Who Feeds the Fledged Pallid Cuckoo?

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In the late afternoon of January 16, 1962, we witnessed, with Biology III external students of the University of New England, what appeared to be a remarkable example of social behaviour in the feeding of a fully-fledged Pallid Cuckoo (*Cuculus pallidus*). It was on the edge of open sclerophyll woodland at Armidale, New South Wales, that our attention was drawn to the incessant begging call of a fledged cuckoo. When we located the cuckoo on a branch about 18 feet from the ground, a Buff-tailed Thornbill (*Acanthiza reguloides*) was about to feed the cuckoo while perched on its back.

The cuckoo was fed at least twice by the thornbill and on one of those occasions a pair of Jacky Winters (*Microeca leucophaea*) near the cuckoo was first chased from the area. The thornbill left the area but the Jacky Winters returned and started attacking the cuckoo alternately. The attack was mostly made from above and behind, with the bird flying in typical flycatcher manner and dropping about a foot to the cuckoo, sometimes actually hitting it. The cuckoo maintained the posture of food-begging, which was intensified as the attacking bird came closer. This continued for some time, until a White-naped Honeyeater (*Melithreptus lunatus*) appeared with food. It chased the Jacky Winters away and quickly approached the cuckoo from the front and fed it without any appearance of hesitation. The honeyeater came back with food several times and fed the cuckoo similarly, but it never remained near the cuckoo nor did the cuckoo attempt to follow it.

In the absence of the honeyeater the cuckoo was again subject to the charges of the Jacky Winters. After a while we saw that one of the Jacky Winters left the cuckoo but soon returned with food in its beak. While holding the food it attacked the cuckoo twice, then it perched near the cuckoo. It flew from branch to branch, gradually coming closer to the cuckoo, and eventually fed it while the other Jacky Winter continued attacking. The feeding was brief but the fact that the food disappeared into the mouth of the cuckoo was confirmed by subsequent observations of feeding by the Jacky Winter. We do not know whether both or only one of the Jacky Winters fed the cuckoo, but the whole process was repeated several times between feedings by the White-naped Honeyeater. The observation commenced at 5.10 p.m. and lasted over half an hour.

It is significant that, while the White-naped Honeyeater never showed agonistic behaviour to the cuckoo (though it attacked the Jacky Winter), the Jacky Winter appeared un-

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certain of its intention when it fed the cuckoo and often attacked the cuckoo before and after feeding it. It is also significant that the cuckoo showed the same intensified food-begging posture to all approaching birds, whether the bird was about to attack or feed it. Judging from the feeding behaviour observed, and the nest preference of the Pallid Cuckoo, it is likely that this cuckoo was reared in the White-naped Honeyeater's nest. The stimulus for food-begging in the young cuckoo seemed to be a general one; that is, the presence of any bird (possibly smaller than itself) near it. The thornbill was apparently attracted to feed the cuckoo while passing through the area. However, the high-intensity food-begging of the cuckoo did not elicit feeding by every species. For example, a pair of Grey Fantails (*Rhipidura fuliginosa*) feeding three fledglings nearby ignored it.

It is perhaps worthwhile to try to explain the situation with regard to the Jacky Winter. Cuckoos are known to be attacked (and mobbed) by smaller birds and such attack is elicited not only by flight but also by a static visual stimulus. Although we do not know the exact nature of the stimulus (the brown barring, white spots, long tail, etc.), it is evident in some cases that the attacked cuckoo is not showing any movement. On the other hand, flycatchers and honeyeaters are pugnacious birds in woodland habitats of Australia and often chase larger birds out of their territories. We have seen adult Pallid Cuckoos being chased by these birds during the breeding season. Therefore, it is possible that the fledged Pallid Cuckoo happened to appear in the Jacky Winter's territory and stimulated the territory owner to attack it by its mere presence.

Unlike the adult cuckoo, the reaction of the young cuckoo to the attack was not fleeing but food-begging, which was a dynamic visual and auditory stimulus (gaping, wing quivering, and begging call) to the attacking bird to feed. As the Jacky Winter was obviously influenced by the breeding drive (territory defence), it could also be motivated for feeding when a sufficiently strong stimulus was given by the cuckoo. As far as our observations go, the two conflicting drives in the Jacky Winter did not produce displacement activities and did not result in low-intensity attack. The reaction was either severe attack or feeding.

As honeyeaters are probably more pugnacious than flycatchers, the question arises as to how a fledged cuckoo can be tolerated by the host species when its static visual stimulus may elicit attack. Does habituation take place in the host species in the course of feeding? Or does the strong food-begging of the cuckoo suppress the attacking drive of the host? Whatever happened, the specific reaction of the cuckoo to a rather general stimulus (approach of another bird) must be favoured by natural selection, and such a cuckoo may be fed more frequently than the host can feed it, or it might be adopted by another bird should the original host

die after the cuckoo has fledged. The young cuckoo could be parasitic throughout the breeding season (as long as the feeding drive persists in birds in the vicinity)! In fact a hand-reared Horsfield Bronze-Cuckoo (*Chalcites basalis*) still gapes six weeks after fledging, which is much longer than the post-fledging feeding period of the host species (i.e. Yellow-tailed Thornbill, *Acanthiza chrysorrhoa*).

There is no doubt that the food-begging behaviour of the fledged cuckoo is a very strong one, but does it also elicit the feeding by an adult cuckoo which happens to be near it? Dr. J. Le Gay Brereton informed us that he had seen an adult Pallid Cuckoo feeding a fledgling. One of us (J.K.) has observed similar behaviour. It was about 6.30 a.m. on December 8, 1961, in pine forest at Armidale. An adult Pallid Cuckoo was seen on one of the lower branches of a pine tree. It rapidly approached a young Pallid Cuckoo from the side and fed it. The intention of feeding was quite clear in the approaching adult and the co-operation of the young was simultaneous, though no begging call was heard. Therefore, the young must have been fed a number of times by this bird before they were first seen. Unlike the young cuckoo described earlier, this bird followed the adult in general direction and the adult fed the young with caterpillars collected from the bark nearby. Feeding was very frequent and the adult seemed to be solely occupied in feeding. There was no other bird in the vicinity and the adult cuckoo led the young to safety when the observer approached.

It would be extremely interesting to know how the initial feeding of the young by the adult cuckoo was elicited. Courtship feeding is not known for the parasitic cuckoos and it is doubtful whether they ever normally feed another bird. If this is so, how can an adult Pallid Cuckoo react by feeding when it sees a food-begging young? Is such behaviour vestigial or a new development? More observations and experiments are necessary to determine these points, but the accumulation of fragmentary observations such as these may provide significant clues to the evolution of parasitic behaviour in cuckoos.