiceps*, the second primary on the second phalanx, the third and fourth on the first phalanx, and the rest on the metacarpal. Sundevall also states that there are as many coverts as primaries.

Until the publication of Baird's "Review of American Birds," it was supposed that Passerine birds varied in the number of their primaries, some families, as the Thrushes, having ten primaries, others, as the Tanagers, and Finches, having nine, and in one group, the Vireos, some species were thought to have nine, others ten primaries. In the work above referred to Professor Baird showed that in nine-primaried *Oscines* there were two "little feathers" placed at the end of the wing, which he considers, judging from position and color, to be the first primary and covert. In ten-primaried birds there is but one little feather, which Professor Baird called a covert.

In 1876, Dr. Coues† repeated the observations of Professor Baird in all the North American families of *Oscines*. He found that, with the possible exception of *Collurio* and *Ampelis*,‡ all

* Kong. Vetenskaps Academien Handlingar, 1843, übersetzt im Cabanis's Journ. für Orn., III. Jahr. (1855), pp. 118–168.

† Bull. Nutt. Ornith. Club, I, No. 3, Sept., 1876, pp. 60–63.

‡ *Ampelis* has two little feathers.

the ten-primaried families have but one "little feather" while the nine-primaried birds have two. Dr. Coues comes to the conclusion that the second little feather is the homologue of the first primary in ten-primaried birds. Next he passes on to the first "little feather" and considers the pros and cons of this being a primary also, but does not commit himself. He states that size and shape point to its being a primary; that color, principally relied on by Prof. Baird, points both ways; and "that if the feathers be not a covert, then the first fully developed primary has none, while the rest have one apiece."

In 1878, Mr. Batchelder* showed that the second "little feather" is sometimes developed into a spurious quill, thus confirming the supposition of Professor Baird. About the same time Dr. Coues† again returned to the subject, only this time he implies that both the "little feathers" are primaries. He states that size, shape, and position are in favor of the first "little feather" being a primary, while "coloration is against such hypothesis," though it sometimes points the other way, as in *Sitta carolinensis*. He entirely omits his argument about the first primary having no covert, though he refers the readers to his paper in the Bulletin.

Before going farther it is necessary to study the feathers on the wing in regard to position, structure, color, and shape. The feathers of the wing are naturally divided into four or more sets. These are (1) the remiges with their coverts above and below; (2) the contour feathers of the upper surface; (3) the contour feathers of the lower surface; (4) the contour feathers of the anterior edge, and the feathers of the false wing. The remiges are developed along the posterior, or radial, edge of the fore-arm and hand. Each remex has two coverts, one above and one below — the upper covert more distal in position than the remex it belongs to — which serve to a greater or less degree in flight. The coverts are arranged in quincunx order in relation to the remiges, and morphologically are only the contour feathers next to the remiges. However, they show such constant relations to the remiges that they are naturally classed with them. The remaining feathers of the upper and lower surfaces are contour

* Bull. Nutt. Ornith Club, III, No. 2, Apr., 1878, pp. 97–98.

† Birds of the Colorado Valley, Pt. I, pp. 480–487, foot note.

feathers more or less modified. Here it is only necessary to note that since all feathers are in quincunx order, they bear definite relations to each other.

The feathers of the anterior edge run in two or more rows along the fore-arm and hand, certain ones being modified to form the spurious wing. Since these are continued to the very tip of the index finger they often fall into rank with the primaries and coverts of the opposite aspect, and hence can not be distinguished by their geometrical relations from the primaries and coverts. They can be distinguished from primaries, however small, by their relations to the finger bones. The primaries are always on the so-called flexor face, the feathers of the anterior surface are on the opposite face. As a rule these two surfaces are separated by the tip of the index finger, which, generally, projects, and in young Ducks bears a claw.

There is no positive distinction between any of the feathers as regards structure and shape. The feathers of the upper and lower surfaces gradually shade into the primaries. Professor Baird has endeavored to distinguish the primaries from the coverts by their colors. But Dr. Coues has shown that the difference in color, when present, does not always separate the coverts from the primaries, and that in many species there is no difference in color. So we are forced to the conclusion that the only reliable means of determining a primary or other feather is by its position. Allowing that position is the true key to the homology of the wing feathers, it is evident that in all attempts to determine the number of primaries in birds we should begin with the most simple condition of the feather: in short, we should study the embryo and fledgeling. The study of these also has the advantage that they are much less specialized than the adult.

I shall now take up several of the groups of birds represented in North America in relation to the number of their primaries, considering the young whenever they have been procurable.

Oscines. In a young nine-primaried bird, as *Melospiza melodia*, nine nearly equal conical papillæ will be seen on the posterior edge of the hand, and besides these a much smaller one on the extreme tip of the wing. These are the papillæ of the nine developed and the rudimentary primary. Immediately above these on the dorsal surface are nine small points projecting from the skin between the bases of the primaries: these are the papillæ of

the primary coverts, and above these yet another row. Besides these there is a double row of feathers running down the anterior edge of the wing to the tip, distinguished from the rest by their smaller size and position on the opposite side of the finger bones. The thumb also has a special set of papillæ, which develop into the spurious wing feathers. Passing to the fore-arm we first come to the secondaries, in this case nine in number. Above these we find another row of papillæ, the secondary coverts, placed between the bases of the secondaries. These papillæ are not nine in number, but eleven, the first one being placed above the tenth primary and the eleventh behind, or proximal to the last secondary. This first secondary covert later grows into close relations with the last primary and has been mistaken for a primary covert. From this arise the statements that there are as many primary coverts as primaries. That this feather is really not a primary covert is apparent in very young birds. Above the secondary coverts there is yet a third row of eight. Besides these, if we look carefully, we find two or more little papillæ placed between the tenth primary and first secondary and the first and second secondaries. When the wing feathers have broken out of their sheaths many more little feathers are developed along the edge of the fore-arm. These little feathers can, for the most, be referred to two rows, one between and alternating with the secondaries and the other between the secondaries and their coverts. Besides these, other little feathers appear at the carpal region, between the primaries and secondaries; these I cannot correllate, though they are quite constant both in position and number.

If we now take a young Sparrow in its first plumage and count forwards and backwards from the carpal joint we find exactly the same number of feathers as papillæ in the nestling. Only the second "little feather" must be counted as the first primary and the first little feather as the covert, not of the first primary but of the second. The first has no covert. In the wing of a young Song Sparrow (*Melospiza melodia*) now before me the "second little feather" is clearly in line with the other primaries and the first little feather, larger than the second is placed above and between the second little feather and first primary of systematic writers: that is to say, between the first and second primaries. In the adult Song Sparrow we find exactly the same conditions save that the two

little feathers lie one over the other and, owing to their small size, apparently on the shaft of the first developed primary. The same condition is found in the young of *Goniaphea ludoviciana*, and *Sialia sialis*. *Passer domestica* differs in that the first primary is in due proportion to the first covert.

This proves that the "first little feather" is nothing but the covert to the first developed primary and that the "second little feather" is an undeveloped primary.

There is no room for doubt about the homologies of the papillæ, and the feathers are nothing but parts of the papillæ. The second and subsequent sets of feathers are developed from buds of the original papillæ, much after the manner of teeth, and hence are equally determinate with the original papillæ from which they spring.

If we examine a ten-primaried Oscinine bird we find the same condition of things as in the nine-primaried, except that the first primary papilla is of good size. Of this condition of things the fledglings of *Troglodytes aëdon* and *Mimus carolinensis* are good examples. So the formula for a nine-primaried and a ten-primaried Oscinine bird is the same. The number of feathers can be represented as follows, "ab." standing for aborted, and a minus sign indicating a feather belonging to a series of the fore-arm beyond the carpus:

Melospiza melodia: Pr., 1 ab., 2—10; pr. c., 2—10, 3rd row, 7. Sec., 9, sec. c., —1, 2 — 11, 3rd row, 8.

Mimus carolinensis: Pr. 1 — 10, pr. c., 2 — 10, 3rd row, 7. Sec., 9, sec. c., — 1, 2 — 11, 3rd row, 1 — 6. 7 — 8 small.

To this rule *Corvus americanus* forms an exception, since it seems to have ten primary coverts.

Passing to the *Clamatores*, the King Bird (*Tyrannus carolinensis*), will be taken as an example. Here the fore-arm remains nearly the same, even in respect to the auxilliary feathers, but in the hand we find a first covert beyond the first primary and another corresponding feather added to the third row. So the formula for *Tyrannus carolinensis* is: Pr., 10, pr. c., 10, 3rd row, 8; sec., 9, sec. c., 10 — 1, 3rd row, 9.

In the fledgling of *Chætura pelasgica* we find the following formula: Pr., 10, pr., c. 10, 3rd row, 8, sec., 9, sec. c., 10 — 1, 3rd row 7. Besides these there are several more rows.

In the adult *Trochilus colubris* there are ten primaries and

ten coverts. The same number is found in the young, though the first covert is very small.

Anisodactylæ. I have not been able to examine any young of this group, which it is especially desirable to do, since in the Kingfishers the adult has ten primaries, ten coverts, and a "little feather," which may be another primary. This at least is the case in *Ceryle alcyon* and in species of *Dacelo*.

Pici. In *Picoides arcticus* the young gives the following formula: Pr., 10, pr. c., 9, 3rd row, 6. In the nestlings of this species and of *Colaptes auratus*, the only young Woodpeckers I have seen, the last three or four primaries are very small and seem not to become fully grown till after the moult. This may be an adaptation to the home of the young bird, since it enables the wing to fold up close with less pressure on the growing feathers than would be the case if they were all fully developed.

Accipitres. Among the Hawks, I have examined the young of *Buteo pennsylvanicus* and found, to my surprise, eleven primaries, ten coverts, and a terminal claw. That it was a true claw there can be no doubt, its resemblance to the undoubted claw of the 1 finger or thumb being complete. The presence of the claw is here of interest, as it points to the existence of a third phalanx, a thing not accredited to the Hawks and not ossified in my skeleton of the Sharp-shinned Hawk (*Accipiter fuscus*). I limit my remarks to this specimen, since, judging from the almost universal absence of the ungual phalanx of the thumb, no reliance can be placed on museum specimens. In adult *Buteones* there is a small feather in the proper position for the first primary, but structurally it is only a contour feather. This may be developed from the first primary papilla or the papilla may abort; it is difficult to say which.

Of the remaining groups of birds my observations have been even more sparse than in the foregoing. For convenience I will next consider the Ducks, taking a domestic Duck in illustration. In this case, as is true of all the lower birds, down tufts are developed from the papillæ of the primaries, thus making a strong contrast to the young birds previously described, where the papillæ assume the structure of pin-feathers before they burst. So instead of simply counting the papillæ we must separate out the little tufts and count their number. If this is done in the case of a young Duck eleven primary tufts and ten smaller covert

tufts can be seen. But this is not all: at the extreme tip of the finger can be seen a well developed claw. Passing now to the adult wild Dusky Duck (*Anas obscura*) we find ten developed primaries, nine well developed coverts and two "little feathers," which, by the way, are good sized. These two little feathers are in precisely the same relative positions as in *Melospiza* and represent the aborted first primary and first covert. A year ago I made an examination of the last phalanx of the second finger for a claw but only found a slight trace of it in one case out of about twenty, so that we may fairly class the claw as an organ now functionless and accordingly disappearing. The same condition of the wing holds good for all the Ducks examined by me. They were the following: *Œdemia perspicillata*, *Anas obscura*, *Aix sponsa*, *Querquedula carolinensis*, *Bucephala islandica*.

Among the *Limicolæ* I have examined the young of *Vanellus cristatus* and of the Woodcock (*Philohela minor*). In the young of the Spur-wing there are distinctly eleven primaries and ten coverts. In the young, however, I have been unable to find more than ten among adult birds of this group. I have examined the following and found all but the last to have "little feathers": *Charadrius fulvus*, *Strepsilas interpres*, *Ægialites semipalmatus*, *Ereunetes semipalmatus*, *Totanus melanoleucus*, *Totanus flavipes*, *Tringoides macularius* (young), *Philohela minor*.

Of Sea-fowl I have been able, through the kindness of Mr. J. A. Allen, to examine the young of a Gull, an Auk and a Petrel. In the first case I found eleven primaries and ten coverts; in the second, the same numbers and a terminal claw; in the third case, only ten primaries and ten coverts.

Mr. Allen also gave me for examination two young of the South African Ostrich. Here the primaries and secondaries run in a straight line from the elbow to the tip of the II finger and have no connection with the little III finger. Hence it is difficult to say how many spring from the hand and how many from the arm, certainly seventeen and perhaps eighteen, there being about thirty-two in all. Whether we call these primaries depends on our ideas of phylogenetic relations of the *Struthiones*. If these are degredational forms from flying birds then we must call them the representatives of primaries; if, on the other hand, the Ostriches never flew they ought, I suppose, to be considered as simple contour feathers.

If we summarize the above facts we find that the number of primaries of which signs can be found varies from ten to eleven in Carinate birds, while many more exist in the Ratitate birds, while the functional primaries vary from nine to eleven in number. In regard to the primary coverts, there are for the most part one less than the number of primaries, varying from nine to ten in number. All the above conditions can be classed in four groups, the first group containing the nine primaried birds, all of which belong to the *Oscines*. In this group the first primary and the first covert are rudimentary. The second group, containing all birds with ten developed primaries and nine coverts, includes the rest of the *Oscines*, and *Pici*, and I presume most of the other Passerine groups.

The third group, all those with ten primaries and ten coverts, includes the *Cypseli*, *Trochili*, *Ardeidæ*, *Turbinares*, and probably others, the young of which I have not been able to examine.

The last group, containing those birds with eleven primaries, includes the *Alcedinidæ*, *Falconidæ*, *Plotidæ*, *Ciconiidæ*, *Phœnicopteridæ*, *Anatidæ*, *Charadriidæ*, *Scolopacidæ*, *Paridæ*, *Colymbidæ*, *Alcidæ*, and probably most of the other lower birds.

Thus we see that the number of primaries does not hold constant for the larger groups of birds, but that the higher birds of the various groups show a tendency towards a reduction in the number of primaries. So the reduced number of primaries and coverts would seem to point to high development, but not to be of use in dividing the major groups.

The rule according to which the primaries and coverts abort is interesting and of importance, since it makes it possible to decide whether a "little feather" be a primary or a covert. The law is simply that the most distal one aborts first, hence a covert before its primary. Hence when one "little feather" is found we can tell if it be a covert, as in the *Tyrannidæ*, or a primary, as in the Kingfishers, by seeing what the next developed feather is,—in the first case a primary, in the last a covert. When there are two little feathers one is a primary and the other a covert, the covert being uppermost.

The definiteness in the wing formula of birds closely related is very great, the formula for one answering perfectly for the rest. So the plan ought to be a help in determining the position of doubtful birds.

Recent Literature.

RIDGWAY'S NOMENCLATURE OF NORTH AMERICAN BIRDS.*—So many species of birds have been recently added to the North American fauna, and so many important changes have been made in the nomenclature of species previously catalogued as North American, since the publication of Dr. Coues's "Check List of North American Birds" in 1874, and especially since the appearance of Professor Baird's "Catalogue of North American Birds" in 1859, that a new check list, faithfully embodying these changes and additions, had become a necessity when Mr. Ridgway set about the preparation of the present catalogue.† Mr. Ridgway's well-known familiarity with North American birds, and his abundant resources for their investigation, render the authorship of the present catalogue eminently fitting, while its publication under the direction of the Smithsonian Institution lends to it a standing and an influence that would alone go far toward making it authoritative. Like Audubon's "Synopsis" of 1839, Baird's "Catalogue" of 1859, and Coues's "Check List" of 1874, its publication marks an epoch in North American ornithology, and will form, like the preceding, a datum-point in the history of the subject. It becomes, therefore, a work of high importance and one to the consideration of which we may well give considerable space.

An interval of twenty years elapsed between the appearance of Audubon's "Synopsis" and Baird's "Catalogue." In 1839 our vast western territories were ornithologically almost unknown. Audubon had not then visited the Upper Missouri region, but Townsend had crossed the continent and explored hastily the plains of the Columbia and the North-west Coast, bringing therefrom many new species of birds. But the great central region and the South-west, still Mexican territory, remained untouched. During the twenty years following, this whole vast region was traversed in the interest of science. The various surveys for a railroad route to the Pacific, begun in 1853 and continued for four years, carried several

* Nomenclature of North American Birds chiefly contained in the United States National Museum. By Robert Ridgway. Bull. U. S. Nat. Mus., No. 21. Published under the direction of the Smithsonian Institution. Washington: Government Printing Office, 1881. 8vo. pp. 1–94.

† The memoir now under notice appeared originally several months since (Proc. U. S. Nat. Mus., Vol. III, pp. 163–246, Aug. 24–Sept. 4, 1880) under the title, "A Catalogue of the Birds of North America." "This catalogue," says its author, "is really the basis of the present one, which is essentially a revised edition, very materially modified, however, by numerous alterations and corrections, involving not only the change of a considerable number of names, but also the writing of a new introduction, etc. The edition the title of which has just been quoted *has not been published separately*, although a number of extras were struck off for private use" (*op. cit.*, p. 5).

lines of exploration across the continent to the Pacific, while a special survey was made of the boundary line separating the United States and Mexico. In the meantime agents of the Hudson's Bay Company and of the Smithsonian Institution had explored the natural history of vast portions of the great northern interior, extending from our northern frontier to the Arctic Sea. The treasures gathered from this wide area had been brought together at the Smithsonian Institution and formed the basis of Baird's monumental work on North American ornithology published in 1858, forming Vol. IX of "Reports of Explorations and Surveys for a Railroad Route from the Mississippi River to the Pacific." It is then perhaps a matter of little surprise that the 491 species known to Audubon in 1839 should have been increased to 760 — an addition of 269 — in 1859. In the nearly equal interval (twenty-one years) next following, almost the whole of the vast unsettled region west of the Mississippi was explored in detail by four regularly organized government surveys, each with their ornithological assistants, while officers of the United States Army and private collectors added greatly to our ornithological knowledge of previously almost wholly unexplored localities, to say nothing of our new territory of Alaska, the ornithology of which has now already received much attention. The accumulation of material thereby resulting has not only added many new forms but thrown much light upon the relationship of others, and rendered necessary many changes in nomenclature. In 1859 we had gathered the first fruits: we now have the mature harvest; but there is still doubtless much left for the gleaners.

The additions made since 1859 are far less numerous than those which marked the period of twenty years immediately preceding, but the wonder is that they are so many rather than so few, when we consider how fully the Great West had been explored prior to 1860. In comparing the present list with that of 1859, the author observes that it "contains 226 valid species and recognized races which have either been first described or added to the North American fauna since 1859, while, on the other hand, no less than 42 names of the old catalogue have been relegated to the ranks of synonymy, and 20 more removed as extralimital. Furthermore, of the remaining 698 names over 300 have been more or less amended, so that only 395 of the 760 names as given in the old catalogue are retained in the current nomenclature!" (*op. cit.* p. 7). The "actual number of names in the catalogue of 1859 is 764" (*i. e.* 760): in the present catalogue (1881), "924," an "apparent increase of 164." In the present catalogue are added 127 species and 99 subspecies, making the total, as above stated, of 226 new names. The number of names of the old catalogue, or their equivalents, retained in the new, is, species, 637, subspecies, 61, making 698 names in a total of 760, or an elimination of 62. Besides the 62 species wholly eliminated as extralimital or synonyms, 61 are reduced to subspecific rank, and 100 generic and 89 specific names have been changed. In the present catalogue only the species are separately numbered, the subspecies being indicated by letters joined to the number of the species to which the subspecies are respectively referred.

In the comparison above made between the catalogues of 1859 and 1881, based on that given by the author of the later catalogue, there is no intimation that the geographical limits of the two are not the same, which, however, is not the case, the later catalogue embracing the peninsula of Lower California and the islands Socorro and Guadalupe, off the western coast of Mexico, not included in the former. These islands furnish 11 species and 3 subspecies, and Cape Saint Lucas 8 (22 new names in all), of the 226 additions; and there are, besides, 5 of Girand's "Sixteen Species of Texan Birds" included which were not given in the earlier catalogue, reducing the number of actual additions from within the same geographical limits to 199. As said above, this number of additions is certainly surprisingly large, and one doultless little anticipated by ornithologists twenty years ago.

It may be further observed in this connection that of the recent additions 20 are from Greenland, 9 from Alaska, and 2 from Greenland and Alaska together. A few others are pelagic, and 38 are from near our southern border, chiefly from the valley of the Rio Grande and Arizona.

In respect to the geographical limits of the area treated in the present catalogue, the author tells us that it includes Greenland and the whole of North America down to the United States and Mexican boundary, besides "the peninsula of Lower California, and the outlying islands of Guadalupe and Socorro, the latter in latitude 18° 35′, and about 240 miles off the coast of northwestern [*i.e.*, southwestern] Mexico, the former in latitude 29°, and 230 miles southwest from San Diego. Guadalupe and Socorro, like Lower California," continues our author, "are included for the reason that their zoölogical relationships are much closer to North America, as usually (but arbitrarily) restricted, than to the tropical coast-region of western Mexico, their avian fauna in particular being decidedly of 'Nearctic,' affinity with the exception, so far as known, of only two species — a *Polyborus* peculiar to Guadalupe and a *Conurus* found both in Socorro and in western Mexico. Indeed, the greater part of Mexico itself (all, in fact, except the narrow coast-region, or *tierra caliente*, and the lowlands of the southern portion) belongs, ornithologically as well as geographically, to North America, as might easily be demonstrated did space permit; but the enlargement of our field to its proper limits would be quite impracticable at the present time. For the surrender of this our rightful territory, however, we have compensation in the fact that the arbitrary line which we have drawn (*i. e.*, the United States and Mexican boundary from the Gulf of Mexico to the mouth of the Colorado) gives a comparative stability to the list which a greater southward extension of the area, with indefinite limits, would render impossible" (*op. cit.*, pp. 7, 8). Audubon's "Synopsis" included "the vast regions extending from the northern confines of Mexico to the Polar Seas"; Baird's "Catalogue" of 1858, on which that of 1859 was based, was a list of the birds of "North America, [occurring] north of Mexico," but included a number of Mexican species which were, however, especially distinguished in the list *as extralimital*; Coues's "Check List" included North America "north of the present

Mexican Boundary: inclusive of Lower California; exclusive of Greenland." This is, therefore, not the first time that Lower California has been included in a catalogue of North American birds. While agreeing most fully with Mr. Ridgway in all that he says respecting the ornithological affinities of these outlying appendages as well as of a large part of Mexico, we still greatly regret that the southern boundary of the United States has not been uniformly adhered to as the southern limit of North America in our check lists and catalogues of North American birds. Since for convenience's sake an arbitrary line must be selected, at least for much time to come, it seems best for purposes of statistical and historical comparisons to choose the one ostensibly recognized in the earlier catalogues.

A few words further in respect to the scope of the new catalogue. Mr. Ridgway tells us that he is "constrained, by important and carefully considered circumstances, to retain in the list some seven or eight species of Mexican birds treated by Professor Baird in volume ix, Pacific Railroad Reports ('Birds of North America'), and included in the Catalogue of 1859. They were all obtained just across the Rio Grande, and therefore it may be deemed perfectly safe to assume that their occasional occurrence on our side of the river is certain, and their capture there merely a question of time. Ten species published by J. P. Giraud as having been obtained in Texas, but which have not been subsequently recorded from within our limits, are also included, there being every probability of their occurrence there, while Mr. Giraud strenuously maintained, to the day of his death, that they were really collected in that State."

Mr. Ridgway further says: "Neither are we prepared to relinquish certain Audubonian species which at present are known only from the works of their describer (*e. g., Regulus cuvieri, Perissoglossa? carbonata, Dendræca? montana* [described and figured *originally* by Wilson] and *Myiodioctes? minutus*), as well as two well-known species given by Audubon on his own authority (*Chrysomitris 'magellanica'* = *C. notata* and *Eudocimus ruber*), having full confidence, as we do, in his veracity." After alluding to three instances in which Audubon was "evidently imposed upon," Mr. Ridgway continues: "But the birds which we have called special attention to above are all so clearly described and accurately figured that we must either regard them as valid species or, as the only alternative, view them as mainly the creation of Audubon's brain and pencil. To do the latter, however, on the purely negative ground that no one else has met with them, seems to us not only a gross injustice to his memory, but, laying aside personal considerations altogether, also a most insecure position to take. The type of *Emberiza* [*Spiza*] *townsendi*, described by Audubon forty-six years ago, remains unique to this day; but since it fortunately exists in an excellent state of preservation, we have, in this case at least, positive evidence of Audubon's good faith. The species may now be extinct, and so may 'Cuvier's Kinglet,' the 'Carbonated' and 'Blue Mountain Warblers,' and the 'Small-headed Flycatcher'; but we have very strong faith that the 'lost' species will even

tually repeat the history of several others which for a long time evaded the closest search, like *Coturniculus lecontei* (Aud.), the type specimen of which was lost, and a second example not obtained until 1869, or twenty-six years after the species was first described and figured, while now it is represented by a greater or less number of specimens in all the principal collections in this country; or *Centronyx bairdii* (Aud.), which passed through even a worse experience, one eminent ornithologist having the good fortune to obtain more than 75 of this species in less than a year after he had 'ventured to foretell' that 'a second specimen would never be found'!" (*op. cit.*, pp. 8, 9). But the cases are hardly parallel, since these and Sprague's Lark, which may be included in the same category, were found as soon as their habitats in the unexplored West were reached by later ornithologists, while the habitats of the other species are the thickly-settled portions of the East, long since thoroughly explored. Despite their being so "clearly described and accurately figured," ornithologists still guess at their generic affinities, and the opinion has more than once been hazarded respecting several of them that they were really based on some immature phase of plumage of common species. Some of these, as the Carbonated Warbler, are not so easily dismissed, since they need be scarcely less rare than Kirtland's and Bachman's Warblers, and some of the other now recognized *Helminthophagæ*, to elude capture altogether. Again, as has been suggested to me by a well-known ornithologist, hybridity may well come in for consideration in this connection, especially in reference to Cuvier's Kinglet, since the fact of hybridity between different species of *Oscines* is now well established. In regard to Audubon, it may be noted that 10 species, now admittedly exotic, were given by him as North American, with definite localities assigned to them. To have excluded all these "lost" or apocryphal species, and also all the (so far as now known) extralimital species from the list proper, and to have given them in supplementary lists only, would have thrown more sharply into relief the extent of our exact knowledge of our *ornis* than is the case in numbering them consecutively in the principal list.* Eliminating the species not certainly known to have been taken north of Mexico, together with the "lost" species of Audubon and Wilson, reduces the list of registered forms from 928 (this number includes four given in the "Addenda" to the catalogue) to 888.

In regard to the nomenclature of the list, it is needless to say that the system is trinomial, and its merits and advantages are thus tersely set forth by our author: "The adoption of trinomials for the designation of nascent species—a direct result of the synthetic method of study which has supplanted the former analytic treatment of the subject—has caused perhaps the greatest difficulty encountered in the compilation of this catalogue, it being in many cases very difficult to decide whether a given form should be treated as having passed the 'varietal stage,' and therefore to be designated by a binomial, or whether it is yet incompletely differentiated.

* It should be here stated, however, and as will be more fully noticed later, these discriminations are all duly and prominently set forth in the "Appendix" of the list.

and to be subordinated in rank by a trinomial appellation." In a footnote the author adds: "It should not be inferred from our remarks in this connection that we find the use of trinomials inconvenient in practical application. On the contrary, no other method seems at all adequate to the proper discrimination between isolated and intergrading forms, and the difficulty in the cases above alluded to arises wholly from the want of sufficient material to decide the question of intergradation or the contrary." In regard to the treatment of doubtful cases "the greatest care has been taken," and "previous conclusions" have been "carefully reconsidered, with the aid of all the material accessible, including many specimens not previously in hand. This reconsideration of the subject has, in not a few cases, resulted in a reversal of former opinion, specimens from important localities not before represented often deciding the point one way or the other. Every form whose characteristics bear unmistakably the impress of climatic or local influences, gradually less marked toward the habitat of another form, with which it thus intergrades, and all forms which certainly intergrade, no matter how widely distinct the opposite extremes may appear (*e. g.*, *Colaptes auratus*, and *C. mexicanus*, and the different races of *Passerella*), together with intergrading forms whose peculiarities are not explained by any known 'law' of variation, have been reduced to subspecific rank. On the other hand, where the difference between allied forms is slight, but at the same time apparently constant, and not necessarily coincident with a difference of habitat (*e. g.*, certain small Thrushes and the various forms of *Junco*), specific rank is upheld. There are some forms which future investigation, based upon adequate material may decide to be of different rank from that accorded them here. We cheerfully acknowledge our fallibility, but at the same time would say that we have endeavored to be as consistent as possible, giving the rank of each form as it appears in the light of our present knowledge, independent of previous conclusions" (*op. cit.*, pp. 9, 10). That the revision here presented is impartially and conscientiously made there can be no doubt, evidence of which is afforded by the cancelling of 4 species and 6 varieties for the erection of which Mr. Ridgway is himself either wholly or in part responsible, while others for which Professor Baird stands sponsor share a similar fate. The really few changes in this respect from the status in Baird, Brewer, and Ridgway's "History of North American Birds" and Coues's "Check List" augurs well for a reasonable degree of fixity so far as forms now recognized are concerned.

