

GENERIC LIMITS OF ZONOTRICHIA

By RAYMOND A. PAYNTER, JR.

The terrestrial, brush-inhabiting, Emberizine sparrows *melodia*, *iliaca*, *georgiana*, *lincolni*, *querula*, *leucophrys*, *atricapilla*, *albicollis*, and *capensis* are closely allied species currently grouped in three, and sometimes four genera, namely, *Melospiza*, *Passerella*, *Zonotrichia*, and *Brachyospiza*. Various proposals (for example, van Rossem, 1929; Hellmayr, 1938; Chapman, 1940; Peters and Griswold, 1943; Bond, 1948, 1951, 1956) have been made to unite these species into one, two, or three genera, but these suggestions have not been generally accepted. For example, in the most recently published of the widely-used check-lists, the fifth edition of the A.O.Ü. Check-list (1957), the eight North American species continue to be divided among three genera, as they have been since the first edition (1886) of that compilation.

While preparing a list of the Emberizinae for a forthcoming volume in the Peters' Check-list series, it has been necessary to examine the generic limits of taxa within the subfamily. By contemporary taxonomic standards, an excessive number of genera are recognized in the New World. However, many of the taxa, particularly those endemic to Central and South America, are poorly known and no meaningful generic revisions are yet possible. This is well illustrated by the *Arremon-Arremonops-Atlapetes-Pezopetes-Pseliophorus-Pipilo* complex which, with our present knowledge, would seem to be comprised of related species, possibly constituting a single genus. But, except for general, external morphology, little is known of some of these birds and there is, moreover, considerable doubt about the specific limits of several of the taxa. Without even this elementary foundation, it would be obviously premature to attempt a generic evaluation of the group. No such fundamental problems exist for the fairly well-studied genera *Melospiza*, *Passerella*, *Zonotrichia*, and *Brachyospiza*, although comparative ethological and biological studies, which might be of taxonomic value, still are lacking. It is the purpose of this paper to review the evidence which leads me to unite the four genera under the name *Zonotrichia*.

Junco, which in juvenal plumage resembles these genera, which is known to hybridize with *Zonotrichia* (see review by Dickerman, 1961), and whose southernmost species (*vulcani*) is notably similar in adult plumage to the *Zonotrichia* complex, is doubtless a close relative; it may possibly be congeneric. *Phrygilus* seems close to *Junco* and eventually may also have to be merged with *Zonotrichia*. As a whole these genera have, however, distinctive adult plumages as well as songs; until a comprehensive review is undertaken of all the Emberizinae, including the Old World forms, it appears preferable to maintain them as separate genera.

Brachyospiza Ridgway (1898), the most recently proposed of the four genera, was created to accommodate the Neotropical species *capensis*, which heretofore had been placed in *Zonotrichia*. *Brachyospiza* was defined as being most closely related to *Melospiza*, but to be differentiated by its shorter, double-rounded tail, heavier and shorter tarsi, and distinct color pattern. Ridgway later (1901) qualified his analysis, mentioning the similarity in head pattern between *capensis* and the species within *Zonotrichia*, but he maintained that *capensis* was more closely related to the melospizans; no one but Ridgway seems to have thought this.

Van Rossem (1929) reviewed the genus *Brachyospiza* comparing the relative proportions of the tail to the wing, the tarsus to the wing, and the tarsus to the tail of *B. capensis costaricensis* and *B. c. canicapilla* [= *australis*] with the same relative proportions in the species of *Zonotrichia*. *Brachyospiza* could not be differentiated.

Chapman (1940) later drew up a series of wing-tail indices for two additional races of *B. capensis* (*antifagastae* and *pulacayensis*); again the genera could not be distinguished. More importantly, Chapman's extensive analysis of color patterns detailed the close similarity between *Zonotrichia* and *Brachospiza*, which is particularly evident in the juvenal plumage. Chapman also remarked on the similarity in song and behavior between *capensis* and both *abcollis* and *leucophrys*, which my limited field experience with *capensis* confirms. Under the weight of this evidence there are clearly no grounds for maintaining *Brachospiza* separate from *Zonotrichia*.

