Feeding

Most of our observations were of feeding birds.

Pigeons were watched feeding on the foliage of two forest-tree species. The leaves, buds and shoots of the ribbonwood *(Plagianthus betulinus* var. *chathamicus)* were frequently taken. A bird would alight in a tree and would proceed to strip all the branches immediately around it, before shifting to another perch. Leaves were torn off in fragments until the entire leaf and stalk had been eaten. The leaves, terminal shoots and green leaf stalks of *Coprosma chathamica* were also taken. After eating leaf and stalk, a bird would often break off and eat the green shoots up to 10 cm long. Although *Coprosma* berries are probably eaten too, none were seen to be taken.

Pigeons were seen feeding on the *Hymenanthera chathamica, Myrsine chathamica,* and *Pseudopanax chathamica,* even though the berries of the last two were still hard and green.

Of the shrubby species growing in thickets along Cascade Stream, pigeons ate both leaves and the berries of *Coriaria arborea* as well as the ripe fruits of *Macropiper excelsum* which were carefully stripped off their spindles.

Of the creepers and vines the Chatham Island Pigeon fed on the leaves of *Calystegia tuguriorum* where it draped the foliage, again mainly along Cascade Stream, and the ripe berries of *Rhipogonum scandens,* especially where its large bunches of red berries were abundant along the rim of the gorge on the warm western wall.

Two small herbs growing on the grassy slips and clearings, that were frequently grazed by pigeons were *Hydrocotyle* spp. and *Epilobium* spp.

Three species which previous observers have recorded as being taken were also growing in the gorge, *Rhopalostylis sapida, Corynocarpus laevigatus,* and *Corokia macrocarpa.*

ROD MORRIS, *4 Ocean Parade, Pukerua Bay.*

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BREEDING OF THE CHATHAM ISLAND FANTAIL

From 17 November to 27 December 1978 we made observations on the breeding of the Chatham Island Fantail *(Rhipidura fuliginosa penitus)* in the Tuku and Awatotara Valleys in the south-west of Chatham Island. Five occupied nests were found and notes were kept on several other pairs and family groups in the region. These observations supplement those made at a nest the previous summer (Dennison *et al.* 1978).

The nests resembled those of the mainland subspecies *(R. f. placabilis* and *R. f. fuliginosa)* in construction and site. Nests were found in *Coprosma chathamica, Cyathea dealbata, Dracophyllum arboreum* and *Hymenanthera chathamica,* the lowest at 1.5 m in *C. dealbata,* the highest at 5 m in a *H. chathamica.* They were composed

of a variety of small twigs, rootlets, leaves, moss and spiderweb, and were usually lined with *D. arboreum* needles. All were situated on a lateral branch above a gap in the shrub layer and all but one of the nests had a tail.

The only territorial dispute seen, on 11 December, was between two birds from pairs that we suspected had nests with eggs. Initially, one bird chased the other through its territory to the boundary. They then flew parallel along the boundary for 10 metres, a few centimetres apart and about 1 metre above the ground, snapping their bills loudly. At the end of each flight they perched facing each other, flicking their wings open and calling with harsh " saw-like " notes. After a brief 10-15 second confrontation they flew back along the boundary repeating the bill snapping. This boundary flight occurred four times before each bird returned to its own territory. This noisy display attracted a pair of Chatham Island Warblers *(Gerygone albofrontata)*, which were feeding fledglings nearby; a male Chaffinch *(Fringilla coelebs)* and several Silvereyes *(Zosterops lateralis)* became agitated and gave alarm calls.

Courtship behaviour before egg-laying consisted of noisy aerial chases interrupted with bouts of loud " saw-like " song; sometimes these chases ended in courtship feeding. On one occasion, five days before the female began laying, courtship feeding of the female by the male was followed by brief copulation. When incubation began, singing, particularly near the nest, became infrequent, the birds fed singly rather than together, and the noisy chases and courtship feeding ceased.

At two nests, we were able to follow laying and incubation daily. One female began laying in the morning of 4 December, the other on 7 December. In both nests, an egg was laid each morning and the full clutch was four eggs. Both sexes incubated and began when the third egg was laid. A pair studied in January 1978 (Dennison *et al.* 1978) began incubating after the second egg of a three-egg clutch was laid. Therefore, at all three nests, incubation began with the penultimate egg. The Chatham Island Fantail seems to differ from the mainland subspecies in this respect as, according to Blackburn (1966), the North Island Fantail begins incubation after the final egg is laid. The incubation period of the two pairs watched was 15 days. Blackburn (1966) and Soper (1972) also recorded 15 days incubation for the North and South Island subspecies respectively.