As already indicated, nomenclatural changes, simply as such, are numerous, affecting many generic as well as specific names. Very few of them are, however, now for the first time introduced; quite a proportion have gradually gained currency during the last five years, but many of them date from April, 1880.* While quite a number of the long-familiar

* See Coues, "Notes and Queries concerning the Nomenclature of North American Birds," Bull. Nutt. Orn. Club, V, pp. 95–102, April, 1880. Ridgway, "Revisions of Nomenclature of certain North American Birds," Proc. U. S. Nat. Mus., 1880, pp. 1–16, "March 27, 1880."

names of several of our commoner species of birds has given place to obscure ones of earlier date, the reasonableness of the change is in most cases apparent, while in others the necessity is doubtful, and their adoption will result rather from a desire for unanimity than from conviction that the change was demanded or even desirable.

As a general criticism we may note the tendency to a multiplicity of genera, — a tendency from which there are already many signs of a reaction. The average in the present catalogue is almost exactly two species to a genus, but of course many of the genera have extralimital species. With the reduction of so many forms formerly regarded as specific to the rank of geographical races, and the consequent wider range of variation admitted within specific groups, it would seem consistent to reduce rather than increase the number of genera and to degrade many of the so-called generic groups, if they must be retained at all, to the rank of subgenera, and also preferable as tending to show with greater precision the degree of relationship many of the so-called genera hold *inter se*. The course adopted by Dr. Coues in his "Key" and "Check List," in reference to the genera of Wading and Swimming Birds, has always seemed to us commendable, although of late repudiated, in practice at least, by Dr. Coues himself.

That the end is not yet reached, either as regards additions to our avian fauna or the status of some of the rarer and less well-known forms, is evident (see, *e. g.*, the several papers in the last number of this Bulletin by Mr. Brewster, in which new forms are added and the status of others changed), and doubtless if a check list be prepared say in 1890 it will differ widely from that now under consideration. Consistency even already demands the recognition of several additional subspecific forms, which we are surprised to see have been so long passed over, especially among the birds of Florida, where the resident form of the Bluebird, the Bluejay, the Red-winged Blackbird, the Meadow Lark, and the Yellow-winged Sparrow are quite as well entitled to varietal recognition as many that have already received this distinction.

Passing now from the "Catalogue" to the "Appendix," which occupies nearly as many pages as the catalogue itself, we find a most important contribution to the historical phase of North American ornithology, and one evincing most painstaking, laborious, and, we may well say, exhaustive research, so far as its scope extends, which is mainly a comparison of the present status of the subject with that of 1859. The matter is arranged in a series of twelve "tables," numbered *a* to *l*. These designate (*a*) the species eliminated from the Catalogue of 1859, with indication of the reason for each elimination; (*b*) the "species or races" described or added to the North American fauna since 1859, the newly described forms being indicated by the use of special type, while references are given respectively to the place of first description or to the original record. In this list are distinguished for the first time* *Muiotilta varia borealis*,

* In these remarks the original and revised editions are treated as the same work.

Chondestes grammica, *stigata*, *Buteo borealis socorroensis* as new races, and *Tinnunculus sparverioides*, *Thrasaëtus harpyia*, and *Actodromas acuminatus* as additions. (*c*) Genera described or added since 1859, and generic names orthographically emended since that date. Under this heading are briefly discussed the status and history of three "genera" among the Thrushes, including a defence of *Merula* as a generic designation for our common Robin, and the genera *Myiodioctes*, *Ulula*, etc. (*d*) Species included which are not yet known to have been taken within the prescribed limits. (*e*) Old World species of regular occurrence in Greenland or merely casual visitants to Eastern North America. (*f*) "Palæarctic" and oceanic species occurring in Alaska or on other parts of the Pacific coast. (*g*) "Palæarctic" species found in both Greenland and Alaska but not at intermediate points. (*h*) Tropical American species occurring only in the southern portions of the United States. (*i*) Supposed valid species described by Audubon and Wilson, but not since met with, and of which there are no known specimens extant. (*j*) Untenable species and races described since 1858. (*k*) Exotic species apparently wrongly attributed to North America. (*l*) Partial list of foreign birds which have been introduced, or which have been captured after escape from confinement. Each of these lists is appropriately annotated, the annotations varying in character with the special requirements of the several categories, and the information thus succinctly presented is not only of the most useful and interesting kind, but hard to find when wanted without this admirable index of references.

The "Addenda" gives, first, a commentary on 6 species, 4 of which are supplementary to those contained in the Catalogue itself. Then follows a list of the families of North American birds, with the number of genera and species of each recorded in the Catalogue, and finally a "Concordance" of the two Catalogues of 1859 and 1881, in which the corresponding numbers of each are given in parallel columns.* There is also an "Index to the Genera."

As already noted, the present "Nomenclature" is a "revised edition" of Mr. Ridgway's "Catalogue" of a few months' earlier date. But it should be added that in a footnote to page 5 of the present work is given a schedule of the more important changes from the first edition, which embrace a new introduction, various changes of generic, specific, and English names, and corrections of authorities. The work is exceedingly free from typographical errors, and in every way evinces the exercise of the utmost care in its preparation.—J. A. A.

Ridgway's Revised Catalogue of the Birds of Illinois.†—The present catalogue is based primarily upon the same author's "Catalogue

* The numbers of the old catalogue are also given in the new, following the English names and enclosed in brackets.

† A Revised Catalogue of the Birds ascertained to occur in Illinois. By Robert Ridgway. Illinois State Laboratory of Natural History. Bulletin No. 4. Bloomington, Ill., May, 1881. 8vo. pp. 161–208.

of the Birds ascertained to occur in Illinois," published (Ann. Lyc. Nat. Hist. New York, Vol. X, pp. 364–394) in 1874, but adds 31 species to the 311 then recorded, making (one having been eliminated) 341 now enumerated, besides 11 additional varieties. The author acknowledges his indebtedness to the several lists of the birds of Illinois published by Mr. E. W. Nelson, and to various private sources. The preface recounts the geographical extent, topographical features and meteorological characteristics of the State which tend to give it so diversified a fauna. Then follows a table of the families represented, with the number of species of each and the number which breed in the State. A bibliography of 26 titles of papers relating to the ornithology of Illinois succeeds, and then the catalogue itself. The species known to breed (213 in number) are distinguished by an asterisk; the annotations are brief, and relate mainly to the abundance, the season of occurrence, and the distribution of the species within the State. An "Appendix" gives a list of 42 species "which probably occur in Illinois," but which have not been actually taken there. The nomenclature is that of Mr. Ridgway's recently published Catalogue of North American birds.

The bird fauna of Illinois is stated to embrace members of 17 "orders," "according to the latest and most improved classifications," among which are the "orders" *Trochili*, *Cypseli*, *Caprimulgi*, and *Sarcorhamphi!*

Illinois takes the lead among the States in respect to number of species of birds, Massachusetts following next with (including the latest additions) 330, the much greater geographical area of Illinois, and especially its greater extent in latitude, together with its central position, more than compensating for the maritime position of Massachusetts. There is no area, however, in the United States in which so many species have been ascertained to occur as in the last named State.—J. A. A.

Mearns's Birds of the Hudson Highlands.—Two installments* of Dr. Mearns's excellent memoir (see this Bulletin, Vol. V, p. 175) have appeared during the last year, completing the List as far as *Ortyx virginiana*. The high praise accorded the earlier installments is equally merited by those now under notice, Mr. Mearns's "List of the Birds of the Hudson Highlands" ranking easily among the best of our long list of contributions to local ornithology. There is much said about the habits of various species that is entertaining or new, while the dates of migrations for periods of eight to ten years, and the averages and extremes of measurements of generally a large series of specimens of each species, give data of high value. In respect to nomenclature, the list is abreast with the latest well-grounded innovations.—J. A. A.

Rathbun's "Bright Feathers or Some North American Birds of Beauty."—Part II of this work, recently issued, is devoted to the

* A list of the Birds of the Hudson Highlands, with Annotations. By Edgar A. Mearns. Bull. Essex Inst., Vol. IX, p. 11–25 (*Egiothus linaria* to *Quiscalus purpureus*), Nov., 1880; pp. 109–128 (*Corvus frugivorus* to *Ortyx virginiana*), Feb., 1881.

Rose-breasted Grosbeak (*Goniaphea ludoviciana*). The colored plate illustrates the adult male and female, but the sixteen quarto pages (pp. 25–40) of text leave the history of the species still unfinished. In noticing Part I (this Bulletin, Vol. V, p. 234) we were compelled to speak unfavorably of the literary execution of the work, and regret that the present issue will not permit of more favorable notice. A single sentence, a portion of which we may italicize, may serve to point our criticism: "The tender blades of golden hued grasses were gently crowding aside the dead leaves of the preceding autumn, *like true lollards of a murmuring hour*." (p. 26). As nearly or quite three-fourths of the text consists of quotations from other authors, bearing mainly upon the utility of the Rose-breasted Grosbeak as a destroyer of the Colorado potato beetle, but including also a long extract from Audubon, the not too fastidious reader may find little to offend his taste.—J. A. A.

Holterhoff's Notes on Western Birds.—These notes, as the title of the paper* indicates, relate to the breeding habits of a few of the lesser known species of Western birds. The observations here recorded were made in Southern California in the spring of 1880, and have reference to some 40 species, among which are included the Curve-billed Thrushes and the *Polioptilæ* of the region in question, about which, as well as of various other species, much interesting information is communicated.—J. A. A.

Ridgway on a Duck new to the North American Fauna.—In the "Proceedings" of the United States National Museum†, Mr. Ridgway records an immature male Rufous-crested Duck (*Fuligula rufina*, Steph.) supposed to have been shot on Long Island Sound. The specimen was found in Fulton Market, New York City, some nine years ago by Mr. George A. Boardman, of Calais, Maine, by whom it was then sent to the Smithsonian Institution. The specimen was then looked upon as a hybrid, and was put aside and forgotten. It received no further attention until recently when it was identified by Mr Ridgway as above stated. In making the record Mr. Ridgway takes occasion to describe the species in its various phases of plumage, and adds a few critical remarks on the generic synonymy of the group to which it belongs.—J. A. A.

Ridgway on the Amazilia yucatanensis (Cabot)‡.—This species was not long since referred by Elliot to the *A. cerviniventris* of Gould, which determination was later accepted by Mr. Ridgway. A comparison

* A Collector's Notes on the Breeding of a few Western Birds. By E. [*i. e.*, G.] Holterhoff, Jr. American Naturalist, March, 1881, pp. 208–210.

† On a Duck new to the North American Fauna. By Robert Ridgway. Proc. U. S. Nat. Mus., April 13, 1881, pp. 22-24.

‡ On Amazila yucatanensis (Cabot) and A. cerviniventris, Gould. By Robert Ridgway. Proc. U. S. Nat. Mus., April 13, 1881, pp. 25, 26.

of Cabot's type with Texan specimens of *A. cerviniventris* shows that the species are distinct. Comparative diagnoses are given of the two species, with some remarks respecting their distribution.—J. A. A.

Harvie-Brown's Second Report on Scottish Ornithology*.—The first third of the report gives a "Journal of the Winter of 1879-80," and is mainly a record of the weather, with references *passim* to the effect of meterological conditions upon the movements of various species of birds, especially in relation to the vernal migration. The remainder of the report gives observations on some 65 to 70 species, mainly in relation to their abundance at particular localities during the period named as compared with former years. The importance of such a record, extended through a series of years, especially in relation to the increase and decrease of particular species, and to the causes to which such fluctuations are due, is sufficiently obvious. The Redpolls (*Linota linaria*) are reported to have warmly lined their nests with feathers in the unusually backward cold spring of 1879, while at the same locality in the more favorable spring of 1880 they almost wholly neglected this precaution. The report abounds with especially suggestive observations in relation to little understood points in bird-life, and leads one to hope that not only these reports will be continued, but that we shall have others equally detailed for other districts, including, indeed, large portions of our own country.—J. A. A.

Godman and Salvin's "Biologia Centrali-Americana."—Part I of the "Zoölogy" of this important work† appeared in September, 1879, and nine other parts have followed at short intervals, Part X, the last issued, bearing date April, 1881. As the title indicates, the work treats of the fauna and flora of Mexico and Central America, or of the region extending southward from the United States and Mexican boundary to the Isthmus of Darien. It is issued in parts, each averaging about 96 quarto pages of text and 6 hand-colored lithographic plates. The zoölogical portion is estimated to form, when completed, about 12 volumes of 500 pages each. Each subject is paged separately, and will thus be complete in itself. The zoölogical portion may be had separately, but the different subjects in zoölogy will not be sold apart from the others. The editors of the work have been collecting material for this great enterprise during the past twenty-two

* Second Report on Scottish Ornithology — October 1st, 1879, to September 30th, 1880. Compiled by Mr. John A. Harvie-Brown, F. R. S. E. &c. Proc. Nat. Hist. Soc. of Glasgow, Vol. IV, Part II, April 1880, pp. 291-326. (For notice of Report for 1878-79 see this Bulletin, Vol. V, p. 233.)

† Biologia Centrali-Americana; or, Contributions to the knowledge of the Fauna and Flora of Mexico and Central America. Edited by F. Ducane Godman and Osbert Salvin. Zoology, Parts I–X. Aves, by O. Salvin and F. D. Godman, pp. 1–152, pll. i–x. 4to. London: Published for the Editors by R. H. Porter, 10 Chandos Street, Cavendish Square, W., and Dulau & Co., Soho Square. September, 1879–April, 1881.

years, and have themselves visited different portions of the country for this purpose. Besides this they are able to avail themselves of collections received from correspondents and naturalists specially employed in visiting previously unexplored districts. In the elaboration of their work they have called to their aid many eminent specialists to whom have been assigned all the Vertebrates except the birds, and all the other groups of animals except one division of the *Lepidoptera*, as well as the plants. The ornithological portion, which alone demands attention in the present connection, is by the editors, who long since became identified with the ornithology of the region in question. The installments of this portion of the work which have thus far appeared are as follows: Pp. 1–32, pll. i–iii, Sept., 1879; pp. 33–56, pl. iv, Nov. 1879; pp. 57–80, pl. v, Feb., 1880; pp. 81–104, pll. vi, vii, Apr., 1880; pp. 105–128, pl. viii, Aug., 1880; pp. 129–152, pll. ix, x Febr., 1881. The arrangement is that of Sclater and Salvin's "Nomenclator Avium Neotropicalium," and in the treatment of the subject the authors have advanced as far as the genus *Geothlypis*. Of each species a short Latin description is given, and all the more important references to the literature are duly cited. The text otherwise relates mainly to the geographical distribution of the species, which is treated with great fullness, with, as occasion requires, remarks on their affinities and nomenclature. There are, however, here and there brief references to their habits. The ten plates thus far published contain figures of 25 hitherto unfigured species.

The work very naturally embraces a large number of North American species, which occur either as winter migrants into Mexico and Central America or whose range extends southward beyond our borders; of the 130 species thus far treated just one-half occur north of Mexico. The authors are, of course, rigidly orthodox in respect to nomenclature, adhering strictly to the binomial system, although in their text they speak of this or that binomially named form as a "race" of some other similarly designated form. To illustrate: all of our Thrushes of the *Hylocichla* group are treated as species. *Turdus swainsoni, T. ustulatus, T. aliciæ, T. auduboni*, etc., all being accorded specific rank, while *T. ustulatus* is spoken of in the text as a "western race of *T. swainsoni*." *Sitta aculeata, Certhia mexicana, Thryothorus berlandieri, T. bairdi*,* etc., are also recognized as species, while such forms as *Catherpes mexicanus conspersus, Cistothorus palustris paludicola, Dendræca dominica albilora*, etc., are wholly denied recognition. In short, the geographical varieties or races, now usually treated as subspecies by American writers and designated by a trinomial name, are, with few exceptions, raised to the full rank of species, while those not so recognized are ignored as not requiring special designation. There is apparent, however, a misunderstanding on the part of our authors as to what American writers mean by a race, as is evident in comments at sundry points, as, *e. g.*, under *Dendræca dominica*, where, speaking of Mr. Ridgway's race *albilora*, they say: "The difference at

* *Thryothorus bairdi* = *Thryothorus bewicki* var. *leucogaster*, Baird (nec Gould).

most is very slight; and its value is further diminished by the fact of Guatemalan specimens having a slight yellowish tinge on the lores, breaking down the chief point of distinction between Mr. Ridgway's races" (*op. cit.*, p. 135). It is just such intergradations as these which prevent the recognition of these forms as "species" but not as "races," for races are supposed to intergrade, while species are not. It is just this difference that we seek to recognize by the third term in the trinomial system of nomenclature. Races, in their extreme phases, are as certainly recognizable as species, and often present wider differences of coloration and size than frequently occurs among closely allied species; but whereas in the latter we know no connecting links, we expect them to occur between races at points geographically intermediate to the regions where they respectively present their greatest degree of differentiation, and to find at such intermediate points more or less difficulty in deciding whether the form there occurring is to be referred to the one phase rather than the other. In respect to the commingling of certain races in Mexico, and the argument based thereon, it is necessary to consider the season of capture of the specimens in question before concluding that because two supposed races have occurred at the same localities they are not, after all, geographically distinct in their breeding habitats.

Hitherto we have had no general treatise on the birds of the region to which the present work relates, the abundant literature of the subject being widely scattered in special papers or more general works, usually not easy of access, and often inaccessible, to the general student. The importance and usefulness of the present work cannot therefore be easily overestimated. A similar work for South America would be a great boon to even the specialist, but it seems almost too much to hope for at present. The execution of the "Biologia," as regards typography and illustrations, it is almost needless to say is excellent, for nothing less would be expected at the hands of its accomplished and enterprising authors.—J. A. A.

General Notes.

Nest and Eggs of the Painted Flycatcher (*Setophaga picta*).—For my knowledge of the nidification of this species, and for the nest and eggs in my collection, I am indebted to Mr. Herbert Brown, who became familiar with the birds while in Arizona. From Mr. Brown's observations it appears that they differ somewhat in their habits from *Setophaga ruticilla*, as they seldom or never catch insects on the wing, but pick them from the leaves and branches of the trees; one specimen was seen feeding her young with what appeared to be moths and long-legged flies. The nesting-site was on a hillside in a slight depression in the ground. A nest, now before me, was taken from a hole in a road bank, in the Santa Rita Mountains, by Mr. Brown, June 6, 1880. It is loosely constructed of

dry gray grasses and fine shreds of vegetable bark, and lined with black and white horse hairs: it measures exactly 4 inches in diameter by 1¾ high, and internally 2 inches in diameter by 1¼ in depth. It contained four incubated eggs, of a light pearl white, thickly dotted with brownish red and traces of lilac on the larger end. They measure .57 x .48; .60 x .50; .64 x .50; .58 x .49.

Another set of four was laid in a similar nest built in a depression beneath a small bush on the lower side of a mountain trail. The eggs of this set are somewhat larger and spotted over the entire egg, the markings clustering about the larger end. The measurements of three of them are .69 x .52; .65 x .51; .66 x .50; the fourth was unfortunately broken.

I have compared both sets with three differently marked eggs of *S. ruticilla* and find scarcely a similarity. The first set mentioned resembles three eggs I have of *Myiodioctes pusillus pileolatus* so closely that it is almost impossible to distinguish between them.—W. E. Bryant, *San Francisco, Cal.*

Breeding of the Horned Lark in Eastern New York.—On April 22, 1881, Edward Root, of Green Island, N. Y., brought to me two young Horned Larks (*Eremophila alpestris*), about three-fourths grown and able to fly. On April 29 of the same year he brought to me an adult pair of the same species. Mr. Root informed me that he took the young and the old all at the same place, on Green Island, which is at the junction of the Mohawk River with the Hudson, about thirty feet above tide-water level, and at latitude 42° 45′.—Austin F. Park, *Troy, N. Y.*

Behavior of Leucosticte tephrocotis in Confinement. — While stationed at Fort Fetterman, Wyoming, in the spring of 1880, I captured eight Gray-crowned Finches, all apparently in perfect health and feather. After the capture I decided, as well as I could from the diagnostic points of size and plumage, that I had the sexes about equally represented. Two of the birds, most undoubtedly males, wore the characteristic plumage of *Leucosticte campestris:* the grey of the crown extending well below the eye. As these birds were very plenty about my quarters, and anticipating the care of my pets, I had already constructed a large double cage for them, consisting essentially of a lower or breeding cage, 3 x 2½ feet, with a large side door, and admitting the light from in front and upper half through a rather coarse net-work. This part of their home was intended to represent and take the place of their outdoor existence. The floor was covered with two or three inches of earth and sodded: the grass growing well. Various styles of perches were introduced, miniature clumps of dry grasses, and odds and ends of building materials. Above and easy of access there was another cage, 2 x 2 x 2½ feet, with its floor also spread with earth, well lighted, and containing a large bath-tub and a shelf intended to represent the eaves of a house, a style of perch the Gray-crowned Finch is particularly fond of. The capture was effected on the 10th of March, and the little fellows were introduced to their home for the summer. I

had two objects in view: first, to observe their style of plumage during the summer months, and, secondly, if possible, to induce them to breed and rear their young. Imagine my delight, when I found that in a few days they not only became accustomed to their narrow quarters, but apparently thoroughly satisfied and happy. Flocks of their companions passing over were certain to be called down, to alight on the fences, the ground, and in fact everything in the neighborhood of the cage, to even the cage itself. Their plumage at this time of year seemed to be almost in a perfect state, all the colorings being very dark. My captives were fed upon canary seed, flax seed, finely cracked wheat, and, later in the year, lettuce, and other tender leaves. As the sods at the bottom of the cage were often entirely removed, they no doubt obtained also many insects. Every morning as I approached the cage, a general and impatient chattering commenced for their breakfast and bath, and they immediately availed themselves of both in my presence; and often I deluged the entire thing, birds and all, with a large watering-pot, they enjoying this sprinkling immensely. Later in the spring this part of the programme was followed by their mounting to the upper cage, pluming themselves in the sun, chattering among themselves, and the males giving utterance to a low, subdued, and plaintive sort of a song, being different from the shrill whistle they gave to attract the attention of their passing fellows outside.

By the middle of May, all the birds of this species had entirely left the country; the spring migration was thoroughly inaugurated, and the weather was becoming very warm. Swallows were breeding and many other birds were evidently thinking of doing likewise. I now made their home as attractive as possible, by every means that my imagination could invent. Nests of birds of about their own size that built on the ground were introduced into the secluded nooks of their breeding cage, but these they invariably pulled to pieces the very day I placed them there. In short, by the middle of June I had abandoned all hope of their breeding and during their entire confinement there never seemed any evidence of their pairing, or having the least desire, like sensible birds, of resorting to the business of the season.

By the first of July, they were as gentle as any cage birds I ever saw: they would pick seed out of one's hand, and alight on your finger, if you quietly introduced it between the bars; in fact, they were all that any one could desire in the way of cage pets. On the 10th of July, I opened the doors of their little prison and allowed them all to escape, as they had suffered intensely from the heat for several days; the sudden exercise was rather too much for one or two of them, and they were readily retaken but only to be kept until the cool of the evening. The brilliancy of their plumage seemed to be at its acme in the early part of May; at the time of their release it was in all of them many shades paler. On several occasions during the summer they were seen about the post, usually one at a time, so I am quite confident they never made the attempt to either breed that season or to follow their companions to the northward. — R. W. Shufeldt, *1st Lt. Med. Dept. U. S. Army, Fort Fetterman, Wyoming.*

HESPERIPHONA VESPERTINA IN CENTRAL ILLINOIS. — The Evening Grosbeak has for its habitat the region extending from the Plains to the Pacific Ocean, and from Mexico into British America. Toward the north it ranges further to the east; so that, while it appears to be not uncommon about Lake Superior, it has been reported as occurring in Ohio, New York, and Canada. In Illinois it was observed at Freeport during the winter of 1870-71; and at Waukegan during January 1873 (Hist. N. A. Birds by Baird, Brewer, and Ridgway). Mr. Robt. Ridgway, in his recently issued "Catalogue of the Birds of Illinois," states that it is "a winter visitant to the extreme northern counties" of the State.

It will, therefore, be a matter of interest to ornithologists to learn that this exquisite bird is sometimes found further south and at a less advanced season of the year. About the year 1872, while hunting during the fine autumn weather in the woods about Eureka, Illinois, I fell in with a flock of these Grosbeaks and succeeded in killing six of their number. They were feeding in the treetops on the seeds of the sugar maple, just then ripening, and were excessively fat. They were very unsuspicious, and for a long time appeared to be incapable of realizing the havoc that I was making in their ranks, as they tarried in the neighboring boughs and uttered their call-notes to summon their missing companions. As the skins of these birds afterward passed out of my hands, I can not now give with certainty the year of their capture. Eureka is in Woodford County and one hundred and twenty miles nearly due south of Freeport. It is about the same distance south of Waukegan.— O. P. HAY. *Butler University, Irvington, Ind.*

HABITS OF THE SWAMP SPARROW IN CONFINEMENT.—*Dr. Elliott Coues: My dear Sir:*—You may recall a conversation on the subject of my aviary which took place at the "Wentworth" last summer. As you then appeared somewhat interested in my experiments with native birds I venture to send you some new facts. In the early part of November I visited a New York bird store, and there found a cage of our native birds, freshly caught, and very wild. The trapper who had just brought them in was present. But as he was a German, speaking very little English, and was moreover more than a little intoxicated: as he also while talking held a short pipe in his mouth from which he puffed the smoke of villainous tobacco into my face, our interview was not wholly satisfactory. Still I succeeded in obtaining some scraps of information. He had a Song Sparrow, a "Chippy," a White-throated Sparrow, two Purple Finches (in different stages of plumage), a Snow-bird (*Junco hyemalis*), a Snow Bunting (*Plectrophanes nivalis*), and one small bird I did not know. On questioning its captor as to this last stranger he gave me to understand that it was "Kleiner wasser bird—live in vet place, vere never could go the lady — she vet her foots." I bought the whole lot, and, when at home, studied up my unknown friend. He proved to be the Swamp Sparrow (*Melospiza palustris*), and his habits are so curious I want you to know of them. I placed him in a large cage, already containing some fifty birds,

native and foreign, and in a few days he became quite at home, and seemed quiet and friendly,—much more so than any of the other new arrivals. I soon noticed that his mode of feeding was peculiar. Instead of eating from the seed dishes or cup of soft food, like the others, he proceeded in this way: Perching upon the edge of the bath tub (a large shallow dish of earthenware filled with water), he balanced himself skilfully upon one foot, and with the other, scratched or dabbled in the water. This stirred up the seed, and bits of green stuff, scattered by the other birds, and as it rose to the surface he secured it, picking it up, bit by bit, with his bill and eating it. This he did constantly, very rarely taking food in any other way. Sometimes he scratched in the gravel, strown upon the floor of the cage, and moistened by spray from the birds' ablutions, and picked up the seeds he thus found.

The constant use of his little right foot, and the strain of reaching so far when the water was low, finally lamed Swampy (my birds have each his own pet name, used only in "the family"), and he was forced to hop about drearily on his left foot. I then scattered seed and Mocking Bird food carefully upon the surface of the water, and he at once accepted the situation and without scratching. He is quite well again now. He has never sung or uttered the faintest chirp, but may begin with the approach of spring. I will not weary you with a longer story, but trust the items concerning *M. palustris* a bird not often caged, will prove of some interest. Very sincerely, ANNIE TRUMBULL SLOSSON, *Hartford, Conn.*

THE SNOWBIRD (*Junco hyemalis*) IN SOUTHERN ILLINOIS IN JUNE.—While on a recent trip to Southern Illinois, I astonished myself by shooting, June 9, one mile from the Ohio River, near Elizabethtown, in Hardin County, an adult specimen of the common Snowbird (*Junco hyemalis*.) I killed the bird from a tree in the edge of a wood. I neither heard nor saw another of the species there.—S. A. FORBES, *Normal, Ill.*

A SINGULAR CAGE PLUMAGE OF THE ROSE-BREASTED GROSBEAK.—In a Boston bird-store I lately saw a Rose-breasted Grosbeak in very remarkable plumage. The whole under-parts, from the throat to the crissum, including the sides, were uniform deep rose, nearly as vivid as is the normal breast-patch. The rump also was rose-tinted and there was a wash of the same color along the superciliary stripe. The bird was evidently a male and apparently an adult, for the wings and tail were clear black.

