

MIXED BIRD PARTIES IN THE TROPICS, WITH SPECIAL
REFERENCE TO NORTHERN RHODESIA

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IN a previous paper (1943), I gave an account of the woodland bird parties [flocks] of the Barotse and Eastern Provinces of Northern Rhodesia and suggested that most of the species found in them fell into two categories: "nucleus" species, always found in parties, either mixed or pure; and "circumference" species, which formed the mixed parties, as a rule, by attaching themselves to parties of "nucleus" species. This method of formation is not invariable, since mixed parties are sometimes found without any nucleus species, or with two or more nucleus species. I also suggested that while both protection and the disturbance caused by the party were possible reasons for their formation, neither was likely to be of as great value as had sometimes been supposed. While nucleus species often communicated the alarm from one individual to another of their own species, other members of the party often paid little attention; the advantage of disturbance depended greatly on the feeding habits of the species concerned and this, for some common members (woodpeckers) of bird parties, was *nil*.

A most important study, based on very detailed and abundant data, has been published by D. E. Davis (1946). Stanford's paper (1947) on the bird parties in Northern Burma revealed the essential similarity of Asiatic and African bird parties. Davis, although no more successful than the rest of us in giving a really convincing explanation of the reason for this flocking habit, has written a most illuminating paper on their "natural history." He divided birds found in the bird parties into "regular" and "accidental," the former being, as the name implies, normally found in bird parties and only abnormally outside them, while the latter only join the flocks occasionally and are normally found outside them. I divided the members of the African bird-parties into two categories also, "nucleus" and "circumference," and Davis is inclined to equate these with his "regular" and "accidental" species, respectively. If I understand his definitions correctly, however, this is not the case, though the drongo, *Dicrurus a. adsimilis*, is, as Davis pointed out, a typical "accidental" species. The other common "circumference" species, such as *Dryoscopus*, *Batis* and *Sylvietta* are "regular" in Davis's sense. Apart from *Dicrurus* which occupies a unique position, a number of other African species occur as "accidentals" in bird parties, but they are infrequent and do not seem to me to affect the theoretical implications. An example from

Northern Rhodesia is the two individuals of *Pycnonotus tricolor* and two of *Uraeginthus angolensis* included in the Fort Jameson party of January 5, 1939, and listed in my previous paper. Even the most frequent of such "accidentals" in Northern Rhodesia does not occur in more than three per cent of the parties. In Brazil, however, they seem to form a more numerous category, since Davis found that in the Boa Fé forests *Ilicura militaris* occurred in about eight per cent of the parties, and four accidental species in the Comari forests occur in more than five per cent of the parties. The distinction brought out by Davis, therefore, is an important one. In conformity with this discussion, we may divide up the species composing bird parties into four categories:

(i) "Nucleus" species, apparently much more important in the African savannah and Burmese forests than in South American forest.

(ii) Other "regular" species.

(iii) "Regular accidental" species, of which *Dicrurus* is the only certain example, but the American *Drymophila* may also fall into this category.

(iv) "Accidental" species.

A possible fifth category, "Accidental nucleus" species, of which an example is the helmet shrike, *Prionops poliocephala*, normally forming parties of its own but sometimes joining mixed parties or being joined by a few other species, may be justified on further analysis.

Davis also discussed the possible origin of the habit of forming mixed flocks. He remarked, "It has often been tacitly assumed that the flocks of birds are formed in response to the food supply aroused by the army ants" and it is certain that both army ants and their African counterparts, the driver ants, are accompanied by parties of birds. In the case of the driver ants, however, this only applies to forest. In Northern Rhodesia, I have never seen birds accompanying driver ants. The reason for this is, I think, that driver ants seldom forage in direct, bright sunlight. In forest where the canopy shields them, they can and do forage at any time of day, but in the woodland and open grass country present in Northern Rhodesia, driver ants forage almost entirely at night. When encountered in the daytime, they are almost invariably in "column of route" and not searching for food. When I first began to study bird parties, I commented on the birds accompanying ants in a letter to Mr. R. E. Moreau. He replied that at Amani the species that accompanied driver ants were quite distinct from those forming the ordinary bird parties. Davis (*op. cit.*) stated "the mixed flocks described in these forests rarely accompanied army ants," but he also noted that these ants were rare in the area. He suggested, however, that "it is conceivable that the flocks which exist in the absence of ants are a further step in the evolution of flocks

