3.—THE SOCIAL KUMPAN AND THE SONG SPARROW

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KONRAD Lorenz's brilliant exposition of "The Kumpan in the Bird's World. The Fellow-Member of the Species as Releasing Factor of Social Behavior" (1935) offers us a foundation for the study of bird behavior. "The peculiar rôle that the fellow-member of the species plays in the life of the bird,"[1] he writes (1935: 145), "has been strikingly designated by Jakob von Uexküll as the Kumpan (companion)." We perceive objects as *things,* for we combine the different stimuli from the same object, but animals react to *one* stimulus from an object. Instinctive behavior, directed toward an object, is released through a very small choice of the stimuli coming from that object. When several functions have the same thing for an object, each function corresponds to a different stimulus coming from the same object. The unity of these several functions lies in the object, not in the subject.

Characters that bring definite instinctive responses in a member of the species, Lorenz calls releasers, while Tinbergen (1939) suggests "signals." These may be bodily organs, or striking behavior, or a combination of both; they are compromises between simplicity and improbability. Five Kumpans are listed by Lorenz: Parent, Child, Sex, Social, and Brother-and-Sister.

I will discuss the Social Kumpan as I have found it in the Song Sparrow (*Melospiza melodia*) from eight years' intensive study on wild birds, individually distinguished by colored bands, in Ohio (Nice, 1937), and six months' experience with a brood of hand-raised birds, hatched in Massachusetts, July 24 (B and R) and 25 (Y) and taken from the nest July 30. All three proved to be males. On October 14, R was killed, apparently by flying against a window. I have had them almost constantly with me, all having the freedom of my study until November 14, when it became necessary to separate the two, putting Y in a cage 2 x 3 x 4 feet in size, and leaving B free.

In the introduction to the section on the Social Kumpan, Lorenz (1935: 347) tells us that with many birds "we find truly organized societies, whose super-individual function comes about through definite social instinctive actions and chains of instinctive actions of their members." Unlike human societies, these associations are not based on tradition, nor on insight into the benefits of cooperation. "By closer analysis of the instinctive actions that effect the cooperation of the members of such a highly organized bird society, it becomes apparent that seemingly very complicated behavior of

[1] My translation of the 1935 article, as throughout this paper.

the society is brought about through remarkably few and simple reactions of the individuals." The problem is to discover the reactions that underlie this highly socialized behavior. Lorenz (1931) has done this for a markedly social bird, the Jackdaw (*Coleus monedula*). I propose to examine the functions of the Social Kumpan in a bird that is primarily an individualist.

Some general statements in regard to the Social Kumpan are given by Lorenz (1935: 348). A striking difference between insect societies and those of birds is that, "just as with the higher mammals and man, the majority of social reactions with birds are bound up with personal acquaintanceship of the individuals." That Song Sparrows on their nesting grounds are personally acquainted with their neighbors within a radius of a hundred meters I discovered by observation and by experiment when using birds in traps as decoys.

"The innate perceptual[1] pattern of the comrade is practically always *wide*," and the reactions of any social bird, raised by hand, can be transferred to man. "In the world of the solitary bird there is no place for a 'friend,' and for the Nightingale or Redbreast the caretaker is at best a useful food automat; but for the hand-raised Bullfinch or Siskin he is a Fellow-Bullfinch or Fellow-Siskin" (1935: 348). The pattern of Social Kumpan in a slightly social bird like the Song Sparrow does not seem to be wide; although I was the Parent-Kumpan of my three birds, I am not their Social Kumpan. The pattern of Social Kumpan for the Song Sparrow is probably that of a bird approximately their size and with the specific notes.

Six releasing functions of the Social Kumpan are listed by Lorenz (1937: 272): "inducing of reaction by 'contagion' and so-called imitation"; "releasing of following reactions"; "of responses to warning"; "responses to the disappearance of the social companion"; "interlocking of instinctive actions pertaining to the pecking-order and to nest-protection"; "social attack reactions." The functioning of the Social Kumpan in the Song Sparrow will be considered under these categories.

