

CORRESPONDENCE

TO THE EDITOR

Courtship Feeding in Cuckoos

Sir—I am grateful to Mrs E. M. McCulloch (*Emu* 67: 56) and Mr. J. Courtney (*Emu* 67: 154-7) for pointing out that Bronze-Cuckoos, genus *Chalcites*, do courtship-feed in the breeding season. Mr. Courtney also cites Mr. Lord's (*Emu* 56: 100-28) account of courtship feeding in the Pallid Cuckoo, *Cuculus pallidus*. Mr. Vincent Serventy (pers. comm.) also drew my attention to Mr. K. A. Hindwood's article (*Aust. Mus. Mag.* 4 (2): 49) in which the courtship feeding of the Pallid Cuckoo is described. Mr. Hindwood considers it possible that some of the published instances of adult Pallid Cuckoos feeding immature birds out of the nest involved courtship feeding.

If the biological significance of courtship feeding in parasitic cuckoos exists at all, it must be much less than that found in the species in which the formation and maintenance of the sexual pair is advantageous to the rearing of the progeny. In many species of birds, food-begging of adult females is generally considered as part of infantile behaviour used in appeasement and courtship, which may act as a stimulus for parental behaviour or dominance on the part of the male. In cuckoos such a response obviously does not exist, so that the feeding by males may be interpreted as part of the ritualised courtship behaviour, the stimulus situation of which no longer involves parental drive. If so it is only the sexually motivated males that respond to food begging of females and the feeding behaviour does not have to be autochthonously functional.

The feeding of young in the Pallid Cuckoo, then, is expected to be by males only, particularly those with strong sexual motivation, and can hardly be functional for any length of time. This is, of course, based on the assumption that the Pallid Cuckoo does not normally feed its young but that courtship feeding is common between adults of different sexes. My observation (*Emu* 62: 171) was brief but sufficient to indicate that feeding of young by the Pallid Cuckoo was functional at the time. The above assumption, therefore, may be erroneous and I should be grateful if you drew the attention of members to the importance of implications and encouraged further description of such behaviour at future opportunities, particularly how frequently the feeding occurs during the courtship and, if the one fed is a juvenile, how different the feeding behaviour is from courtship feeding and whether the juvenile is fully supported by the adult cuckoo or not.

Because this kind of social behaviour requires a great deal of co-operation between the birds involved, the responsiveness to food-

begging must have had in its evolutionary origin a great adaptive significance, e.g. successful rearing of own young. But once it is established a bird with parental drive may not require a rigid species-specific stimulus for its elicitation if the proper stimulus situation does not exist. For example, Welty (*The Life of Birds*, p. 325) shows an extraordinary photograph of a North Carolina Cardinal, *Richmondia cardinalis*, feeding a group of goldfish at the edge of a garden pond. It is this kind of loophole in the evolved cues of social behaviour that made brood parasitism possible.

A high degree of species-specificity evolved in the parental feeding of a closely related sympatric species (e.g. Australian finches) may be considered to have a function in preventing parasitism and inter-breeding in general through imprinting, etc. The nestlings of different species have different structures in and around the mouth which become conspicuous in food begging.

For the evolution of parasitism in cuckoos, selection against deposition of eggs in the nests of seed-eating or fruit-eating birds must occur at all times. For example, it would be disastrous for a bronze cuckoo to lay eggs in the nest of finches instead of thornbills. To this extent cuckoos must discriminate the host species in the first instance. If they select only one type of nest there would be fewer mistakes of this kind. Also it would provide a possibility of developing egg-mimicry according to the host species. Thus cuckoo species contain several "gentes," each laying a certain type of egg, most similar to a particular host species (see "Mimicry in cuckoos' eggs," by H. N. Southern in *Evolution as a Process*, edited by J. Huxley, A. C. Hardy and E. B. Ford, 1954).

Mr. Courtney's hypothesis that young cuckoos have vocal mimicry of the host species presents some difficulties. First, as he points out, it is unlikely that the nestling cuckoo has an opportunity to learn and imitate the food-begging call of the nestling of the host species. Secondly, if they developed as something like "gentes" in the course of evolution, it would imply that the food-begging call had an important species-specific function in the host species. However, if this were the case, closely related species should tend to develop different food-begging calls. While displacement of morphological and behavioural characters associated with feeding develops among closely related species, the calls seem to remain characteristic of higher categories (e.g. honeyeaters, flycatchers or finches as a group). Analysis of food-begging calls and experiments with dummy calls are needed to substantiate this view, but the first thing to do as far as cuckoos are concerned would be to collect on the tape food-begging calls of many immatures out of the nest to see if they do vary significantly within the species.—

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