

***Sitta carolinensis lagunæ*, new subspecies. ST. LUCAS  
NUTHATCH.**

SUBSPEC. CHAR.—Similar to *Sitta carolinensis aculeata*, but with the wings and tail shorter, the black on the tips of the outer tail-feathers more restricted.

TYPES.—*Male ad.* (No. 14,691, collection of William Brewster, Sierra de la Laguna, Lower California, May 5, 1887; M. Abbott Frazar).—Wing, 3.41; tail, 1.97; tarsus, .72; bill from nostril, .59 inch.

*Female ad.* (No. 14,705, collection of William Brewster, Sierra de la Laguna, Lower California, May 7, 1887; M. Abbott Frazar).—Wing, 3.20; tail, 1.73; tarsus, .67; bill from nostril, .53 inch.

The differences just mentioned, though slight, are remarkably constant in the large series of specimens before me. Specimens of *S. c. aculeata* from various localities in the Rocky Mountain region, California, and as far south along the Sierra Madre Mountains of Mexico as Chihuahua, present very little variation in size. The Lower California birds have the wings decidedly, the tail slightly, shorter than in *aculeata* but the bill is fully as long and slender. The difference in the tail marking is a curious one. The white spots on the outer three rectrices are not more extensive than in *S. c. aculeata* but they are nearer the tips of the feathers, thus narrowing the blackish apical band to from one half to three quarters the width that it is in *aculeata*. The third feather has at most only a trace of dusky on the tip, and in a few birds none whatever. Several specimens in the Lower California series have the wing-quills and all the tail-feathers, except the middle pair, light reddish brown at their tips.

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NOTES ON BACHMAN'S WARBLER (*HELMINTHOPHILA BACHMANI*).

BY WILLIAM BREWSTER.

ONE of several attractive possibilities discussed by Mr. Chapman, Dr. Allen, and myself before starting on the trip described elsewhere in this number of 'The Auk'\* was the meeting with

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\**Antea* pp. 125-138.

Bachman's Warbler. If I remember rightly we did not venture to hope that more than a few of these interesting birds would be taken or seen; accordingly it was an agreeable surprise to find them actually common along the Suwanee River,\* at nearly every spot where we landed, between the mouth of Santa Fe Creek and a point some fifteen miles north of the Gulf. Here the varied and luxuriant forests which line the banks of the Suwanee throughout the greater part of its course give place to monotonous and uniformly swampy woods composed chiefly of stunted cypresses intermingled with bay trees and red cedars and interspersed with saw-grass savannas. Below this point we searched vainly for our Warbler. Either it had passed northward before we arrived, or the coast country is not to its liking. The latter seemed to us the more probable theory in view of what we had learned of the bird's habits and haunts on the river above.

Our first specimen, a male, was killed by Mr. Chapman, March 12; the first female, March 15. The date of greatest apparent abundance was March 23 when I identified upwards of thirty individuals and took nine males and a female in less than three hours. The species was last seen March 24. During the period covered by these dates we traveled about seventy miles down stream (in a generally southerly direction), and rarely spent two days in the same place.

Nearly or quite all that has been hitherto written about this Warbler would lead one to infer that its favorite haunts are dense thickets, undergrowth, or low trees, and that it seldom ventures to any considerable height above the ground.† Our experience,

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\*There seems to be no record of the previous occurrence of the species anywhere on the *mainland* of Florida.

†Its discoverer, Dr. Bachman, according to Audubon (*Birds Am.*, Vol. II, p. 93), described it as "a lively, active bird, gliding among the branches of thick bushes, occasionally mounting on the wing and seizing insects in the air in the manner of a Fly-catcher." The numerous specimens which Mr. Atkins has observed at Key West during migration were also "very active, and constantly in motion" and were "found alike in the trees, low bushes, and shrubbery, sometimes on or quite near the ground," seeming to "prefer the heavy and more thickly grown woods to trees or bushes more in the open" (*Scott, Auk*, VII, Jan. 1890, p. 17). All but two of the thirty-one specimens obtained by Mr. Galbraith on the shores of Lake Ponchartrain, Louisiana, in March, 1888, were taken "in the tops of the sweet-gum, probably attracted by insects found in the buds and blossoms of this tree." The two exceptions were "so low down on the tree on which they were discovered, that their plumage was easily distinguished" (*Auk*, V, July, 1888, p. 323). The last statement implies, of course, that the other birds were high above the ground, but this point is not distinctly brought out by anything in the account from which these quotations are made.

however, was directly contrary to this, for we found it oftenest on bottom lands where the forests, although composed of grand old trees thickly hung with Spanish moss, were rarely dense or tangled, the ground being nearly or quite free from undergrowth and either muddy with pools of stagnant water or carpeted with dry leaves. The bird, moreover, not only frequented the tops of the tallest trees, but at all times of the day and under every condition of weather kept at a greater average height than any other Warbler excepting *Dendroica dominica*. In its marked preference for cypresses it also resembled the species just named, but unlike it was never seen in pines. It was usually met with on or very near the banks of the river or its tributary creeks, but this may have been due to the fact that we found paddling a light canoe so much more agreeable and expeditious than walking that we seldom went far from the attractive and convenient waterways with which the region abounded.

