ADDITIONAL HYBRIDS OF THE SLATE-COLORED JUNCO AND THE WHITE-THROATED SPARROW

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Hybrids between the Slate-colored Junco (*Junco hyemalis*) and White-throated Sparrow (*Zonotrichia albicollis*) are known to number at least seven (see references beyond); this paper adds two more. Further descriptions of these hybrids might seem of little value, except in establishing the range of variation in such hybrids. Certain resemblances of one of the hybrids reported herein to forms of *Junco* other than *J. h. hyemalis* and the recent renewed interest (Dickerman, 1961; Paynter, 1964) in generic affinities of *Zonotrichia, Junco* and related genera have stimulated us to describe these hybrids.

The known hybrids of *Junco hyemalis* × *Zonotrichia albicollis* are as follows:

Sex	Age	Date	Locality	Authority
♂	ad.?	Dec. 1882	Montgomery County, Pa.	Townsend, 1883; Stone, 1893
♀	imm.	Oct. 1953	St. Thomas, Ontario	Snyder, 1954
♂	ad.	Jan. 1955	Dalton, Georgia	Hamilton and Hamilton, 1957
♂?	ad.?	Apr. 1956	Fairfax, Virginia	Peacock, 1956
?	?	Nov. 1958	Philadelphia, Pa.	Warburton, 1959
♂	ad.	Oct. 1959	Huntington, N. Y.	described herein; Dickerman, 1961
?	imm.	Oct. 1961	Riverside, Conn.	W. E. Lanyon, pers. comm.
♀	ad.	Apr. 1964	Monkton, Md.	described herein
♂	imm.	Oct. 1964	Ocean City, Md.	described herein

The hybrids described herein are: an adult female (USNM no. 480446), which we took on April 18, 1964, from a banding net at Monkton, Maryland; an immature male (USNM no. 480775) secured from a banding net by Mrs. Richard D. Cole and Chandler Robbins just north of Ocean City, Maryland, on October 27, 1964; and, through the kindness of Wesley E. Lanyon, the adult male (AMNH no. 775741) mentioned by Dickerman (1961), taken by Lanyon in a Potter trap at Huntington, Long Island, on October 14, 1959.

Description of Adult Female Taken in Maryland in 1964

Head.—The hybrid's head is gray dorsally from forehead to back, except for a narrow, broken rufous-brown patch on its hindneck, and a vague suggestion of the lateral crown stripes of *albicollis* (due to black centers of the gray lateral crown feathers, and the black tips of new, incoming feathers there). There is no trace of a median crown stripe. The superciliary stripe of *albicollis* is evident only in a few white traces at the bases of several posterior feathers, and a white (no yellow present) area anteriorly near the bill. There is no postocular stripe. The auricular areas and sides of the neck are gray, as on the crown. The throat is white in a patch as in *albicollis*, but not so sharply bordered by gray. The submalar streak is entirely lacking.

Underparts.—The upper breast is gray forward to the throat patch; the gray is darker than in typical *albicollis*, but not so dark as in *hyemalis*. The posterior border of the patch is not as sharply defined as in the latter. The gray extends laterally along the sides and flanks, as in *hyemalis*, the flanks becoming browner posteriorly; however, the brown does not tend to concentrate into streaks as it does in *albicollis*. The abdomen and undertail coverts are generally similar in both species and in the hybrid, but the hybrid and *albicollis* have the basal and central parts of their undertail coverts brownish, rather than grayish like *hyemalis*.

Upper parts.—The hybrid's back is like that of browner-backed female juncos, except for the streaked interscapular region. The dark brown streaks are faintly edged with buff, as in

albicollis, but the streaks and buff edges are narrower, and the rufous of *albicollis* is lacking. The rump is intermediate between the pale brown-gray of *hyemalis* and the olive-brown of *albicollis*.

