

Tyrannus dominicensis (<i>Gmel.</i>).	Dendroica plumbea <i>Lawr.</i>
Elænea martinica (<i>Linn.</i>).	Dendroica petechia melanoptera
Blacicus brunneicapillus <i>Lawr.</i>	<i>Lawr.</i>
Quiscalus guadeloupeusis <i>Lawr.</i>	Setophaga ruticilla (<i>Linn.</i>).
Euethëia bicolor (<i>Linn.</i>).	Thryothorus guadeloupeusis <i>Cory.</i>
Loxigilla noctis (<i>Linn.</i>).	Allenia montana (<i>Lafr.</i>).
Saltator guadeloupeusis <i>Lafr.</i>	Cichlherminia fuscata densirostris
Vireo calidris (<i>Linn.</i>).	(<i>Vieill.</i>).
Cæreba dominicana (<i>Taylor</i>).	Cichlherminia herminieri <i>Lafr.</i>
Seiurus noveboracensis (<i>Gmel.</i>).	Cinclocerthia ruficauda (<i>Gould</i>).

A FURTHER REVIEW OF THE AVIAN FAUNA OF CHESTER COUNTY, SOUTH CAROLINA.

BY LEVERETT M. LOOMIS.

THE PRESENT contribution to the ornithology of the Piedmont region of South Carolina resumes the subject as it was left by the 'Partial List' (Bull. Nutt. Orn. Club, Vol. IV, Oct., 1879, pp. 209-218) and the 'Supplementary Notes' (Auk, Vol. II, April, 1885, pp. 188-193).

The centre and chief scene of observation, furnishing the material for this and the earlier papers, has been the vicinity of the town of Chester, within a limit of five miles. Excursions have been made at different times, particularly during winter, to outlying parts of the County along the Broad and Catawba Rivers. These brief expeditions have revealed that a highly promising field lies immediately at hand awaiting exploration in common with the rest of the river portions of the Piedmont region. Besides affording the only really suitable situations for water birds in the County, these streams offer favorable avenues of approach for characteristic species of the Low-Country, which have not thus far been detected above the fall-line.

Even in the narrow area where the most effort has been expended there is still much to be learned. At the close of fourteen years, during which I have been able to devote much time to field study, I realize fully the verity of what Gilbert White long ago said, after more than forty years of observation at Selborne—

“new occurrences still arise as long as any inquiries are kept alive.” Knowledge of this sort is gained slowly. The power to grasp expands with advancing experience, and facts accumulated in earlier years, the chief import of which was not perceived at the time of their gathering, are seen in the end to be conspicuous illustrations of great ornithological truths. In an extended series of years seasons, too, happen that are peculiarly propitious for investigation in certain directions, and circumstances then become palpable that have previously eluded satisfactory interpretation. Such, in an eminent degree, were December, 1889, and January, 1890.

The birds, species and subspecies, added since the publication of the last list, number twenty-three, raising the total, exclusive of the English Sparrow, to two hundred and two. These are believed to represent only about four fifths of the normal avifauna of the County, the river districts being expected to yield the bulk of the remaining fifth. Forty-two are ‘resident’; sixty-seven are known as migrants; fifty, besides ‘residents,’ occur in the winter season; thirty-six have been found to be breeding summer visitors; seven are of doubtful rank, owing to insufficient observation. The general character of the fauna is Louisianian. The near proximity of the mountains exerts a modifying influence upon it, lessening the force of the Louisianian, however, rather than bringing into marked prominence the Carolinian.