The habit of keeping high in the trees was not, on the part of our Warbler, wholly without exceptions — which will be given later. But what species is so strictly arboreal as never to approach the ground? Under certain conditions birds often turn up in strange and unexpected places. Especially true is this of the season of migration. I remember starting a Carolina Rail and a Bittern at the same moment in a patch of beach grass on the sand-hills at Swampscott, Massachusetts, and on another occasion, in a similar place at Nantucket, I killed a Gray-cheeked Thrush, a Connecticut Warbler, and a Tennessee Warbler in the course of a few minutes; while it is not unusual, in early autumn, to find such tree-loving species as Red-bellied Nuthatches and even Brown Creepers feeding among rocks on barren points or islands along the seacoast. In view of these considerations there now seem reasons for suspecting that when, as at Key West, Bachman's Warbler has occurred numerously in thickets or low scrub, this has been due, not to a preference for such cover, but simply to the fact that no better shelter was available during a necessary halt in a long journey, and that its favorite haunts are lofty tree tops.

It would be possible, of course, to argue on the other side of the question and to suggest that the conditions which existed during our visit to the Suwanee were peculiar. Thus it may be that the tender young foliage of the great cypresses furnished an excep-

tional supply of insect or other food which at that season was scarce or wanting near the ground. In support of this assumption is the fact that Prairie Warblers, Blue-gray Gnatcatchers, and certain other species of normally low-ranging habit were often seen in the upper branches of the tallest trees where the Bachman's Warbler may have been equally out of place. But on the whole the hypothesis first suggested seems to be the better sustained, while, taken in connection with some considerations which I shall presently mention, it may partly explain why our bird has thus far eluded observation in the breeding season when, as is now evident, it must be a common bird in at least some of the Southern States.

At the time of our visit the Suwanee bottoms were alive with small birds many of which were doubtless migrants. They banded together in mixed flocks often of large size and motley composition. It was not unusual to find in close association forty or fifty Parula Warblers, half as many Yellow-rumps, and smaller numbers of Yellow-throated and Palm Warblers, Tufted and Carolina Titmice, Red-eyed and Solitary Vireos, Blue-gray Gnatcatchers, Ruby-crowned Kinglets, Carolina Wrens, Catbirds, Brown Thrushes, and Towhees, with perhaps a Prairie or Orange-crowned Warbler and often several of the smaller Woodpeckers. Such a gathering was nearly certain to contain from one or two to five or six Bachman's Warblers. These with the Parulas were most likely to be feeding in the upper branches of some gigantic cypress, at least one hundred feet above the earth, where they looked scarcely larger than humble bees and were safe from all but the heaviest charges with which our guns were supplied. Under such conditions it was next to impossible to distinguish the two species except by certain slight peculiarities of form or movement, for against the dazzling light of the southern sky they appeared as little more than silhouettes and the chestnut throat-markings of the Parula showed quite as dark and distinct as the black cravat of the Bachman's Warbler.

The latter bird, however, was the larger or rather plumper-looking of the two, and if the upper side of its wings could be seen the absence of the white bars which are so conspicuous on the wings of the Parula Warbler was quickly noticed. But these differences were not easily made out when the birds were in tree tops, and as we refrained from chance shots most of our specimens

were obtained at the expense of much patient 'star gazing' accompanied by inevitable straining of the neck muscles; while far too often, despite our utmost care, the victim finally selected would prove to be an unfortunate Parula.

Of course it is only the male Bachman's Warbler which can be confounded with the Parula, for the female — setting aside occasional individuals which have black on the throat — is most like the Orange-crowned Warbler. Indeed it resembles the latter species so very closely, not only in general coloring but in form and movement also, that it would require a remarkably keen and practised eye to distinguish one from the other at a greater distance than a few paces. Both sexes of Bachman's Warbler habitually carry the feathers of the crown a little raised, giving the head a fluffy appearance.