Wings.—The coverts and secondaries lack the rufescence found in *albicollis* and have browner edges than in *hyemalis*. The primaries are dark and edged with gray like *hyemalis*. The wing bars (tips of greater and middle coverts) are present, but are slightly narrower and grayer than in *albicollis*. There is no trace of yellow at the bend of the wing, as there is in *albicollis*.

Tail.—The hybrid's tail resembles that of *hyemalis* in having white tips, although the white is less extensive. Rectrix 6 is white on its outer vane except for a dusky base, and its inner vane is two-thirds grayish (basally), with the rest white; this rectrix is all white in *J. h. hyemalis* (Miller, 1941). Rectrix 5 is gray except for a small white tip, and rectrix 4 has the white further reduced to a small terminal spot. The tip of the tail is notched centrally (R 1 shorter than R 6).

Bill.—The bill was horn-colored to pink just after the hybrid was taken. Following preparation it appears pinkish in the middle of the upper mandible and dusky toward the tip and base. The lower mandible is now horn-colored, rather like *albicollis* and not *hyemalis*.

Measurements and size.—Measurements of the hybrid are as follows: wing (chord), 74.6 mm.; tail, 67.6 mm.; tarsus, 20.9 mm.; exposed culmen, 11.0 mm.; and bill from nostril, 8.3 mm. Because of the overlap in measurements between the two species, these are not enlightening. The bill of the hybrid is slightly longer than those of females of *Junco h. hyemalis* (in comparable plumage) which we measured (20 *hyemalis* all measured below 8.1 mm. in bill length from nostril; the hybrid falls well within the range of *albicollis*, and 0.3 mm. above the high measurement for *hyemalis*). When compared with museum skins of the two species, the hybrid is larger than all specimens of *J. h. hyemalis* and similar to those of *Z. albicollis*; this probably indicates a real size difference between the hybrid and *J. hyemalis*.

Description of Immature Male Taken in Maryland in 1964

Head.—The hybrid's crown is brown, heavily streaked with black, and with the barest indication of crown stripes; hence, it shows little resemblance to that of *Z. albicollis* or *J. hyemalis*. The crown streaks are narrower than those of juvenal juncos, and the brown rather than gray-brown background renders the crown different from them. The hybrid most closely resembles *Junco vulcani* (juveniles and adults) in color, except that the brown is less yellowish and more chestnut. There is a vague indication of white beside the bill at the anterior end of what would be the superciliary stripe in *Z. albicollis*. The auricular area is gray-brown, becoming blackish posterior to and below the eye. The black is most pronounced in the loral region. Each blackish feather has a small basal white area, so that the black appears white-flecked when viewed closeup, and grayer when viewed at a distance. The effect is very like that presented by *Junco vulcani* (it is also seen in juveniles of various races of *J. hyemalis*, and it is present, but blacker, in the *caniceps* group of *J. hyemalis* and in *J. phaeonotus*). The malar area is buffy-white, set off by a definite, but weak, submalar streak. The throat is dull white mixed with buffy, forming a vague throat patch, which merges gradually into the brownish-gray of the lower throat.

Underparts.—The upper breast and lower throat are brownish-gray, intermediate between the darker gray of *J. hyemalis* and the brown-gray of *Z. albicollis*. The upper breast becomes browner laterally and the sides and flanks are brown as in *albicollis*, except that there is no sign of streaking in the hybrid. The abdomen is similar in both species and the hybrid. Its undertail coverts are white with gray centers and bases, as in *J. hyemalis*.

Upper parts.—The hybrid's back is buffy brown with narrow black stripes, which are distinct in the interscapular region but become vague anteriorly. Absence of rufous-brown and pale buff, and narrower black streaks, render the hybrid unlike *Z. albicollis*, while the richer brown and presence of the streaks are unlike *J. hyemalis*. Except for the yellower cast of its back feathers, *Junco vulcani* is very like the hybrid in back color and markings. The hybrid's rump is brown-gray, browner than in *J. hyemalis*, but much grayer than *Z. albicollis*.