I was told that it had been kept in a cage for about six months; when first captured it was of the usual color, but shortly afterwards it moulted and the present plumage was assumed. The owner had never seen a similar case although he has had many of these Grosbeaks in confinement.—WILLIAM BREWSTER, *Cambridge, Mass.*

CARNIVOROUS PROPENSITIES OF THE CROW BLACKBIRD.—One sultry afternoon a few summers since I was writing at an open window when my attention was attracted—or rather distracted—by the clamor of a number

of English Sparrows which were quarreling among the foliage immediately below me. Happening to want a specimen, I selected an adult male and shot it. Scarcely had it struck the ground when a Crow Blackbird (*Quiscalus purpureus æneus*) pounced upon it from a linden above, and with a few well-directed strokes of its bill put an end to its struggles. At this juncture a Robin interfered but soon retreated before the Grackle's menacing front. The latter next seized the Sparrow in its bill and flew off with it to the lawn, a few paces distant. Here it deliberately went to work to eat its victim. Holding it between one, or sometimes both, its feet, exactly as a Hawk would do, it broke open the skull and feasted on the brains. I was near enough so see that its bill was reeking with blood. After watching it awhile I walked directly towards it when it again took up its prize and tried to carry it into the tree above, but its strength proved insufficient and it was obliged to drop it. Upon examining the Sparrow I found that its brains had been cleanly scooped out and the eyes as well as the throat devoured. Meanwhile the Grackle scolded me most emphatically for thus interfering and the moment my back was turned again descended and resumed its feast.

Many of our native birds seem to have a standing grudge against this Blackbird and rarely let pass an opportunity to pursue and harass it. It would seem that this hatred is not without just cause.—WILLIAM BREWSTER, *Cambridge, Mass.*

ICTERUS BALTIMOREI AND POPULUS TREMULOIDES.—Two specimens of the American aspen (*Populus tremuloides*) stand in my garden which I transplanted from the woods in the spring of 1876. During the latter part of May, 1878, I noticed that the trees were being denuded very rapidly of their leaves and I could not detect the presence of worm or fly by the use of a glass of twenty diameters. The leaves did not appear to have been eaten by insects but torn away piecemeal, leaving ragged edges, and not infrequently the leaf-stalks broken off or hanging loosely to the branch. About three-fourths of the leaves disappeared in this manner in the space of fifteen or twenty days from one tree and nearly all from the other. A second set of leaves was produced in June and the trees made a strong and healthy growth during the remainder of the season. In 1879 the denudation was again commenced in like manner at the same season of the year. I could not charge it to the wind because other trees in the garden were not so affected and my meteorological record forbade any such cause. Upon careful watching while at work in the garden I detected a Baltimore Oriole eating the leaves with evident relish. The bird stood on a branch and picked at and tore off the leaves, eating them with as much apparent enjoyment as our domestic fowls eat the leaves of the plantain.

I watched him closely for a while and upon going towards the tree he flew away, uttering his rattle in such a tone that it required no stretch of the imagination to think that he was somewhat irritated at being molested in his gastronomic proclivities. He soon returned, however, accompanied by a female, and the pair continued to eat for several minutes, interlarding

the feast with various acts of courtship, and then flew off, each with a leaf or part of one in the beak. The same act was repeated during the day and on succeeding days until the trees were nearly as bare of leaves as in winter. As in the former year, a second set of leaves appeared and though the trees received a check in their growth, they recovered, increased in size and ripened their wood in due season. A similar destruction of leaves was performed by the same species of bird — probably the same pair — in 1880, and the trees recovered their wonted vigor by repeating the process of preceding years. The second set of leaves were not eaten by the birds in either year, though they were in the garden more or less every day during the summer and frequently alighted in the trees, separately, together, and with their young.

I had formerly considered the *Icterus baltimorei* essentially insectivorous and frugivorous; I am now aware that some of them at least are decidedly vegetarian once in the year — ELISHA SLADE, *Somerset, Mass.*

A PECULIAR NEST OF THE BALTIMORE ORIOLE.—When the leaves fell in the autumn of 1876, I discovered a bird's nest suspended from a slender limb of a cotton-wood that stands, with others, on the outskirts of Charles City, (Iowa). This nest immediately attracted my attention, and I made several attempts to secure it, but was unsuccessful, as it hung near the end of a limb too slender to bear my weight.

It hung there throughout the following winter, but in the spring of 1877 a young friend of lighter weight than myself obtained it and gave it to me. It is, unmistakably, the nest of a Baltimore Oriole,—the material used in its construction and the manner in which it is woven plainly show this; but it differs very materially in shape from any other nest of the species that I have ever seen.

The length of the nest is eleven inches; greatest diameter, four inches. Body of nest, an upright cone about eight inches in height, with a rounded base. It is composed of the ordinary material: "natural strings of the flax of the silk-weed," horse-hair, etc. At its apex, several pieces of twine are woven into the fabric, and, about three inches above, are securely fastened to a horizontal twig, all at the same point, forming the sole support of the nest. The opening for entrance is in the side of the nest, at the point of its greatest diameter, about three inches from the base. It is perfectly circular and about one inch in diameter.— HENRY S. WILLIAMS, *Charles City, Floyd Co., Ia.*

THE THREE-TOED WOODPECKER (*Picoides arcticus*) IN MASSACHUSETTS. —Records of the occurrence of the Black-backed Three-toed Woodpecker in Massachusetts have multiplied so slowly that the following additional one may be considered of interest: An adult male shot Dec. 17, 1880, at Plymouth, Massachusetts. I saw the specimen at Goodale's when it was being mounted for Mr. John A. Joyce, the person by whom it was killed. WILLIAM BREWSTER, *Cambridge, Mass.*

A Second Massachusetts Specimen of the Red-bellied Woodpecker (*Centurus carolinus*).—At the establishment of Pertia W. Aldrich, the well-known taxidermist, I have lately seen a freshly-made skin of a Red-bellied Woodpecker which Mr. Aldrich tells me was shot at Cohasset, May 28, 1881, by a young son of Matthew Luce, Esq., of Boston. The bird is an adult male in fine plumage. It is the second known Massachusetts specimen, the first having been recorded in the last (April) number of the Bulletin, by Gordon Plummer, Esq.—William Brewster, *Cambridge, Mass.*

[Although the two specimens alluded to above are doubtless the only ones thus far known to have been *actually taken* in Massachusetts it may be well to call attention to two earlier records. In my "Catalogue of Birds found at Springfield, Mass.," etc., published in 1864 (Proc. Essex Institute, Vol. IV, pp. 48-98), I gave the species as a "Summer Visitant. Accidental"; and add: "Saw one May 13th 1863" (l. c., p. 53). I also cite Peabody (Rep. on the Birds of Mass.) as stating that Professor Emmons had found it breeding in Western Massachusetts. Whatever may be the weight of the testimony last cited, I will take this opportunity of stating more fully the instance I give on my own authority. The specimen was shot and fell, but just as it reached the ground scaled off a few feet into a pile of brush thickly overgrown with bushes, and a prolonged search, repeatedly renewed on subsequent days, failed to discover the bird. Nothing in my ornithological experience ever made so deep an impression on my memory, or gave me keener dissappointment, for I knew what a prize I had lost. The species was then well known to me, and was as distinctly recognized as it could have been had I had it actually in hand. A specimen of this species has since been taken by Mr. E. I. Shores within five miles (at Suffield, Conn. (see Merriam's Birds of Conn., p. 65), of the locality where my example was shot.—J. A. Allen.]

A curious Colaptes.—The most remarkable case of *C. mexicanus* + *auratus* which has come under my observation is that of a specimen taken here February 20, 1881. The bird is *mexicanus*, excepting the 1st, 2d, 3d, and 5th tail feathers of the left side, which are *auratus*—the golden-yellow in striking contrast with the orange-red of the rest of the tail. The specimen also illustrates the rare anomaly of bilateral asymmetry in coloration. It is deposited in the National Museum.—Elliott Coues, *Fort Whipple, Arizona.*

A Vernacular Synonomy.—The compiling of a list of the names of our birds in use among the people to whom they are popularly known has always seemed to me a matter both of interest and value; and I have for some years been making notes for such a Vernacular Synonomy, as it might be termed. There is more in it than the mere grouping of this class of information, since opportunities for philological study exist in plenty, and other general facts of interest are likely to be brought out. As an unimportant example of what I mean, take the case of the Golden-winged Woodpecker (*Colaptes auratus*) which is variously known as follows.

Colaptes auratus.

Golden-winged Woodpecker. (General.)
Yellow-shafted Woodpecker. (General.)
Flicker, or *Yellow-shafted Flicker.* (General.)
Yellowhammer. (General.)
High-hole or *High-holder.* (General.)
Pigeon Woodpecker. (New York and New England.)
English Woodpecker. (Long Island; Newfoundland.)
Yucker. (Western New York.)
Yarup. (New York; Pennsylvania.)
Clape. (New York.)
Wâkeup or *Wacup.* (Massachusetts; Long Island.)
Shad-spirit. (New England coast.)
Hittock, or *Hittuck.* (Canada.)
Fiddler. (Cape Cod.)
Yellow Jay. (Wisconsin.)
Piúte, or *Pee-út.* (New England.)
Pique-bois jaune. (Louisiana.)
Yaffle. (Connecticut.)
Sapsucker, or *Sucker.* (Florida.)
Gēl Spēcht: Spēcht. (Pennsylvania, German.)

Examining this list, one sees how several of the names might arise. The expressions "golden-winged," "yellow-shafted," the French "pique-bois jaune," and the Pennsylvania German name (pronounced *gail speycht*), refer of course to the color of the wing quills, which are very conspicuous. "Yellow-hammer" was among the very first names given by the colonists to this bird, and, like "Yellow Jay," alludes to the color utterly irrespective of likeness of form to the namesake in each case. "English Woodpecker," perhaps, belongs to the same category. The word "Flicker" undoubtedly designates its well-known wavering manner of flight, to which the alternate appearance and disappearance of the yellow quills gives a twinkling, *flickering* look. As for "Pigeon Woodpecker," I think it arises from the peculiar Pigeon-like attitude of this species, which perches *across* the branch, instead of lengthways along it as do other more genuine Woodpeckers. "Highhole," "Highholder" and "Woodwall" (of which I have a note, but no location for) describe the bird's home, of course; and Sapsucker states the popular idea that that is what all Woodpeckers are doing when they move about tree-trunks in search of insect-food. What "Yaffle" and "Fiddler" signify I have no idea. Dr. DeKay remarks concerning "Clape": "some provincial word introduced by the early English colonists."

"Hittock," though now a Canadian term, appears to have been handed down from the Delaware Indians, since Heckwelder says that *hittuck* was the Lin-Lenape word for tree; and also that the Swedes who colonized the lower Delaware Valley in the seventeenth century gave the name "Tree-pecker" to this whole race of birds. In the name "Shad-spirit" is embodied a half-superstitious idea of the New England fishermen of former days (and it may be until now) that this bird came up from the South

and ascended the rivers just ahead of the vernal migration of shad, in order to inform them of the approach of the fish; it is the noting of a coincidence, in other words.

There remain several terms, "Yarrup," "Wakeup," "Pi-ute," and "Yucker," which evidently represent the harsh well-known cry of this species; that is, they were at first intended to be imitations of one or another phase of the bird's voice, but have become changed and corrupted until, perhaps, they no longer answer well to any of its notes. Nuttall has a pertinent note on this head in the second edition of his "Manual of Ornithology," which I append: "They have also a sort of complaining call from which they have probably derived their cry of *pee ùt, pee ùt*; and at times a plaintive *quéàh quéàh*. Occasionally they also utter in a squalling tone, when surprised, or engaged in amusing rivalry with their fellows, *we-cŏgh we-cŏgh we-cŏgh we-cŏgh*, or *wecŭp wecŭp wecŭp*."

This is far from a complete example of what such a study may be in this case or in some others of still greater interest. If any readers of the Bulletin should take the trouble to send me names used in his district, no matter how well-known they may seem to be, or any suggestions as to the "why or wherefore" of this and that term being applied, I should highly appreciate the assistance thus afforded.— ERNEST INGERSOLL, *Smithsonian Institution, Washington, D. C.*

NESTING OF KENNICOTT'S OWL.— I have this season (1881) found here two sets of the eggs of Kennicott's Owl (*Scops asio kennicotti*.) The first set of four eggs, taken April 7, measure as follows: 1.47×1.28, 1.43×1.29, 1.45×1.30, 1.46×1.30. The nest was in a hole in a cotton-wood tree, about 25 feet from the ground. The eggs rested on the decayed wood and a few dead leaves. The second set, consisting of five eggs, was taken April 11. The eggs measure 1.53×1.31, 1.50×1.27, 1.47×1.32, 1.50×1.32, 1.49×1.30. This nest was also in a hollow of a cottonwood, about 40 feet from the ground. The eggs rested on the rubbish at the bottom of the hole, there being neither feathers nor leaves. The parents in both instances remained in the hole while the eggs were being removed.—CHARLES BENDIRE, *Fort Walla Walla, Wash. Terr.*

BREEDING OF THE ACADIAN OWL IN EASTERN MASSACHUSETTS.— On June 4, 1880, I found a nest of the Acadian Owl (*Nyctale acadica*), containing five nearly fledged young, in a cedar tree, in the midst of a dense swamp in Braintree. The nest was an old nest of a Night Heron, repaired with a few leaves and feathers. From the size of the young birds it is evident that the eggs must have been laid about the end of April or very early in May. The young birds were clad in a mottled plumage — gray intermixed with a sprinkling of red. Close to this nest of the Acadian Owl was found the nest of a Long-eared Owl. I have never heard before of Owls of different species nesting so near each other.— N. A. FRANCIS, *Brookline, Mass.*

Early Arrival in New England of the Least Bittern.—On March 1 of the present year while at Providence, Rhode Island, I saw a freshly-killed Least Bittern at the natural history store of Messrs. Southwick and Jencks. It was brought in by a boy who said that he shot it on the shore of the bay near the city. It was an adult male, thin in flesh even for the shadowy pattern of its race, but in very perfect plumage.—William Brewster, *Cambridge, Mass.*

The Least Bittern in Northwestern Minnesota.—It is said in Dr. Coues's "Birds of the Northwest" that the Least Bittern (*Ardetta exilis*) "does not appear to be anywhere abundant." In this vicinity is a small lake or pond, covering thirty or forty acres, whose very reedy shores furnished last summer nesting room for eighteen or twenty pairs of these birds. The other ponds near here, some dozen in number, each had their complement. So that I think I am fairly entitled to regard it as abundant. The nests were all placed on floating bog, a few feet from open water, and the eggs average larger than the measurements given in the above-mentioned work, specimens 1.30 inches by 1.00 inch being not uncommon. The habits of this bird have been compared to those of the Rails, but to my mind it more frequently calls up the Marsh Wren. As it laboriously fixes itself on the stem of a long reed, one foot above the other, in the position taken with such airy lightness by the Wren, one is reminded of the lapdog and the donkey. It climbs awkwardly and with much effort, foot over foot, up two neighboring reeds, until at a convenient height, it stands with legs wide apart, or, after a squawk or two, launches into the air. My first acquaintance with the bird was at Ripon, Wisc., where it was rare and shy. Here, on the contrary, it is quite tame. It arrived this year May 10, making the eighty-sixth on my list of spring arrivals.—W. W. Cooke, *White Earth, Minn.*

Occurrence of the Purple and Florida Gallinules near St. John, New Brunswick.—M. Chamberlain, Esq., of St. John, New Brunswick, has very kindly furnished me with the following notes for publication in the Bulletin.

On April 6, 1881, a Purple Gallinule (*Porphyrio martinica*) was shot at Irishtown, a few miles west of St. John. It was taken in a meadow a short distance from the shore of the Bay of Fundy. A Florida Gallinule (*Gallinula galeata*) was also captured by Henry Ketchum, Esq., at Dick's Lake, in September, 1880.

There is a record (*Jones*, Am. Nat., IV, 253) of the occurrence of the Purple Gallinule at Halifax, Nova Scotia, January 30, 1870, but I cannot learn that the Florida Gallinule has previously been detected so far to the eastward as St. John.—William Brewster, *Cambridge, Mass.*

The Yellow Rail (*Porzana noveboracensis*) in Massachusetts.—Mr. Charles I. Goodale, the Boston taxidermist, tells me that he once found Yellow Rails actually abundant at Plymouth, Massachusetts. In

company with a friend he killed ten specimens in a few hours. They were flushed from tall sedge on a salt marsh and many more were seen at the same time. They, however, have never since been found in the same locality.

Mr. Goodale also kills one or two specimens every season at Wakefield, Massachusetts. He finds them, both spring and fall, when shooting Snipe on fresh-water meadows.— WILLIAM BREWSTER, *Cambridge, Mass.*

EXCEPTIONAL ABUNDANCE OF THE SHOVELLER AT PORTLAND, ME.— The Shoveller (*Spatula clypeata*) is so rare a bird in Maine that I was not a little surprised to find five handsome males hanging in one of our city markets on April 18 of this year. Suspecting that the unusually bleak weather of the season might have driven others to the vicinity, I watched the markets closely for several days subsequent, and was rewarded by detecting two more birds, one of them a female. Four other specimens were received by Mr. A. Nelson, taxidermist, making a total of eleven birds taken between April 18 and 23. All of these, with the exception of one female, which was killed in a pond on Cape Elizabeth, were said to have been shot in Casco Bay.

Until this year, but three instances of the Shoveller's occurrence in this vicinity have come to my knowledge. In September, 1876, I examined two specimens which were taken on Scarborough marsh, and on April 14, 1879, I received a female from one of the littoral islands of the same township.— NATHAN CLIFFORD BROWN, *Portland, Me.*

THE VELVET SCOTER AT GREEN BAY, WISC.— A male specimen of the Velvet Scoter (*Œdemia fusca*) was sent to me April 23, 1881, which was shot at Little Suamico, on Green Bay, Wisconsin. Its capture here is a little out of the usual order.— SAMUEL W. WILLARD, *West DeVere, Wisc.*

LARUS GLAUCUS IN TEXAS.— I procured a skin of a Gull shot by my friend Mr. A. Hall of Clay County, Texas, December 17, 1880. I have been unable to refer it to any other genus than *Larus* and species *glaucus*. The red spot on the under mandible was not discernible, the bird having been killed six weeks prior to its reception by myself. The length (skin measurement) is 28 inches; wing 18.25. The bill is yellowish at base and dark at tip; feet, flesh colored. Sex ♂. The bird was shot in Red River while feeding upon the carcass of a skunk. Mr. Hall has seen no other specimen like this in Clay County, Texas.— G. H. RAGSDALE, *Gainesville, Texas.*

[This specimen of *Larus glaucus* is now in the collection of the Museum of Comparative Zoölogy, Cambridge. It is in immature plumage, verging on the adult phase. It seems not to have been previously recorded from south of Long Island, N. Y.— J. A. ALLEN.]

THE IVORY GULL (*Pagophila eburnea*) AT ST. JOHN, NEW BRUNSWICK.— I am indebted to M. Chamberlain, Esq., for permission to announce the recent capture of an Ivory Gull at St. John, New Brunswick. The

bird, which was in immature plumage, was shot in the harbor near the city in November, 1880. The skin was afterwards forwarded to the Smithsonian Institution where it was identified.

In a hurried glance through the various New England lists I do not find the species anywhere mentioned, excepting by Herrick, who gives it (Bull. Essex Inst., Vol. V, 1873) as a "winter visitant" at Grand Menan. The occurrence of the present specimen so near our eastern border is therefore of no little interest.— WILLIAM BREWSTER, *Cambridge, Mass.*

A CORRECTION.— In this Bulletin, this Vol., p. 75, has not Dr. Sclater left a singular slip of the pen, in saying that the *Trogonidæ* are "the only form of the whole class of birds in which the fourth or outer digit is reversed instead of the second." For "fourth or outer" read "second or inner"; and for "second" read "fourth."— ELLIOTT COUES, *Ft. Whipple, Arizona.*

MIGRATION OF BIRDS AT NIGHT.— On the 16th of April last, at Princeton, Mr. J. A. Allen and myself made the following observations with the aid of the telescope. We noted in about three-quarters of an hour thirteen birds passing the field of the instrument. Nine were going from the south to the north, three in the opposite direction, *i. e.* from the north to the south, and a single bird was flying from the east to the west. Four of these birds we determined from their shape and flight to be Swallows, the others being small land birds which we could not decide on save in one case, where the bird was unquestionably some species of the genus *Turdus*. The moon was 2½° to 10° in altitude during these observations and consequently the birds were flying comparatively low.— W. E. D. SCOTT, *Princeton, N. J.*

[I take this opportunity to correct a mistake inadvertently made in my note to Mr. Scott's paper on the "Migration of Birds" published in the last number of the Bulletin (Vol. VI, p. 100), where in line three of the second paragraph "four" should read two; *i. e.*, the birds seen may have ranged in elevation from one to two miles, instead of "one to four miles," as there stated.— J. A. ALLEN.]

BIRDS AND WINDOWS. — Reading in the April Bulletin the note by Mr. Lucas on "Birds and Windows" brings to mind that when in business in Hartford, Conn., in 1871 and 1872, I found in the spring the following birds that had been killed by flying against the Charter Oak Life Ins. Co.'s building — a very high building with "the windows opposite one another." *Myiodioctes canadensis, Geothlypis trichas, Icterus baltimore, Chætura pelasgia, Trochilus colubris* (6 specimens). —JOHN H. SAGE, *Portland, Conn.*

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ON SOME OF THE CAUSES AFFECTING THE DECREASE OF BIRDS.

BY H. W. HENSHAW.

In an extended field experience in Massachusetts and at various points along the Eastern coast, I have often noticed marked changes in the relative abundance of the species of birds of a given locality from summer to summer. A locality that for several years has furnished a certain species or a summer resident in great numbers will be found after the usual spring migration to be inhabited by comparatively few of that species, although the associate kinds may continue in undiminished force. Or it may be that the reduction will be found to affect several species to a varying degree, involving perhaps birds of very different habits. As my experience in this particular is by no means unique but, on the contrary, as I find, has been shared by every ornithologist whom I have consulted, I have been led to an inquiry as to the probable cause of these seemingly mysterious fluctuations in the numbers of birds, amounting in some instances to almost the complete extermination of a certain species over a restricted area.

It is perhaps scarcely necessary to call attention to the fact that the great variation occasionally to be noticed in the number of migrants passing a given point can have comparatively little weight in an estimate of the actual increase or decrease of the several species, the facts concerning migration being too general

in their nature and the number of observers too small for exact inferences to be drawn. Evidences of a general stability in the course of migration are, however, numerous, and it is certainly true that given species may confidently be expected to occur and recur in abundance along a certain route, while the uniformity with which a species known to be rare will present itself each year in just about the same numbers is still more remarkable. Nevertheless, most observers will agree that no two seasons yield precisely similar notes on migrations, and not infrequently the differences are very great. It is evident that it needs but a slight deflection to one side or the other to carry the bulk of a certain species quite outside the range of observation of the limited number of observers, and this may readily happen from a number of causes. The effect of a severe storm is frequently to retard the migration, and in the long delay that sometimes follows, birds become more or less scattered and may resume their journey on somewhat different lines.

Possibly, also, and especially in fall, the scarcity of food along an accustomed line of flight, and its abundance elsewhere, may be to some extent instrumental in influencing the course taken. But the most potent agent in deflecting birds from their course is adverse winds, and to them doubtless are due most of the variations noted in the number of migrants which are not caused by actual mortality. In connection with the effect of winds in turning migrating birds aside from their usual paths, the interesting question arises whether large numbers are not forced to such remote distances that they are unable to regain the lost path leading to their old homes, and are thus compelled to settle in new quarters. That this does occasionally happen there can, I think, be no question, and doubtless these accidental dispersions form an important means for the spread of species.

Doubtless many of the "accidentals" that so frequently figure in our local lists are to be thus accounted for. But these wanderers are almost always reported singly, and I can recall no instance where a neighborhood has been invaded by a large number of breeders of a species hitherto rare. The home instinct in birds is so strong and enduring that it seems certain that nothing but the most adverse circumstances will cause them to relinquish their efforts to reach their old homes. Were it not indeed so our Avifaunæ would become sadly unstable.

Before advancing an hypothesis to account for the decimation in the ranks of species occasionally to be noticed, it may be well to glance at certain factors in the mortality of bird life, natural and other, with a view to ascertaining what part they play, if any, in the phenomenon.

As is well known, foxes, skunks, weasels, snakes, and the whole tribe of predatory birds, animals, and reptiles contribute towards the reduction of bird life, and unquestionably in wild sections, where nature reigns supreme, play an important and as usually thought, a beneficent part in preventing the overproduction of birds.

While it is true that the aggregate of birds destroyed by these agents is large, it nowhere, I think, even during the nesting season, the period of greatest danger, amounts to the proportions necessary to account for the decrease noticed. This belief is changed to certainty with respect to the civilized districts, where birds of prey, predatory animals, and even snakes are themselves subject to extermination at the hands of man.

If the above be true of the nesting season, still less can natural enemies be supposed to affect to any very appreciable extent the ratio of birds at other seasons or in other regions when away from our observation.

Little appears to be known of the number of diseases among wild birds and the extent to which they prevail. That diseases do actually exist among birds, and to a greater extent than is usually supposed, is, I believe, true, and in a few instances I have myself found dead birds under circumstances that precluded the idea of death from any form of violence.* The almost total lack of evidence upon the diseases of birds is, however, conclusive proof of their comparative rarity,† since if serious diseases were common, or anything like epidemics prevailed, we may be sure their presence and effects would make themselves visibly known.

* Upon this point see Shufeldt in American Naturalist (Vol. XV, Apr. 1881, pp. 283-285). The subject is an interesting one and that its fuller investigation would result in developing some valuable facts cannot be doubted.

† As compared, for instance, with mammals, which are well known to be subject to epidemic diseases that actually depopulate wide districts. Buffalos among large animals, and rabbits among small ones, may be cited in illustration. The latter, particularly, fairly swarm in certain parts of the western Territories, and by their numbers and the consequent damage they inflict upon the farmer would be intolerable nuisances were it not for the occasional epidemics that sweep them off by thousands.

Old age among birds, as elsewhere throughout animated beings, is instrumental as a check on increase, and doubtless many birds survive the various dangers to which bird life is heir to and pay the last great debt from the decay of their vital powers. But the number of deaths from disease and old age doubtless varies within comparatively narrow limits, and hence either alone or combined with natural enemies cannot furnish the cause we seek. Of death-dealing causes none is so curious as that modern invention the telegraph wire. On the plains where high winds prevail and where there is insufficient shelter many birds have been noticed under the wires, dead or crippled from being blown against them. Under such circumstances it has proved a source of considerable mortality among small birds. But when the wires are first put up in a neighborhood it is by no means a rare accident for birds of various kinds to fly against them in calm weather, evidently not seeing, or at least not comprehending, the nature of the obstruction. As might be expected from the height at which it flies and the time of day when most active, the Woodcock is particularly prone to this sort of accident, and scores of this bird have been reported in the sporting papers as being found dead or disabled under newly laid wires. It bears witness to the intelligence of birds and their power to profit by the lessons of experience that in a very short time they learn to appreciate the danger and to avoid it by flying above or below the obstruction, so that they rarely suffer even in high winds.

Storms, especially when they are prolonged and accompanied by sudden and excessive change of temperature, are directly responsible for important changes in the relative numbers in the species of a district, and not a few instances could be cited where certain species have been entirely exterminated from a locality.

The less hardy of our small Insectivores are specially liable to disasters of this kind, particularly in the spring, during or just subsequent to their return from their tropical winter quarters. Indeed, taking our country at large, it is probable that scarcely a year passes without the loss in one or several districts of great numbers of birds from this cause. Sometimes the storm-visited area is small, and occurring early in the season the storm works injury to comparatively few of the earlier migrants. But occasionally it is wide-spread in its effects and, coming in the height of the migration, destroys great numbers of individuals and affects a considerable number of species.

