NOTES ON THE BEHAVIOR OF THE SCALY DOVE

By C. J. O. Harrison

In a recent paper Johnston (1960) has described the behavior of the Inca Dove (*Scardafella inca*) of Central America. The behavior of the closely related Scaly Dove (*Scardafella squammata*) of South America does not appear to have been adequately described. There are two populations of this species, one in Brazil and Paraguay, and another, described as a distinct subspecies *Scardafella squammata ridgwayi*, in northern Colombia and Venezuela.

The Inca and Scaly doves have been treated as separate species (A.O.U. Check-list, 1957) and as subspecies of a single species by different authorities (Hellmayr and Conover, 1942). In such allopatric populations where the degree of relationship is uncertain and cannot be decided from structural and plumage characters, a comparative study of behavior is of value in that it makes available additional information which can be used to assess the degree of similarity and difference between the two birds.

Having kept and bred the Scaly Dove in England I have been able to record some aspects of its behavior which I think are sufficient to form a basis for comparison. Like all such studies this one suffers from the limitations of aviary conditions, where only a few individuals can be studied and movement is limited. Observations were made on seven birds. The aviary consisted of three flights, 8, 10, and 12 feet long, 3 to 4 feet wide and 6 feet high, attached to a shed allowing additional 3 × 4 feet shelters for two flights. No more than four birds were placed together at any one time, and when breeding occurred unmated birds were removed from the flight.

A study such as this has some advantage in that reactions may be seen in more detail than is possible in the field. It has not been possible to make a full comparison but the behavioral characters chosen are those which involve a fixed pattern of responses and which are least likely to be changed or altered by the surroundings.

In the following notes I have, for the most part, assumed that the reader is already familiar with Johnston's paper, and I have concerned myself with a comparison of the two species.

PLUMAGE

There are differences in the details of plumage coloration which make identification possible. The Scaly Dove is generally paler, being almost white on the underside, with a faint pink flush on the upper breast and head. The dark edges of the feathers are blacker and more numerous, giving a very distinct scaly pattern. The greater secondary coverts are white, showing as a broad zone of white, black-edged feathers along the lower edge of the closed wing.

This latter may have some signal value. Except when the chestnut and black coloring of the primary feathers is exposed in flight, the plumage tends to be cryptic, and I have found the doves hard to discern when, viewing them from a slight elevation, I have watched them feeding among plants and bare earth at a distance of only 25 feet. But frequently a bird will stretch the closed wings by raising them above its back, and at such times the sudden appearance of two white areas of plumage is strikingly conspicuous. I would tentatively suggest that this coloration, which is also present to a lesser degree in the Inca Dove, might serve to advertise the whereabouts of otherwise cryptically-colored birds in a species which, outside the breeding season, tends to be sociable in feeding and roosting.

VOICE

Advertisement call.—This appears to be distinct from the similar call of the Inca Dove in that it is trisyllabic—*quor-cu-cor*, the first note being very emphatic, the second short and subdued, and the third emphasized, but not as much as the first. I found the call relatively high-pitched and audible for at least one hundred yards. Goodwin (*in litt.*) compared its incisive, clear, and monotonously repetitive character to that of the call of the European Quail (*Coturnix coturnix*).

When the birds are not sexually active this call is occasionally used in circumstances where it appears to be merely self-assertive. It may be uttered, usually only once or twice, by apparently quiescent birds at almost any time. When I have heard it from a known female it has been rather higher in pitch and weaker than that of the male. I have very frequently heard it uttered at night, particularly in the breeding season. I think that at this season it is probably a self-assertive response by an awakened bird and has no special sexual significance, although it might have a functional value in alerting another bird.

The full extent to which the advertisement call is used appears to depend on the degree of sexual activity. It is used most during the nesting period and, at the beginning of each nesting cycle, the male of a pair may call incessantly for two or three hours in the early morning, although I have heard only comparatively short periods of calling at later times of day during the same part of the cycle.

Alarm call.—The alarm call of the Scaly Dove appears to be similar to that of the Inca Dove, a soft subdued *cut*. I have usually heard it uttered, not singly, but as a rapid series of notes uttered in an undertone by a mildly alarmed or nervous dove.