Wings.—The wings of the hybrid are like those of the female hybrid described above, except that its wing bars are more buffy and less distinct, and its wings are browner with a trace of the rufescence found in *Z. albicollis*. No yellow is present at the bend of the hybrid's wing.

Tail.—The tail is more like *J. hyemalis* than *Z. albicollis*, and is like the tail of the hybrid female, except for more extensive white in R6 (outer half of inner vane white) and R5, and less extensive white (tiny spot only) in R4. The tip of the tail is slightly notched at its center, but more like *albicollis* than *hyemalis* (R1 longer than R6).

Bill.—The bill of the specimen is like that of *Z. albicollis*, but is slightly pinker.

Measurements and size.—The hybrid male measures as follows: wing (chord), 69.2 mm.; tail, 65.1 mm.; tarsus, 21.8 mm.; exposed culmen, 11.4 mm.; and bill from nostril, 8.3 mm. The tarsal and bill measurements are too great for *J. hyemalis*, and the hybrid agrees with *Z. albicollis* in these. Wing and tail measurements overlap, so these provide no indication of similarity to one or the other parental species. As in the case of the hybrid female, the prepared skin of this hybrid is larger than all available skins of *J. hyemalis*, and the size of those of *Z. albicollis*.

Description of Adult Male Taken on Long Island in 1959

Head.—The hybrid's head is marked by two black crown stripes, as fully developed as in *Zonotrichia albicollis*. The pileum, median crown "stripe," and posterior two-thirds of the superciliary stripes are gray, slightly paler than the dark gray sides of the neck and auricular regions. The anterior superciliary stripe above the lores is white with pale yellow posteriorly. The upper throat is white as in *albicollis*, but more restricted by gray. The submalar streak is poorly defined, nearly absent, except for gray projecting a short distance anteriorly from the lower throat region.

Underparts.—The lower throat and upper breast are dark gray as in *Junco hyemalis*. Indeed, the entire underparts are like those of *hyemalis*, except that feathers of the sides have darker, more rusty brown edges than in that species.

Upper parts.—This hybrid's back is more like that of *Z. albicollis* than *J. hyemalis*. The only gray areas present are found anteriorly on the upper back (especially laterally, where they join the gray sides of the neck). The black back markings are present, and narrower than in *Z. albicollis*. The brown of the back is more strongly rufescent (*albicollis*-like) than in the other hybrids examined. Although the browns are less contrasting in the hybrid than in *albicollis*, traces of the buffy edges of back feathers found in that species are detectable in the hybrid's back feathers. The central back feathers have considerable gray near the shafts and bases, and the bird would appear grayer-backed in worn plumage. The hybrid's rump is grayer than in *albicollis*.

Wings.—The wings are barred with white and are strongly *albicollis*-like. Tendencies toward *J. hyemalis* are visible in the grayer feather bases and the reduced contrast of the browns, owing to less buff present in the feather edges. The bend of the wing is white, with a trace of yellow.

Tail.—The white tips of the tail are less extensive than in the other two hybrids examined. Rectrix 6 is primarily white on its outer vane, but with a definite brown base and brownish tip. The inner vane is dark brown at the base and fully half way toward the tip along the shaft; beyond, there is a continuation of the brown as a dusky streak through the white, darkening again at the tip of the feather. Rectrix 5 is brown except for its white inner border, and a grayish-white streak along the shaft of the inner vane from the tip one-quarter of the way toward the base of the feather. The fourth rectrix exhibits no white. The tail is essentially unnotched and rounded like that of *albicollis* (R1 much longer than R6, barely shorter than the longest, R2).

Bill.—The hybrid's bill is junco-like, pinkish-horn colored with a dark tip.