*The Trans-Appalachian Movement.**—A peculiar complexion is given to the bird fauna of this region through the infusion of such characteristic Western species as *Ammodramus lecontei* and *Scolecophagus cyanocephalus*. If these birds could be dismissed with the simple statement that they were stragglers that had wandered from their usual habitat, their presence would be of little moment, but when it is understood that the former has occurred in considerable abundance and in successive seasons, the matter assumes a very different aspect, and one urgently requiring investigation. Besides the two birds mentioned, quite a number of others, commonly regarded as belonging to the western side of the Appalachian highlands, have been taken, as well as most of the rarer land species of the Atlantic slope

*This portion of the article was read, under a separate title, before the Eighth Congress of the American Ornithologists' Union.

whose centre of abundance lies in the interior. The first inquiry that arises is, how do these birds get here? In seeking an answer to this, an obstacle is encountered at the outset—the common obstacle that confronts every student who endeavors to arrive at conclusions based upon geographical distribution. While it is idle to look for absolute data for generalization, yet sufficient is known to remove the subject from the realm of mere conjecture.

The study of the list of trans-Appalachian birds occurring in Chester County reveals that they belong to four categories, as follows:—

1. Those, appearing in winter, which have not been reported on the Atlantic slope, so far as known, north of the South Atlantic States,—*Scolecophagus cyanocephalus*, *Calcarius pictus*, *Ammodramus leconteii*.

2. Those, also winter visitants, whose breeding range extends eastward from the Mississippi Valley and the region of the Great Lakes into the North Atlantic States,—*Otocoris alpestris pratensis*, *Quiscalus quiscula æneus*.

3. Those which have been found numerous in Chester County during migrations and also, though sparingly, at such times on the Atlantic slope as far north as Washington and New England,—*Dendroica palmarum*, *Seiurus noveboracensis notabilis*.

4. Those formerly considered as trans-Appalachian which are now known to breed on both sides of the mountain system, though ranging farther north on the western,—*Peucaea aestivalis bachmanii*, *Dendroica dominica albilora*.

There are two movements of 'Western' birds, distinct from each other, demanding exposition. Both are intimately connected with the general southward and northward migrations. The first is a movement from northern latitudes in fall and winter, the second from southern latitudes in spring. In the order mentioned the movement in a southerly direction is the first presenting itself for consideration. To understand fully the significance of this movement it is necessary to examine in detail the distribution of the birds of categories one and three. From the records it is found that the range of *Dendroica palmarum* stretches diagonally across the continent from the Great Slave Lake in the interior of British America to the Bahamas and Greater Antilles. In the central portion of the United States

Kansas appears to be its western limit. In the east it extends, numerous, to Ohio and the South Atlantic States. The trend of the comparatively limited breadth of territory outlined indicates that this species migrates from its breeding grounds, in the northwest, in a southeasterly direction. The range of *Ammodramus leconteii* and *Calcarius pictus* furnishes in a measure a parallel example. Both breed in the interior to the northwestward, the latter north to the Arctic coast, and both migrate southward and eastward in fall and winter to Illinois and South Carolina, but, in following the Great Plains to Texas, they bear further to the west than *Dendroica palmarum* does. The general tendency, however, of the movement as a whole is southeasterly. *Scolecophagus cyanocephalus* and *Seiurus noveboracensis notabilis* differ from the others in their occurrence along the Pacific coast and in the southerly extension of their breeding range. In the east *cyanocephalus* is known only as an occasional winter visitant, while *notabilis* is a regular migrant there. From the foregoing it is seen that the movement, in its entirety, of these birds from the interior to the South Atlantic States is a southeasterly movement. Their scarcity or absence at the North on the Atlantic slope evinces that the highlands are crossed in the immediate region.

The presence of *Dendroica kirtlandi* near Washington in autumn (Auk, Vol. V, April, 1888, p. 148) is explained by this southeasterly movement. It seems also that the numerous isolated autumnal instances of trans-Appalachian birds in the North Atlantic States should not be regarded as mere accidents, but rather as further manifestations of this movement—the outskirts of the great wave that sets across the continent after the breeding season in a southeasterly direction.