I would agree with Johnston that this is a "weak fear" note. He suggests that the Inca Dove shows strong fear by flying away. Captive Scaly Doves could not do so and, at the approach of a predator, even at a distance of three or four yards, uttered a "strong fear" note. This was an abrupt, loud *quok*, rather high-pitched, and repeated more frequently as fear increased. It sounded like a high-intensity version of the *cut* note, with a pitch and volume similar to that of the advertisement call. If handled, Scaly Doves utter this call note continuously and are in such circumstances the noisiest of doves.

The Scaly Dove appears to be much more sociable outside the breeding season than are other species of dove, and, while there is no evidence that the two facts are related, a loud alarm call would be of greater value to a social species than to one in which individuals were normally isolated.

In circumstances where the state of alarm of the bird appeared to be intermediate between that of "weak alarm" and "strong alarm" another note was heard, a lower-pitched, rolling *crorr*. I am not certain whether this is merely an intermediate note of alarm or whether it may have some other function.

HEAD BOBBING

Head bobbing as performed by the Scaly Dove is similar to that described for the Inca Dove but differs in some minor details. The most vigorous performance that was witnessed occurred when a male was united with a female from which he had been separated for two days. Bobbing occurred on a wooden platform in the open and it was possible to see that the male commenced by throwing back the raised head so that the bill tilted upward, after which the head described a forward and downward arc, finishing with the bill pointing downward and very near the platform. The action was rapid and was repeated a number of times in quick succession. The female responded on this occasion with a similar but less vigorous action. When this display was seen on other occasions the details were similar.

MUTUAL PREENING

I find Johnston's use of terms confusing here. I would advocate the following terminology.

A bird may either preen itself, "self-preening," or preen another bird, "heteropreening" (= mutual preening; see Carpenter, 1933). Heteropreening may be of three types. In "reciprocal preening" each bird preens the other. In "non-reciprocal preening" one bird actively preens another which is a passive recipient of the preening. This non-reciprocal preening may occur where reciprocal preening could occur if the other bird were responsive, as in the case of Carpenter's (*op. cit.*) castrate *Columba livia*. But it also occurs frequently in mixed collections of waxbills (*Estrilda* sp.) where a dominant bird is always the preener while subordinate birds are always recipients. Finally, "simultaneous preening" can occur, as in the spoonbills (*Platalea* sp.).

Johnston describes non-reciprocal preening carried over into reciprocal preening by Inca Doves. The same behavior has been noted for the Scaly Dove and it appears to be a common type of low-intensity sexual behavior in most species of dove. If one of the partners is unresponsive, the preening remains non-reciprocal. It may be initiated by either sex. In the Scaly Dove non-reciprocal preening of unmated birds was observed outside the breeding season. It was not possible to assess the degree of sexual development in the individuals concerned, but it usually occurred when an active bird joined one which was resting and preened the head of the quiescent bird. It was not possible to be certain that the birds concerned might not have established a pair bond, but if it does occur casually in this species, then it would appear to be a specific, or generic, peculiarity, possibly associated with the greater degree of sociability which appears to occur in nonbreeding birds of this genus.

Apart from the latter, it has not been possible to detect any difference in heteropreening between the Scaly Dove and other doves such as species of *Columba* and *Streptopelia*, the Diamond Dove (*Geopelia cuneata*), and *Oena capensis*, which have also been studied. Goodwin (1956*a*) has referred to apparent specific differences in the amount of preening that occurs, but since its occurrence may be related to the physiological condition of individual birds a considerable amount of quantitative data will be needed before this can be established.

VERTICAL TAIL FANNING

The display posture appears to be the same in both species of dove. I have observed a male assume this posture gradually while walking about, the tail rising in a series of jerks to become vertical and spread, while the head was lowered a little and drawn in to the shoulders. The call associated with it appears to differ in the two doves. Johnston describes tail fanning accompanied by a soft throaty call, *cut-cut-ca, doah*, which does not carry far.

