

Observations on hybridism among rosellas in the natural state.—

The Crimson Rosella, *Platycercus elegans*, and the Eastern Rosella, *P. eximius*, are two quite closely-related parrots that over wide areas in south-eastern Australia are sympatric in distribution and frequently associate together where hilly forest country merges with open-timbered grasslands, forming a compromise in habitat suited to both species. It is not uncommon in such an environment to see small mixed flocks feeding together on seeds on the ground, and nesting in a common locality using similar nesting sites. Although so obviously close in relationship and casual association, the two species apparently possess a most effective reproductive species-isolating mechanism, for wild hybrids between the two species are extremely rare, in contrast to more frequent hybridism exhibited by the northern Pale-headed Rosella, *P. adscitus*, and the southern Eastern Rosella, in their zone of overlap (in part roughly parallel to the N.S.W.-Qld. border).

It was therefore with considerable interest that on August 3, 1965, at approximately 1300 hours, I closely observed, for the first time in many years of familiarity with rosellas, a probable hybrid between the Crimson and Eastern Rosella feeding on the ground in company with a small flock of Eastern Rosellas, beside a clump of Apple trees, *Angophora* spp., at Swan Vale, N.S.W.

Although the possibility of mutation has to be considered, it seems more likely that the bird was a true hybrid as hybridism between the Crimson and Eastern Rosellas has been known in the natural state (see McKean, 1959). In the artificial conditions imposed by captivity, as might be expected, hybridism between these two species is not uncommon, the general appearance of the young being sufficiently stereotyped for the acquisition of an artificial name, the "Red-mantled Rosella", and the description of such individuals somewhat resembles that of the specimen in question (c.f. Cayley, 1938, pp. 157-8). The dorsal surface of this bird generally resembled a Crimson Rosella, in having the mantle feathers red and black, a red rump, and tail deep blue instead of bluish-green as in the Eastern Rosella. As a parental legacy from the Eastern Rosella, the back had yellow-edged feathers (however, faintly washed with red) and the upper tail coverts were pale green, in effect forming a narrow band of green between the tail and extensive red rump. The ventral surface differed from the completely red front of the Crimson Rosella, and generally resembled an Eastern Rosella, however, close scrutiny revealed minor differences, in that the red of the throat and upper breast extended further down than normal and absorbed the yellow lower breast area. The abdomen, which is normally pale green, appeared to be pale blue instead. The cheek patches were sky-blue, in contrast to the near-white of an Eastern, and dark blue of the Crimson Rosella. The red in general appeared darker than that of

an Eastern Rosella, but noticeably lighter than the very deep red of a Crimson Rosella. When flushed, this bird and a very dull coloured Eastern Rosella, presumed to be a female, parted company with the flock and flew off together. In flight, the red rump of the hybrid contrasted strongly with the pale sea-green rump of its mate, which in the Eastern Rosella is the most conspicuous in-flight feature, enabling instantaneous identification.

Subsequent to the original sighting, contact was made with the hybrid a further eight times prior to the preparation of this note, detailed as follows:

August 24, 1965. 1009 hrs. The two were feeding unaccompanied on the ground at the same location. When flushed, they flew off together.

October 31, 1965. 1205 hrs. Both were perched at the edge of a scrub consisting of saplings of Yellow Box, *Eucalyptus melliodora*, 900 measured yards north from where first sighted. When disturbed, they flew off together in the direction of original observation.

December 28, 1965. The hybrid was seen just prior to sundown, unaccompanied, approximately half-way between previous sightings. He called a number of times, and it seemed the vocalizations, especially the flight-call, were typical of an Eastern Rosella. He camped for the night in a giant Yellow Box tree near the vicinity of the October sighting.

December 31, 1965. 1135 hrs. The hybrid and mate were perched in the roosting tree of last sighting, dispelling fears that they had parted.