It is not intended to convey the idea that all migration over the mountains is strictly southeasterly. Species occurring east of the eighty-eighth meridian might follow a direct line south, particularly where the breeding range touches the mountains. Such movements might be expected of *Otocoris alpestris pratensis*, *Quiscalus quiscula ceneus*, *Chondestes grammacus*, *Dendroica caerulea*, *Dendroica dominica albilora*, *Dendroica palmarum*.

The extension eastward to New York and New England of the breeding habitat of *Quiscalus quiscula ceneus* and *Otocoris*

alpestris praticola raises the question whether Chester County examples do not come from the eastern portions of those sections as well as from west of the mountain system. The abundance of the former in New England and its appearance here during fall associated with *quiscula* proper seems to signify that birds are drawn from both regions. *Otocoris alpestris praticola*, however, breeds too sparingly near the coast to supply many representatives by the seaboard route.

So far as the South Atlantic States are concerned, the number of characteristic species involved in this movement is at present a matter of speculation. A thorough survey of the region alone will determine the strength of the representation as well as the relative abundance of the birds now known to occur.

Whether there are meteorological conditions that specially favor southeasterly migration, might be made a theme of profitable inquiry. As set forth beyond, a correlation has been found to exist between cold and warm waves and the fluctuations in abundance of *Otocoris alpestris praticola*.

The movement from the south must now in turn be examined. The absence in spring of birds of the first category, and the rarity of those of the third, north of the South Atlantic States prove that the return over the mountains is effected in the southern portions of the system. It is obvious that the most direct route for winter residents of the Bahamas and Florida to the interior is across the mountains of the South Atlantic States. *Dendroica kirtlandi* in April in the lower part of the State (Auk, Vol. III, July, 1886, p. 412) is indication of the route from the Bahamas, as also is *Dendroica palmarum* in Chester County from the region immediately to the south and southeast. *Seiurus noveboracensis notabilis in transitu* on the Dry Tortugas (*vide* Scott, Auk, Vol. VII, p. 314) and in Chester County, vaguely marks out a line of migration from northern South America. The two instances reported from the vicinity of Washington (Auk, Vol. V, April, 1888, p. 148) are accounted extreme exemplifications of the movement from the southward, *Dendroica palmarum*, further north, furnishing an additional illustration. Whether the mountains,—especially influential factors in distribution when the season of reproduction approaches,—deflect the line of migration of these outlying birds, causing them to cross higher up, or whether they journey by a more easterly course, regardless of

land, cannot be affirmed without more definite data. The same uncertainty exists in the southerly movement as to the points of departure from the mainland, it being an open question whether all follow the coast to Florida, or whether the transit is made in the most direct way.

The comparative abundance of *Helminthophila peregrina* in fall in Chester County is seemingly due to transalpine migration, as the species is reported rare along the Atlantic slope at the northward. Its apparent absence in spring is probably occasioned by the majority following the Mississippi Valley at that season. *Geothlypis agilis* seems to afford a parallel case further north.

It may well be asked whether the southeasterly movement is confined to certain characteristic species, or whether it embraces many that are common both to the interior and to the Atlantic slope, or whether its proportions are vaster still, involving, to a greater or less degree, all the migratory birds of North America. The conformation of the continent favors such a movement. A glance at the map discovers the southeasterly trend of the coast along the Pacific from Cape Mendocino to the Isthmus of Panama. A migration extending through Mexico and Central America would be a southeasterly one, while a movement from the South Atlantic States to the outer West Indies would certainly be southward and eastward if not directly southeast.

To recapitulate, a wide-spread movement of characteristic trans-Appalachian birds occurs after the breeding season, sweeping over the country from the northwest to the southeast, the main portion of the eastern wing crossing the Appalachian highlands in the South Atlantic States, its extreme outskirts reaching northward along the whole Atlantic slope. Some of the representatives of this movement stop short their journey on arriving on the South Atlantic seaboard, while others, occurring there as transients or wintering numerously, extend their migrations beyond to the Bahamas and Greater Antilles and northern South America.