In the case of the Scaly Dove the tail fanning is accompanied by two different notes. One is an abrupt, relatively high-pitched, loud *corrok*. It is similar in pitch to the advertisement call and strong alarm call and seems to be nearly as loud. In addition, interspersed between these, there is a less intense, subdued *cut* note. The tail, which is held almost vertically upward, is jerked spasmodically upward and forward at each call. At times it is almost tilted beyond the vertical, moving vigorously with each *corrok* note and less so with the *cut* note.

The two notes do not appear to be uttered in any fixed pattern. My suspicion that these may represent high- and low-intensity versions of a single call is reinforced by the fact that if a display is prolonged and the original drive begins to weaken, the proportion of *cut* notes increases, whereas the arrival of a female near a displaying male

evokes a rapid series of emphatic *corrok* notes, without the utterance of any subdued notes between them.

Throughout this irregular calling the tail is in constant jerky movement, and at times it does not appear to be wholly synchronized with the calls.

NEST CALLING

This is not recorded for the Inca Dove. The Scaly Dove shows typical nest calling behavior when the male has selected a site, prior to its recognition by the female.

In the nest calling of most of the species that I have observed the male squats on the site and calls repeatedly with a nest call which usually sounds like a modified version of the advertisement call. It is usually accompanied by some ritualized movement such as wing flicking.

The Scaly Dove differs from these species in that its nest calling closely resembles the sexual display. The male squats on the site and raises the fanned tail, although this is not normally raised so high, or fanned so completely, as in the full display. The calls uttered appear to be indistinguishable from those uttered during vertical tail-fanning.

On one occasion when a male gave the nest call on a bare twig fork in full view I was able to observe a downward thrust of the head with bill pointing downward which was repeated a number of times. It appeared homologous with the "nodding" shown by other species of dove at such times (Goodwin, 1956*a*).

AGGRESSIVE FLEEING BEHAVIOR

This is the horizontal display, and wing-up and unilateral rush, of Johnston's paper.

In simple aggression, particularly toward smaller species, as when a Scaly Dove attacked a Diamond Dove, the Scaly Dove reacts in a similar manner to the Inca Dove in "horizontal display." The head is lowered and the tail raised in a posture similar to that shown in aggressive tail-fanning of Johnston (1960, fig. 2) although I have not noticed a very marked spreading of the tail. In this posture the dove rushes directly at the object of aggression. A similar posture is adopted by a dove perching near a bird that is about to be attacked.

In writing of the "wing-up and unilateral rush" Johnston has stated that the wing-up display is a sign of aggressiveness in most pigeons and doves and that the raised wing is a signal of the intent to hit with that wing. From a study of doves in general I would question both these assertions.

In the raised-wing posture the wing farthest from the evoker of the reaction is raised and spread, and the body is aligned laterally so that a side view, with the whole upper surface of the wing displayed, is shown to the evoker.

This wing-raising posture manifests itself most frequently in situations where a bird, either through physical inability or conflicting emotional drives, is unable to escape from the approach of a predator or aggressor. In addition to its occurrence in fighting and chasing, when the drive to maintain territory probably conflicts with the desire to flee, I have seen it in partly tame, brooding adults of *Oena capensis, Geopelia cuneata*, and *Streptopelia chinensis*, where the urge to cover the eggs conflicted with fear at my close approach. I have also observed it in a juvenal Scaly Dove, too weak to flee, which after an initial effort squatted and raised one wing high above its back. This posture also occurred when captive Scaly Doves found themselves unable to escape when about to be caught.

Johnston describes what I consider are three good examples. He recorded this behavior from a male mounted by another male, from a feeding dove when a Black Phoebe (*Sayornis nigricans*) flew low and straight toward it, and from another dove threatened, while foraging, by a House Sparrow (*Passer domesticus*).

I would maintain that this is a type of threat display intended to intimidate the aggressor, and that it arises in a conflict situation where there is a thwarted desire to flee, the latter being indicated by the raised wing. I do not, however, consider that the raising of the wing is in itself a fleeing movement. It appears to have a similar function to the erectile dorsal fins of some fish and the head adornments of some reptiles in that it makes the bird appear, at least to a small predator, several times its original height, more difficult to attack, and a formidable opponent. Goodwin (1956*b*) suggests that it might help the bird to maintain balance when the bird strikes with the nearer closed wing.