The past season has been unusually fruitful in casualites of the sort referred to, and during early May storms in New England carried off great numbers of Swallows which, from their tender organization and inability to procure food in tempestuous weather, easily succumb to the effects of long, cold storms. Even as far south as Washington, and as late as June, a rain storm accompanied by hail killed large numbers of as hardy a bird as the English Sparrow, other species suffering in due proportion. Of the local effects of a storm, however, the best example I know of is the case of the extermination of the Purple Martins in Cambridge and near vicinity years ago during a cold storm which caught the birds a day or two after their arrival from the south.* This instance is of peculiar interest, insomuch as the Martins, although affected only within a small area and remaining abundant outside of it, have never reoccupied the lost ground; whether from a failure to increase sufficiently to colonize it, or from inability to make headway against the Swallows and Wrens, usurpers of their ancestral seats, is uncertain.

That the causes above named play an important part in the reduction of birds is certain, but with the exception of the last they act in so regular and systematic a manner, or are too unimportant in their effects, to be accepted as explaining the marked decrease which many species undergo in the interval between their departure from and their return to their northern homes. We have now to consider another class of facts in which storms appear as the destructive agents but in a totally different way from those hitherto noticed.

It has long been well known that in foggy and tempestuous weather, at all seasons of the year, but particularly during the migrations, birds are killed in great numbers by being dashed against the light-houses.†

* Facts of this sort, which may be indefinitely multiplied, are of themselves a sufficient refutation of the common superstition that birds are endowed with some mysterious faculty by means of which they are enabled to foretell the weather in advance, and time their movements accordingly. The ill-timed arrival of migrants may be studied to peculiar advantage on the shores of the Great Lakes, where the sudden northers of early spring often check the migrations and fill the shrubbery of the southern shores with great numbers of northern bound birds. The much quoted adage of the "early bird," with its appropriate lesson, fails of application most signally in the case of our migrants, whose forwardness not rarely bears bitter fruit in the death of thousands.

† For interesting data on this see Mr. J. A. Allen in Bulletin Nuttall Ornithological Club, Vol. V, pp. 131–138. July, 1880.

It is not necessary to enumerate the species that have been noted among the birds thus destroyed or to institute any comparisons as to their relative or aggregate numbers. It is enough to note here that the list when fully made out will be found to embrace all our smaller species whose routes of migration or whose habitats are not so far inland as to place them beyond the reach of the coast storms. That the larger species, too, are not wholly exempt from disasters of this sort can be readily shown, Hawks, Owls, Ducks, and even Pelicans having been forced by gales against light-houses. The testimony is sufficient to show that thousands of birds are annually destroyed in this way, and that an infinitely greater number pass by unharmed and are lost to sight in the obscurity of the gale. What then becomes of these latter?

It is perhaps not so well known that vessels coasting off shore from ten to one hundred miles or more are frequently visited by birds that have been swept off the land by the wind. I have frequently during a voyage in the calm summer months found in the early morning three, six, eight or a dozen or more land birds perching on the vessel or flying in excited circles around and over it. Some of these are doubtless forced away from land by the pursuit of Hawks,* or by moderate off-shore breezes, and without doubt soon find their way safely back. The same facts hold good, I believe, for the coast line all over the world, and I am told that in the Mediterranean it is extremely common for birds to alight on vessels, and that here their flight is rarely sufficiently protracted to in anywise injure them. But if caught at any considerable distance from land, it is noticeable that these wanderers will invariably die from exhaustion, no matter what care be taken of them, showing conclusively that they must have been on the wing a very long time. This fact is of interest, as it seems to imply the utter impossibility of at least the weaker-winged North American species — so many of which have been detected in England and the Continent — crossing the ocean without material assistance from vessels or other stable support upon which to alight and rest.

* In fact, I once saw a *Falco polyagrus* in attendance upon some Snowbirds and Sparrows at a distance of about seven miles off the California coast, and similar observations have been made by others.

But it is in spring and fall, and especially after high winds and foggy storms, that the full effects of this class of disasters are to be observed and to some slight extent measured, instances being known where in an interval to be measured by minutes hundreds of birds have been seen from a vessel to fall into the water and perish from sheer inability to sustain themselves longer on the wing.*

The same disastrous results which often accompany the migratory birds along the ocean coasts are also experienced as they pass over the great interior lakes. An account of an instance of such destructive results has just appeared in a late Chicago newspaper, which is of such interest in the present connection, I give it in the subjoined note.†

These two classes of facts point to the conclusion to which I wish to call attention, *viz.*, that the ocean each year proves the burial place for vast numbers of birds. If, as is the case, "hundreds" of birds are dashed against the slender shaft of a lighthouse in a single night, a thousand are hurried past on the wings of the gale for one that meets its doom through the treacherous lantern's rays, and if, as is equally true, not alone hundreds but multitudes are occasionally noticed from the decks of vessels after storms dropping into a watery grave or striving with faint and failing wing-beats against a stern and inevitable fate — if these

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[* See Mr. Frazar's note on destruction of birds by storms in the Gulf of Mexico, published in this number of the Bulletin in the department of "General Notes."—ED.]

† "Very few people have any idea of the really immense number of birds which are lost in the great lakes every year. They are driven off shore by heavy winds, or, crossing from shore to shore, are tired out and fall into the water.

"Very many are lost when they come up from the South in spring, and there are more or less losses all summer, though the fall is the time in which the greatest destruction occurs. Then the birds are gathered in families or flocks, living a nomadic life all through the time of molting, wandering everywhere in search of food. Their new plumage is not always perfect, and their flight is therefore apt to be feeble, and September gales drive them where they will. It is not the small birds alone that fall victims, but the largest and strongest as well as the small and delicate.

"Two years ago there was a heavy storm, lasting some twenty-four hours. It occurred during the first week in September, and the eastern shore of Lake Michigan was strewn with dead birds. I took some pains to count these on a certain number of yards, and estimated that if the eastern shore was alike through all its length over half a million of birds were lying dead on that side of the lake alone. It is more than likely that nearly as many more were on the west. Not *all* the birds could be counted, because many were immediately buried in the sand that is being swept back and forth on the beach.

limited points of observation give such results what estimate will suffice to comprehend the number of the Ocean's victims in its vast expanse of storm-visited surface! That millions of birds are annually thus destroyed cannot be doubted, and it is in this way I would account for the numerical fluctuations noticed in the beginning of this article.

The migrations of birds have been well likened to the waves of the ocean, each billow of this living sea being made up of different species, the individuals of each species coming from more or less contiguous ones. This latter statement is proven from the fact that the main body of a given species arrives at a locality in the spring, as it leaves it in the fall, almost simultaneously, a single day usually sufficing to see a neighborhood stocked with its full quota, the onset of the numerous clans having been

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"It was a strange and pitiful sight. Some were so fresh and perfect, and their feathers so unruffled, that it seemed impossible that they had been drowned. There were multitudes of wrens, with narrow, gauzy wings spread out, so that the wind swept them up and down on the sand, like autumn leaves sere and brown. Tiny creepers, looking ghastly with only a head and wing unburied, and moving as if alive; kinglets with their bright crowns defaced huddled into a group, where I counted a robin with fair unruffled breast, a kingbird, a summer yellowbird, and one orange-crowned warbler. The greatest number of any one species was the yellow-winged sparrow, both young and old. The grass finch and the song sparrow were abundant, as was also the familiar little pair bird. Of the goniaphea I do not remember a single specimen. They leave before September, I think. There were cowbirds, and one or two blackbirds, and no orioles. Blue jays one or two, much worn and defaced, and the common phebe more numerous. Belted king-fishers I saw once or twice, and of the picidæ, the red-head and the golden-winged, a single specimen each, as well as two of the downy woodpeckers.

"There were none of the varieties of the hirundinidæ, and but one or two of the thrushes, except the robin, which was rather numerous. Evidently that bird comes earlier and stays later than any others of his family. A single catbird came under my notice.

"I have observed that all through the summer more or less birds are drowned and thrown up on the beach. How many it is impossible to say, as they are soon covered with sand or carried away by prowling wildcats, whose tracks I constantly saw there. It is unlikely that during the breeding season any bird ventures so far from home as to cross the lake, and as there are no bays, and a sandy beach skirts all the wooded shores, the birds are not lost in flying voluntarily over the water, but are blown out and exhausted by baffling winds, fall down, and perish. . . .

"If one had time to follow the beach during the season a pretty fair knowledge of the birds that haunt the shores of Lake Michigan might be gained. My observation was necessarily limited to a small space, but a wider research would no doubt give many other varieties of birds that perish in the lake. This is a very large percentage of loss no doubt, and must be reckoned as only the part belonging to Lake Michigan, since the same thing happens on all the great lakes to some extent. . . . ."—*Chicago Tribune*, Sept. 3, 1881.

heralded, perhaps one or two, possibly six or eight days, previously.* So that a gale would have precisely the effect noticed: that is, it would strike the long migrating line at a certain point where the victims taken would consist largely of the individuals belonging to the same neighborhood, perhaps of but one species or of more, as the case might be. The earlier and later migrants of that neighborhood would alone escape, except the fortunate few that succeeded by favoring circumstances in releasing themselves from the grasp of the storm. Thus it happens that a species usually abundant in a locality may suddenly become rare and yet the species hold its own over its general range.

That the ocean is responsible for the lives of many birds has long been known, but the idea that its victims annually reach such figures as to affect the numerical relation of species over extensive areas has not, I think, been hitherto advanced. That such is the fact seems to me certain and it is with the idea of directing the attention of observers to this class of facts, as well as with the hope of eliciting information already gathered but not yet made known, that these pages have been written.

ON THE OSSICLE OF THE ANTIBRACHIUM AS FOUND IN SOME OF THE NORTH AMERICAN FALCONIDÆ.

BY R. W. SHUFELDT, M.D., CAPT. MED. DEPT. U. S. ARMY.

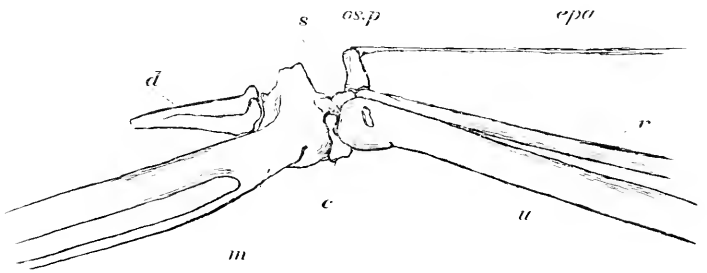
IT does not seem possible that a bone the size of one which I am now about to describe could have been entirely overlooked by ornithologists, yet after a careful perusal of such parts of the works of the most prominent writers, as refer to the skeletology of the upper extremity I fail to discover the barest mention as to the existence of any such an one.

* The departure of birds in the fall is less regular than their return in spring. At least this is true of many species, as for instance the whole Sparrow tribe and many of the Warblers that saunter along as fine weather and an abundant food supply may tempt. The Swallows are the best examples of the other class. Their deliberative gatherings in the fall and prompt departure as though at a preconcerted signal are familiar to all.

My attention was called to the fact several months ago, while engaged in preparing the skeleton of a fine specimen of *Circus hudsonius* which I had secured for that purpose. The bird in question had been allowed to macerate for a long time, as a disarticulated skeleton alone was desired, so that disintegration of the soft parts was very complete and the bones sank to the bottom of the vessel containing my Hawk. Upon collecting these together and assorting them I found a pair of ossicles that I could not exactly account for, nor conceive as to which part of the bird's skeleton they rightfully belonged; of course the vertebral column, sternum, ribs, and pelvis could, one and all, be immediately discarded; first in order, naturally came the carpus and tarsus both of which were carefully examined, an examination that at the time I am free to confess threw no further light upon the subject, for the extremities of the long bones seemed to possess nothing that approached the appearance of additional facets for articulation, and the two free ossicles of the carpus seemed to exhibit all their usual characteristics as irregularly formed bonelets, not differing materially from their homologues in other birds of powerful flight. From the bony remains of my disjointed Marsh Harrier, I turned to the authors and authorities but only after thorough search through the works of those then at my command did I find that my labors were to terminate as already cited. Nothing was revealed or described that assisted me in the elucidation of such an unsuspected problem. My fowling piece and another specimen was the only and best resort left, but, as we all know, when a certain species of the class *Aves* becomes particularly desirable and *must* be had at once, no matter how common it may be, that bird suddenly develops a remarkable shyness, to say nothing of rarity, and such was the case here, for fully a month elapsed before a duplicate was taken; but it came at last in the shape of a fine adult female of the species already considered, and she was eagerly carried to my study.

My first suspicions were the first to be satisfied, and to this end I made an incision, carried only through the skin, around the shoulder, then carefully removed the integuments, allowing the quills of the primaries to remain, from the entire wing. This being successfully accomplished, the following condition of affairs at the wrist joint at once were disclosed to me, and carefully noted.

The usual long bones and carpal segments interested in the formation of the wrist joint of this Hawk held their positions and relations to each other as we find them described by ornithotomists generally; but superadded to these I found the ossicle which proved to be the counterpart of one of the pair I already had in my possession, found in the first specimen; in form it resembles an irregular parallelopiped or rather, and more correctly speaking, the frustum of a four-sided pyramid, its distal face being concave and its summit more or less tuberous. Its altitude measures 6 centimetres, while its base has a diameter of 3 centimeters, and is smooth, being covered with a thin layer of cartilage for articulation with a diminutive facet found on *scapholunar* and an extension of the usual horizontally compressed, distal end of radius that was produced anconad for that special purpose. The articu-



Right Carpus, Circus Hudsonius, Ulnar aspect.

u, ulna. *r*, radius. *c*, cuneiform. *s*, scapho-lunar. *os.p*, os prominens. *m*, metacarpus. *d*, index digit. *epa*, tendon of extensor plicæ alaris.

lation is a true arthrodia, the little bone being perfectly free to glide over the surface in question, being restricted in its movements mainly by the ligaments that are attached to it and by the tendon of the *extensor plicæ alaris* that is found to be inserted at its summit. The principal ligaments are found to be those that are attached about its base to hold it in the position it occupies, and are blended with the carpal ligaments, generally; and an additional broad ligamentous expansion that is thrown out from the radial angle and aspect, from its summit to its base, to be inserted into the head of the metacarpus.

My sketch of the carpus in *Circus*, accompanying this paper, represents the bones of a life size from a large female of the species, entirely divested of all the engaged tendons and liga-

ments, with the one exception already referred to, the limb being in a position of extreme extension. When the member is brought to the side in a position of rest, the ossicle no longer being held in its erect position by the stretched tendon of the *extensor plicæ alaris*, falls forwards and inwards to cover the ulnar aspect of the carpal articulation and forms in so doing an unusually rotund joint, particularly noticeable in the bird before the removal of the elastic integuments that tend further to hold it in this position in the closed wing.

As this little bone can in no way be considered as belonging to the bones of the carpus proper, I have named it the *os prominens*, and regard it in the same light and place it in the same category with the *os humero-scapulare* of the shoulder joint of others of the class, they being simple segments super-added to the series of vertebræ, modified or otherwise, of the avian skeleton, to fulfil a certain purpose.

The function of the *os prominens* can be studied, and its action thoroughly appreciated, by an examination of the wing in any of the Hawks where it is found; a very recently killed specimen being the best subject.

With the wing closed, it simply falls into the position that I have already endeavored to describe, and in doing so, it acts more as an additional protection to the anterior aspect of the carpal articulation than anything else — by no means an unimportant object among the *Falconidæ*; in the extended limb, where it becomes erect, and the elastic tendon of the *extensor plicæ alaris* is put on the stretch, we will at once observe that the surface of the integumental membrane, that is found in the triangular space between shoulder and carpus, is very much greater than if that tendon were simply inserted at the wrist-joint; this circumstance giving to these Raptorial birds a more extensive alar superficies, a very important auxilliary during their sustained flight aloft when, sailing in circles, they scan the earth below for their food.

The various bones in the cut are lettered to correspond with the same bones of my former published monographs, and the *os prominens* is here lettered *os. p.*, and will be invariably so designated in future plates and papers when it becomes necessary to refer to it. I have thus far failed to discover this osteological character in any of the class except the *Falconidæ*, and doubt

its existence in any of the American Owls. The opportunity of examining the skeleton of *Surnia funerea* has never been afforded me.

In the skeleton of *Buteo borealis*, from the collection of the Smithsonian Institution, we find this bone present, although of relatively smaller size as compared with *Circus;* it also seems to articulate almost, if not quite, exclusively with *scapho-lunar*, barely coming in contact with radius at all.

In the same collection we observe, in the skeleton of *Haliæetus leucocephalus*, the *os prominens* again present, and here of a more quadrate outline and figure, though evidently designed to carry out a like purpose as in the other diurnal Raptores.

The skeletons of *Accipiter cooperi* that I have examined, an indifferent one in my own possession, and another, not entirely reliable, in the collection of the Army Medical Museum, Washington, seem to be without these bones, and I am of the opinion that if this Hawk possesses them at all, they will be found to be very small as compared with others of the family. They are present in *Archibuteo lagopus sancti-johannis*, where they again resemble these bones as found in *Circus*, differing principally in the position they occupy, being placed apparently still further towards the inner aspect of the joint. We find them also in *Astur atricapillus*, in *Accipiter fuscus*, where they are quite prominent and elongated, and again in *Pandion*, but further than this I have not looked into the subject and would prefer, in any event, describing their exact size, position, and relation to surrounding parts from the recently killed specimens rather than from museum skeletons, as valuable as these subjects are to osteological students in so many other respects.

We may be certain that the *os prominens* will never be regarded by any one in the light of one of the bones of the carpus, but articulating as it does with one of those bones and the distal end of radius, it will be the proper place in descriptive works or special monographs upon ornithotomical subjects to notice and describe it; just as Professor Owen treats the *os humero-scapulare* of birds, directing attention to it under the section treating of the Scapular Arch and Appendage, where he says: "In *Raptores*, *Scansores*, and *Cantores*, an ossicle (*os humero-scapulare*) lies between the scapula and humerus at the upper and back part of the glenoid cavity." (Comp. Anat. & Phys. of Vert., Vol.

II, p. 67.) In the same volume, page 73, in his general description of the bird-wrist, he simply describes it in the following terms: "The ulnar trochlea articulates with the two free carpal bones, one — the 'scapho-lunar' — being wedged into the radial, the other — 'cuneiforme' — into the ulnar part, leaving a small intermediate tract for the 'magnum' which is confluent with the base of the mid-metacarpal" — not mentioning any such bone, nor do we find, further on under special references to certain departures in some of the genera from the general rule, any allusion to such an ossicle as the *os prominens*. Moreover, in the same work, in treating of the Muscular System of Aves, page 98, and apparently describing the muscles of a Hawk, too, — *Buteo vulgaris*, I think, — the opportunity, one would suppose, was afforded to have called our attention to the presence or absence of such a feature; but nothing of the kind has been noted, the muscle being simply described (for all birds) as follows: —

"A remarkable muscle, partly analogous in its origin to the clavicular portion of the deltoid, but differently inserted, is the *extensor plicæ alaris*, ib. 30, a, b, [the Hawk] and forms one of the most powerful flexors of the cubit. It is divided into two portions, of which the anterior and shorter arises from the internal tuberosity of the humerus; the posterior and longer from the clavicular extremity of the coracoid bone. In the Ostrich and Rhea, however, both portions arise from the coracoid. The posterior muscle, *b*, sends down a long and thin tendon which runs parallel with the humerus, and is inserted, generally by a bifurcate extremity, into both radius and ulna. The anterior muscle, *a*, terminates in a small tendon [the one shown in the cut, for *Circus*, accompanying this paper] which runs along the edge of the aponeurotic expansion of the wing. In this situation it becomes elastic; it then resumes its ordinary tendinous structure, passes over the end of the radius, and is inserted into the short confluent metacarpal, *a*. It combines with the preceding muscle in bending the forearm; and further, in consequence of the elasticity of its tendon, puckers up the soft part of the wing."

Professor Edward S. Morse, in his discussion upon the carpus of birds (On the Tarsus and Carpus of Birds: Ann. Lyc. Nat. Hist. New York, Vol. X, 1872), makes no mention of the

presence of any such bone, as being one likely to be confounded with the carpal bones, in our study of the carpi of *Falconidæ*. He sums up the results of his valuable and advanced studies by stating, "Thus we must recognize in birds the presence of four tarsal bones, and at least four carpal bones" (op. cit. p. 152).

Prof. Huxley in his "Manual" (Manual of the Anatomy of Vertebrated Animals, New York, 1872, pp. 248–9) has nothing to say to us in regard to any such segment; he concludes with the wrist-joint by briefly remarking that "There are only two carpal bones, one radial and one ulnar," although this same profound anatomist, to whom we owe so much, calls our attention, in another paragraph, to the much smaller ossicle, in these terms: "A small bone, the *scapula accessoria*, is developed on the outer side of the shoulder-joint in most *Coracomorphæ* and *Celeomorphæ*."

One would hardly look for it in Dr. Coues's elaborate description of the bird-wing in his "Key" (Key to North American Birds, 1872, p. 30), as that section was evidently written with a very different purpose in view, and certainly not to decide the peculiar osteological characters that might be or were already known, to occur in the various wings of the many representatives of the class. These remarks apply with equal force to all that Professor Carl Vogt has to say to us in his paper upon the *Archæopteryx macrura* (Ibis, Oct. 1880), where he devotes a paragraph to a revision of the osteological points as they occur in the upper extremity of the Ring-Dove.

OÖLOGICAL NOTES FROM MONTANA.

BY DR. J. C. MERRILL, U.S.A.

THE following notes on the nests and eggs of six species of birds may be of interest, as all are rare and two, those of the Snowbird and Woodpecker, are, I think, undescribed. These nests were found during the past season in the northern part of the Big Horn Mountains, so near the Montana-Wyoming boundary line that in some cases it is impossible to say in which of these Territories they were located.

Regulus calendula (*Linn.*) *Licht.*—The Kinglets offer a remarkable illustration of the fact that a bird may be very common, and yet its eggs remain for years among the greatest desiderata of oölogists. So far as I am aware, but four nests of the Ruby-crown have been found up to the present time, and all were found in Colorado.* A fifth nest was found by me on the 18th of June at an elevation of 7,700 feet. It was in a fir tree, about eighteen feet from the ground, and placed directly against the trunk, supported by a single branch beneath and by several twigs to which the sides were firmly attached. It is large for the size of the bird, measuring externally 3×4, internally $1\frac{2}{5}\times1\frac{2}{5}$ inches. It is a very neat, well-made structure with soft thick walls. With the exception of the lining, which consists of feathers of the Richardson's Grouse well woven into the sides and bottom, the whole nest is composed of delicate strips of bark, small pieces of green moss, and fibres of weeds, with a few feathers, spiders' webs and fragments of a wasp's nest, the whole forming a somewhat globular mass of soft materials. Of the eggs, which were eight in number, one had apparently just been laid; the others were somewhat advanced in incubation, but in varying degrees, showing that the female† had begun to sit soon after laying the first egg. Dissection of the female showed that this was the full complement of eggs. They average .55×.43, with scarcely any variation in size, though some are much more pointed at the smaller end than others. It is not easy to give an accurate idea of the color of these eggs by any description. At first sight they appear to be of a uniform dirty cream-color, but a close examination shows that in most of the specimens this color is deeper at the larger end and there forms a faint ring. In six of the eggs there are one or two very fine hair lines at the larger end. Other eggs of this species are spotted, a fact which is strongly indicated by the appearance of the set just described. Thus, Dr. Brewer, in speaking of the egg found by Mr. Batty, says "the ground color is a cream-white, and over this are profusely scattered minute dots of brown with a reddish tinge." Mr. Scott describes the eggs he found as "of a dirty white color, faintly spotted all over with light brown, which becomes quite definite at the larger end." The single egg obtained by Mr. Drew is described as "white." It is thus evident that many more sets must be obtained before the prevailing type of egg of the Ruby-crown can be determined. I may add that this species was breeding in considerable numbers, but owing to want of time I only succeeded in finding the nest above described.

Parus montanus, *Gamb.*—Common in the same localities as the preceding species. This is another bird whose eggs have only recently been described, and especially interesting from the fact that they usually differ from those of other members of the genus in being unspotted. The first

* See this Bulletin, IV, 91; *ib.*, 97, *note;* VI, 87. I cannot now refer to the original description of the nest found by Mr. Henshaw.

† It may be stated here that the crown of this specimen was plain with the exception of *three* scarlet feathers.

specimen described was found by Captain Bendire in Oregon; it was white, "moderately spotted and blotched with pale reddish-brown, but not thickly." Mr. Belding, who found three nests, was the first to describe the eggs as white.* A fifth nest is recorded by Mr. Scott;† and Dr. Brewer describes§ a set of seven eggs, six of which are pure unspotted chalky white, the seventh being "marked over its entire surface with fine rounded dots of reddish-brown."

A nest found June 18 was in a fire-killed pine at a height of about sixteen feet. A knothole had been cleared out and the soft decayed wood removed to a depth of four inches, the hardness of the surrounding wood preventing a deeper excavation. On a warm felted bed of various soft materials were five or six recently hatched young and an addled egg. The latter measures .58×.48 and is a dull unspotted chalky white, only slightly pointed at the smaller end. While examining the nest the parents were very bold, perching on a branch within a foot of my head and scolding vigorously.

Dendrœca audubeni (*Townsend.*) *Baird.*—Breeding rather abundantly in the Big Horn Mountains but only one nest was found. Several descriptions of the eggs of the Western Yellow-rump have recently appeared, and its breeding habits are now fairly well known. My nest was found on the 17th of June in a young pine tree growing on the top of a ridge at the edge of a deep cañon, at an elevation of 6,500 feet. It was about seven feet from the ground and placed against the main trunk, supported by and partly saddled upon two twigs. It is large for the size of the bird, measuring 4×4 inches: internally 1½×1¾. Externally it is composed of many small twigs and fine strips of bark; within this is a thick wall of well matted strips of a weed and of bark and pine needles. The inner lining consists of fine fibrous roots and hairs, with a feather or two. The most curious feature of the nest is a circle of feathers of Richardson's Grouse attached to the rim for nearly the entire circumference, a small bare space being left which was apparently used by the bird on entering. These feathers are fastened to the rim by the larger ends and are directed upwards and inwards forming a sort of canopy which completely hid the female while sitting. The appearance is very peculiar and quite unlike anything I have seen, for this use of the feathers is evidently intentional and is very different from what is seen in nests with a lining of loose feathers in which the bird sinks nearly out of sight. One egg was broken; the other four, far advanced in incubation, average .68×.53. The ground color is a decidedly greenish-white, sparingly marked over the entire surface with small spots and dots of black, brown, and lavender, the latter predominating, and form an irregular wreath around the larger end.

Junco annectens, *Baird.*—Rather common in the mountains, but only at a considerable height and among the pine trees. A nest taken June 13

* Proc. U. S. Nat. Mus., I, 400.
† Bull. Nutt. O. C., IV, 92.
§ *Ib.*, V, 47.

was near the top of a ridge connecting two peaks, at an elevation of 8,000 feet. The nest was under a shelving stone, one of many exposed by a land slide, and was in a little hollow dug out by the parents. The nest was rather large, but well and compactly built, composed externally of coarse dry grasses, with an inner lining of fine yellow straws and hairs of the mountain sheep. The eggs, five in number, were far advanced in incubation and one was broken in blowing. They measure .81×.60; .80×.59; .84×.60; .83×.60. The ground color of three of these eggs is a dull yellowish-white, marked with spots and blotches of light reddish-brown and with a few blotches of lavender. The spots are scattered over the entire surface of the eggs, but are largest and most numerous at the larger end. The ground color of the fourth egg, the largest one, is a rather greenish-white.

Pipilo maculatus arcticus (*Swains.*) *Coues.*—Though a common species in many places, the eggs of the Northern Towhee are rare in collections. In all parts of Montana I have found it abundant wherever a stream with bordering underbrush afforded the needed shelter. There is great diversity in the time of laying, or rather in the contents of nests found on about the same dates from the middle of May until late in July, which I attribute more to the great number of nests that must be destroyed by snakes, birds, and small mammals, and to the attempts of the parents to raise another brood, than to any other cause.