The monospecific genus *Passerella* Swainson (1837) is the weakest of the taxa under consideration. Its close affinities, in morphology, song, nest, eggs, and habits, with the Song Sparrow (*M. melodia*) have been noted frequently (for example, Grinnell, 1908; Swarth, 1920), and after an elaborate comparison of skull osteology, as well external morphology and habits, Linsdale (1928) proposed their generic merger. This was again suggested by Grinnell and Miller (1944).

Parkes (1954) seems to have been the most recent author to urge the retention of the two genera. He argued that all taxa of *Melospiza* are streaked dorsally while among the races of *Passerella* only the nominate form is so marked, and this "is of a sort quite different from that typical of *Melospiza*" (pp. 172-173). I fail to appreciate this distinction and, furthermore, do not believe the presence or absence of such markings is a generic character. Parkes claimed also that the shape of the bill "is very different in the two groups as a whole" (p. 173) and that what similarity there is might have arisen through evolutionary convergence. No marked difference in bill shape is evident to me. The shape of the bill is, of course, one of the most plastic characters within the class Aves, and it is precisely for this reason that it is seldom of taxonomic value, even at the generic level. Parkes' final argument for retaining the two genera is that the juvenal plumage of *Passerella* is very similar to that of the adult while among the melospizans the juvenal and adult plumages display a number of differences. The differences between the juvenal and adult plumages of the Song Sparrow appear no greater than those of *Passerella* at like ages. The streaked ventrum of the juvenal plumage of the Lincoln Sparrow (*M. lincolnii*) is, it is true, distinctly different from the unmarked ventrum of the adult; the distinction is less marked (see beyond) in the Swamp Sparrow (*M. georgiana*). But, if one were to follow Parkes' argument, *melodia* would have to be placed in *Passerella*, leaving *lincolnii*, and probably *georgiana*, in a separate, unnamed genus. This would be obviously unacceptable to Parkes since he stated (p. 173) "the Swamp Sparrow and Lincoln's Sparrow, . . . are clearly congeneric with the Song Sparrow."

In my opinion, the Fox Sparrow (*P. iliaca*) is essentially a large, more heavily marked Song Sparrow, unequivocally distinguished only by its lengthened toes and claws. It is sometimes suggested that *Passerella* might also be separated from *Melospiza* by its more square tail. While it is true that nominate *P. iliaca* has a square tail, this is a racially variable character; in some subspecies (for example, *mariposae*) the outer rectrices are much shortened and the tail rounded like that of the Song Sparrow. The Fox Sparrow's large feet and claws are doubtless adaptations for foraging in heavy litter and probably enable the species to utilize sources of food which are not available to the more lightly built Song Sparrow, with which it is sympatric through most of its range. Foot size is a highly plastic character, often varying geographically within a species. It is a much too trival and variable a character to be of generic significance. *Melospiza*, therefore, must be merged with *Passerella*.

Melospiza (*sensu stricto*) Baird (1858), containing *lincolnii*, *georgiana*, and *melodia*,

with the latter as the type species, is a poorly defined genus and, paradoxically, somewhat difficult to synonymize. Baird, ignoring *Passerella* and the species *capensis*, differentiated *Melospiza* from *Zonotrichia* by means of a shorter and more graduated tail, a longer hind toe, a shorter and much more rounded wing, longer tertials, a short ninth primary which "is not longer than the tertials," (p. 476) a spotted [= streaked] ventrum, and a crown which is streaked like the back. This definition was inadequate even at the time it was proposed because it failed to accommodate *georgiana* and *lincolnii*. In the former the adult male has a plain rufous crown and the ventral streaking is obsolete in both sexes; the latter species has a pointed wing with the outer primary considerably longer than the tertials. Both taxa have much narrower and more pointed rectrices than *melodia*. However, rather than separate *georgiana* and *lincolnii* into additional genera, which would seem to have been the logical step if one believed *melodia* generically distinct from the zonotrichians, Baird merely placed the two aberrant species in the subgenus *Helospiza*.

During the 100 years since *Melospiza* was described a few additional characters have been used in an attempt to differentiate that genus from *Zonotrichia*; all fail to separate the genera when the full complement of species and races is considered. The more important of these characters will be briefly reviewed.