With regard to the statement that the raised wing indicates a readiness to strike with that wing, it must be pointed out that in the cases where this display has been observed, any blows that were struck were struck with the nearer, closed wing. The lateral posture would appear to make it still more difficult for the raised wing to be of immediate effective use. It would appear that this posture is more frequent in its occurrence and more ritualized in some of the small ground doves, particularly in relation to territorial fighting, but I consider that it is homologous with the examples already mentioned and that it represents a conflict situation where a desire to flee is present. I would suggest that the horizontal display represents true aggressive behavior where no such conflict tendencies are present.

While the raising of one wing appears to indicate the presence of an ambivalent attacking/fleeing tendency, the raising of both wings appears to indicate an intention of attack. I have observed males of both the Talpacoti Dove (*Columbigallina talpacoti*) and the Scaly Dove raise both wings when pursuing another of their own species, and I have seen a male *Oena capensis,* when suddenly confronted by small estrildine waxbills in a cage, raise both wings high and partly spread the tail. Since such birds, when fighting, tend to fly onto the back of the opponent and peck at the head, the raised wings may indicate a readiness for such a movement. Goodwin (*in litt.*) has suggested that the contrasting coloration on the underside of the wings of many small doves might have a signal function in such circumstances.

It would appear to have been the latter posture that was witnessed by Evenden (1954) in the Inca Dove and mistaken for epigamic display.

Both Whitman (1919) and Goodwin (1956*b*) have described and discussed these postures, the latter referring to them under the term "defensive-threat display" to indicate the apparently conflicting drives that are evident.

DRIVING

I have not witnessed driving in the Scaly Dove, probably because mated birds were in a separate enclosure, but it may be significant that driving did not occur when a female came near a rival male separated only by a single layer of wire netting, although the two males threatened one another with lowered heads and raised tails.

Goodwin (1956*a*) stated that the purpose of driving was to remove the female from the immediate neighborhood of possible sexual rivals. He makes the suggestion that driving is a form of redirected aggression (attributed by Johnston to R. I. Smith). Johnston has criticized this on the grounds that it implies reasoning ability on the part of the male, but there appears to be no explanation as to why such a behavioral mechanism should not function innately, but with the force of the reaction governed by the recognition of the individual male against whom it was directed. Goodwin studied this behavior in individually recognized birds, and he showed that the difference in the reaction of a driving male could be related to the potential degree of sexual rivalry offered by other males. We know from the study of "peck orders" that birds are capable of recognizing individuals and varying their reaction toward them accordingly.

If redirected aggression is involved, the intensity and duration of the driving urge might indicate the degree of aggression aroused by the other male.

DISCUSSION

There seems to be relatively little difference between the two species of dove in their recorded behavior. The only definite difference is in the advertisement call and in the display call.

The differences would seem to be similar to those shown by the collared species of *Streptopelia* in Africa. There a number of species are found that differ little in plumage but have distinct call notes. In some cases there is apparent sympatry. In the case of such species, however, there appear to be ecological differences which serve to separate them. Hybridization is recorded in captivity, and where the spread of the Oriental Collared Dove (*Streptopelia decaocto decaocto*) has brought it into contact with feral stocks of the Barbary Dove (*Streptopelia risoria*) random hybridization has occurred, although the calls of the latter are different and it is thought to have been derived from the African species *Streptopelia roseogrisea*.

Using these African species as criteria one may say that the Inca Dove and Scaly Dove represent two species. While they are undoubtedly good subspecies, and while speciation is obviously occurring, I doubt whether they would at present maintain their specific identity were it not for their allopatric distribution.

SUMMARY

The behavior of the Scaly Dove (*Scardafella squammata*), recorded from captive birds, is compared with that of the Inca Dove (*Scardafella inca*), as recorded by Johnston.

There are differences in plumage coloration; the advertisement call and the display call differ; and a "strong alarm" call and nest calling were recorded for the Scaly Dove but not for the Inca Dove.

Johnston's interpretation of aggressive/fleeing behavior and driving are criticized.

The differences recorded appear similar to those found in some African species of *Streptopelia* and on these grounds the two could be considered distinct species, although it is noted that specific separation is probably not complete, the distinction being maintained by allopatric distribution.

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