The nests are placed on the ground under some bush, a favorite place being in one of the many small isolated growths of cherry brush that are so often seen near streams flowing down many of the mountains in this Territory; lower, on the plains, any growth of bushes or shrubbery appear to answer as well. The rim of the nest is flush with the surface of the ground, the birds scratching a hollow large enough to contain the nest. These are well and strongly built; externally are placed dead leaves and broad strips of bark; then a wall of finer strips of bark and blades of dry grass, lined usually with yellow straws. The internal diameter is about 2¼×2¼. The complement of eggs is four or five, averaging .94×.69 in size. Five sets now before me are of two very distinct types. In two of the sets the ground color is white, slightly tinged with greenish and covered with dots and small spots of reddish-brown and lavender, most numerous at the larger end, where a more or less distinct wreath is formed. The other sets have the ground color scarcely distinguishable on account of the very numerous markings which cover the entire surface of the eggs and which do not tend to aggregate at the larger end; the appearance is that of a general suffusion of reddish and lilac brown.

Sphyrapicus varius nuchalis, *Baird.*—The Red-naped Woodpecker seems to be one of the rarest of its family in Montana, and I have met with it on two occasions only, once near Fort Shaw and once in the Big Horn Mountains.

On the 12th of June a nest was found near the mouth of the cañon of the Little Big Horn River, a short distance below the point where the pine trees give place to cottonwoods. The nest-cavity was in a dead young

cottonwood tree about forty feet in height. The hole was twenty-five feet from the ground, and near the top of the same tree were three similar holes, very probably occupied by the same pair in previous years. The entrance was rather large for the size of the bird. At the bottom of the cavity, about ten inches deep, lay five eggs upon wood dust and a few chips. These eggs were far advanced and measure .91×.72; .90×.73; .93×.71; .93×.73; .91×.73. The male, which was shot, was evidently assisting the female in incubating.

Fort Custer, Montana.

ON A TROPICAL AMERICAN HAWK TO BE ADDED TO THE NORTH AMERICAN FAUNA.

BY ROBERT RIDGWAY.

IN "Forest and Stream" for April 14, 1881 (p. 206), I briefly announced the capture, at Oyster Bay, Florida, by Mr. W. S. Crawford,* of a specimen of a small black Hawk, well-known as an inhabitant of Tropical America, but not previously recorded from any portion of the United States; the name *Buteo fuliginosus*, Sclater, being provisionally adopted for the species. Since the announcement in question was published, Mr. George A. Boardman, of Calais, Maine, has sent me for examination a finely mounted specimen of a Hawk obtained by him on the first of February last at Palatka, East Florida, which proves to be the *Buteo brachyurus* of Vieillot, a bird having the same range as *B. fuliginosus*, and by many ornithologists regarded as the light-colored phase of the same species. The question of the relationship of the two forms was referred to in the "Forest and Stream" article as follows: —

"This question of what name the species [*i.e.* the black specimen obtained at Oyster Bay] should bear is one involving considerable investigation, pending which I will call it, provisionally, *Buteo fuliginosus*, Sclater. It is a small species, about the size of *B. pennsylvanicus*, but with longer wings, and of a

* This specimen was presented to the National Museum by Mr. W. H. Collins of Detroit.

uniform black color, like *B. abbreviatus*.* It has been considered by various writers to be a dark or melanistic phase of *B. brachyurus*, but in this view I cannot concur, no specimens among many which I have examined indicating that any light color-phase exists; both young and old, though otherwise quite different, being uniform black below as well as above.

"While premising that this bird *may* be the *Buteo fuliginosus* of Sclater, it should be remarked that in 'History of North American Birds' (Vol. III, p. 266), I referred this name to *B. swainsoni*, on the presumption that it was probably based on a small specimen of the latter species in the dark phase of plumage; but I may have been wrong in this determination."

That this latter conclusion was incorrect seems now quite certain, as the following will show. Having, as previously stated, a suspicion that the *Buteo fuliginosus* of Sclater might be the small black Hawk usually regarded as a phase of *B. brachyurus* Vieill., I wrote to Dr. Sclater about the matter, laying special stress upon the following facts: (1) That in the plate of *B. fuliginosus* there appeared no trace of the white frontlet usually, if not always, observable in the so-called black form of *B. brachyurus*, and (2) that of the considerable number of specimens of the latter which I had examined the characters were very uniform, giving one the impression of its being, like *B. abbreviatus*, a species without any light color-phase. The type of *B. fuliginosus* being in the Norwich Museum, Dr. Sclater applied to Mr. Gurney, the well-known high authority on Raptorial birds, the results of whose investigations I have, through the courtesy of Dr. Sclater, the privilege of giving herewith. Mr. Gurney writes: —

"I have consulted Mr. Salvin on the subject of Mr. Ridgway's inquiry, with the following result in which we both concur:

"We think that Mr. Ridgway is correct in his identification of the bird which he refers to the melanistic phase of *Buteola brachyura*, but we observe that the melanistic specimens of this species vary as to the intensity of the black coloring of the plumage and also as to the amount of white on the forehead which is sometimes almost *nil*.

"Messrs. Salvin and Godman have a good series of *Buteola brachyura* in various stages and they also have a specimen from

* "*B. zonocercus*" of Hist. N. Am. Birds.

Guatemala which appears to me to be identical with the type of *Buteo fuliginosus* preserved at Norwich. This specimen agrees in dimensions with the female of *B. brachyura* but (like the type specimen of *B. fuliginosus*) is dark brown rather than black and has scarcely any white on the forehead, the type specimen having absolutely none.

"Mr. Salvin and myself are now of opinion that these are only individual variations (seeing that the dimensions and form of the primaries agree) and that therefore *Buteo fuliginosus* should sink into a synonym of *Buteola brachyura* and should not be considered as a melanism of *Buteo swainsoni*."

That this black form, for which *Buteo fuliginosus* appears to be the earliest name, is unquestionably referable to *B. brachyurus* does not, however, appear to be so easily demonstrable; at least none of the authors whom I have been able to consult give sufficient reasons for taking this view of its status. I have examined altogether eleven examples of *B. fuliginosus* and four of normal *B. brachyurus*, the latter all adults, the former including both adults and young. Not one of the former indicated in the slightest degree, by any variation from the typical plumage, the probability of intergradation with true *B. brachyurus*, which, considering the number of specimens, seems strange if they were really the same species. It is a well-known fact that in the case of all the other North American *Buteones* which have a well-marked melanistic phase (*e.g. Buteo borealis*, *B. swainsoni*, and *Archibuteo lagopus sancti-johannis*), examples wholly black in plumage are *comparatively rare*, or altogether less numerous than those which simply tend toward this condition, the light normal and the completely melanistic extremes of plumage being connected by an unbroken series of variously intermediate specimens. In the eleven specimens of *B. fuliginosus*, however, we observe exactly the same uniformity of characters as in *B. abbreviatus*—a species which, so far as known, *has no light-colored phase*, while the differences distinguishing the young and old are exactly the same as in that species! The four adult specimens of *B. brachyurus* are likewise very much alike, and I have never heard of any specimens of this species, except young birds, which possessed a mixed lower plumage. Taking these facts alone as my guide, I should not think of uniting the two forms, but assuming that Messrs. Gurney and Salvin, having

access to larger series of specimens than I have been able to examine, may have seen intermediate specimens (though I am not aware that either of these gentlemen have so stated in their writings) I yield to the opinion of such high authority, though, for the sake of convenience, and in view of possible future developments, have arranged separately the synonymy and description of the two forms.

440.*—Buteo brachyurus.*

SHORT-TAILED BUZZARD.

Normal phase.

Buteo brachyurus VIEILL. N. D. iv. 1816, 477 (= ♀ adult). GRAY, Gen. B. i. 1849, 12.—PUCHER. Rev. et Mag. Zool. 1850, 86.—BONAP. ib. 481.—RIDGW. Pr. Boston Soc. May, 1873, 67 (Brazil).

Buteola brachyura BONAP. Rev. et Mag. Zool. 1850, 489. — SCL. and SALV. P.Z.S. 1869, 130; Nom. Neotr. 1873, 118 (Guatemala to Brazil). — TACZAN. P.Z.S. 1874, 552 (Central Peru).—SHARPE, Cat. B. Brit. Mus. i. 1874, 201† (Veragua to Amazonia and Peru).—GURNEY, Ibis, 1875, 477–'80 (part).

Asturina brachyura BONAP. Rev. et Mag. Zool. 1850, 489. — STRICKL. Orn. Syn. i. 1855, 42.

Astur brachyura GRAY, Hand-list. i. 1869, 30.

Falco albifrons MAX. Beitr. iii. 1830, 187 (= adult).

Asturina albifrons KAUP, Isis, 1847, 200; Jardine's Contr. Orn. 1850, 67.—BONAP. Consp. i. 1850, 31.

Buteo albifrons SCHLEG. Mus. P.-B. Buteones, 1862, 10; Rev. Acc. 1873, 109.—RIDGW. Pr. Phil. Acad. Dec. 1870, 142.

(?) "*Asturina diadema* KAUP, Rev. et Mag. Zool. 1850, p. 489." (SHARPE ?)

Buteo minutus PELZ. Sitz. Ak. Wien, xliv. 1862, 14 (= young); Verh. z.-b. Wien, 1862, 141; Reis. Novara, Vög. 1865, 16; Orn. Bras. 1871, 3, 396.

Buteola minuta GIEBEL, Thes. Orn. i. 1875, 517.

Hab. Tropical America in general, from Brazil and Peru to Eastern Mexico (Mirador) and Eastern Florida (Palatka).

SP. CH. — Size small (total length not more than 16 inches); wings proportionately long, reaching when closed nearly or quite to the end of the tail. 3rd or 4th quill longest, 1st about equal to or a little longer than the 10th; four outer quills with their inner webs distinctly emarginated. Tarsal scutellæ 8–9. Wing, 11.25–12.70; extent of primaries beyond longest tertials, 2.70–3.30; tail, 7.00–7.20; culmen, .75; tarsus, 2.05–2.50; middle toe, 1.35–1.80.

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* The number (440*) prefixed to the name is that which the species should bear in the new catalogue of North American Birds.

† Excl. syn. "*Buteo melanoleucus* Less" and "*Astur poliogaster* Gray"!

Adult ♂ (*Palatka, Florida, February* 1, 1881; *G. A. Boardman*): Upper surface continuous and nearly uniform blackish-brown, darkest and most uniform on the head, which, with the exception of the anterior half of the lores, the anterior malar region, chin, and throat, is solid sooty black, the occipital feathers snow-white beneath the surface; back with a strong chalky or glaucous cast in certain lights, the scapulars and wings dull grayish-brown with the feathers darker centrally; sides of the rump strongly tinged with rufous. Tail grayish-brown, very narrowly tipped with dull white, and crossed near the end by an indistinct band of dusky, and showing, when widely spread, indications of about four other narrow broken bands, in the form of irregular, but mostly somewhat V-shaped, bars of black along the middle portion of the feathers. Lateral upper tail-coverts lighter brownish-gray, with broad but rather indistinct bars or spots of dusky. A spot on each side of the base of the bill, covering the anterior half of the loral and malar regions, chin, throat, middle of the jugulum, breast, and remaining lower parts, immaculate pure white, the tibiæ, especially on their inner side, washed with pale ochraceous or light buff. Sides of the jugulum rufous-brown, the feathers with dusky shaft-streaks; sides of the breast and anterior portion of the sides marked with a few dusky shaft-streaks, the more posterior ones of which expand terminally into a broad streak of dusky brown. Lining of the wing and axillars immaculate pure white, the under primary-coverts, however, with a large patch of dusky near the end. Bill black, bluish basally; cere, legs, and feet, yellow; iris, brown. Wing, 12.00; tail, 7.00; culmen, .75; tarsus, 2.10; middle toe, 1.35.

Adult ♀ (?): Similar to the ♂, but without rufous tinge on sides of breast, which are grayish-brown, similar to, but lighter than, the wing-coverts. Size larger (wing about 12.70).

Young: "Very similar to the adult, but browner above, the feathers being margined with fulvous; the crown and sides of face streaked with pale ochre; the under surface, especially the under wing-coverts, washed with ochre." (*Sharpe, l.c.*)

An adult specimen (sex not indicated) from Mirador, Eastern Mexico (No. 23,887, U. S. Nat. Mus.), is much like the Florida example described above, but has the white loral spaces larger and connected across the anterior part of the forehead, the sides of the breast almost entirely rufous (there being little if any of the grayish-brown) and the dusky shaft-streaks more distinct. The upper portion of the flanks, adjoining the sides of the rump, are also more distinctly and more extensively rufous. The 3rd quill, instead of the 4th, is longest, the wing-formula being 3, 4, 5–2, 6–7–8, 1. Wing, 11.25; tail, 7.20; culmen, .75; tarsus, 2.05; middle toe, 1.40.

Some specimens presumed to be adult females have the sides of the breast grayish-brown, like the wing-coverts, without any tinge of rufous.

While the young are, like the adult, sometimes immaculate beneath, as described by Mr. Sharpe, they appear to occasionally have the lower plumage striped with dusky, since Mr. Gurney (Ibis, 1876, p. 480) describes an example from Peru, which he refers to *B. fuliginosus*, and which "bears a considerable general resemblance to the young of *Buteola brachyura*, from which, however, it differs in having all the feathers of the underparts, except those of the throat and crissum, which are immaculate, embellished with a conspicuous dark longitudinal shaft-mark of varying breadth, these being narrowest on the upper breast and abdomen, broader on the lower breast, and occupying almost the entirety of each feather on the flanks; on the tibiæ the shaft-marks are expanded into a double transverse bar across each feather: the transverse dark bars on the upper surface of the tail in this specimen are ten, whereas in the immature *Buteola brachyura* they are but seven."

(?) **Buteola fuliginosus** SCLATER.

LITTLE BLACK HAWK.

(= *melanistic phase of B. brachyurus?*)

Buteo fuliginosus SCL. P.Z.S. 1858, 356 (Tamaulipas, N. E. Mexico; = young ♀); Trans. Zool. Soc. iv, 1858, 1, 267, pl. lxii.—LAWR. Ann. Lyc. N. Y. ix, 1868, 133 (La Palma, Costa Rica); Bull. U. S. Nat. Mus. no. 4, 1876, 42 (Tehuantepec City, S. W. Mexico).—RIDGW. Pr. Philad. Acad. 1870, 142.—GURNEY, Ibis, 1876, 235, 477–'80 (critical).

"*Buteo brachyurus*" SALVIN, P.Z.S. 1870, 215.

"*Buteola brachyura*" GURNEY, Ibis, 1876, 477–'80 (part).

Hab. Eastern Tropical America, from Brazil to Northern Mexico (Mazatlan and Tamaulipas) and Western Florida (Oyster Bay).

SP. CH. — Size small (total length not exceeding 16 inches); wing proportionately long, reaching, when closed, nearly or quite to the end of the tail. 3rd or 4th quill longest, the 1st equal to or longer than the 10th; four outer quills with inner webs emarginated, the cutting less abrupt on the 4th, however. Tarsal scutellæ 8–11. Wing, 11.20–13.20; extent of primaries beyond longest tertials, 2.50–4.50; tail, 7.00–8.00; culmen, .70–.85; tarsus, 2.05–2.65; middle toe, 1.35–1.60.

Adult: Uniform black or dusky, varying from dark sooty brown to almost a coal-black, freshly moulted specimens usually having a chalky or glaucous cast on the back, and a more or less distinct purplish reflection

to the general plumage: frontlet usually more or less distinctly white, but this sometimes wholly absent: occipital feathers pure white beneath the surface: outer surface of primaries plain black, without the slightest indication of spots or bars. Tail brownish-gray, or grayish-brown, crossed by about six or seven narrow bands of black, of which the subterminal is much the broadest, the grayish bands becoming gradually narrower toward the base of the tail: under surface of the tail appearing silvery white, with cross-bands of slate-color. Under surface of the primaries chiefly white anterior to their emargination, but this broken by irregular bars, or, as is sometimes the case, confused mottlings of grayish: rest of under surface of the wing uniform dark brown or black, the under primary-coverts sometimes spotted or barred with white. Bill black, bluish basally: cere and feet yellow: iris brown. ♂: Wing, 11.20–11.70: tail, 7.00–7.30: culmen, .70–.75: tarsus, 2.05–2.25: middle toe, 1.35–1.40 (4 specimens). ♀: Wing, 11.90–13.10: tail, 7.50–8.00: culmen, .78–.85: tarsus, 2.50–2.65: middle toe, 1.50–1.60 (6 specimens).

Young: Very similar to the adult, but tail dull brown with more numerous, narrower, and much less distinct bars of dusky, usually 8–9 in number. Contour feathers (both above and below) with much concealed white on the basal portion of the feathers, the lower parts sometimes slightly varied with white or ochraceous spots and streaks, the axillars and under wing-coverts with small round spots of the same, and the under tail-coverts spotted with ochraceous.

Specimens of this form are exceedingly constant in their characters, the eleven which have come under my notice being so much alike that all variations are covered by the terms of the above diagnoses.

A specimen from Mazatlan (12,117, U. S. Nat. Mus.: Col. Abert), appears to very exactly resemble in coloration the type of *B. fuliginosus*, as described and figured by Dr. Sclater. The dimensions also agree rather closely, as may be seen below: —

	Wing.	*Tail.*	*Tarsus.*	*Middle toe.*
Type of *B. fuliginosus*.	12.60	4.10	2.05	1.50
Mazatlan specimen.	12.90	3.65	2.25	1.50

The specimen from Oyster Bay, Florida, being an adult female in perfect plumage, a detailed description of it is given herewith: —

Adult ♀ (No. 81,757, U. S. Nat. Mus., Oyster Bay, Florida, Jan. 28, 1881: W. S. Crawford): General color uniform brownish-black, deeper black and more uniform on the lower parts, which show no markings whatever, though the concealed bases of the feathers are white: frontlet and anterior portion of the fores white, and occipital feathers pure white beneath the surface, showing wherever the feathers are disarranged: inter-

scapulars with a slight chalky cast, showing, however, only in certain lights; terminal borders of the tertials, secondaries and shorter primaries smoky brownish, and secondaries more brownish than the general surface; outer surface of wing showing no indication of bars, except exceedingly faint ones on the secondaries, discernible only on close inspection. Tail grayish-brown (the intermediæ more grayish), narrowly bordered at extreme tip with paler grayish, crossed with a well-defined subterminal band of black nearly one inch wide, and with about six narrow, irregular bands of the same, broken on the intermediæ into irregular spots; under surface of the tail light silvery-gray (appearing hoary-white in some lights) relieved by a distinct subterminal band of dusky, and, anterior to this, by another less distinct, narrower, and more grayish band, the others being concealed by the lower coverts. Under surface of the primaries with the broad portion of the quills chiefly white, but this more or less broken, chiefly on the inner quills, by a grayish clouding, tending to form regular broad bars when the quills are separated; lining of the wing and narrowed portion of the quills uniform black.

Wing, 13.10; tail, 7.50; culmen, .85; tarsus, 2.50 (the unfeathered portion in front 1.50, and with 10 large transverse scutæ); middle toe, 1.55.

The specimens of this species in the U. S. National Museum are from the following localities: Oyster Bay, Western Florida (Jan. 28, 1881; W. S. Crawford); Mirador, Mazatlan, and Tehuantepec, Mexico; La Palma, Costa Rica, and Brazil (Sr. Albuquerque).

ON *PODICEPS OCCIDENTALIS* AND *P. CLARKII*.

BY H. W. HENSHAW.

By at least one author* the specific distinctness of our two largest Grebes, *P. occidentalis et clarkii*, has been denied and *clarkii* formally reduced to varietal rank. Since, however, this view of the relationship of the two seems not to be fully accepted,† and inasmuch as recently I have examined an unusually

* Coues in Birds of the Northwest, p. 128.

† Mr. Ridgway in the recent "Check List of North American Birds" names them as full species.

instructive series of these birds, I propose here to briefly discuss the question with a view to definitely settling, if possible, the relationship of the two. The series alluded to consisted of eleven beautifully prepared specimens in the collection of Mr. D. S. Bryant of Oakland, California, to whose kindness I am indebted for the opportunity of studying the series, and were all shot the same spring in San Francisco Harbor by Walter Bryant.

The characters which served originally to distinguish the two birds are as follows:* —

Occidentalis†: Size large — wing $8\frac{3}{4}$ inches; bill 3 inches; tarsus 3 inches; bill straight, dusky or nearly black, except cutting edges near end where it is yellow; line from eye to base of upper mandible gray.

Clarkii: Size smaller — wing $7\frac{1}{4}$ inches; bill $2\frac{1}{4}$ inches, tarsus $2\frac{3}{4}$ inches; bill with both upper and lower mandibles slightly recurved; color yellow except the edge of upper mandible, which is black; line from eye to base of upper mandible white.

Assuming that the above characters are all that can be brought forward to distinguish the two birds — and I can find no others — the simple question is Do the two maintain their respective characters so as to be always distinguishable or do specimens occur having the supposed distinctive features variously intermingled and varying to a greater or less extent? In other words, can intergradation between the two birds be proven? I answer in the affirmative and for proof refer the reader to the annexed table.

A glance at the table will reveal the fact that the several characters assigned the two birds are variously interchanged, some of the larger individuals referable to *occidentalis* having in addition to certain of the characters of that form peculiarities belonging to *clarkii*; others possess the small size of *clarkii* but with the form and color of bill and loral space of *occidentalis*. Therefore no distinct line can be drawn between the two, and it occasionally becomes a matter of nice judgment to decide to which of the two forms a given specimen should be referred.

The color of the loral spaces varies from being indistinguishable from the color of the head (greenish-black) to a pure white;

* See Birds North America, 1858, p. 894, 895.

† It is noticeable that the series examined by the original describer contained one specimen which, though doubtfully referred to *occidentalis*, was remarked to possess certain of the characters distinguishing *clarkii*.

Comparative Measurements of adult specimens of Pelecanus occidentalis and P. clarkii.

No.	Sex.	Length.	Wing	Bill.	Tarsus	Depth of bill just anterior to nostrils	Curvature.	Color of Upper Mandible.	Color of Lower Mandible.	Color of Lores.	Date.
195	♂	25.50	8.00	2.45	3.25	.48	Straight.	Ridge bluish-black, tip and cutting edge yellow.	Yellow.	Dusky but distinct.	
174	♀	24.50	7.62	2.50	2.75	.40	Very much recurved.	Black: edges and tip yellow.	Black: edges and tip yellow.	Scarcely different from color of head.	Jan. 3, '81.
194	♂	25.50	7.56	2.50	3.00	.44	Recurved.	Ridge black: yellow at tip and along edge.	Bright yellow.	Pure white.	
238	♂	26.00	7.43	2.60	3.00	.48	Straight.	Ridge black: edge and tip yellow.	Bright yellow.	White.	Mar. 10, '81.
199	♀	26.25	7.43	2.50	3.00	.37	Straight.	Ridge black: edges and tip yellow.	Bright yellow.	White.	Feb. 19, '81.
197	♀	23.00	7.37	2.37	2.50	.37	Straight.	Ridge black: edges and tip yellow.	Bright yellow.	White.	Feb. 19, '81.
25	♀	——	7.29	2.50	2.10	.37	Straight.	Ridge black: edges and tip yellow.	Bright yellow.	White.	
248	♀	24.00	7.25	2.25	2.87	.37		Bluish-black.	Black: edges and tip yellow.	Dusky.	Mar. 10, '81.
249	♀	23.00	7.25	2.31	2.69	.32	Slightly recurved.	Ridge black: edges and tip yellow.	Bright yellow.	Brown.	Mar. 10, '81.
198	♀	24.00	7.19	2.56	2.50	.38	Very much recurved.	Bluish-black: cutting edges yellow.	Bluish black: edges and tip yellow	Dusky; scarcely lighter than head.	Feb. 19, '81.
200	♀	23.50	7.00	2.25	2.56	.37	Slightly recurved.	Ridge bluish-black: edges and tip yellow.	Bright yellow.	Pure white.	Feb. 19, '81.

when differently colored, two specimens rarely agree in the extent of the colored area. In some the white or gray extends in a broad area from the bill to behind the eye. In others it is limited to a narrow line reaching only to the eye.

Although in the table the bills of several specimens are given as straight, it is rare to find two birds with the bills alike, and it is evident that it needs only a large number of specimens to constitute a series leading from one extreme to the other.

None of the above specimens chance to equal the extreme size often attained by *occidentalis*, and, on the other hand, specimens of *clarkii* may be had somewhat smaller than here given, yet the larger and smaller individuals in the list are quite within the requirements of size of their respective forms.

As but eleven specimens are considered here, it is easy to understand to what an unlimited extent the characters of the two forms may be intermingled even when, as in the present instance, the birds are derived from the same locality and taken during the same season.

Regarding the distinctive distribution of the two forms, we have little to offer save conjecture. The original specimens of both forms came from the Pacific coast, where the two are found together, at least in winter and during the migrations. Dr. Coues says "both varieties occur together in the United States west of the Rocky Mountains." This was probably a slip of the pen, since Dr. Coues clearly could not have intended to imply the occupancy of the same region by forms the disparities of which are only to be accounted for on the ground of geographical variation, *i.e.*, variation dependent on difference of locality.

As a matter of fact, *clarkii* appears never to have been found in the interior except in fall or winter in Mexico, where, as is well known, birds may, in the dispersion attendant on migration, cross from the Pacific to the Atlantic side and yet be wholly wanting in the interior regions to the northward.

On the other hand, all the specimens I have seen from the interior, *i.e.*, between the Rocky Mountains and the Sierras, were typical examples of the large straight-billed form, *occidentalis*, and during the breeding season, typical *occidentalis* may be confined to the interior. Of the breeding range of *clarkii* nothing is positively known. The fact that the two forms are

found together on the coast up to the last of the migration would seem to imply that their breeding ranges cannot be far separated. It may be ascertained that typical *clarkii*, with its small size and weak bill, only occurs in summer well up on the North-west Coast, and that the coast districts of California, Oregon, and perhaps Washington Territory furnish the intermediate specimens.

ON THE RELATIONSHIP OF *HELMINTHOPHAGA LEUCOBRONCHIALIS*, BREWSTER, AND *HELMINTHOPHAGA LAWRENCEI*, HERRICK: WITH SOME CONJECTURES RESPECTING CERTAIN OTHER NORTH AMERICAN BIRDS.

BY WILLIAM BREWSTER.

Since my original description of the White-throated Warbler (*Helminthophaga leucobronchialis*) appeared, specimens have slowly multiplied until, including the two announced by Dr. Fisher in the present number of the Bulletin, there are now no less than twelve known examples. Until recently there has been no apparent reason for doubting the validity of the species, which has been generally accepted, and even heartily endorsed by several prominent ornithologists. But not long since Dr. Edgar A. Mearns and Mr. Eugene P. Bicknell sent me some puzzling specimens which, at the time, I was obliged to consider aberrant individuals of *H. pinus* and *H. chrysoptera*, but which nevertheless raised certain suspicions affecting *H. leucobronchialis* and *H. lawrencei*. These suspicions are now confirmed by the examination of a fine series, belonging to Dr. A. K. Fisher, which throws a flood of light on the whole subject. I am indebted to Dr. Fisher's kindness for permission to make use of this material in the present investigation.

Before entering into the details of the evidence before me it may be well to emphasize some of the prominent characters which respectively distinguish *H. pinus*, *H. chrysoptera*, *H. leucobronchialis*, and *H. lawrencei*.*

* See beyond, under "General Notes."—EDIT.]

H. pinus. Above yellowish-olive; wing-bands white; lores and post-ocular spot black; cheeks, throat, and under parts generally, rich yellow.

H. chrysoptera. Above bluish-ash; wing-bands yellow; throat, with a broad head-stripe, embracing the lores, cheeks, and auriculars, black (ashy in the female). Under parts white tinged with ashy on the sides.

H. leucobronchialis. Upper surface, including wing-bars, as in *chrysoptera*, but with the back and wings tinged with olive-green; head-stripe restricted as in *pinus;* throat, cheeks, and under parts silky-white, unlike either *pinus* or *chrysoptera;* breast more or less strongly washed with yellow.

H. lawrencei. Throat and head-stripes black, the latter embracing the cheeks and auriculars, as in *chrysoptera;* wing-bands white, and general coloring yellow or olive-green, as in *pinus.*

From the above summary it will appear that neither *leucobronchialis* nor *lawrencei* possesses any important *original* characters. The former borrows its ashy back and yellow wing-bars from *chrysoptera;* its restricted eye-stripe from *pinus;* — while the differential value of its white throat and under parts is materially affected by the usual presence of more or less yellow on the breast. *Lawrencei* has absolutely no peculiar markings or coloration; it simply unites the black throat and broad head-stripes of *chrysoptera* with the white wing-bands and general coloring of *pinus.* In either case there is simply a peculiar combination of borrowed characters. Let us see how constant these combinations are.