(1) *Inducing of reaction by "contagion" and so-called imitation.*—In the reciprocal behavior of parents and young, and of mates, the instinctive action of one bird usually releases a different reaction in the other. With the members of a society, however, the instinctive action of an individual is characteristically released by the same action. It is not a matter of imitation, but of suggestion, as in yawning in human beings.

With my hand-raised Song Sparrows there was a definite social bond lasting through the fall. When one bathed or ate or preened, the others were apt to do likewise; when one flew to my desk, another was apt to follow him, while expeditions into the forbidden regions of the dining or living room were

[1] That "perceptual" is the correct form rather than "perceptory" was pointed out by Craig in 1938.

usually made, not singly, but two or three together. Later, whichever bird was caged, although apparently content most of the time, occasionally tried hard to get out on noticing his free brother eating weed seeds in a box below him, or tearing up newspaper, or when the latter had flown into the living room.

The usefulness of this tendency to go where another has gone is apparent in the matter of locating sources of food. The suggestibility that tends to make all do the same thing at the same time contributes to flock solidarity in birds with a definite flocking tendency, for all eat at the same time and are ready to fly at the same time. Other evidence of a positive reaction to members of the species was given in the spring in Ohio when I often noticed that a newly arrived male would attempt to locate his territory in an area already full of Song Sparrows instead of selecting some of the suitable places not yet occupied.

(2) *The release of following reactions.*—With the Song Sparrow, which has no strong flocking tendency, there are no special structures nor notes to induce following. There was some tendency with my birds in the fall to follow a flying brother—without hostile intent. The Junco (*Junco hyemalis*), a markedly social species during the non-breeding season, not only has white tail feathers, but a characteristic flight note.

In cold, snowy weather in central Ohio the Song Sparrows form into loose flocks, but no bird acts as leader. This lack of leadership has been noted in the Domestic Fowl (Fischel, 1927), the Coast Bush-tit, *Psaltriparus m. minimus* (Miller, 1921), and Long-tailed Tit, *Aegithalos c. caudatus* (Paechnitz, 1936).

An interesting example of 'leadership' of a flock is given by Lorenz (1935: 352). His pet Jackdaw 'Tschock' associated in flight with a flock of Hooded Crows (*Corvus cornix*). "In such cases when I called the Jackdaw and he flew hurriedly in my direction, the whole flock of Hooded Crows came after him, to turn aside in fright when almost upon me. This following the example of one that 'knows what he does' gives food for thought. Since these intelligent Corvidae meet with many experiences with increasing years, and gradually become more purposeful and decided in all their movements, I believe that with them the old experienced leader plays an important biological rôle."

(3) *Responses to warning.*—The Song Sparrows react instantly to evidences of fright in their companions; a sudden flight or the fear note given by one will send the others into hiding immediately. The bird does not intentionally 'warn' its companions nor even its young; it also 'warns' when alone; this behavior and these notes are understood by them instinctively.

The earliest age at which this reaction was seen with my birds was with Y at the age of six days. Because of the hot weather I had put B in a nest

by himself, and when at 7.30 p. m. I picked the bird up to return him to his brothers he crouched and shrieked; immediately the others crouched—the first time I had seen this action in Y. The fear note *tik tik tik* was first noted at twenty and twenty-one days.

(4) *Responses to the disappearance of the social companion.*—The Song Sparrow's call note *tsip* is heard most often in the autumn, since the social bond is evidently strong at the time of the fall migration. In the spring and summer one of a pair gives it when it has lost track of the whereabouts of its mate. This 'lonely' note, of course, is a device for keeping in touch with others of its kind—*Stimmfühling* as Heinroth (1924) calls it.

With my hand-raised birds the *tsip* appeared to develop from *yeep*—the location note of the young bird that has left the nest. At twenty days it was clearly *tsip*. Y had made an expedition out of my room and finding himself alone and in strange surroundings called *tsip* many times, but neither brother answered. In the fall, when one went into the next room, he usually called *tsip*, the others sometimes responding to him; perhaps the bird was reassuring himself in the new situation by keeping in contact with his brothers. In January the room had become familiar, and it was the bird that was left behind—confined in the cage—that was more apt to call than was his brother.