February 17, 1966. 1605 hrs. I located the pair in company with an adult pair of Eastern Rosellas, perched in the Angophora tree-clump at site of original observation. The accompanying pair soon flew off, leaving the hybrid and mate which, by 1630 hrs., had flown to the ground and commenced feeding. It was a disappointment to find them without young, though disastrous seasonal conditions prevailing may have precluded breeding.

April 23, 1966. 1705 hrs. The hybrid and mate were seen perched in a dead tree near October sighting.

May 23, 1966. 1217 hrs. The hybrid and mate were located perched in a small Yellow Box tree, close to previous sighting. At 1259 hrs. they flew 100 yards further north, extending the length of their known range to 1,000 yards.

June 4, 1966. 1650 hrs. At sunset, a flock of about 8 Eastern Rosellas was seen in flight at the vicinity of previous sighting, and after covering 100 yards a pair separated and landed in a Yellow Box tree. A close approach revealed the hybrid and mate. The comparative ease with which they can usually be located points to the fairly sedentary nature of adult rosellas, as indicated by the studies of Brereton (1963a and 1963b).

The field observations are quoted in detail as supporting evidence that the conclusion reached that this hybrid rosella is actually mated to an Eastern Rosella, is a correct and reasonable assessment. This case is of interest, for not only is another example placed on record of a failure having occurred in the usually impervious reproductive barrier operating between the Eastern and Crimson Rosella in the natural state, but the rather more important conclusion may be reached that the mating of this resultant hybrid Crimson x Eastern Rosella to a female Eastern Rosella brings about the distinct possibility that this union of unusual inter-specific genetical composition may pass this gene flow into the local pool of Eastern Rosellas, per medium of healthy, potentially reproductive young. Thus the gene flow first begun in the male Crimson x Eastern Rosella may not have reached a dead-end to be naturally eliminated.

As the basic criterion of the modern concept of what defines a species is the self-contained, reproductively isolated population—the breeding unit—with its own gene pool, it is worthy of note that this case would seem to show the possibility that, in theory at least, limited gene exchange may take place between two rosella species that are good species none the less. It should be observed that in the present instance, the gene flow is one-way directed, in that it is the local Eastern Rosella population that is being “contaminated” (or enriched), and not the Crimson Rosella population. This begs a question worthy of investigation:—Are there dominant and recessive factors involved in inter-specific hybridism resulting in gene flow always being one-way directed between two particular species?

Finally, it may be observed that this presumed male hybrid of quite unconventional colouration has obtained an apparently normal mate from the Eastern Rosella population, suggesting that the species-isolating mechanism in rosellas may consist more of behavioural traits than plumage differences.—JOHN COURTNEY, “Ashgrove”, Swan Vale, via Glen Innes, N.S.W.

REFERENCES

- Brereton, J. Le Gay. 1963a. “The life cycles of three Australian parrots: Some comparative and population aspects”. *The Living Bird*, Second Annual of the Cornell Laboratory of Ornithology, pp. 21-29.
———. 1963b. “Evolution within the Psittaciformes”. *Proc. XIII Intern. Ornithol. Congr.*: 499-517.
Cayley, Neville W. 1938. *Australian Parrots*. Angus & Robertson: Sydney.
McKean, John L. 1959. “Crimson x Eastern Rosella Hybrid in the wild state”. *Emu* 59: 166.

The juvenile food-begging call of some fledgling cuckoos—vocal mimicry or vocal duplication by natural selection?—Traditionally, the term “vocal mimicry” conveys an image of a songbird imitating varied sounds, mostly the songs of other birds, and interestingly

this phenomenon is apparently limited, at least in Australia, to the Passeriformes (see list by Chisholm, 1965).