No. 1,208 (Dr. Fisher's collection, ♀ ? Sing Sing, New York, July 24, 1881) is in every way similar to the type of *leucobronchialis* save that the lores are more broadly black and the black of the post-ocular spot spreads backward and downward, embracing nearly the whole of the auricular region.

No. 1,235 (Dr. Fisher's collection, ♂, Sing Sing, August 3, 1881) differs from the type of *leucobronchialis* only in having a broad patch of pale yellow on the breast. A large proportion of the specimens previously reported have also exhibited this same peculiarity.

No. 605 (Dr. Fisher's collection, ♂, Sing Sing, August 24, 1879) exhibits a faint wash of lemon-yellow on the throat, while a broad space across the breast is deep gamboge-yellow, and the wing-bands are pure white.

No. 2,620 (author's collection, ♀ ? adult, Nyack, New Jersey, May, 1878; presented by Eugene P. Bicknell) has the chin decidedly yellow; the throat, cheeks, and a small space on the

abdomen white; the remainder of the lower parts gamboge-yellow; the wing-bands white; the nape ashy tinged with green; the occiput, back, and wings as purely olive-green as in *H. pinus*.

No. 1,210 (Dr. Fisher's collection, ♀ adult, Sing Sing, July 24, 1881) is entirely pale greenish-yellow beneath; the back is similar to that of *pinus* but the nape is decidedly ashy and the wing-bands as clearly yellow as in *chrysoptera;* the dusky brown eye-stripe is restricted to the lores and post-orbital spot.

Of the above specimens, No. 605 is perhaps the most important; with its white wing-bars, ashy back, and yellow breast and throat it very equally combines the respective characters of *leucobronchialis* and *pinus*. Nos. 2,620 and 1,210, approach *pinus* even more closely; but the former has the white throat and cheeks of *leucobronchialis;* and the latter an ashy nape, yellow wing-bands and generally pale coloring beneath. No. 1,208 shows a significant variation in the other direction, the extension of the black eye-stripe indicating an increased affinity with *chrysoptera*. No. 1,235 is apparently similar to Gibb's type of *H. "gunnii,"* afterwards referred to *leucobronchialis* by Mr. Ridgway (this Bull., IV, p. 233). Taken as a whole, the series perfectly connects *leucobronchialis* with *pinus*, as well as showing an extension of the former toward *chrysoptera*. This fact being established, the question immediately follows, How can these aberrant birds be accounted for? Before attempting to answer this let us take up *H. lawrencei* and examine a few more specimens.

I have before me a female *Helminthophaga* (No. 4,667, author's collection, Highland Falls, New York, July 7, 1879, presented by Dr. Mearns) which has the crown yellow; the back and wings dull ashy tinged with olive-green; the wing-bands yellow; the cheeks and throat ashy; the chin, sides of throat, and remainder of the under parts heavily washed with greenish-yellow. Making due allowance for the fact that its plumage is excessively worn and faded, this specimen presents nearly the relative characters that would be looked for in the *female* of *lawrencei;* the throat and cheek-markings are those of *chrysoptera* (female), while the remainder of the plumage is colored nearly as in *pinus;* the wing-bands however are yellow, instead of white, and the back is not purely olive-green; but these variations are closely parallel to those which occur in *leucobron-*

chialis, and, reasoning from that analogy, it seems quite as consistent to refer the present example with yellow wing-bands to *lawrencei* as the specimen No. 605, with white wing-bands, to *leucobronchialis*. Assuming this to be granted, we will next consider a young bird (No. 4,668, author's collection) of which the individual just described was ascertained to be the parent. Although in process of change, the fall plumage is fortunately sufficiently developed to afford some important points: the gray first plumage of the under parts is replaced across the breast and along the sides by patches of *bright yellow feathers*, while the sprouting second plumage of the throat is *pure white;* the lores are black, but the few second feathers which appear on the auriculars are, like those of the throat, *white*.*

It may with confidence be stated that this individual would have developed a fall plumage characterized by black lores, white throat, and yellow breast and sides, a condition, in short, nearly similar to No. 605. Now the only way of accounting for the parentage of such an offspring is to assume that the female, No. 4,667, had mated with a male of either *H. pinus* or *H. chrysoptera;* for had the male been either *lawrencei* or *chrysoptera*, the black throat and cheek patches would inevitably have been reproduced.

A nice muddle, certainly! But let us see how all the facts in the several cases look when more closely associated. We have found: (1) That the prominent characters of *leucobronchialis* and *lawrencei* are not original, but are essentially borrowed from their allies, *H. pinus* and *chrysoptera*. (2) That the characters of *leucobronchialis* are inconstant, and that this supposed species intergrades with *pinus*. (3) That the characters of *lawrencei* are also inconstant, and that *lawrencei* interbreeds with some unknown ally—presumably *H. pinus*, producing offspring that resemble aberrant specimens of *leucobronchialis*.

The inference to be drawn from all this can scarcely be doubtful. Race affinities will not explain the peculiar characters of either *leucobronchialis* or *lawrencei*, for the region over which all the known specimens have occurred is everywhere occupied by either one or both of the species to which they are most intimately related. Nor can they be considered as either immature

* Specimens of young *chrysoptera*, in precisely the same stage, have the throat and cheek-patches distinctly indicated by black or ashy pin-feathers, according to sex.

or abnormal examples; the former hypothesis being decidedly negatived by the fact that all the early plumages of both of their affines are known to be widely different; while the latter is made untenable by the number of essentially similar specimens that have come under our notice. Only one possible solution remains: — that they are *hybrids* between *Helminthophaga pinus* and *H. chrysoptera*. And in support of this view an additional fact may be pointed out; viz., that nearly all the known specimens have been taken within an area where *both these species breed, either together, or in close proximity*. The very different combinations of markings and coloring in the two hybrid forms, as restricted, is unquestionably due to a reversal of the parents in each case. That is, one of them is produced by the union of *H. pinus* ♂ with *H. chrysoptera* ♀; the other by that of *H. chrysoptera* ♂ with *H. pinus* ♀. Just which combination produces either must for the present remain a matter of conjecture. The logical inference is, perhaps, that "*leucobronchialis*" is the offspring of *H. pinus* ♂ with *H. chrysoptera* ♀, for in the case of No. 4,668 we have seen that the black throat and cheek-patches, characterizing *lawrencei* equally with *chrysoptera*, were eliminated by an assumed cross with the male of *pinus*. But additional facts must be forthcoming before this part of the question can be regarded as settled.*

Before leaving the Golden-winged Warblers it may be well to dwell a moment on the general bearings of the facts adduced, for it must be evident to all that they have a wider significance than simply showing that *pinus* and *chrysoptera* interbreed, producing so-called "*leucobronchialis*" and "*lawrencei*." They also show that these hybrid offspring—at least the females, as in

*On a former occasion (this Bulletin, Vol. II, pp. 66–68) I bestowed a compound specific name on a hybrid Grouse, thereby adopting a custom followed by certain European ornithologists, notably Mr. Robert Collett of Christiana, Norway. Since that time, however, correspondence with my friend Mr. Ridgway has convinced me of the inadequacy of this form of nomenclature. As Mr. Ridgway pointed out, the hybrid in question was derived from parents of different *genera*, and hence a due regard for accuracy would have demanded the compounding of the *generic* as well as specific titles: the result, it is needless to say, would be an absurdly cumbersome title. As this objection will frequently be met with, and, moreover, in view of the fact that such specimens are in the majority of cases of exceptional and abnormal significance, I fully agree with Mr. Ridgway that a distinctive name is not called for. The Smithsonian specimens of hybrid origin are labeled with the names of both parents connected by the sign +, a method that fully meets the requirements of such cases.

the case of No. 4,667 — reproduce with at least one, and probably either of the parent species: if not — as is by no means impossible — with each other. But the case is not without precedent. As long ago as 1847, Dr. Samuel George Morton, in the course of an essay on the subject of hybridity* cited several well-authenticated instances of the interbreeding — often in a wild state — of various European Finches. A yet more remote alliance, given on the authority of M. Vieillot, was that of a Canary and a Nightingale, the single egg resulting from their union proving, however, unfertile. Among his conclusions the following are especially pertinent to the above connection:

"1. A latent power of hybridity exists in many animals in the wild state, in which state, also, hybrids are sometimes produced.

"2. Hybridity occurs not only among different species, but among different genera: and the cross-breeds have been prolific in both cases.

"3. Domestication does not cause this faculty, but merely evolves it."

The Rev. John Bachman subsequently took the matter up† and supported the negative side of the question, but while he severely criticised Dr. Morton's views we find him admitting (p. 169), "That in a very few species a progeny has been produced that was incapable of propagating with the half-breeds, — in other words, that the hybrid male was physically incapable of having offspring with a hybrid female; hence the latter had to resort to the full blood of either species, and thus the intermediate breed returned to one or the other of the original species."

In the latter fact we doubtless have the explanation of such aberrant specimens as Nos. 1,210 and 2,620, which unmistakably exhibit a slight and otherwise unaccountable trace of hybrid parentage; and similarly it is not unlikely that the yellow breast of occasional specimens of *chrysoptera* may be due to a taint of *pinus* blood. The impaired sexual vitality — granting, for the

* "Hybridity in Animals and Plants considered in reference to the Question of the Unity of the Human Species." American Journal of Science and Arts, 2d Ser., Vol. III, 1847, pp. 203–211.

† An Investigation of the Cases of Hybridity in Animals on Record, considered in reference to the Unity of the Human Species. Am. Journ. Sci. and Arts, 2d Ser., Vol. V, 1848, pp. 168–197.

sake of argument, that it is always impaired in such cases — of the original hybrids, would soon be restored by this breeding back into one of the parent stocks, and the descendants would hence stand a good chance of being numerous, while it would certainly require the succession of many generations to wholly eliminate the traces of their mixed ancestry. And if this state of affairs exists in one genus of birds, why may it not be looked for in others? There are some puzzling instances of the occasional cropping out of respective characters among allied but apparently perfectly distinct species which cannot be explained by any of the known laws of geographical variation. The possibilities opened by this field are bewildering, but for the present we are safer to lay them aside and apply the direct analogy furnished by the case of the *Helminthophagæ* to a few obviously similar ones.

Until very recently there was not a single established example of hybridity among North American *Passeres*, and many of our leading ornithologists were incredulous as to its occurence in a state of nature save among the Grouse and some of the Swimming Birds, while no one seems to have considered the possibility of its explaining some of the standard puzzles* that have been handed down to us by Audubon and other of the earlier ornithologists. But Mr. Trotter's hybrid Swallow (described in Vol. III, pp. 135, 136 of this Bulletin) gave us an undoubted instance, and now we have startling evidence that some of the *Helminthophagæ*† have been regularly contracting misalliances under the very noses of the scientists who were insisting that such things could not be. Who can say where this entirely irregular state of affairs will be found to end? Cuvier's Kinglet, with its *vermillion* crown-patch bordered by *black stripes*, its *black eye-stripe* and *white wing-*

* From a review in a recent number of "Nature" I learn that Mr. Seebohm in his late work on the *Turdidæ*, forming Vol. V, of the "Catalogue of the Birds of the British Museum," has lately recognized hybridity as accounting for certain obscure Old World species; but up to the time of placing the present article in the printer's hands I have been unable to obtain a copy of his book or to ascertain the precise nature of his investigations.

† Mr. Ridgway has lately shown (this Bulletin, Vol. V, p. 237) that *Helminthophaga cincinnatiensis*, Langdon (originally described in Jour. Cin. Soc. Nat. Hist., July, 1880, pp. 119, 120, Pl. VI — description and plate reproduced in this Bulletin, Vol. V, pp. 208–210, Pl. IV) perfectly combines the characters of *Helminthophaga pinus* with those of *Oporornis formosa*. If, as seems highly probable, he is right in considering it a hybrid between these species, it affords another striking example of the tendency of *H. pinus* to seek alien connections.

bands, very closely reproduces the prominent characters of *Regulus calendula* and *R. satrapa;* the Carbonated Warbler similarly combines the *black crown*, *streaked back* and *double wing-bands* of *Dendræca striata* with the general coloring of *Perisoglossa tigrina*, and possesses no individual characters which might not have been derived from such a parentage; *Ægiothus brewsteri* is very nearly intermediate between *Æ. linaria* and *Chrysomitris pinus;* and there are still others among the doubtful or "lost" species which show strong traces of a hybrid origin. But for the present we rest the case here: the bars are down; the gate stands open; "he who runs may read."

PRELIMINARY LIST OF BIRDS ASCERTAINED TO OCCUR IN THE ADIRONDACK REGION, NORTH-EASTERN NEW YORK.

BY C. HART MERRIAM, M.D.

THE present "List" includes only such species as are positively known to occur within the limits of the region of which it treats. It is of necessity incomplete, and many species, especially among the Waders and Swimmers, will be hereafter added to it. One object of its publication at this time is to call forth supplemental information, and the author hopes that any one knowing of the occurrence of a species not herein mentioned, in the Adirondack region, will communicate the fact to him at once in order that it may be incorporated in a more complete paper which will appear at no distant day.

One point in the present list requires explanation. The terms "common," "abundant," etc., do not have the same signification as in a treatise on the birds of Southern New England for example. Birds of all kinds are rare in the dense evergreen forests of the Canadian Fauna. One may travel hours, and sometimes a whole day, among these lonely mountains and scarcely see a single bird. Therefore these terms, as here employed, have a relative significance only. They have the same meaning that they must

ever have when applied to the Canadian Fauna. The nomenclature and arrangement of species followed in the present "List" is that given by Mr. Robert Ridgway in his late revised edition of the "Nomenclature of North American Birds."*

1. **Hylocichla mustelina** (*Gmel.*) *Baird.* WOOD THRUSH. — Rare. Have found it along the borders of Brown's Tract, in eastern Lewis Co., but only stragglers occur here at all. It breeds about Lake George (Dr. A. K. Fisher).

2. **Hylocichla fuscescens** (*Steph.*) *Baird.* WILSON'S THRUSH.—Common in certain localities, where it breeds.

3. **Hylocichla aliciæ**. *Baird.* GRAY-CHEEKED THRUSH. — Occurs during the migrations. I have taken it as late as June 1, but am not sure that it breeds.

4. **Hylocichla ustulata swainsoni** (*Cabanis.*) *Ridgw.* OLIVE-BACKED THRUSH. — Tolerably common summer resident, breeding throughout the wilderness.

5. **Hylocichla unalascæ pallasi** (*Cabanis.*) *Ridgw.* HERMIT THRUSH. —Abundant summer resident.

6. **Merula migratoria** (*Linn.*) *Sw. and Rich.* ROBIN. — Breeds more or less commonly throughout the Adirondacks, and is found in large flocks (often numbering over 200 individuals) in the fall, feeding upon mountain-ash berries and beechnuts.

7. **Galeoscoptes carolinensis** (*Linn.*) *Cabanis.* CAT-BIRD. — Breeds along the borders of the mountains but rarely penetrates the wilderness to any great extent.

8. **Harporhynchus rufus** (*Linn.*) *Cabanis.* BROWN THRASHER. — Occurs with the last and the Wood Thrush about the western foot-hills and borders of this region.

9. **Sialia sialis** (*Linn.*) *Haldeman.* BLUEBIRD. — Breeds sparingly. Have seen it along the Fulton Chain and at Big Moose Lake.

10. **Regulus calendula** (*Linn.*) *Licht.* RUBY-CROWNED KINGLET. — Occurs during the migrations.

11. **Regulus satrapa**. *Licht.* GOLDEN CRESTED KINGLET.—Common during the migrations and probably breeds.

12. **Parus atricapillus**, *Linn.* BLACK-CAPPED CHICKADEE.—Common; breeding plentifully.

13. **Parus hudsonicus**. *Forster.* HUDSONIAN CHICKADEE. — Rather rare visitor from the north. A few may breed, occasionally, but are not known to do so.

14. **Sitta carolinensis**. *Gmelin.* WHITE-BELLIED NUTHATCH.—Breeds, but not common.

15. **Sitta canadensis**. *Linn.* RED-BELLIED NUTHATCH. — Breeds abundantly.

* Bull. of the U. S. Nat. Museum, No. 21, Washington, 1881.

16. **Certhia familiaris rufa** (*Bartr.*) *Ridgw.* BROWN CREEPER.—Tolerably common summer resident, breeding about the lakes. Have seen it in February, but do not think it winters here with any kind of regularity.

17. **Troglodytes aedon**, *Vieillot.* HOUSE WREN. — Confined, so far I can ascertain, to the borders of the wilderness, where it breeds.

18. **Anorthura troglodytes hyemalis** (*Vieillot*) *Coues.* WINTER WREN. — Breeds abundantly. Comes when the melting snow uncovers the mossy logs and brush heaps in April, and follows the wanderings of the mixed flocks in autumn till late in October. A very characteristic bird of the entire Adirondack region.

19. **Anthus ludovicianus** (*Gmelin*) *Licht.* TITLARK. — Occurs during the migrations.

20. **Mniotilta varia** (*Linn.*) *Vieillot.* BLACK-AND-WHITE CREEPER.—Breeds. This is one of the rarer of the summer residents.

21. **Helminthophaga ruficapilla** (*Wilson*) *Baird.* NASHVILLE WARBLER.—Have shot it on Moose River, and at Big Moose Lake, in October (latter locality Oct. 19, 1879). Also given by Roosevelt and Minot from Franklin Co.

22. **Helminthophaga peregrina** (*Wilson*) *Baird.* TENNESSEE WARBLER.—Breeds. Not rare in suitable localities. Generally prefers hardwood areas.

23. **Parula americana** (*Linn.*) *Bonap.* BLUE YELLOW-BACKED WARBLER.—Tolerably common summer resident.

24. **Dendrœca æstiva** (*Gmelin*) *Baird.* SUMMER YELLOW-BIRD. — Breeds, but not very common.

25. **Dendrœca cærulescens** (*Linn.*) *Baird.* BLACK-THROATED BLUE WARBLER.—Common summer resident, usually breeding in hard timber. Have found it in all parts of the woods.

26. **Dendrœca coronata** (*Linn.*) *Gray.* YELLOW-RUMPED WARBLER. —This is the commonest of the Warblers in the Adirondacks, and breeds plentifully throughout the region.

27. **Dendrœca maculosa** (*Gmelin*) *Baird.* BLACK-AND-YELLOW WARBLER.—Common summer resident, breeding throughout the wilderness.

28. **Dendrœca pennsylvanica** (*Linn.*) *Baird.* CHESTNUT-SIDED WARBLER.—Common. Breeds in the deciduous undergrowth about the lakes and streams, depositing its eggs early in June.

29. **Dendrœca castanea** (*Wilson*) *Baird.* BAY-BREASTED WARBLER. — Rather rare. Occurs during the spring migration. Not known to breed.

30. **Dendrœca blackburniæ** (*Gmelin*) *Baird.* BLACKBURNIAN WARBLER.—Common summer resident. Breeds in tall pines.

31. **Dendrœca virens** (*Gmelin*) *Baird.* BLACK-THROATED GREEN WARBLER.—Common, breeding at various localities.

32. **Dendrœca palmarum** (*Gmelin*) *Baird.* REDPOLL WARBLER.—At West Pond, near Big Moose Lake, Oct. 13, 1879, I shot the only Redpoll Warbler that has thus far been noted from this region.

33. **Siurus auricapillus** (*Linn.*) *Swains.* OVEN-BIRD. — Common summer resident.

34. **Siurus nævius** (*Bodd.*) *Coues.* COMMON WATER THRUSH.—Rather rare summer resident. Have found it breeding near the "Old Forge House" below First Lake.

35. **Siurus motacilla** (*Vieillot*) *Coues.* LARGE-BILLED WATER THRUSH.—Strange as it may seem, several typical specimens of this southern bird have been killed about the southern end of Lake George, in Warren County.*

36. **Geothlypis philadelphia** (*Wilson*) *Baird.* MOURNING WARBLER.—Common summer resident, breeding chiefly in the dense growth of blackberry and raspberry bushes that spring up on nearly all the burned districts.

37. **Geothlypis trichas** (*Linn.*) *Cabanis.* MARYLAND YELLOW-THROAT.—Tolerably common summer resident.

38. **Myiodioctes pusillus** (*Wilson*) *Bonap.* BLACK-CAPPED YELLOW WARBLER.—Rare. Have seen it only during the migrations.

39. **Myiodioctes canadensis** (*Linn.*) *Audubon.* CANADA FLYCATCHING WARBLER.—Breeds abundantly. Found everywhere in suitable localities.

40. **Setophaga ruticilla** (*Linn.*) *Swainson.* REDSTART.—Common summer resident.

41. **Vireosylvia olivacea** (*Linn.*) *Bonap.* RED-EYED VIREO.—Common and noisy.

42. **Vireosylvia gilva** (*Vieillot*) *Cassin.* WARBLING VIREO.—Not common and only met with, so far as I am aware, about the borders of the great forest.

43. **Lanivireo flavifrons** (*Vieillot*) *Baird.* YELLOW-THROATED VIREO.—Breeds. Tolerably common.

44. **Lanivireo solitarius** (*Vieillot*) *Baird.* BLUE-HEADED VIREO.—Breeds plentifully in many places.

45. **Lanius borealis**, *Vieillot.* GREAT NORTHERN SHRIKE.—Tolerably common during the fall, winter, and spring. Not known to breed, numerous "records" to the contrary notwithstanding—they all fit the next.

46. **Lanius ludovicianus excubitoroides** (*Swainson*) *Coues.* WHITE-RUMPED SHRIKE.—A rather common summer resident, in suitable localities, where it breeds. In a paper written nearly four years ago† I narrated the occurrence of this bird in Lewis County, and called attention to the fact that the specimens killed here agree more closely with the western (*excubitoroides*) type than with the southern (*ludovicianus*). Since then they have steadily increased in numbers till now they breed throughout Lewis County and have extended their range into all congenial spots within the Adirondack wilderness. Last summer (1880) Walter H. Merriam found it breeding on the South Branch of Ausable River, in Essex County, on the eastern or Lake Champlain side of the

* Bull. Nut. Ornith. Club, Vol. I, No. 2, p. 117, April, 1880.

† Published in Bull. Nutt. Ornith. Club, Vol. III, No. 2, pp. 52–56, April, 1878.

mountains, while I have taken its nest, and seen others, in Lewis County, on the western or Black River side.

47. **Ampelis cedrorum** (*Vieillot*) *Baird.* CEDAR-BIRD. — Common summer resident nesting in dense alder thickets near water.

48. **Progne subis** (*Linn.*) *Baird.* PURPLE MARTIN.—Breeds in "Martin houses" in the villages that lie within the limits of the Adirondack region.

49. **Petrochelidon lunifrons** (*Say*) *Lawrence.* CLIFF SWALLOW.—Breeds at suitable localities.

50. **Hirundo erythrogaster**, *Boddaert.* BARN SWALLOW. — Common enough everywhere outside the woods.

51. **Tachycineta bicolor** (*Vieillot*) *Cabanis.* WHITE-BELLIED SWALLOW.—The commonest Swallow.

52. **Cotile riparia** (*Linn.*) *Boie.* BANK SWALLOW.—Breeds. Not uncommon in places.

53. **Pyranga rubra** (*Linn.*) *Vieillot.* SCARLET TANAGER. — Common summer resident, breeding in the hard timber.

54. **Pinicola enucleator** (*Linn.*) *Vieillot.* PINE GROSBEAK.—Tolerably common winter visitant from the North, but does not occur every winter.

55. **Carpodacus purpureus** (*Gmelin*) *Baird.* PURPLE FINCH.—Always here from before the snow goes off in spring till late in October, and sometimes throughout the winter.

56. **Loxia curvirostra americana** (*Wilson*) *Coues.* RED CROSSBILL.—Abundant resident, rather scarce and irregular in summer but the commonest bird in winter and early spring. Breeds in February and March while the snow is still four or five feet deep on the level and the temperature below zero (Fahr.). Have taken fully fledged young early in April.

57. **Loxia leucoptera**, *Gmelin.* WHITE-WINGED CROSSBILL. — Resident, but not nearly so common as the last.

58. **Ægiothus linaria** (*Linn.*) *Cabanis.* COMMON REDPOLL. — Winter visitant from the north and more or less irregular.

59. **Astragalinus tristis** (*Linn.*) *Cabanis.* AMERICAN GOLDFINCH.—Common summer resident, breeding late — generally in July and sometimes in August.

60. **Chrysomitris pinus** (*Wilson*) *Bonap.* PINE LINNET; SISKIN.—An irregular visitor; sometimes breeding in vast multitudes, and during other seasons not seen at all.

61. **Plectrophanes nivalis** (*Linn.*) *Meyer.* SNOW BUNTING.—Common in flocks in winter.

62. **Centrophanes lapponicus** (*Linn.*) *Cabanis.* LAPLAND LONGSPUR.—Occurs with the last, but is not so common.

63. **Passerculus sandwichensis savanna** (*Wilson*) *Ridgway.* SAVANNA SPARROW.—A rather rare summer resident in suitable spots, where it breeds.

64. **Pocœtes gramineus** (*Gmelin*) *Baird.* GRASS FINCH.—Common in places; breeding in dry grass-covered clearings and sandy fields.

65. **Zonotrichia leucophrys** (*Forster*) *Swainson.* WHITE-CROWNED SPARROW.—Common during the migrations. Not known to breed.

66. **Zonotrichia albicollis** (*Gmelin*) *Bonap.* WHITE-THROATED SPARROW.—Abundant summer resident, far outnumbering all the other Sparrows together.

67. **Spizella montana** (*Forster*) *Ridgway.* TREE SPARROW.—Occurs plentifully in fall and spring on the passage south and back, from its northern breeding ground. Have seen it from October 10 till November 10, and from the middle of February till the last of April.

68. **Spizella domestica** (*Bartram*) *Coues.* CHIPPING SPARROW.—Breeds, but not common. Nests about the Forge at foot of Fulton Chain.

69. **Spizella pusilla** (*Wilson*) *Bonaparte.* FIELD SPARROW.—Dr. A. K. Fisher writes me that he has seen the Field Sparrow about the southern end of Lake George, in Warren County, and that O. B. Lockhart has two sets of eggs taken there. Both Mr. A. Jenings Dayan and myself have found it in the Black River Valley, in Lewis County, where, however, it is a very rare bird.

70. **Junco hyemalis** (*Linn.*) *Sclater.* SLATE-COLORED SNOWBIRD.—Common. Breeds in low woods and deep mossy ravines, depositing its eggs from the early to the latter part of June.

71. **Melospiza fasciata** (*Gmelin*) *Scott.* SONG SPARROW.—A tolerably common summer resident, breeding at various localities.

72. **Melospiza palustris** (*Wilson*) *Baird.* SWAMP SPARROW.—Breeds, but rather rare.

73. **Melospiza lincolni** (*Audubon*) *Baird.* LINCOLN'S FINCH.—Regular summer resident, and apparently not very rare.

74. **Passerella iliaca** (*Merrem*) *Swainson.* FOX-COLORED SPARROW.—Have taken it at Big Moose Lake (in both Herkimer and Hamilton Counties) in October (Oct. 12 and 18, 1879).

75. **Pipilo erythrophthalmus** (*Linn.*) *Vieillot.* CHEWINK.—Rare, and confined to the borders of the Adirondacks.

76. **Zamelodia ludoviciana** (*Linn.*) *Coues.* ROSE-BREASTED GROSBEAK.—Breeds: not uncommon in the areas of hard timber.

77. **Passerina cyanea** (*Linn.*) *Gray.* INDIGO BUNTING.—Found breeding about the foot-hills.

78. **Dolichonyx oryzivorus** (*Linn.*) *Swainson.* BOBOLINK.—Breeds at suitable places and common enough outside.

79. **Molothrus ater** (*Boddaert*) *Gray.* COW BUNTING.—Not rare.

80. **Agelæus phœniceus** (*Linn.*) *Vieillot.* RED-SHOULDERED BLACKBIRD.—Breeds in the "Big Marsh" at the head of Big Moose Lake, at Raquette, the Fulton Chain, and various other localities, and is by no means uncommon.

81. **Sturnella magna** (*Linn.*) *Swainson.* MEADOW LARK.—Owing to the absence of suitable meadows this species is necessarily rare in the Adirondack region.

82. **Icterus galbula** (*Linn.*) *Coues.* BALTIMORE ORIOLE.—This species rests on the authority of Dr. A. K. Fisher, who writes me that it occurs in southern Warren County.

83. **Scolecophagus ferrugineus** (*Gmelin*) *Swainson.* RUSTY BLACKBIRD.—Common summer resident.