Lorenz (1931) describes the uneasiness in a Jackdaw community after the disappearance of comrades and the searching that takes place; he says he knows of this only in this highly socialized species.

On October 14, R was killed; the two others, although in company of each other, called *tsip* for about an hour appreciably more than they ever had before. The disappearance of this lively bird—the middle one in the peck order—made a striking difference in the action and noise in my study.

Experiments were tried the last of December, of first removing B from the study and then returning him and banishing Y. The brother that was left called *tsip* a few times, but the birds, subjected to extra light in the evenings and to spring temperatures, were ready to proclaim territory, preferring each other's "room to his company."

On February 2, B killed himself by flying into something at night. The following morning Y did not call *tsip*, but was restless and gave the *chunk* note that sometimes expresses uneasiness.

(5) *The interlocking of instinctive actions pertaining to the pecking order and to nest protection.*—With wild Song Sparrows there is a certain amount of despotism. In the fall they frequently chase each other, while in the loose winter flocks there is some driving, particularly at feeding shelves. In such situations in Columbus, Ohio, Song Sparrows usually drove English Sparrows (*Passer domesticus*) and Juncos, and sometimes threatened Cardinals (*Richmondena cardinalis*).

In Nature, young Song Sparrows normally leave the nest at ten days; they spend a week separated from one another, hidden in the bushes, after which they appear, well able to fly, and come in contact again with their nest mates. With my three birds it was at seventeen days that the first fight took place and a note of antagonism was first heard. From then on there were occasional bickerings, particularly between R and B. Until the birds were nearly two months old the situation remained one of 'give and take' or 'peck dominance' as found by Masure and Allee (1934a, 1934b) in pigeons and Shell Parakeets (*Melopsittacus undulatus*) and by Shoemaker (Allee, 1936) in canaries, rather than of 'peck right' as in chickens (Schjelderup-Ebbe, 1935; Masure and Allee, 1934a). Chasing was more or less indiscriminate, although on the whole R was top bird, Y middle bird and B at the bottom.

On September 21, B suddenly became despot over Y and on the 24th over R. B used the note of antagonism as a threat whenever R approached him as he (B) was eating. Y had difficulty in getting baths as both brothers drove him away as soon as they noticed him in this occupation. Many fights were staged between R and Y; on such occasions B often hurried to the scene, giving the *chunk* note of disapproval or the threat note. It gave me the impression of a rudimentary policing technique, on something the same order, although far less definite, as that of the communal nest-protection reaction of the Jackdaw community (Lorenz, 1931). Much the same thing is often seen in barnyards where the dominant rooster breaks up fights between his subordinates. Schjelderup-Ebbe (1935) speaks of this as follows: "The sight of two combatants in their fighting attitudes has a strong exciting and stirring effect upon the bird which is despot over both. . . . it cannot bear to see its subordinates in their fighting attitudes, taking this as a kind of challenge to itself."

Dr. N. Tinbergen writes me, "With Eskimo sledge dogs, the leader of a team often intervenes in a struggle between two subordinate dogs of the same team."

After R's death on October 14, the study was a far more peaceful place. B was the benevolent despot over Y, warning him with the threat note when he came too near at meal times. On the morning of November 7 it was evident that a revolution had taken place, and Y proved to be a real despot.

Up to this time both birds had been put into their small cage to sleep at night, but on the 7th Y was caged and B left free. The next morning B was benevolent despot once more. He was caged that night and in the morning I found Y on top of the cloth-covered cage singing his loudest; I released B, and Y persecuted him. Y was confined the rest of the day and all night; on the 10th, B's mild rule was reinstated, but by evening Y became dominant

and remained so for two days despite the fact that he was again banished to the little cage. (The criterion for dominance when one bird was caged was the threat note.) I then installed a large cage—2 x 3 x 4 feet—in the study and kept Y inside till November 29, when he was let out and B confined till December 23; all this time B was despot. Both birds were free from the 23d to 28th, B being dominant, but not tyrannical.