Measurements, size, and weight.—Measurements of the hybrid are: wing, 73.0 mm.; tail, 67.3 mm.; bill length (culmen), 11.0 mm.; bill from nostril, 7.8 mm.; and tarsus, 21.2 mm. All measurements fall within the area of overlap between the two species. In size the prepared specimen matches the largest male junco specimens available; it is smaller than all male white-throats examined. The hybrid weighed 25.0 gm. Comparable white-throat and junco weights for Long Island birds are lacking. Lanyon has kindly provided us with these weights of December adult males of the two species, which, although not strictly comparable, may afford some comparison: 17 juncos, range, 21.1–27.3 gm.; 15 white-throats, range, 27.9–33.8 gm. The hybrid

would appear to weigh about the same as a large male junco. The hybrid showed small testes (under 1 mm.) and was very fat.

DISCUSSION

A comparison of the three additional hybrids of the Slate-colored Junco and the White-throated Sparrow described herein with those previously described (references above) yields the following information. Hybrids tend to have junco-like crowns with crown stripes poorly developed (occasionally well developed). They lack the strong superciliary stripes of *Z. albicollis*, except for white at their anterior end. The yellow loral-superciliary mark of *albicollis* is either present or absent. All hybrids have a white throat patch, either as in *albicollis*, or less strongly defined. The submalar stripe is absent or poorly developed. The breast and flanks are variable. The hybrids' backs are intermediate, generally with narrower streaks than in *albicollis*, and without the several shades of brown found in that species. The wings are barred in all the hybrids, but the color of the wings is generally intermediate (grayer, less rufescent than *albicollis*). The tails are intermediate; all have white in the outer two rectrices, but the white is less extensive than in *J. hyemalis*. The hybrids' bills tend to be intermediate or junco-like in color, but they are larger than juncos' bills. The hybrids vary in size from junco-like (1953 bird) to as large as a white-throat (both 1964 hybrids). Vocalizations have been reported for two of the hybrids. The bird taken in Virginia in 1956 gave the distress call and the note "seet" of a white-throat (Peacock, 1956:59). The hybrid taken in Connecticut in 1961, according to Mrs. Willis Geis (letter of Nov. 2, 1961, to Lanyon), had the call note of a white-throat.

We do not know where the hybrids noted above were produced, nor do we know the circumstances under which breakdown of isolating mechanisms occurs between the parental species. The breeding ranges of the junco and whitethroat overlap broadly. There is some ecological separation of the two species, but despite this they frequently nest side by side in Ontario and elsewhere (Short, personal observation). The widely scattered localities at which hybrids have been secured and the time over which they have been recorded suggest that hybridization is not of local occurrence but occasionally takes place throughout the vast area of sympatry between the species. The several adults taken in fall and winter are birds over one year old. This proves that the two species are genetically compatible enough to produce (at least rarely) hybrids which are successful in feeding, avoiding predators, and migrating. One of the hybrids showed an obvious bill deformity (the bird taken in Georgia in 1955); this bird also apparently had but one testis (Hamilton and Hamilton, 1957). The sex of all the other hybrids collected was noted by the persons preparing them. The preparators apparently observed no gonadal or other abnormalities in hybrids other than the bird taken in 1955.

Paynter (1964) has recently urged that the genera *Passerella* and *Melospiza* be merged into *Zonotrichia*. He states (p. 280) "The recent discovery (Dickerman, 1961) of a *Melospiza melodia* × *Zonotrichia leucophrys* hybrid further suggests that the taxa are congeneric." Yet Paynter excludes *Junco* from this assemblage on the basis of song and adult plumage differences. The frequency of hybrids between *Zonotrichia albicollis* and *Junco hyemalis* (at least nine), the similarity of *Junco vulcani* to species of *Zonotrichia*, and the resemblance of one hybrid *Junco hyemalis* × *Zonotrichia albicollis* to *J. vulcani*, all suggest that merger of *Melospiza* and *Pas-*

serella into *Zonotrichia* might be carried a step farther, with these included along with *Junco* in a broadened genus (*Junco*).

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