84. **Quiscalus purpureus** (*Bartram*) *Lichtenstein.* PURPLE GRACKLE.—Breeds. Not common. I have found it along the Fulton Chain in June.

84 *a*. **Quiscalus purpureus æneus** *Ridgway.* BRONZED GRACKLE.—This form of the species breeds here and is by all odds the commonest in the Adirondack region.

85. **Corvus corax carnivorus** (*Bartram*) *Ridgway.* RAVEN.—Common resident throughout the Adirondacks.

86. **Corvus frugivorus**, *Bartram.* COMMON CROW.—Common summer resident, remaining, in spots, during some of the mild winters.

87. **Cyanocitta cristata** (*Linn.*) *Strickl.* BLUE JAY.—Abundant resident.

88. **Perisoreus canadensis** (*Linn.*) *Bonaparte.* CANADA JAY.—Resident; tolerably common in summer and very abundant in winter. Breeds very early—before the snow goes off.

89. **Eremophila alpestris** (*Forster*) *Boie.* SHORE LARK.—Rare, but becoming more common. Breeds on the sandy fields along the western border of the wilderness and probably at other localities.

90. **Tyrannus carolinensis** (*Linn.*) *Temminck.* KINGBIRD.—Breeds. Common in many places.

91. **Myiarchus crinitus** (*Linn.*) *Cabanis.* GREAT-CRESTED FLYCATCHER.—Breeds, but rather rare.

92. **Sayornis fuscus** (*Gmelin*) *Baird.* PHŒBE-BIRD; PEWEE.—Breeds, but rather rare.

93. **Contopus borealis** (*Swainson*) *Baird.* OLIVE-SIDED FLYCATCHER.—Common summer resident, breeding about the middle of June.

94. **Contopus virens** (*Linn.*) *Cabanis.* WOOD PEWEE.—Tolerably common summer resident.

95. **Empidonax flaviventris**, *Baird.* YELLOW-BELLIED FLYCATCHER.—A rather rare summer resident.

96. **Empidonax pusillus traillii** (*Audubon*) *Baird.* TRAILL'S FLYCATCHER.—Summer resident. Not common.

97. **Empidonax minimus**, *Baird.* LEAST FLYCATCHER.—Common summer resident, generally breeding in hard timber.

98. **Trochilus colubris**, *Linn.* HUMMING-BIRD.—Tolerably common summer resident.

99. **Chætura pelasgica** (*Linn.*) *Baird.* CHIMNEY SWIFT.—Common summer resident.

100. **Caprimulgus vociferus**, *Wilson.* WHIP-POOR-WILL.—Breeds, but not common except about the borders of the woods.

101. **Chordeiles popetue** (*Vieillot*) *Baird.* NIGHTHAWK.—Rather rare, but breeds in places. I have seen it at Big Moose Lake in July.

102. **Picus villosus**. *Linn.* HAIRY WOODPECKER.—A common resident, breeding everywhere.

103. **Picus pubescens**. *Linn.* DOWNY WOODPECKER.—Not so common as the foregoing, but like it a resident, breeding throughout the wilderness.

104. **Picoides arcticus** (*Swainson*) *Gray.* BLACK-BACKED THREE-TOED WOODPECKER.—Tolerably common resident, found in all parts of the Adirondacks.

105. **Picoides tridactylus americanus** *Brehm*) *Ridgway.* BANDED-BACKED THREE-TOED WOODPECKER.—A resident, like the last, but not so common.

106. **Sphyrapicus varius** (*Linn.*) *Baird.* YELLOW-BELLIED WOODPECKER.—Common summer resident, breeding in all sorts of places.

107. **Hylotomus pileatus** (*Linn.*) *Baird.* PILEATED WOODPECKER.—A tolerably common resident, and much more abundant now than it was ten years ago.

108. **Melanerpes erythrocephalus** (*Linn.*) *Swainson.* RED-HEADED WOODPECKER.—Not common but breeds about the borders of the wilderness.

109. **Colaptes auratus** *Linn. Swainson.* GOLDEN-WINGED WOODPECKER.—Rare.

110. **Ceryle alcyon** (*Linn.*) *Boie.* BELTED KINGFISHER.—Common summer resident, breeding about the various lakes and rivers.

111. **Coccyzus americanus** (*Linn. Bonaparte.* YELLOW-BILLED CUCKOO.—Breeds, but rare.

112. **Coccyzus erythrophthalmus** (*Wilson*) *Baird.* BLACK-BILLED CUCKOO.—Rather rare. Breeds about the borders of the woods, but is far from common.

113. **Asio americanus** (*Steph.*) *Sharpe.* LONG-EARED OWL.—Breeds, but not common.

114. **Strix nebulosa.** *Forster.* BARRED OWL.—A common resident, usually breeding in holes in trees.

115. **Ulula cinerea** (*Gmelin*) *Bonaparte.* GREAT GRAY OWL.—Rare. I saw a Great Gray Owl near Seventh Lake, in Hamilton County, late in the fall of 1870; and skinned a specimen that was killed in north-eastern Oneida County, April 10, 1873. Mr. Robert Lawrence has a female that was shot in the Adirondacks (exact locality not stated) in March, 1879.*

116. **Nyctale acadica** (*Gmelin*) *Bonaparte.* SAW-WHET OWL.—Tolerably common resident.

117. **Scops asio** (*Linn.*) *Bonaparte.* MOTTLED OWL: SCREECH OWL.—Breeds and is not rare. Don't think it winters here.

118. **Bubo virginianus** (*Gmelin*) *Bonaparte.* GREAT HORNED OWL.—Common resident.

119. **Nyctea scandiaca** (*Linn.*) *Newton.* SNOWY OWL.—This handsome species is of irregular occurrence in the Adirondack region in winter.

120. **Surnia funerea** (*Linn.*) *Rich. and Swain.* HAWK OWL.—Rare and not known to breed.

121. **Æsalon columbarius** (*Linn.*) *Kaup.* PIGEON HAWK.—Rather rare, but doubtless breeds.

* Bull. Nutt. Ornith. Club, Vol. II, No. 2, p. 122, April, 1870.

122. **Tinnunculus sparverius** (*Linn.*) *Vieillot.* SPARROW HAWK.—Breeds. Not common.

123. **Pandion haliaëtus carolinensis** (*Gmelin*) *Ridgway.* FISH HAWK.—Tolerably common summer resident.

124. **Circus hudsonius** (*Linn.*) *Vieillot.* MARSH HAWK.

125. **Accipiter cooperi,** *Bonaparte.* COOPER'S HAWK.—Breeds and is not very uncommon.

126. **Accipiter fuscus** (*Gmelin*) *Bonaparte.* SHARP-SHINNED HAWK.—Common. Breeds at various places.

127. **Astur atricapillus** (*Wilson*) *Bonaparte.* GOSHAWK.—In the Adirondack region the Goshawk is a resident species, but it must be ranked among our rarer Hawks.

128. **Buteo borealis** (*Gmelin*) *Vieillot.* RED-TAILED HAWK.—Breeds. Tolerably common.

129. **Buteo lineatus** (*Gmelin*) *Jardine.* RED-SHOULDERED HAWK.—Breeds, but not so common as the preceding.

130. **Buteo pennsylvanicus** (*Wilson*) *Bonaparte.* BROAD-WINGED HAWK.—A rather common summer resident, breeding about the different lakes.

131. **Archibuteolagopus sancti-johannis** (*Gmelin*) *Ridgway.* ROUGH-LEGGED HAWK.—Occurs sparingly during the migrations.

132. **Aquila chrysaëtus, canadensis** (*Linn.*) *Ridgway.* GOLDEN EAGLE.—Rare.

133. **Haliæetus leucocephalus** (*Linn.*) *Savigny.* BALD EAGLE.—The White-headed Eagle has nested for many years at Lime Kiln Lake, in Hamilton County, and it is by no means a rare bird in this wilderness.

134. **Ectopistes migratoria** (*Linn.*) *Swainson.* PIGEON.—Breeds plentifully some years and not found at all others.

135. **Zenaidura carolinensis** (*Linn.*) *Bonaparte.* MOURNING DOVE.—Dr. Albert K. Fisher writes me that he has seen this species, and its eggs, taken in Warren County near the south end of Lake George.

136. **Canace canadensis** (*Linn.*) *Bonaparte.* CANADA GROUSE; SPRUCE PARTRIDGE.—Resident, and tolerably common in certain localities.

137. **Bonasa umbellus** (*Linn.*) *Stephens.* RUFFED GROUSE.—A common resident.

138. **Lagopus albus** (*Gmelin*) *Audubon.* WILLOW PTARMIGAN.—Mr. Romeyn B. Hough has a specimen of this species that was killed in the town of Watson on the eastern border of Lewis County, May 22, 1876.* Mr. Hough writes me that he has been told by lumbermen from this region that they had seen "White Partridges" there in winter, and he presumes they were of this species.

139. **Ardea herodias,** *Linn.* GREAT BLUE HERON.—A common summer resident, breeding in small colonies.

140. **Butorides virescens** (*Linn.*) *Bonaparte.* GREEN HERON.—Breeds, but rare except about the borders of the woods.

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* Bull. Nutt. Ornith. Club, Vol. III, No. 1, p. 41, Jan., 1878.

141. **Botaurus lentiginosus** (*Montag.*) *Stephens.* BITTERN.—Breeds, and not rare.

142. **Oxyechus vociferus** (*Linn.*) *Reich.* KILDEER.—Occurs during the migrations.

143. **Philohela minor** (*Gmelin*) *Gray.* WOODCOCK.—Breeds, but rather rare.

144. **Gallinago media wilsoni** (*Temminck*) *Ridgway.* WILSON'S SNIPE.—On the 7th of October Mr. Gregoire de Willamov (Secretary of the Russian Embassy) shot and killed a bird of this species on the big marsh at the head of Big Moose Lake, Hamilton County.

145. **Totanus melanoleucus** (*Gmelin*) *Vieillot.* GREATER YELLOW-LEGS.—Occurs during the migrations.

146. **Totanus flavipes** (*Gmelin*) *Vieillot.* LESSER YELLOW-LEGS.—On the 9th of June, 1878, I shot a female of this species of Yellow-shanks on the inlet to Seventh Lake, in Hamilton County.

147. **Rhyacophilus solitarius** (*Wilson*) *Cassin.* SOLITARY SANDPIPER.—A summer resident, but not very common.

148.—**Tringoides macularius** (*Linn.*) *Gray.* SPOTTED SANDPIPER.—Tolerably common summer resident.

149. **Lobipes hyperboreus** (*Linn.*) *Cuvier.* NORTHERN PHALAROPE.—A rare migrant.

150. **Porzana carolina** (*Linn.*) *Baird.* SORA RAIL.—Breeds about the old Forge at the foot of the Fulton Chain of Lakes in Herkimer County.

151. **Fulica americana**, *Gmelin.* COOT; MUD HEN.—Breeds, but rather rare.

152. **Olor americanus** (*Sharpless*) *Bonaparte.* WHISTLING SWAN.—De Kay gave this Swan as breeding in Herkimer and Hamilton Counties, and stated that "The outlet of Lake Paskungamet, or Tupper's Lake, was specified as a spot to which they were particularly attached."* I do not know of any recent record of its occurrence here.

153. **Bernicla canadensis** (*Linn.*) *Boie.* CANADA GOOSE.—Occurs during the migrations.

154. **Anas boscas**, *Linn.* MALLARD.—A rare migrant.

155. **Anas obscura**, *Gmelin.* BLACK DUCK.—A tolerably common summer resident.

156. **Spatula clypeata** (*Linn.*) *Boie.* SHOVELLER.—Rare.

157. **Querquedula discors** (*Linn.*) *Stephens.* BLUE-WINGED TEAL.—Occurs during the migrations.

158. **Nettion carolinensis** (*Gmelin*) *Baird.* GREEN-WINGED TEAL.—Not common.

159. **Aix sponsa** (*Linn.*) *Boie.* WOOD DUCK.—Tolerably common summer resident.

160. **Clangula glaucium americana** (*Bonaparte*) *Ridgway.* GOLDEN-EYE.—Summer resident, breeding at various places.

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*Birds of New York, p. 353, 1844.

161. **Clangula albeola** (*Linn.*) *Stephens.* BUTTERBALL.—Occurs, but not so common as the above.

162. **Harelda glacialis** (*Linn.*) *Leach.* OLD SQUAW.—Occurs during migration.

163 **Œdemia americana,** *Swain. and Rich.* BLACK SCOTER. — Occurs during the fall migration.

164. **Melanetta velvetina** (*Cassin*) *Baird.* WHITE-WINGED SCOTER. —Common during the fall migration.

165. **Pelionetta perspicillata** (*Linn.*) *Kaup.* SURF DUCK; SKUNK-HEAD.—Occurs with the preceeding, but not so common.

166. **Nomonyx dominicus** (*Linn.*) *Ridgway.* BLACK-MASKED DUCK. —An accidental straggler from the West Indies and South America. Dr. Cabot found it on Lake Champlain (Proc. Bost. Soc. Nat. Hist., Vol. VI, p. 375.)

167. **Mergus merganser americanus** (*Cassin*) *Ridgway.* SHELDRAKE. Common summer resident, breeding on numerous lakes. Very abundant in the fall.

168. **Mergus serrator,** *Linn.* RED-BREASTED MERGANSER.—Occurs during the migrations.

169. **Lophodytes cucullatus** (*Linn.*) *Reich.* HOODED MERGANSER. —Tolerably common summer resident.

170. **Sula bassana**(*Linn.*) *Brisson.* GANNET.—Accidental straggler from the Gulf of St. Lawrence.

171. **Larus leucopterus.** *Faber.* WHITE-WINGED GULL.—A rare winter visitor from the north.

172. **Larus argentatus smithsonianus,** *Coues.* HERRING GULL.—Common resident, breeding plentifully at those lakes that are not too exposed.

173. **Larus philadelphiæ** (*Ord*) *Gray.* BONAPARTE'S GULL.—Occurs during the migrations.

174. **Podiceps holbœlli,** *Reinh.* RED-NECKED GREBE.—Occurs during the migrations—in spring about the last of April.

175. **Podilymbus podiceps** (*Linn.*) *Lawrence.* HELL-DIVER.—Common summer resident.

176. **Colymbus torquatus,** *Brünnich.* LOON.—A common summer resident.

177. **Colymbus septentrionalis,** *Linn.* RED-THROATED DIVER.—Occurs during the migrations. Have seen it at Big Moose Lake in October.

Recent Literature.

STEARNS AND COUES'S "NEW ENGLAND BIRD LIFE."* — After many years of waiting we at length have a work on New England birds of which no ornithologist need feel ashamed. Indeed, this goes without saying when it is known that "New England Bird Life" is edited by Dr. Coues. It is a timely little volume and forms so important an addition to the literature of the subject of which it treats that we propose to consider it at some length.

Immediately following the somewhat significant "Editor's Preface" is an "Introduction," which includes exceedingly useful chapters on the classification and structure of birds; the "Preparation of Specimens for Study"; the "Subject of Faunal Areas"; and the "Literature of New England Ornithology." This preliminary portion occupies fifty pages, not one of which can be considered superfluous. The main body of the work comprises two hundred and seventy pages and treats the successive families in order, from the Thrushes through the Crows and Jays, thus embracing the whole order of *Oscines*. It is a pity that so many of our works are similarly incomplete, but in the present case we are assured that Part I is "to be followed as soon as practicable, by a second volume, completing the treatise"; and perhaps it is not too much to hope that nothing will occur to prevent the fulfilment of this promise.

The intended scope of the book is thus trenchantly defined in the Preface: "It is the object of the present volume to go carefully over the whole ground, and to present, in concise and convenient form, an epitome of the Bird-life of New England. The claims of each species to be considered a member of the New England Fauna are critically examined, and not one is admitted upon insufficient evidence of its occurrence within this area; the design being to give a thoroughly reliable list of the Birds, with an account of the leading facts in the life-history of each species. The plan of the work includes brief descriptions of the birds themselves, enabling one to identify any specimen he may have in hand; the local distribution, migration, and relative abundance of every species; together with as much general information respecting their habits as can conveniently be brought within the compass of a hand-book of New England Ornithology."

This plan is fully and consistently followed to the end, never slighted, seldom overstepped. The specific characters are given in the very simplest language but usually with sufficient definiteness to meet all the

* New England Bird Life, being a Manual of New England Ornithology, revised and edited from the manuscript of Winfrid A. Stearns, Member of the Nuttall Ornithological Club, etc., by Dr. Elliott Coues, U. S. A., Member of the Academy, etc. Part I — Oscines. Boston, Lee and Shepard, Publishers. New York, Charles T. Dillingham, 1881, 8vo. pp. 324, numerous woodcuts.

requirements of that class of readers for whom they are presumably intended, while the biographical passages, although containing little that is new, are always apt and interesting. The references to previous records, as might be expected, form a marked feature; in the case of the more important species, especially, they are so accurately collated, so dispassionately weighed, and so conveniently grouped that they cannot fail to render the work of the utmost value to even the most advanced student of the subject. There are no new features of classification, but it will be noticed that the nomenclature has in most cases been arranged in accordance with some important changes which have been recently proposed. The illustrations are fairly numerous, mainly technical in character, and all taken from Dr. Coues's previous works.

It is, of course, not to be expected that such a book will be entirely free from errors, especially when we consider the fact that its editor (who, it should be stated, announces himself "responsible for the accuracy and completeness of the work") has had little personal experience with New England birds as such. Those which do occur usually affect the breeding distribution of the birds to which they relate. In most cases this is made out with great judgment and in strict accordance with known facts, but where the positive evidence is incomplete there are indications that the editor occasionally gave free scope to his prophetic fancy. This running ahead of the records is a dangerous business, despite Dr. Coues's masterly argument in defence of "logical deductions" and the "logical results of ratiocination." Birds, like many other beings, sometimes take it into their heads to be erratic, and thus disappoint the prophets in various ways. It is not always safe to base a positive general statement on one or two exceptional occurrences, while it is even more hazardous to fill absolute blanks from the analogy furnished by known parallel cases. This may be appropriately demonstrated by considering some of the following quotations from "New England Bird Life."

Turdus pallasi.—"The Hermit Thrush is another bird whose breeding range draws a line between the two principal Faunæ of New England, being restricted in the breeding season to the Canadian Fauna, as the Wood Thrush is to the Alleghanian." In point of fact, the Hermit Thrush breeds regularly in Massachusetts at many places in Essex and Middlesex Counties, and on Cape Cod in abundance. Authenticated nests have been taken at Gloucester, Beverly, and Concord, while in June and July we have heard many males singing near Hyannis, Marston's Mills, and Osterville. Its distribution in the breeding season, so far from being, as is elsewhere stated, closely coincident with that of Swainson's Thrush, is rather to be compared with that of the Olive-sided Flycatcher, which breeds generally and most abundantly throughout the Canadian Fauna; locally and sparingly, but still regularly, in the Alleghanian, and perhaps occasionally just within the northern boundary of the Carolinian.

Regulus calendula.—The Ruby-crowned Kinglet, given as "one of the many birds which mark the distinction between the Canadian and Alleghanian Faunæ, being apparently limited by the former in its southward

range during the breeding season," has not actually been ascertained to breed in the Canadian Fauna at all. Boardman alone has catalogued it as a rare "summer visitant," but none of the recent investigators have detected it excepting in the migrations. Its southward range in summer is much more likely to prove limited by the Hudsonian than the Canadian Fauna.

Certhia familiaris.—The statement that "the Brown Creeper is resident throughout New England and a common bird in all suitable localities" is perhaps not sufficiently qualified by the reservation that it breeds "*chiefly* in the Canadian Fauna." The three southern New England States have now been comparatively well explored, and the record by Mr. Allen of a nest seen at Springfield, and another by Dr. Brewer of one found near Taunton, with Mr. Merriam's simple statement that it "breeds" in Connecticut, are all the reliable data that we have for attributing it to the Alleghanian Fauna of New England. Opposed to this is the great mass of negative testimony on the part of numerous local observers who have never found the bird in summer at all. While it must be admitted that there is something to be said on both sides of the question, we cannot at present believe that the breeding of the Creeper south of the Canadian Fauna is otherwise than a rare and exceptional occurrence.

Anthus ludovicianus.—"The manner of the Titlark's presence in New England" is decidedly not "similar to that of the Shore Lark" for, as Mr. Purdie has insisted (Bull. N. O. C., Vol. I, p. 73, Sept. 1876 and II, p. 17, Jan. 1877), the former normally occurs only as a spring and fall migrant, while the Shore Lark regularly winters. Dr. Brewer is the sole authority for the wintering of the Titlark in Massachusetts, and if there was no mistake about the instances he records they were unquestionably exceptional. The negative evidence in this case is unusually conclusive. It would not be difficult to produce a dozen reliable persons who have had many years' experience in winter collecting along the Massachusetts coast who yet have never seen a Titlark there after November. Our own experience is that the species arrives from the north about the middle of September, is at the height of its abundance during the latter part of that month and the first half of October, and wholly disappears before the close of November to reappear in April, when it is less frequently seen and apparently more irregular in its movements.

Dendræca cærulescens.—Despite the fact that three identified nests of the Black-throated Blue Warbler have been found in Connecticut, "its local distribution in New England" cannot fairly be considered as "coincident" with that of *Dendræca virens.* The latter breeds regularly throughout the whole of New England and is, if anything, rather commoner in summer in the pine woods of Eastern Massachusetts than among the spruces and firs of the more northern States, while the Black-throated Blue Warbler is, to say the least, mainly confined to the Canadian Fauna. The statement that "it has been observed in summer in Massachusetts" presumably relates to Allen's record (Birds of Springfield, p. 62) of its being "found in the breeding season on Mt. Holyoke (C. W. Bennett)

and along the ridges in the western part of the State (B. Horsford)." But these elevated places are both outlying spurs of the *Canadian* region and many strictly Canadian species, such as the Black Snowbird, regularly breed there. The occurrence of nests at Eastford, Connecticut, is certainly hard to understand, but the explanation may probably be found in some peculiar feature of the locality where they were taken. At all events there are at present no sufficient reasons for regarding them as other than exceptional examples.

Siurus nævius.—In the "Birds of the Colorado Valley" (p. 301) Dr. Coues asserted that the Northern Water Thrush "breeds in the greater part if not the whole of its North American range," and in the present work this view is substantially reiterated in the following terms: "Being a species of the widest distribution in North America, the Water Thrush is found in all suitable situations in New England, where it is a summer resident, and more or less abundant according to circumstances in no way connected with geographical or faunal areas." Waiving for the present any discussion of the question at large, we will confine ourselves to a consideration of the character of the bird's presence in New England. Upon examining the records it appears that no identified nest has ever been found south of the limits of the Canadian Fauna. In the "Catalogue of the Birds of Springfield" Mr. Allen stated that "apparently a few breed here," but as he has reversed this opinion in his later "List of the Birds of Massachusetts," the presumption is that there was some mistake about the earlier observations. Mr. Merriam surmises that "possibly a few occasionally remain and breed in Connecticut." All the other authors (save Minot, whose testimony on questions of this kind is inadmissible) agree in considering the Water Thrush as a spring and fall migrant in the three southern New England States. Going by the records alone, Dr. Coues will find it difficult to maintain his position, while if the unwritten testimony on the subject were produced we fancy that it would go very strongly against his view of the case. Certainly there are no present grounds for believing that the Northern Water Thrush breeds at all in New England south of the Canadian Fauna.

Collurio borealis.—The breeding of the Northern Shrike anywhere south of the Fur Countries is at present so much a matter of uncertainty, owing to the recently developed fact that the Loggerhead has frequently come in where he did not belong and wilfully muddled the records, that we cannot but think that Dr. Coues would have been wiser had he avoided taking any positive stand in this much disputed question. The comparison of its presence with that of the Black Snowbird, is manifestly inappropriate, while the prophecy that "it will doubtless be found to breed in the highest parts of Massachusetts" can scarcely be warranted by any of the known facts.

Taken for all in all, however, "New England Bird Life" is remarkably free from errors of every kind: we doubt if there is another outsider who could have come among us and done so well, but it must not be overlooked that Mr. Purdie helped "in collating and sifting the scattered

records," an assistance which was a practical guarantee against any very gross errors.

To say that the book is exceedingly well-written would be doing it scant justice. Dr. Coues's brilliant talents in this respect are already well known, but we have perhaps never had so striking a proof of them as is afforded by the present volume. The work has been done so thoroughly that in point of completeness it is almost perfect; so consistently that but few points are open to criticism; so concisely that one hundred and thirty-eight species are treated in two hundred and seventy octavo pages. And the arrangement of the whole is masterly. Gracefully turned descriptive passages and sparkling bits of commentary everywhere enliven the substructure of fact, as the brighter colors of an old piece of tapestry set off its more sombre background. Those who are familiar with such works as the "Birds of the North-west" and "Birds of the Colorado Valley" will have no difficulty in judging for themselves to what extent the editor acted on the author's permission "in revising, and to some extent rewriting" the latter's notes for publication.

There is, however, one feature which we cannot approve, and which will doubtless be regretted by all who are familiar with the history of the case on which it bears. We allude to the numerous comments on the records left by a late well-known ornithologist. The strictures themselves are in many, perhaps most, cases just, but they are characterized by a certain bitterness of tone which implies a lack of respect for the memory of an opponent who is no longer able to speak in his own defence.

It remains to make some reference to the ostensible author of the work. Simply, then, Mr. Stearns may be congratulated on his wise choice of an editor.—W. B.

Cory's Beautiful and Curious Birds.—Part III of Mr. Cory's work* treats of *Menura superba*, the well known Australian Lyre Bird; *Diphyllodes respublica*, a peculiar Bird of Paradise found on Batarra and the Waigiou Islands in the Malay Archipelago; and the Ruff (*Machetes pugnax*). The latter is of interest to American ornithologists as an occasional straggler from Europe, where, as in Asia and Africa, it is widely distributed and generally known, and is especially noteworthy for its pugnacious disposition and remarkable plumage.

The plates in the present number fully sustain the high degree of excellence which characterized those of the earlier ones. That of the Lyre Bird is notably fine; the coloring is rich and soft, while the wonderful details of the lyre-shaped tail are executed with great clearness and delicacy. The iridescent hues of the Bird of Paradise are also well managed. The work is well worthy of the patronage of those who may desire excellent life-size figures of a series of exceptionally remarkable forms of bird-life, with the accompaniment of appropriate text.—J. A. A.

* See this Bulletin, Vol. V, p. 236 and Vol. VI, p. 111.

MINOT'S "LAND AND GAME BIRDS OF NEW ENGLAND."—A stricture, in the July Bulletin (Vol. VI, p. 145), on my work convinces me the more firmly that ornithologically I am a heretic. Being a sincere heretic, and being thus impugned, I wish to avow my creed, and to vindicate my methods. As to the particular point assailed, I submit that the presentation of evidence, probabilities, and judgment, is not a statement of inference as fact, and, moreover, that no statement ought utterly to be condemned before the evidence has been either demanded or examined.

I most willingly confess that, after five years' more experience and judgment, there is much in my "Birds of New England" that I would gladly alter: but my theories of work I have no reason to change. To the servant of science the gun is often indispensable, not only for satisfying the judgment of others, but for confirming one's own observation; but, on the other hand, I believe that ordinarily it far too often takes the place of the naturalist's faculties and senses, and that too often the animal love of sport or killing, and the human love of material acquisition, are unconsciously his motives. It is astonishing how many persons are dependent for their sight quite as much upon their fingers as their eyes, and to how many obtuse and illogical minds (I make no personal reference whatsoever) circumstantial evidence is of no value.* In this common demand for tangibility, there seems to me a want of perception and sentiment, of ideality and liberality. This may sound sentimental and sententious: but I know not how better to express a strong feeling upon which much of my practical work has been based. If the notes and eggs that I can produce, though unaccompanied by a dried skin, are not what I claim them to be, I defy any one on earth to tell me what they are. As for wilful dishonesty, the gun surely is no protection against that.

As arguments from analogy are usually misleading, I prefer suggestions by comparison. What is evidence? If A testifies to seeing B at a certain time and place, is his evidence to be questioned simply because he cannot now produce B in court? Is his evidence of no value, that a certain builder built a certain house, because he cannot now produce the body of that architect for identification? If A can reproduce exactly B's peculiar voice and intonation, can it reasonably be questioned whether he has ever known him? Is not the question properly: is this witness of accurate observation, competent judgment, truthful memory and honest purpose? or, on the other hand, if he is a perjurer, is his evidence to be trusted, no matter what its nature?