In the complementary movement from the southeast to the northwest, the western winter visitors of the South Atlantic States disappear behind the mountains and their places are filled by the returning migrants, and the movement is felt along the whole Atlantic slope, strongly in the South Atlantic States and

teebly to the northward. It is not strange then that Chester County, a mere point in the pathway of these vast movements, should feel their influence in so marked a degree.

The appended notes pertain (1) to the birds added since the appearance of the last list; (2) to those, noteworthy ones, previously noticed, which have been found in greater abundance or at other seasons than recorded; (3) to those reflecting in an especial manner the different phases of the migratory movements, treated of at length beyond. The numbers below 141 refer to the 'Partial List,' from 141 to 180, inclusive, to the 'Supplementary Notes'; above 180 are additional. In the matter of dates the whole fourteen years have been passed in review and the normal extremes selected. The minor observations omitted in the present paper have been reserved for another connection.

181. *Urinator imber*. LOON.—Of the occurrence of the Great Northern Diver on the Broad and Catawba I have long been aware, but the fact of its presence has remained unverified by a specimen until the present year (1890) when a bird in immature plumage was shot April 26, on the latter river.

182. *Urinator lumme*. RED-THROATED LOON.—A young male was captured, alive and unhurt, on the morning of February 28, 1885, in a field of oats near the town of Chester. This locality, which is on the dividing ridge between the Broad and Catawba Rivers, is somewhat remote from any extended body of water, the nearest considerable stream or mill-pond being several miles distant. Attention was first directed to the bird by its loud and unusual cries. On removing the skin, the body was found to be very greatly emaciated.

183. *Porzana noveboracensis*. YELLOW RAIL.—In 1887 a female was shot Nov. 12, and a male Nov. 23. Dec. 10 of the same year another was seen. This latter instance seems to indicate that the species will ultimately prove to be a winter resident, but it should be borne in mind that the winter of 1887-88 was one of unwonted mildness in this region. In October, 1890, a fourth example was noted.

184. *Porzana jamaicensis*. BLACK RAIL.—Sept. 3, 1887, an adult female was killed with a pitchfork in a little hillside sink from which the grass was being cut.

As to the abundance of the Rails of our local ornithology, as well as of the dates of their appearance and disappearance, I am unable to speak with certainty. The time required for the systematic investigation of these points has heretofore been devoted to the study of the birds of the woods and fields.

185. *Nyctea nyctea*. SNOWY OWL.—During the early part of December, 1886, I saw an individual several times under circumstances that

dispelled all doubt from my mind as to its identity. That this Owl occasionally wanders southward to South Carolina has long been a matter of record. Bartram mentions its occurrence in his 'Travels' (second edition, 1794, p. 285), and Audubon ('Ornithological Biography,' Vol. II, p. 137) notes its presence at Columbia and in the vicinity of Charleston.

104. *Melanerpes erythrocephalus*. RED-HEADED WOODPECKER.—Red-headed Woodpeckers were common through the winter of 1877-78 in the immediate neighborhood of the County Seat. During the previous winter they were not present, but through several subsequent winters a few stragglers remained. Of late years, until the past season, when a single bird was observed, they have entirely forsaken its vicinity from October to April. Back in the County the case is somewhat different. In the winter of 1884-85 a colony was established in a large piece of original hardwoods four miles north of the County Seat, but they were not met with in this situation in succeeding winters until December, 1887, and then in greatly diminished numbers. Toward the close of December, 1884, they were common in the northeastern part of the County near Landsford on the Catawba River. I have not visited that section since in winter, and do not know whether they have regularly continued to reside there. A friend, however, has informed me of their occurrence in midwinter, 1888-89. During a ride of forty-five miles, taken December 29, 1885, through the northwestern portion of the County, in the vicinage of the Broad River, only a single individual was encountered, and this one, which was the only one seen during the winter, was within seven miles of the Court-House. In December, 1887, and January, 1888, considerable time was spent in riding over the country adjacent to the County Seat, but only very few 'Redheads' were noticed, and none nearer than four miles, and all on ground wholly unoccupied the winter before. During the winter of 1888-89 not one was seen, although several extended excursions were made. The past season (1889-90) extensive field investigation failed to reveal the presence of this species except in the instance mentioned.