This peaceful situation was ended by my taking B away for a night and the early morning. Territorial behavior came into play—hastened by disturbed evenings and warm temperature; Y adopted the study as his territory and drove B savagely upon his return. Y was then removed for two days, at the end of which time B had taken over the study. Nevertheless Y was able to gain the mastery the next day, losing it three days later, but regaining it once more in less than two days. Throughout January there were seven reversals of dominance, B having the mastery about one third of the time. Reversal of dominance has not been effected through fighting. It is difficult to analyze the conditioning factors; all we can say is that one bird gains self-confidence and is able to intimidate the other through loud singing.

Dr. Tinbergen wrote me that sudden changes in the despotism relationship occurred with his Song Thrushes (*Turdus ericitorum*) "when, in midwinter or even during fall, one of the subordinate birds suddenly began to sing." With my birds, B was the most precocious singer in early October, but by the first of November Y had caught up with him. On November 8, the day after the first revolution, I noted, "Y is maturing faster than B; witness the short songs." On November 11, "Y's songs are loud, harsh, whistled. B never sings in this way." November 14, "Y is singing splendidly." November 16, "B is silent; he almost never warbles."

By November 23 when B had become despot, both were singing loud, short songs. From November 28 to December 8 there was no singing at all; after that B—the despot—was the first to take up adult singing once more, on December 19 giving loud, separate songs. On the 28th when B had been removed, Y for the first time since November sang in this territorial manner.

To sum up, the situation from seventeen days to two months was that of peck dominance; after that it was peck right, either one bird or the other being definitely master. It must be remembered that these Song Sparrows are living under distinctly abnormal conditions.

The fact that Y is a much more tyrannical despot than B appears to be a rule of wide application in the animal kingdom. My sister and I as girls noticed that the lowest hen in the peck order would persecute a newcomer far more than did the others. Tompkins (1933) reports the same with captive Spotted Towhees (*Pipilo maculatus falcifer*), and Schjelderup-Ebbe says in regard to chickens: "A bird which has originally been pecked by all

the others becomes strikingly cruel and merciless when it finds opportunity to peck at others; the unpractised despots are the worst of despots."

Despotism in the nesting season is kept in bounds, as with herons as described by Lorenz (1935: 362), by the factor of territory. The weakest male is master on his own territory. It is with territory that the Song Sparrow's social organization as I studied it in Ohio is most marked. Through chains of instinctive actions a large population of this aggressive species is able to live in proximity without serious interference with one another's affairs. I believe that Song Sparrows prefer to live side by side with members of their own species, for in this way many of their instinctive reactions can function which are never called into play in the case of a solitary pair. That some Song Sparrows appeared to seek territorial quarrels was shown when individuals deliberately trespassed on each other's land.

(6) *Of social attack reactions.*—The alarm note (*chunk*) given by nesting Song Sparrows on the approach of an enemy—cat, Cowbird (*Molothrus ater*), or man—is often taken up by neighboring Song Sparrows and also by other species of small passerines. Although such behavior often gives away the secret to man, it is useful to the birds in two ways: it warns the young to keep quiet, and it makes it impossible for the predator to creep unheralded upon its prey. A loud scream, given by an adult when carried 400 meters in a darkened gathering cage with a Cowbird, brought out all the nesting Song Sparrows along the way, their crests up and giving the alarm note.

SUMMARY

The Song Sparrow is ordinarily considered rather anti-social, being a typical territory-holder during the long breeding season, although forming into loose flocks in cold, snowy weather, and probably migrating with others of its kind in the fall. A close study reveals, however, a surprising number of social reactions, many of which function throughout the year. Some of these are of undoubted survival value: the so-called imitative tendency that assists in location of food supplies, the reaction to evidences of fright in companions, the social defense against enemies, and territorial behavior that affords protection of individual rights.

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