* "I hold that logical deduction from certain known facts may be a positive and decisive kind of knowledge; and that the mental processes concerned are strictly scientific." . . . I "feel little respect for a frame of mind that prefers to take 'ten to one' chances of blundering empirically as against logical results of ratiocination." (Dr. Coues, pp. 79–80, in Stearns's "New England Bird Life," Part I.) These remarks seem fairly correspondent in spirit, if not in letter, to the feelings expressed above. I may here add that the value of Mr. Stearns's new work renders that of his predecessors of much less account. *H. D. M.*

It is my earnest hope and desire that my declaration may not provoke further controversy or correspondence.—HENRY D. MINOT.

[Mr. Minot has expressed his peculiar views with such naïveté, that his letter may, in a general way, be taken as its own answer. It would be gratuitous at this late day to essay any elaborate defence of the established systems of work which he rejects, but there are certain important statements resting on his authority, which it is fitting to reconsider in the light of their author's avowed methods and principles. Many of our readers will remember the very complimentary notice of the "Land and Game Birds of New England" which appeared in a former volume of this Bulletin: the high authority from which it emanated undoubtedly gave it much weight and possibly silenced the other critics; at least, the book has never been reviewed on its merits, and things which should have been severely censured, have passed nearly unchallenged up to the present time. The precedent is too dangerous to be allowed to stand.

A few prominent examples will suffice to point the moral of what I have to say.

In the "Land and Game Birds" Mr. Minot speaks of finding near Boston such nests as the Northern Water Thrush's, the Cape May Warbler's, the Blackburnian Warbler's, the Short-eared Owl's and the Pigeon Hawk's. Now it might be reasonably supposed that the importance of any one of these discoveries would have called for the very strictest identification. Yet the text furnishes no assurance of this. On the contrary, the author does not even tell us that the birds were *seen* and in no instance is any evidence whatever, direct or circumstantial, advanced in support of their assumed identity. The descriptions of the nests and eggs, too, are so brief and general that they give little satisfaction. It may well be doubted if any of our older ornithologists would care to risk his reputation on such unsupported but entirely positive statements. Of course the *sincerity* of Mr. Minot's convictions is not called in question: but the school boy whose collection embraces alleged eggs of every species of Sparrow that breeds from Maine to Florida is equally sincere, though the parentage of most of his specimens may generally be safely referred to a few of the common kinds. The parallel may seem a harsh one, but the basis of identification is essentially the same in the two cases: viz., *individual opinion.*

Now we fancy that there are many persons besides Mr. Minot whose feelings often revolt at the thought of killing a harmless and confiding little bird. But if the importance of the case renders this necessary no one ought to hesitate. A bird's life should count as nothing against the verification of a rare nest or the establishment of a new fact. A sombre-plumaged Sparrow cannot always be recognized as it skulks through the undergrowth, or the females of many of our Warblers separated with certainty while sitting half-buried in their nests or flitting among the foliage. The collector may satisfy himself, especially if his imagination is allowed to supply some of the blanks, but he must not expect to satisfy others who know by experience the difficulties of such cases. If the nest in question is common and well known, especially if the eggs are in them-

selves diagnostic of the species, it is well enough to be content with a good sight at the birds and a careful record of the position and surroundings. Even if an occasional mistake be made in this way there is little harm done. But he who would chronicle the occurrence of a rare nest in a region where the bird is not known to breed, must see to it that his chain of evidence is absolutely complete. And no such evidence *can* be complete without the capture and proper identification of at least one of the parent birds. Circumstances, it is true, will sometimes render such an identification impossible, despite the utmost efforts on the part of the collector. A bird may be shot at and missed, or lost among the vegetation after it has fallen. In cases of this kind the observer's impressions are always entitled to attention, provided the facts on which they are based are frankly and fully given. The record then stands open to the scrutiny of all and can be judged on its merits, while its acceptance or rejection will depend largely on the reputation which the writer bears for accuracy and experience in such matters. The author who disregards these cardinal principles must of necessity defy the opinions of those who accept them, and he should expect his work to be judged accordingly.

But the most conspicuous act of daring remains to be mentioned. On page 290 of the "Land and Game Birds" the author describes a species of *Empidonax*—a new genus even was suggested, "to be called *Muscaccipiter*," basing his diagnosis on a bird which *he saw flying about in the shrubbery of his father's place near Boston.*

This last example needs no comment. We trust it is one of the things that Mr. Minot would now "gladly alter": but it stands prominent among the fruits of that "system of work" which he sees "no reason to change" and is perhaps no more than an extreme example of the opera-glass method of identification. If such work is to be recognized—and toleration is in some sense recognition — the gun may indeed be dispensed with and rare nests and new birds described *ad libitum* without the shedding of more blood. But if ornithology is to continue to hold a place among the sciences the leaders must see to it that such dangerous heresy is promptly discountenanced. The quotation from Dr. Coues in the foot-note to Mr. Minot's communication has absolutely no bearing, either direct or indirect, on the points here at issue. It originally appears in connection with some general remarks affecting the philosophic composition of faunæ and the methods followed in the preparation of certain lists of New England birds. Dr. Coues's published sentiments regarding the proper identification of important *specimens* are too well known to need repetition, but any one who wishes to satisfy himself on this point will find some pertinent remarks on page 101 of "Field Ornithology" and on page 33 of "New England Bird Life."

In conclusion I beg to assure Mr. Minot that the above remarks are prompted by no ill-feeling and—excepting in so far as an author is to be held responsible for his printed utterances—are intended to have no personal application. Nor would I be understood as wholly condemning the "Land and Game Birds of New England." On the contrary, leaving

out the faulty portions, which in nearly all cases relate to abstract points similar to those just cited, the pages bear the impress of accurate observation and original thought, while no one who loves the out-door side of Nature can fail to sympathize with the author's sentiment or to be impressed by the truth and beauty of many of his passages. It is a pity that one who writes so delightfully will mar his work by a persistent adhesion to false principles.—WILLIAM BREWSTER.]

General Notes.

THE GOLDEN-CRESTED WREN BREEDING IN THE COLORADO VALLEY.—July 1, at an elevation of 11,500 feet, I shot an adult Golden-crested Wren (*Regulus satrapa*). Its presence made its nesting here almost a certainty, but all doubts were set at rest by the capture of a young bird just from the nest, in another part of the county, at 11,000 feet on July 25. Several others were heard and seen. I judge it is not uncommon, but from the fact of its ordinary call-notes being so deceptively similar to the Creeper's notes, it is easily passed by. So far as I know it seems to range a little above the bulk of the Ruby-crowns.—FRANK M. DRAW, *Hazzardsville, San Juan County, Col.*

NOTES ON THE WINTER WREN (*Anorthura troglodytes hyemalis*).—My chance acquaintance with a chapter in the life-history of this species, during a recent visit to Grand Manan, N.B., may not be uninteresting to the readers of the Bulletin. I was informed by Mr. S. F. Cheney that its occurrence in that locality, where it is called the Spruce Wren, is not common. He has seen an occasional pair in previous years, principally in the winter season, and noted its prolonged sweet song but he had never met with their nest, supposing always that it was placed on the ground in hollow logs. During the breeding season the dense spruce swamps are its home and in such a situation, upon one of the outlying islands near Grand Manan, I found its snugly hidden nest. At that time no owner appeared and I was ignorant of the value of my prize, but visiting the locality again on June 2, and carefully approaching to avoid disturbing its occupant, if any, to a distance of scarce five feet, I saw, cautiously thrust out from the mass of green moss, a brown little head, followed in a moment by the unmistakable form of the Winter Wren. It displayed scarce any fear, alighting only three or four feet from me, jerking its tail forward over its back and scolding vehemently, somewhat in the manner of our common House Wren. After watching it for several minutes, in my anxiety to procure it, I proceeded to back

off through the thick growth, in order to shoot, but it became alarmed at my movements and suddenly dropped to the ground when a hasty shot failed to procure it, nor did either of the pair subsequently appear. The nest was placed about six feet from the ground, in the end of a decaying stub, the irregularities being neatly filled with green wood moss, both below and around the nest proper, which measures outside 5½ inches in depth by 4 in width. The entrance is perfectly round, nearly an inch in diameter, placed two inches from the top, and is strengthened by a framework of a few slender dead spruce twigs, woven into the outside covering of green moss. Above it is well protected by a thick mass of the same green moss which serves so admirably to conceal it from prying eyes. Long, slender, dried grasses form the inner walls, just sufficient to give it strength, and within this a thick lining of soft white feathers of the Herring Gull (*Larus argentatus smithsonianus*). A neater, warmer bird home it would be hard to conceive, and had the little architect not incautiously left a "white feather" partly protruding from the entrance I doubt if I should be its possessor. Five eggs were the full complement in this case. They are ovate, slightly pointed at the smaller end, of a brilliant white ground color, very evenly but sparingly sprinkled with reddish-brown dots, and measure respectively .65 × .49, .65 × .48, .63×.49, .63×.47 and .62×.48. They are larger and less rounded than are the eggs of *Parus atricapillus*, though resembling them somewhat in style of marking.—R. F. Pearsall, *New York City*.

Two more specimens of *Helminthophaga leucobronchialis* from Sing Sing, N. Y.—While collecting with Mr. Eugene P. Bicknell, on Croton Point, among some small pines, July 24, 1881, I shot a specimen of the above-named Warbler. We were attracted by a flock of small birds flitting through the pines, composed of Chickadees, Yellow Warblers, Black-and-White creepers, and Blue-winged Yellow Warblers. While following these up we got a glimpse at this bird and killed it as it flew to the ground in pursuit of an insect. This specimen differs from others in having a black auricular patch. Sex not absolutely determined, as the bird was badly shot, but it was apparently a female.

On August 3, 1881, I shot another specimen, in some low bushes bordering a stream, near where I procured a specimen August 24, 1879.* It resembled that specimen in having a yellow pectoral band, but, unlike it, the wing-bands were normal: yellow, not white.—A. K. Fisher, M. D., *Sing Sing, N. Y.*

Another specimen of *Siurus motacilla* at Lake George, N. Y.—Mr. Oliver B. Lockhart showed me a specimen of this bird which he shot, May 16, 1881, at Lake George. He is positive that he has seen other specimens, but failed in procuring them except the pair† which he and Mr. Bishop killed a few years ago.—A. K. Fisher, M. D., *Sing Sing, N. Y.*

* See this Bulletin, Vol. IV, No. 3, Oct. 1879, p. 234.

† See this Bulletin, Vol. V, April, 1880, p. 11.

MYIODIOCTES CANADENSIS IN KANSAS. — In watching for the early arrivals of the returning migrants, I shot August 29, at this place, on the banks of the Neosho River, a female Canadian Flycatching Warbler.

As the birds inhabit the low swampy timbered lands, this is without doubt their extreme western limit, and is therefore worthy of note. — N. S. GOSS, *Neosho Falls, Kansas.*

CAPTURE OF THE WORM-EATING WARBLER IN MASSACHUSETTS.—On September 19, 1881, I shot in some low moist woods in Cambridge, a fine female Worm-eating Warbler (*Helmitherus vermivorus*). This is the first capture of this bird in Massachusetts. The only previous note of its occurrence in this State on record is that of Mr. W. A. Stearns, who says he saw one at Easthampton, Mass. (see New England Bird Life, p. 111).—HENRY M. SPELMAN. *Cambridge, Mass.*

MELOSPIZA LINCOLNI BREEDING IN NEW YORK AGAIN. —On page 197 of Volume III of this Bulletin, is an account of my taking the nest of this bird in 1878. To this record I now desire to add another. On June 16, 1881, on the shore of Otter Lake (or Pond) Hamilton Co., N. Y. (about half a mile from the locality in which I took the nest in 1878), I flushed a Lincoln's Finch from her nest. She was so quick in her flight that I missed her with both barrels and was obliged to retire into the bushes and wait her return, and as I stood up to my ankles in wet moss and mud among the alders, being devoured by mosquitoes, blackflies, and punkies, I kept saying to myself "If it is only a Lincoln's Finch it will pay for all this." But I could scarcely believe my good fortune when, after returning to the nest and killing the female bird, I took her out of the water, where she fell, and saw it really was the desired bird. The nest was situated almost exactly like the other, in wet spongy ground at the edge of the lake, not under any bush or weed, but quite well concealed by last year's grasses. Diameter outside, 3.75 inches; inside, 2 inches; depth outside, 2.25 inches; inside, 1.75 inches. It was composed of fine grasses loosely put together, and set down nearly level with the moss. The eggs, which were four, slightly advanced in incubation, were exactly like those taken in 1878, except that the spots of reddish-brown were rather larger and more marked.—EGBERT BAGG, JR., *Utica, N. Y.*

XANTHOCEPHALUS ICTEROCEPHALUS IN LOWER CANADA. — While on the Lower St. Lawrence, in July last, Mr. N. A. Comeau handed me for identification the skin of a Yellow-headed Blackbird (*Xanthocephalus icterocephalus*) that he shot, early in September ("about Sept. 4"), 1878, in his dooryard, at Gedbout River, Province of Quebec, Canada — six miles west of the entrance to the Gulf. — C. HART MERRIAM, M. D., *Locust Grove, New York.*

COLAPTES AURATUS + C. MEXICANUS. — Quite a number of instances of specimens of *Colaptes auratus* showing traces of *C. mexicanus* coming to my knowledge, I have thought it worth the while to record them. In this Bulletin, Vol. V, No. 1, p. 46, I noted the capture of one of these abnormal individuals by myself at Fort Hamilton. Its black mustaches were sprinkled with red feathers, and its back was different from that of ordinary *auratus*, the black bars being very narrow, and the ground color more of a brownish-olive, nearly corresponding to Audubon's Plate of *C. ayresi* (Birds of America, Vol. VII). Last autumn (1880) I shot two more "Highholders" having a few red feathers intermixed with the black cheek patches. These are all the cases of this curious variation that have come under my personal observation, but Messrs. Bell and Wallace of New York furnish me with some valuable notes on the subject. Mr. Bell tells me he has had several such in his many years of experience as a taxidermist. He remembers one in particular which was remarkable for the deep salmon color of the parts which are golden-yellow in normal *auratus*. Nearly half of each of the maxillary patches of this specimen was red. It was shot in Orange Co., N. Y., or in some adjacent county. Mr. Wallace also says he has had a number of these varieties, and among them the strangest case of differentiation I have yet heard of. A few years ago a *Colaptes* was brought to him, one side of which was *auratus* and the other *mexicanus*. That is, one of the mustaches was black and the other red, and the quills and under surfaces of wings and tail on the corresponding sides were respectively yellow and red.

Mr. Ridgway, in this Bulletin, Vol. VI, No. 2, p. 121, says that of two hundred *aurati* taken in the vicinity of Mount Carmel, Ill., which he had examined, he detected only one aberrant specimen showing any trace of *mexicanus*. As out of thirty shot last fall at Fort Hamilton and examined by me two showed this variation, it may be that these mixed forms are more plentiful in the Atlantic States than in the interior. In view of the number of known instances of these "half-breeds" occurring in the East we need not be surprised if some cis-Alleghany collector yet takes a pure *mexicanus*.—DE L. BERIER, *Fort Hamilton, Long Island, N. Y.*

FURTHER NOTES ON THE LABRADOR GYRFALCON TAKEN ON LONG ISLAND, N. Y. — In the Bulletin for April, 1881, page 126, I recorded the capture of *Falco gyrfalco obsoletus* on Long Island, in Queens County, my information being derived from Mr. J. Wallace of New York City. Since then I have received a more detailed account of the matter from the gentleman above named, and to correct some doubts which have probably arisen as to the accuracy of my note, I make this somewhat lengthy statement. The bird in question was shot in the autumn of 1875, near Flushing, Queens Co., and brought to Mr. Wallace by two men. They were in haste and left saying they would return in a few days and give the particulars of the bird's capture. They failed to do so, however, and it was nearly two years before Mr. Wallace again met them. In the meantime he had presented the Falcon to Mr. George A. Boardman. Mr. Wallace, knowing nothing of the bird except that it had been brought to him

by two men from Westchester County, told Mr. Boardman it had probably been killed in that locality. Mr. Boardman published a note to that effect in the "Rod and Gun" (Vol. VII, Dec. 4, 1875, p. 153). When Mr. Wallace again met one of the men who had brought him the bird, he learned that the man and his companion were fishing in a boat not far from Flushing when they saw the Hawk perched upon a tree on the shore, and having a gun with them they easily secured it.—DE L. BERIER. *Fort Hamilton, Long Island, N. Y.*

PROBABLE OCCURRENCE OF SARCORHAMPHUS PAPA IN ARIZONA.—There has long been recorded (Pr. Phila. Acad., 1866, p—) a note of mine to the effect that I saw on the Rio Verde, in Arizona, a pair of birds that I supposed to be King Vultures. Mr. Willard Rice, an amateur naturalist of excellent powers of observation and long experience, who was with me on the occasion to which I refer, and to whom I pointed out the birds, told me the other day that he remembered the circumstances perfectly well, and that some years afterward, on the Verde again, he shot and killed a pair of birds which he has no doubt were of the same kind. They had a nest in a large cotton-wood tree. From his description of the specimens, which unfortunately were not preserved, I suppose them to be the Vulture in mention. But is not the fact of tree-nesting entirely against such supposition? I consider it established, however, that there occurs in Arizona a large rapacious bird, brownish or tawny above, white below, and naked headed, of some species as yet undetermined.—ELLIOT COUES, *Washington, D. C.*

NYCTHERODIUS VIOLACEUS IN KANSAS.—April 17, 1878, Samuel W. Reed shot, on Crooked Creek, in Coffee County, a female Yellow-crowned Night Heron, and sent me the skin for identification. The bird was in full breeding plumage, and Mr. Reed stated in a note accompanying the bird that he found on dissection six or seven of the eggs enlarged to from one-eighth to three-fourths of an inch in diameter—also that another bird, probably her mate, was with her.

From this and the further fact that I have shot at this place in the months of July and August young birds (a pair of which I have in my collection), I think it safe to say they occasionally nest in the State. The young, as happens with the White, Snowy, and Little Blue Herons, may have wandered north from their breeding grounds, but there can be no question that the adult birds would have nested in the vicinity.—N. S. GOSS, *Neosho Falls, Kansas.*

CAPTURE OF THE SNOWY HERON (*Garzetta candidissima*) ON LONG ISLAND.—Although the habitat of this species includes this region as well as the greater part of New England, I consider it worth the while to record its capture here, as it is now rare so far to the North. Mr. John M. Rodocanachi shot a fine specimen on Cedar Island, Great South Bay, Long Island, on August 4, 1881, which he kindly sent to me.—LOUIS A. ZEREGA, 111 *East 72nd St., New York City.*

LOBIPES HYPERBOREUS AT 9500 FEET. — I was greatly surprised on May 22 by the appearance of a friend with six Northern Phalaropes (*Lobipes hyperboreus*) in his hands. They were killed by flying against the telegraph wires. Unless the flock turned back and retraced 50 miles of their journey, in migrating further north, they would be forced to cross the range at an elevation of over 12,000 feet, where we may expect to hear from the bird some day.

I thought birds were only killed in this manner when the wires were on a plane with their eyes. Such was not the case with these birds, as one had a wing completely torn off, two others were cut open longitudinally on the breast, and the rest were bruised on breast and neck, but none on the head at all. — FRANK M. DREW. *Howardsville, Col.*

BREEDING OF BARROW'S GOLDEN-EYE IN LOWER CANADA. — During the middle of July last (July 11-19, 1881) I several times came across a female, with several young, of Barrow's Golden Eye (*Clangula islandica*) in the Godbout River, about a mile above its mouth. Mr. N. A. Comeau showed me skins of the adults of both sexes that he had taken here, and assured me that the species breeds regularly in this region. The Godbout River empties into the St. Lawrence, from the north, six miles west of Pt. de Monte which guards the mouth of the Gulf on that side. The place falls a trifle short of 50° north latitude. Dr. Coues says (Birds of the Northwest, p. 577) "It is the most northerly species of the genus, having apparently a circumpolar distribution, breeding only (?) in high latitudes," etc.—C. HART MERRIAM, M. D., *Locust Grove, New York.*

NOTES ON A FEW MAINE BIRDS.—**Corvus corax.** RAVEN.—These birds are frequently seen about the islands on the Maine coast, to the west of Penobscot Bay, particularly on Isle au Haut, Duck Islands, Cranberry Islands, and other points to the westward, but so far as I can ascertain they have not been found breeding on our coast east of Grand Menan. At that place, however, Mr. George A. Boardman has found them nesting on the high cliffs.

On May 5 of this year (1881) I received two Raven's eggs, which were taken from a nest on Duck Island about the last of April. Both birds were shot down, but were not secured. The nest was placed in the top of a *spruce tree*, and described as a very bulky affair, built of sticks and lined with moss, cow's hair, and wool. It contained three eggs at that time.

Several of these birds were poisoned on Isle au Haut in the winter of 1879–'80 by a Mr. Curran who was using meat poisoned with strychnine to kill foxes. The inhabitants assert that they breed on that island, and that they kill lambs by alighting on them and picking out their eyes.

Cymochorea leucorrhoa. LEACH'S PETREL.—During a visit to the coast last June in search of ornithological and oölogical specimens I went to a well-known breeding ground of Leach's Petrel. We found the birds breeding by hundreds and out of some fifty burrows that we dug out, all but two or three contained a single bird sitting on its egg. One burrow

contained two birds but no egg. When taken from the holes the birds showed no disposition to fly but on being released would scurry back into their holes or under some log. They appeared to be completely dazzled by the light, and if thrown into the air would fly in an aimless and dazed way for a few moments, very much after the manner of a Night Hawk when thrown from the limb of a tree.

In a letter written by Mr. Manly Hardy of Brewer, Me., to Mr. William Brewster, and quoted by the latter gentleman in the Bulletin for 1881 (Vol. VI, p. 125), Mr. Hardy says "the males do most if not all the incubating," but he further says that of twelve specimens taken from the nest and sent him June 15, 1880, *five* proved to be females. Having this communication in mind, my friend (Mr. N. A. Eddy) and myself thought to investigate a little, and to this end took twelve birds from their nests. None of the forty-three found on their nests showed bare spots on the breast as described by Mr. Hardy, though our visit was on June 23, or about a week later than when Mr. Hardy's birds were secured the year before, so our selections were entirely at random. Of the twelve birds *eight* were females and *four* males. One female and one male of those counted were from the burrow spoken of as *without* an egg, leaving to those taken from their eggs, seven females and three males. I have had others taken from the nest and sent me, and have found that the number of males and females was about equal. This would seem to indicate,—by Mr. Hardy's testimony above quoted,—that both male and female share about equally the task of incubation and *not* that the male alone does most if not all of it.

Collurio ludovicianus. Loggerhead Shrike.—These birds, which were first reported as breeding in this vicinity a few years ago, still continue to visit us, and were among our earliest arrivals last spring. I have taken two nests the past season, both of which were taken in the same location where they have been found breeding for several years past. It may not be without interest to state that these birds seem peculiarly partial to two or three localities in this vicinity. In these places I have almost always found them from early spring till late in the fall, while elsewhere about our city they are very rarely seen.

Cotile riparia. Sand Swallow.—While examining some Sand Swallow's burrows on Cranberry Islands, this summer, three were found containing two nests each, each nest having in it fresh eggs. The finding of two nests with eggs in the same burrow struck me as somewhat remarkable and I thought it was perhaps worthy of notice.—Harry Merrill, *Bangor, Maine.*

Destruction of Birds by a Storm while migrating.—April 2, 1881, found me in a small schooner, on the passage from Brazos de Santiago, Texas, to Mobile, Alabama. At about noon of that day the wind suddenly changed from east to north, and within an hour it was blowing a gale; we were now about thirty miles south of the mouths of the Mississippi River, which would bring the vessel on a line with the river and the

peninsular of Yucatan. Up to the time the storm commenced the only land birds seen were three Yellow-rumped Warblers (*Dendroica coronata*) that came aboard the day previous, keeping us company the most of the day; but within an hour after the storm broke they began to appear, and in a very short time birds of various species were to be seen in all directions, singly and in small flocks, and all flying towards the Mississippi River. These birds of course must have been far overhead and only came down near the surface of the water in endeavoring to escape from the force of the wind. By four o'clock it had come to be a serious matter with them, as the gale was too strong for them to make scarcely any progress. As long as they were in the trough of the sea the wind had very little effect on them, but as soon as they reached the crest of a wave it would catch them up and in an instant they were blown hundreds of yards back or else into the water and drowned.

A great many flew on to the deck of the vessel to be washed about by the next wave that came over the side. Although I made no attempt to count the number of specimens that came aboard, I should estimate them at considerably over a hundred, and a great many more struck the sides and tumbled back into the water. It was sad indeed to see them struggling along by the side of the vessel in trying to pass ahead of her, for as soon as they were clear of the bows, they were invariably blown back into the water and drowned. Most of those that came aboard were washed into the sea again, but the next day we found about a dozen dead bodies that had lodged underneath the galley. The following is a list of the species recognized, and if more time could have been given to observation I undoubtedly could have made out others.

1. Wood Thrush. About twenty seen.
2. Black-and-white Creeper. Abundant.
3. Prothonotary Warbler. Large numbers.
4. Worm-eating Warbler. Large numbers.
5. Yellow-rumped Warbler. A few.
6. Chestnut-sided Warbler. Quite a number.
7. Yellow Warbler. Quite a number.
8. Golden-crowned Thrush. A few.
9. Kentucky Warbler. Large numbers.
10. Mourning Warbler. Large numbers.
11. Maryland Yellow-throat. Very abundant.
12. Hooded Warbler. Large numbers.
13. Redstart. The most abundant.
14. Cliff Swallow. Saw one.
15. Scarlet Tanager. Quite a number.
16. Summer Redbird. A few.
17. Towhee. A few.
18. Indigo Bird. As plentiful as Redstarts.
19. Nonpareil. Quite abundant.
20. Flycatchers. Saw a large number of the smaller species, but recognized only *Sayornis fuscus* (Phœbe.)

21. Pigeon Hawk. Saw one.
22. Carolina Dove. A few.
23. Turnstone. Only one seen.

One important conclusion which can be drawn from these observations seems to be that instead of following the land a large number of species migrate direct from Central America to the Mississippi Valley across the Gulf of Mexico, and the scarcity of these species in Southwestern Texas is thus explained.—A. M. FRAZAR. *Watertown, Mass.*

ADDITIONS TO THE AVI-FAUNA OF THE UNITED STATES.—During the spring and early summer of 1881 the following birds, which are either new to the United States, or for the first time definitely ascertained to have been taken within their limits, were collected for me in Southern Arizona by Mr. F. Stephens. A simple list is here given, as there is not at present time to prepare a more detailed consideration of these, as well as many others of great interest, which will be fully considered in a future number of this Bulletin.

1. **Parus meridionalis**. *Sel.* MEXICAN CHICKADEE.—Hab., highlands of Mexico; Arizona (Brewster). Several specimens taken in March among the Chiracahua Mountains, where the species was found to be not uncommon.

2. **Myiarchus cooperi** (*Kaup*) *Baird.* COOPER'S FLYCATCHER.—Hab., Southern and Western Mexico (Tehauntepec, Yucatan, Mazatlan, etc.) Ascertained to be an abundant summer species about Camp Lowell. Numerous specimens taken between May 31 and June 25.

This species is *true cooperi* of Kaup and is not to be confounded with "*cooperi erythrocercus*" of the Lower Rio Grande Valley in Texas.

3. **Myiarchus lawrencei** (*Giraud*) *Baird.* LAWRENCE'S FLYCATCHER.—Hab., Northern Mexico, from northern boundary south to Colima, Tehauntepec, Yucatan, and Salvador. Eight specimens taken in the Santa Rita Mountains between May 12 and May 17. These captures confirm still another of Giraud's alleged sixteen Texas species.—WILLIAM BREWSTER, *Cambridge, Mass.*

INDEX TO VOLUME VI.

ERRATA.

Page 7, line 9, for carpel read carpal.
" 7, " 11, for anchylos read anchylosed.
" 20, " 2 from bottom, for *coprymna* read *prymna*.
" 64, " 7, for Naturhistorische read Naturhistoriske.
" 100, " 16 from bottom, for four read two.
" 116, " 7, for Squam read Squan.
" 159, " 6 from bottom, for *melodia* read *meloda*.
" 160, " 24, for *melodia* read *meloda*.
" 171, " 1, *dele* first comma.
" 172, " 26, after area add "of equal extent."
" 232, footnote, for Vol. II read Vol. V, and for 1876 read 1880.