and that the flocking behavior first developed in relation to ants and then continued even in the absence of ants." This is a most attractive hypothesis and deserves further study by ornithologists in an area where army and driver ants are regularly accompanied by birds.

One point about the advantages of the flocking habit which I overlooked in my last paper, but which is clearly brought out by W. C. Allee (1938), is the "confusion effect" on predators of the simultaneous presence of a considerable number of prey. While I still remain doubtful that, in mixed bird parties, the aggregations afford any protection to the members, either by an intimidating influence on predators or from an increased vigilance due to so many pairs of eyes, the "confusion effect" is probably an actual one and of real advantage.

The flocks with which the present paper is chiefly concerned are those of the Southern Province of Northern Rhodesia, in an area geographically between those where the previously studied flocks were found. In all, 169 bird parties were noted, divided between the months as follows: January (7); February (12); March (21); April (24); May (16); June (15); July (15); August (16); September (16); October (5); November (18); December (4).

Although no special effort was made to analyze exactly the same number of parties in each month, I believe the low figures for October and December do represent a lower incidence of parties. It is significant that the breeding seasons of the first six species, listed below in order of frequency, are at their height in October, and the fledged young of these birds are abroad in considerable numbers in December.

As compared with the other areas in Northern Rhodesia, studied in the previous paper, it might be expected that the Southern Province, being geographically intermediate, would show intermediate features in the composition of the bird parties found there. This, as a glance at Table 1 will show, is only partly true. The more varied terrain of the Southern Province may perhaps in part account for this, for in addition to most of the woodland types found in the other two areas, the more open Acacia woodland, which does not extend into Barotse-land or the Eastern Province, occupies a good deal of the area. One of the most striking differences between the present area and those previously studied was in the comparative abundance of the various "nucleus" species. The most abundant of such species in the Southern Province is the black tit, *Parus niger*, a bird which occurs comparatively infrequently in the other areas. In this connection, it should be noted that I am regarding as one unit, the true black tit and the larger *insignis* which at present is considered a different species;

both occur within the Barotse boundaries, *niger* in the south and *insignis* in the north. *Insignis* occupies most of the Eastern Province, though *niger* occurs in the extreme south and in the Luangwa Valley. Only *niger* has been collected, thus far, in the Southern Province, but it is possible *insignis* may occur in the north and west. The only other species recorded there is the grey tit, *P. cinerascens*, in 10

TABLE 1
COMPARISON OF NORTHERN RHODESIAN BIRD PARTIES

	Barotse	Southern	Eastern	Category
Number of parties	65	169	42	—
Total species recorded	61	64	53	—
Species per party	9.9	7.8	7.7	—
<i>Dicrurus adsimilis</i>	88 per cent	84 per cent	88 per cent	(iii)
<i>Batis molitor</i>	63	57	74	(ii)
<i>Dendropicos fuscescens</i>	20	36	64	(ii)
<i>Dryoscopus cubla</i>	61	66	36	(ii)
<i>Eremomela scotops</i>	40	19	60	(i)
<i>Oriolus monacha</i>	34	20	29	(ii)
<i>Prionops poliocephala</i>	25	18	24	(i)
<i>Anaplectes rubriceps</i>	23	15	31	(ii)
<i>Sylvietta rufescens</i>	52	43	17	(ii)
<i>Zosterops senegalensis</i>	20	37	17	(i)
<i>Pogoniulus chrysoconus</i>	34	16	14	(ii)
<i>Campephaga flava</i>	29	16	2	(ii)
<i>Rhinopomastus cyanomelas</i>	18	22	24	(ii)
<i>Parus niger</i>	12	52	21	(i)
<i>Oriolus auratus</i>	21	31	7	(ii)
<i>Petronia superciliaris</i>	23	30	7	(ii)