A few shots fired into a flock such as that just described would usually alarm and scatter its members or start them in rapid motion through the woods, but one of our party made the curious and very useful discovery that they could be quieted and brought together again by an imitation of the whistle of the Tufted Titmouse. Apparently this bird was recognized as a guide or leader of the throng, a fact possibly due to its loud and persistent voice.

At times, especially on frosty mornings, or when there was a cold north wind, most of the small birds (including the Parulas) inhabiting this region, descended from the tree tops into low bushes, especially those growing out over the water on the sunny side of the river; but with a single exception — that of the bird shot by Mr. Chapman, March 12 — no Bachman's Warblers were even seen in such situations. On these, as well as certain other occasions, however, they frequented to some extent small maples, magnolias, or hackberry trees on the river banks and on dry ridges in the swamps, coming down occasionally to within twenty or thirty feet of the ground but almost never lower. Once I found two males together, but not in company with any other birds, in oak scrub, on the crest of a sandy bluff. They kept as high as the trees permitted and appeared restless and ill at ease, as if the place were not to their liking, which was doubtless the case. Most of the specimens collected on the 23rd were taken on rather high ground bordering the river, in a tract of open woods where the trees were chiefly deciduous oaks the leaves of which, just beginning to unfold, had that delicate salmon-pink tint seen in our northern oaks at the corresponding season. Within an area

of ten or fifteen acres there must have been nearly one thousand Warblers, of which probably five per cent were Bachman's. It was comparatively easy to identify them, for the trees although large and spreading were not excessively high, and with more time I could have taken thrice as many specimens as were actually obtained.

On the morning just mentioned I heard several males singing, and shot one in the act, after watching him awhile. He was perched on a dead twig in the very top of a tall sweet gum, with his breast turned toward the sun. At each repetition of the song he threw up his head and I could see the throat swell and the wings quiver under the strong effort, but during the whole time that I was looking at him there was no other movement, save an occasional turning of the head. The song is unlike that of any other species of *Helminthophila* with which I am acquainted and most resembles the song of the Parula Warbler. It is of the same length and of nearly the same quality or tone, but less guttural and without the upward run at the end, all of its six or eight notes being given in the same key and with equal emphasis. Despite these differences it would be possible to mistake the performance, especially at a distance, for that of a Parula singing listlessly. The voice, although neither loud nor musical, is penetrating and seems to carry as far as most Warblers'. Besides the song the only note which we certainly identified was a low hissing *zee-e-eeep*, very like that of the Black-and-white Creeper.

Both Dr. Bachman and Mr. Atkins have characterized Bachman's Warbler as an active, animated bird, and the former saw it "mounting on wing and seizing insects in the air in the manner of a Flycatcher."\* This again is curiously at variance with our experience which I find described in my notes in the following words, written at the close of the trip and fully approved by Mr. Chapman when the subject was fresh in our minds:

"The habits and movements of Bachman's Warbler are in some respects peculiar and characteristic. It does not flit from twig to twig nor launch out after flying insects in the manner of most Warblers, and many of its motions are quite as deliberate as those of a *Virco*. Alighting near the end of a branch it creeps or sidles outward along a twig, and bending forward until the head points nearly straight down, inserts the bill among the ter-

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\*See foot-note on page 150.

minal leaflets with a peculiar, slow, listless motion, keeping it there a second or two, and repeating the leisurely thrust many times in succession without changing its foothold. The action is like that of several other members of the genus — notably *H. pinus* and *H. chrysoptera* — under similar conditions, and suggests the sucking in of liquid food, perhaps honey or dew. Not infrequently a bird would hang back downwards beneath a twig and feed from the under sides of the leaves in the manner of a Titmouse. The Parula Warblers did the same thing — and many fell to our guns in consequence.”

When in maple, hackberry, or magnolia trees the male Bachman's Warbler was not difficult to recognize, especially if it showed its throat and breast against a background of solid foliage, for then the black cravat and rich, uniform yellow of the under parts were conspicuous and unmistakeable. In such a position it might have been mistaken for a Black-throated Green Warbler, but this species, fortunately for us, was not among the birds found on the Suwanee River.

Many of the hackberry trees along the banks of this stream contained compact bunches — nearly as large as a child's head — of dead leaves blackened by exposure to wind and weather. These bunches probably sheltered insects or their larvæ, for they attracted several species of birds, especially the Bachman's Warblers which would work at them\* minutes at a time with loud rustling, sometimes burrowing in nearly out of sight and sending the loosened leaves floating down to the ground. Upon exhausting the supply of food or becoming tired of the spot — whether one of the leaf bunches or the extremity of a cypress branch — the bird almost invariably started on a long flight, often going hundreds of yards through the woods or crossing the river, instead of merely passing to the next branch or tree as almost any other Warbler would have done under similar circumstances. This habit seemed to us characteristic of the species.