From these observations it is apparent that a territory may be occupied one season and partially or wholly abandoned the next, and that in the lapse of time, with the shifting of the local centres of abundance, it may again come, in a varying degree, into favor as a winter resort. In the breeding season and during the height of the migrations there is, also, in a series of years, a fluctuation in the scale of abundance, but I have no personal knowledge of a complete desertion of a locality during the former period. I am unable to assign any satisfactory reason for their erratic distribution and migrations. The ordinary explanations advanced—unusual persecution, great changes in the face of the country, severity of seasons, obvious failure of the food supply—do not adequately account for their movements. It should be added further that these singular removals are so marked and well known that they have long attracted the attention of observant country residents.

22. *Otocoris alpestris praticola*. PRAIRIE HORNED LARK.—Mr. Henshaw's elaborate review of the Horned Larks led me in the winter of

1886-87 to study anew the birds of this locality. The result of this investigation showed that *praticola*, one of the newly described races, was at least an occasional visitant. With the view of determining the precise status of this subspecies, as well as of *alpestris* proper (the style currently believed to occur in upper South Carolina), systematic observations were made through the three following winters, but instead of finding *alpestris*, as had been confidently expected at the outset, only *praticola* was discovered. The appearance of Mr. Ridgway's 'Manual,' with its broadened characterization of the latter form, further disclosed the fact that a series of measurements taken at intervals during the decade previous to 1886 were typical of *praticola*, and that *alpestris* had never been secured. The uniformly small size of these examples had attracted my attention from the outset.

The past three winters were exceptionally mild throughout this region, and therefore apparently inauspicious for the occurrence of Prairie Horned Larks. However, the continuous effort put forth developed them in unexpected numbers. The earliest arrivals each year were noted during the last week of November, their coming being coincident with a colder term. Through the ensuing two months they were constantly present, and straggling bands remained until the close of February. During December and January the changes in temperature which occurred, though not extreme, were accompanied by marked fluctuations in abundance—the cold waves re-enforcing, and the warm ones diminishing their ranks. On several occasions an increase took place when there was no specially noteworthy fall in the mercury, but cold spells were prevailing in the northwest. While the periods of greatest abundance have been during the severest stresses of weather (as in December, 1876, and January, 1877, when the snow lay on the ground for the longest time in my remembrance), the last three seasons have demonstrated that these birds are not uncommon here during the mildest winters, and that their presence is not dependent upon extreme inclemency in the immediate vicinity. The companies in which they congregate have varied in extent, the past three winters, from little squads of half-a-dozen to flocks of above a hundred, the average being from twenty to thirty. In former years the gatherings have not differed materially in size, except in January, 1877, when a single assemblage of several thousand was met with after the snow had disappeared.

In recording the experiences of the previous winter in 'The Auk' for April, 1888, mention was made of the fact of the great excess in number of females. The subsequent two years have exhibited a similar preponderance—the males secured being less than twenty per cent of the total of females.

The particular attention paid of late to these Horned Larks has further revealed that they are extremely partial to certain restricted localities, and that considerable territory might be examined without their presence being detected, except when transient parties were passing overhead from one rendezvous to another. Each year these favored situations have been

re-occupied, while other locations apparently not dissimilar have been discarded. A single field is often the centre of attraction, and here the birds are always certain to be found. If persecuted they leave the spot with reluctance, repeatedly returning before seeking a retreat in some other quarter of their range—the flocks when broken up coming back in detached companies. In the times of greatest abundance they are more generally dispersed, the Northern hordes overflowing the narrow bounds held in occupancy in ordinary seasons. Barren upland pastures, where the grass has been cropped to the roots, and wind-swept grain fields are, above all other situations, chosen by them. Cotton-fields where the stalks are small and the ground free from grass are also much frequented. If these congenial haunts abound in small stones, a further attraction is afforded. In all, the color of the surroundings harmonizes so nearly with the color of the upper parts of the birds as to render them exceedingly inconspicuous.