Quite outside of this traditional narrow concept of vocal mimicry with singular meaning, there would seem to be another kind of imitative vocalisation which would also qualify as "vocal mimicry", though having a different function, and occurring in a different order of birds, namely the Cuculiformes. I first became aware of this when on January 23, 1967, from 0830 hrs. to 1030 hrs., I observed and tape-recorded a fully-fledged young Pallid Cuckoo, *Cuculus pallidus*, which was being closely attended and fed by a pair of White-eared Honeyeaters, *Meliphaga leucotis*, in the grounds of the residence of Mr. Jack Gilbert of "Kokoda", Swan Vale, N.S.W. The most striking feature of the performance was that the fledgling cuckoo was vigorously vocalising in a fashion which, to judge by auditory means, was a perfect imitation of the juvenile food-begging call of the White-eared Honeyeater. This call, a single, brief high-pitched "chick" (which seems common to all the *Meliphaga*-type honeyeaters) appeared to be the primary food-begging stimulus from young to foster-parents, and it was only on the close approach of one of the foster-parents actually arriving with food that the youngster momentarily gaped and quivered its wings. This bird had been observed daily by the Gilbert family in their grounds for about a week, always attended only by the pair of White-eared Honeyeaters.

Again, on February 1, 1967 at about 1400 hrs., I saw a young Bronze-Cuckoo (which I presumed to be the Narrowed-billed Bronze-Cuckoo, *Chalcites basalis*, from the amount of rufous on tail and grey unbarred ventral surface) following a family party of Blue Wrens, *Malurus cyaneus*, in the grounds of my own residence at Swan Vale, N.S.W., and soliciting food by vigorously vocalising in a fashion apparently identical to the juvenile food-begging call of the Blue Wren, which is an extended reel of quickly repeated, soft, thin squeaky notes. This call, too, was placed on tape for future reference, during the subsequent three days that it spent with the Blue Wren family before disappearing.

Though in general the *juvenile food-begging call* is a highly-stereotyped species-typical vocalisation (in that all young of a given species sound alike), this call is greatly varied and differentiated among distantly-related species so that even within the Passeriformes alone this vocalisation exists in great variety among the different genera; and when this basic fact is considered, a problem immediately arises as to how cuckoos can successfully parasitise a wide range of foster-parents possessing basically different food-begging calls, unless by some method a way is present to duplicate the appropriate begging-vocalisation and thus act as a releaser to stimulate foster-parents to consistently feed the voracious young flyer.

My own observations make available positive evidence that there is, in some circumstances at least, a remarkable inter-specific duplication in this call between fledgling cuckoos and their actual foster-parents. Unfortunately, though there is no shortage of references in the literature to young cuckoos vocalising on being fed by fosterers, there seems to be a general dearth of precise information as to whether the calls resembled the juvenile food-begging calls of those of the foster-species or not, and so it is difficult to decide if this interesting phenomenon of vocal duplication in young cuckoos is a widespread trait, or not. Here we may note however that Serventy and Whittell (1962: 267) observe that in Western Australia the begging call of young Pallid Cuckoos, described as "tzwit, tzwit", resembles very much that of the nestling Red Wattle-bird, *Anthochaera carunculata*, one of the species most commonly parasitised in the South-West; while Lord (1956), in regard to the Channel-billed Cuckoo, *Scythrops novae-hollandiae*, states: "In January 1949 Pied Currawongs moved down from the ranges earlier than usual and with them came young Currawongs and young Channel-bills. The close resemblance in call of the young of these two species is most noticeable."