parties (six per cent). A third species, *P. rufiventris*, occurs in the east and west. The total percentage for all *Parus* species added together is 37 in the Eastern Province and 34 in Barotseland, both figures being well below that for *P. niger* only, in the Southern Province.

The second in abundance of the nucleus species was the white-eye, *Zosterops senegalensis anderssoni*, which occupied the same relative position in the Barotse and Eastern provinces but was considerably less abundant there. The green-cap eremomela, *E. scotops pulchra*, came third, but it was markedly less abundant than in the areas previously studied.

The relative abundance of the two orioles was reversed in the Southern Province, and the numerical abundance there of the rock sparrow, *Petronia superciliaris*, may be noted.

The cardinal woodpecker, *Dendropicos fuscescens hartlaubi*, occupied an intermediate position as between Barotseland and the Eastern Province. The percentage for all woodpeckers was 53, still below the Eastern Province figures for *Dendropicos*.

The total number of species noted, in the 169 parties analysed, was 64, only three more than in the 65 Barotse parties, while in the number of species per party (7.8), the Southern Province agreed closely with the Eastern Province.

Of the Palaearctic migrants found in the parties, the commonest in the Southern Province, as elsewhere, was the willow-warbler, *Phylloscopus trochilus*, but it was even commoner than it was in the east, occurring in 22 parties (13 per cent). The spotted flycatcher, *Muscicapa striata*, occurred nine times.

Considering all 276 parties together, the ten most frequent species were:

1. Fork-tailed drongo (*Dicrurus adsimilis*), 236.
2. Chin-spot flycatcher (*Batis molitor*), 169.
3. Puff-back shrike (*Dryoscopus cubla*), 167.
4. Black tit (*Parus niger*), 105.
5. Cardinal woodpecker (*Dendropicos fuscescens*), 100.
6. Rufous-bellied crombec (*Sylvietta rufescens*), 95.
7. Green-cap eremomela (*Eremomela scotops*), 86.
8. Yellow white-eye (*Zosterops senegalensis*), 79.
9. African golden oriole (*Oriolus auratus*), 69, and
Rock sparrow (*Petronia superciliaris*), 69.

It will be noticed that only three species occurred in more than 50 per cent of the parties, and that none of these was a nucleus species of which there were three in the first ten places, numbers 4, 7 and 8.

A vast amount of work still remains to be done in the field of bird flocks and mixed parties. What, for instance, of territory? E. M. Nicholson (1931) implied that mixed bird parties in forests of British Guiana are confined to well-defined localities in their wanderings, but there is no explanation of why they should be. I have three times seen encounters of flocks of helmet shrikes, *Prionops poliocephala*, in Northern Rhodesia followed by incidents that looked like territorial skirmishing, but such reactions seem unlikely to occur in mixed parties. We need more mapping of a party's wanderings. Again, we need detailed observations of how the parties are built up at the beginning of the day and how, and how far, they disperse in the evenings. I have implied that nesting tends to prevent the formation of mixed parties, but it does not do so entirely; I have seen such a party pass the nest-hole of a cardinal woodpecker, *Dendropicos fuscescens*, when opportunity was taken by the parents to effect a change-over on the nest. I have already mentioned the need for additional observations on the relationship, if any, of bird parties and ants. There is no information about the vertical zonation of the species comprising bird

parties, a point likely to be of special interest in forest. Curiously enough, we still await any detailed study of mixed parties in temperate regions where, even though the parties may be a less conspicuous feature of the bird life, the ornithologists are more numerous than in the tropics.

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