I now believe that every year Prairie Horned Larks are regular visitors and that their reported absence in some winters was due to an inadequate knowledge of their habits and distribution.

In the subjoined table are the dimensions of forty-two males and two hundred and twenty-five females, representing two series; one of twenty-five males and one hundred and thirty-three females, procured during the winter of 1887-88, and the other of sixteen males and ninety-two females obtained during the ensuing winter. All the measurements that follow are in millimetres. They were originally taken in inches and hundredths and then reduced to the metric equivalents.

	Sex	Length		Extent		Ch'd of wing		Longest rectrix	
Maximum	♂	187.96	185.42	337.82	340.36	106.17	105.66	79.75	80.01
Minimum	"	176.53	175.26	320.04	317.50	99.82	99.31	69.85	70.10
Mean	"	181.36	180.34	330.96	326.39	102.87	102.61	75.94	75.44
Maximum	♀	173.99	173.99	320.04	317.50	99.82	99.82	73.15	73.40
Minimum	"	162.56	162.56	299.72	299.72	91.95	91.95	62.23	65.02
Mean	"	169.16	168.66	310.64	308.36	95.75	96.01	68.32	68.83

The maximum extremes were not derived from single specimens, and are thus not necessarily indicative of direct approaches toward *alpestris* or *leucolæma*. In the first series of females they were furnished by the combined dimensions of two birds. In the second the maximum wing, 99.82 mm., occurred in an individual whose length was only 166.37 mm., and tail, 69.34 mm., while the longest tail, 73.40 mm. appeared in one in which the entire length was but 171.45 mm., manifesting that the total length is diminished by the shortening of the body as well as by the shortening of the rectrices. The chief length, 173.99 mm., was attained in twelve instances in the first series and in but three in the second. The following measurements of females further attest the absence of a uniform variation in the proportions of many examples:—

Length	Chord of wing	Longest rectrix
173.99	99.82	72.64
166.37	99.82	69.34
173.99	98.29	70.86
171.45	96.52	73.40
166.37	97.79	71.37
163.32	97.02	67.56
168.91	93.98	66.80
168.66	98.80	71.12
168.66	94.74	70.61

The minimum extremes of the females for both seasons represent the actual size of the two smallest ones. In the males, however, these were obtained from different specimens. It will be noticed that the wing and tail measurements of the smallest males and the largest females overlap. Where there is such wide individual deviation, it is remarkable that the general averages of the two series differ so little. This is further illustrated in the appended table of the means of three groups of females—the product of three days' shooting (Nov. 24, 29, Dec. 8, 1888) in a single field:

No. Spec.	Length	Extent	Chord of wing	Longest rectrix
13	168.40	308.10	96.26	69.34
20	169.16	308.36	96.01	68.32
12	169.16	308.36	96.01	69.34

The great uniformity with which the Horned Larks of this section fall within the limits prescribed for *praticola*, evinces that they are drawn from the centre of distribution of the subspecies during the breeding season and not from the confines of the habitat of another form.

(To be concluded.)

DESCRIPTION OF A NEW SUBSPECIES OF CYPSELIDÆ OF THE GENUS *CHÆTURA*, WITH A NOTE ON THE DIABLOTIN.

BY GEORGE N. LAWRENCE.

Chætura dominicana colardeaui.

Chætura, LAWRENCE. Proc. U. S. Nat. Mus. 1885, p. 623.

Male.—Crown, lores, and upper plumage black; rump brownish ash-color; upper tail-coverts brownish black; tail black; the spines project