Then there is the problem of why birds of a number of different species (possessing different food-begging calls) may be seen feeding a single cuckoo fledgling. Kikkawa and Dwyer (1962) observed a young Pallid Cuckoo being fed by a Buff-tailed Thornbill, *Acanthiza reguloides*, White-naped Honeyeater, *Melithreptus lunatus*, and—aggressively—by a pair of Jacky Winters, *Microeca fascians*, and though the authors commented on the incessant begging-call, failed to describe it. The drawn-out, high-pitched hissing begging-call of *Acanthiza* is quite unlike the very brief "chick" of the small honeyeaters (*Melithreptus* included) so it is unlikely that this example of auxiliary feeding was caused by the vocalising alone. They (Kikkawa and Dwyer, *loc. cit.*) observed that the stimulus for high-intensity food-begging (gaping, wing-quivering, food-begging call) seemed to be the close approach of any small bird. The close presence of a vigorously wing-quivering, gaping young cuckoo may in turn bring about an irresistible urge in many birds to feed the young fosterling, the foreign begging-call possibly having nothing to do with this and serving only the more important end of ensuring regular and consistent feeding from the true foster-parents. Kikkawa and Dwyer (*loc. cit.*) also comment on the apparent paradox of adult Pallid Cuckoos indulging in the auxiliary feeding of young of their species, expressing puzzlement as to how the urge to feed the young could first be elicited, this uncertainty stemming from their seemingly erroneous statement that courtship-feeding is not known for the parasitic cuckoos, and that it is doubtful whether they ever normally feed another bird. In actual fact, courtship-feeding is well known for the Australian parasitic

cuckoos, e.g., Lord (*loc. cit.*) has witnessed courtship-feeding in the Pallid Cuckoo prior to copulation; Serventy (1958) lists the feeding of a female-Golden Bronze-Cuckoo, *Chalcites plagosus*, twenty times by the male before successful copulation was performed; and Watson (1955) quotes an observation of feeding between two Narrow-billed Bronze-Cuckoos; and as the act of feeding one by the other is obviously present in these birds, its extension to a vigorously begging young may not be inexplicable.

Many problems remain to be resolved in the cuckoos by careful observing, and it is suggested that investigation of the actual extent of vocal duplication in begging-calls in the Australian cuckoos is worthy of further study. A further problem, rather more difficult because of its hypothetical nature, is the actual cause of this duplication. Can it be the result of pure natural selection in action, which would seem to mean the existence of various "strains" of cuckoos within the same species that parasitise only a narrow range of host-species, which possess the appropriate begging-call, as in alleged "egg mimicry" (see Welty, 1964: 501)? If nestling cuckoos allowed the fosterer's own young to remain with them in the nest for the first week (which they normally do not), it would be attractive to postulate that the correct begging-call is learned from the chicks of the host-species. Can it be that the "parental feeding call" (used by the parents for the purposes of stimulating the young to gape), is actually the same as the juvenile food-begging call in those species such as the White-eared Honeyeater and Blue Wren, and that the nestling cuckoos learn this vocalisation from their foster-parents, which would mean duplication by imitation and not natural selection?

Equipment (and methods) used in this observation was a Uher 4000 Report-L battery-powered portable tape-recorder, recording at a speed of 7.5 ins. per sec. The microphone was connected to an extension line, and while strapped to an 18-foot aluminium tube was slowly brought within a couple of feet of both young, which showed little concern at the presence of the microphone.—JOHN COURTNEY, "Ashgrove", Swan Vale, via Glen Innes, N.S.W.

REFERENCES

- Chisholm, A. H. 1965. "Further Remarks on Vocal Mimicry". *Emu* 65: 57-64.
Kikkawa, J., and Dwyer, P. D. 1962. "Who feeds the Fledged Pallid Cuckoo?" *Emu* 62: 169-171.
Lord, E. A. R. 1956. "The Birds of the Murphy's Creek District, Southern Queensland". *Emu* 56: 100-128.
Serventy, D. L., and Whittell, H. M. 1962. *Birds of Western Australia*. (Ed. 3.) Paterson Brokensha Pty. Ltd., Perth.
Serventy, Vincent. 1958. "Bird Notes from the Dumbleyung Camp-out, 1956". *Emu* 58: 5-20.
Watson, Ina M. 1955. "Some Species Seen at the Laverton Saltworks, Victoria, 1950-1953, with Notes on Seasonal Changes". *Emu* 55: 5-20.
Welty, Joel Carl. 1964. *The Life of Birds*. Constable & Co., London.