The sexual organs of all the specimens examined, especially those of the females, were only slightly developed, which may account for the fact that the males sang so seldom. Probably none of the birds which we killed would have bred for three or four weeks. Hence there is no proof that they were not all migrants bound to some point further north, and simply following

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\*Mr. Atkins has also observed this at Key West. See Auk, VII, Jan. 1890, p. 17.

the course of the Suwanee as a convenient pathway. Nevertheless, I cannot help suspecting that they breed numerous in this river-bottom, and that the nest is placed in the Spanish moss (*Tillandsia*). On several occasions I saw females clinging to streamers of this moss, peeping into it as if looking for a nesting-place, although of course they may have been merely searching for food. A few of our specimens had the skin thickly lined with fat, but the majority were in only fair condition.

Our males, thirty-six in number, vary exceedingly in respect to the depth and extent of the black of the head and throat. This in the finest birds is essentially pure with a slight lustre, but most of the black feathers are narrowly tipped with ashy or olive yellow which doubtless disappears later in the season. In the duller birds this light edging is broad and diffused, obscuring or half concealing the black, and giving the plumage a mottled appearance. Owing partly to this, but chiefly — as is shown by examination of the under plumage — to variation in the extent of its actual distribution, the black in some cases appears over the entire throat and jugulum; in others is restricted to a small central space on the latter, leaving the whole throat, as well as the chin, yellow. Various styles intermediate between these extremes are shown by our series of which scarcely any two specimens are precisely alike. In some the anterior border of the black is abruptly and sharply defined, in others the throat constitutes a neutral area which is spotted or mottled with black on a yellow ground. One bird has the spots confined to the centre of the throat where they form a cluster separated from the black of the jugulum by an interval of nearly pure yellow, in another the middle of the throat is immaculate and the spots extend forward along its sides. The posterior border of the black varies similarly in distinctness, but its position is nearly always at about the dividing line between the jugulum and the breast. Its outline is sometimes deeply concave, sometimes decidedly convex or rounded, and occasionally nearly straight. The black on the head varies from a solid, glossy patch embracing the entire crown — but never the occiput, as represented in Audubon's plate — to a narrow, dusky band bordering the forehead. Even this band is wanting in occasional birds which have the dark color represented only by inconspicuous and half-concealed black or dusky spots on the centres of the feathers of the crown.

The yellow of the underparts is also very variable. In some



birds it is pale or obscured with dusky olive, in others rich and pure ranging from deep lemon to light gamboge, which, however, in the brightest specimen before me does not quite equal the coloring represented in Audubon's much criticized plate. The yellow sometimes spreads over the entire abdomen and also tinges the sides, flanks, and crissum, but in the dullest birds it is confined to the breast and a narrow central space on the fore abdomen, the remainder of that part, with the crissum and flanks, being ashy white more or less suffused with smoke-gray. There is apparently no correlation between the extent of the black on the jugulum and throat and that on the crown, nor between the amount or purity of black on either or both of these parts and the depth of the yellow. Thus the bird with the largest crown patch has most of the throat yellow, and the one in which the cravat is best developed has an exceptionally small amount of black on the crown, while neither is among the specimens which are most richly colored in respect to the yellow of the under parts. The yellow frontal band is fairly uniform in color, but is twice as wide in some birds as in others.

We collected ten females. Of these the brightest is practically indistinguishable from the dullest male when the two are placed side by side on their backs, for in the general coloring of their underparts they agree very closely, much better in fact than does the male with any of the other examples of its own sex. This female, however, has a trifle less black on the jugulum and only a little concealed black spotting on the crown, but another which shows only a very little black on the jugulum possesses a band of exposed dusky spots on the crown. The most constant and evident sexual character seems to be the presence of a clearly outlined yellow frontal band in the male and its absence in the female. In all the males which I have examined this band is conspicuous and well defined. Many females, it is true, have the forehead tinged with yellowish or olive, but this is merely a suffusion, not a pure color, and in its extension backward it invariably shades insensibly into the color of the crown instead of being separated from the latter by a distinct line of demarcation. It should be stated, however, that I have been able to apply this test only to spring specimens and that it may fail with the young in autumn plumage.\*

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\*Audubon states that the female is "considerably smaller than the male," but our specimens show that there is only a slight *average* difference in this respect. The largest females are decidedly larger than the smallest males.