The shape of the tail might seem to be one of the most promising characteristics for differentiating the genera. All races of *melodia* have broad, shorter outer rectrices, creating a rounded tail. In *albicollis*, *leucophrys*, *atricapilla*, and *querula*, the outermost rectrices, which are also broad, are longer, making the tail square. In *capensis* the rectrices are narrower than in the nearctic zonotrichians and in *melodia*, but the outer feathers are generally long and the tail is similar in shape to that of the former group. *M. lincolnii* and *georgiana* have narrow, pointed rectrices, quite unlike those of *melodia* or of any species of *Zonotrichia*, but the outer tail feathers are short, agreeing with the condition in *melodia*. Up to this point the two genera may, then, be distinguished by the shape of the tail, that is, a square tail in *Zonotrichia* and a rounded tail in *Melospiza*. However, when *Passerella*, with its sometimes rounded and sometimes square tail, is merged with *Melospiza*, the distinction is completely bridged.

The relative length of the tail and wing is a useless character for separating the genera. Generally speaking, in all of the taxa under consideration, the tail is shorter than the wing, but there is much specific and racial variation spanning any apparent generic patterns. For example, in males of nominate *melodia* the tail and wing are almost equal in length (see Ridgway, 1901:355), whereas in the race *azteca*, as well as in most other subspecies, the tail is shorter, being about 93 per cent as long as the wing (see Dickerman, 1963:54), but in the race *saltonis* the tail slightly exceeds the wing length (average ca. 100.5 per cent in a series of five fresh plumaged males selected at random from the Museum of Comparative Zoology collection). For various races of neotropical *capensis* Chapman (1940:410) gave tail-wing ratios ranging from 75 to nearly 95 per cent, and for northern zonotrichians van Rossem (1929:548) found these ratios to be from roughly 90 to 101 per cent.

The shape of the wing is often employed as a character for separating the genera, but this is applicable only within certain taxa. Dickerman (1961), for example, separated *melodia* from *leucophrys* partly on the basis of the former's more rounded wing, in which the ninth primary is shorter than the third and the eighth is shorter than the fifth. These points of difference clearly separate *melodia* from all the nearctic zonotrichians, but they also separate *lincolnii* from other melospizans, and the races

of *capensis* are split between *Melospiza* and *Zonotrichia*, with some subspecies falling into neither genus.

The relative length of the "tertials" and the ninth primary is sometimes used to differentiate the genera. All the northern species of *Zonotrichia* have "tertials" which are much longer than the outer primary, in contrast to *melodia*, where the ninth primary is comparatively long. But, when utilizing this character *lincolnii* is again placed with the zonotrichians, *georgiana* fits with neither taxon because its "tertials" and first primary are about of equal length, and the races of *capensis* are distributed among all three categories.

The most apparent general difference between adults of *Melospiza* and *Zonotrichia* (including *capensis*) is the presence of ventral streaking in the former group and its absence in the latter. There are, however, two exceptions. *M. georgiana* has obsolete streaking and *Z. querula* has heavy markings on the sides and upper breast. Since the juvenal plumage, which is assumed to be evolutionarily conservative in these birds, is streaked in both taxa, it seems logical to conclude that *georgiana* is evolving toward the unmarked condition of the zonotrichians and that the streaking on *querula* is a partial retention of an ancestral character of the zonotrichians.

No osteologic characters of generic significance separate *Melospiza* from *Zonotrichia*. Tordoff (1954) has noted that the squamosal region is swollen in *Melospiza* and *Passerella* in contrast to the uninflated condition in the northern zonotrichians, but in *capensis*, which otherwise seems closest to the nearctic zonotrichians, it is inflated. The significance of the variable condition of the squamosal area is unknown and probably is of no taxonomic value at the generic level.

The recent discovery (Dickerman, 1961) of a *Melospiza melodia* x *Zonotrichia leucophrys* hybrid further suggests that the taxa are congeneric.

From this accumulated evidence it is concluded that *Melospiza* must be merged with *Zonotrichia*.

The relationships of the nine species is probably best indicated by the following linear arrangement: *iliaca*, *melodia*, *lincolnii*, *georgiana*, *capensis*, *querula*, *leucophrys*, *albicollis*, and *atricapilla*. If a three dimensional figure were drawn, the relationships could be better expressed by clustering the first four species (melospizans) in one group, with *iliaca* and *lincolnii* closest to *melodia*, and *georgiana* slightly farther away. The last four species (zonotrichians) would constitute another group, with *querula* standing somewhat apart. The species *capensis* would be a third unit, placed between *melodia* and the main body of the zonotrichians.

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