The parents shared the continuous brooding of the chicks at these two nests during the first five days, while the chicks were still blind. The brooding bird left the nest to preen and forage whenever the relieving bird returned to feed and brood the chicks. During six hours' observations, faecal sacs were removed by the adults about every 30 minutes. By nine days old, the chicks were being brooded less often during the day, for about 10-15 minutes per hour. The adults fed the chicks at a rate of about one feed per 2.25 minutes, increasing to one feed per minute in the last hour before dusk. The chicks were still brooded at night.

Adults with chicks often called and sang near the nest, usually before feeding the chicks. The " saw-like " song was given when both parents were at the nest or when one bird was waiting to feed the chicks and the other was brooding. During incubation, birds called when nest change-overs occurred. Our observations on Chatham Island ceased before the fledgling period of any brood was determined. In one instance a nest was preyed upon when the chicks were ten days old.

Adults often fed in *Cyathea dealbata* systematically flying and hopping along the underside of the fronds catching insects they disturbed. Moths were commonly flushed from the vegetation and caught in mid-air. On returning to a perch the bird transferred the moth from bill to foot, and holding the moth " hawk-like " the bird removed the moth's wings before eating it or feeding it to chicks.

Three recently flledged chicks, being fed by both parents on 30 November, was our earliest record of flying young, even though several weeks had been spent in suitable habitat prior to this date. This pair had probably begun nesting at the end of October, allowing 15 days incubation and assuming a fledging period of 15 days as in the North Island subspecies (Blackburn 1966). A pair with flying young was seen in the Awatotara valley on 8 December and another pair was very vigorously defending a nest with two chicks, that were nearly ready to fly.

The latest laying date recorded for the Chatham Island Fantail is 21 January (Dennison *et al.* 1978). The nest had been repaired and added to and so was probably a repeat clutch. At this time, breeding in the Tuku valley had virtually ended, and adult and juvenile Fantails, Silvereyes and Chatham Island Warblers were feeding in mixed flocks.

The breeding season of the Chatham Island Fantail therefore probably extends from late October to late January, which allows time for only one or two broods to be raised. The mainland subspecies have a longer season, with up to five broods being raised between August and February (Blackburn 1966, Falla *et al.* 1979). The single-brooded Chatham Island Robin *(Petroica traversi)* similarly has a shorter breeding season, from mid-October to early December, than the double-brooded Robin *(Petroica australis)* in New Zealand, from September to February (Falla *et al.* 1979). Chatham Island Fantail breeding reaches its peak around late November-early December, about the same time as other bush-bird species. In November-December 1978, many Silvereye nests with eggs and chicks, two Chatham Island Warbler nests probably with eggs, another with chicks, and Blackbird *(Turdus merula)* and Hedge Sparrow *(Prunella modularis)* nests were found. In eight hectares of bush around our campsite 12 pairs of Chaffinches had territories and were nesting.

The breeding of bush-birds on the Chatham Islands, therefore, seems more synchronised than on the mainland. This is not surprising as the islands have a bleak climate and so there is probably only a

short period from November to January when conditions are optimal for breeding.

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PARAKEET HYBRIDISATION

On 24 December 1978 I was on Little Barrier Island in a photographic hide at a nest hole I believed to be occupied by parakeets. This nest hole was in a kauri *(Agathis australis)* of 60 cm d.b.h. some 230 m above sea level in unmodified forest described as " kauri forest with beech and rata as important elements " by Hamilton (1961, *Little Barrier Island (Hauturu)*, DSIR Res. Bull. 137).

At about 10 a.m., a male Yellow-crowned Parakeet *(Cyanoramphus auriceps auriceps)* came to a perch beside the nest hole and gave a chattering call. After a few seconds a parakeet came so rapidly out of the nest hole that I could not see what species it was before it disappeared from view. A few minutes later it returned to the nest with equal speed. By 4.30 p.m., I had determined that a Red-crowned Parakeet *(Cyanoramphus novaezelandiae novaezelandiae)* was leaving the nest in response to the Yellow-crowned Parakeet's calls. To make further observations, I cut peepholes in all sides of the hide.

At 9.58 the next morning the male Yellow-crowned Parakeet approached the nest chattering. At 10.10 the female Red-crowned Parakeet left the nest, and the two birds flew to a branch some 12 metres away behind the hide. I observed that the female begged for food and was fed by the male. At 10.16 the female returned to the nest.

It is not known whether this pair raised young. Aviculturists who have seen but not bred hybrid parakeets from Red-crowned × Yellow-crowned matings report that the progeny vary in size and may be distinguished by " a variable mottling of red and yellow on the crown " (A. G. Dobbins, pers. comm.) or a " flame-coloured crown " (J. Lobb, pers. comm.).

Extensive parakeet hybridisation in the wild is known on Mangere Island in the Chatham Group and on the Auckland Islands, where the habitats have been modified (C. A. Fleming, pers. comm.; Taylor 1975, *Some ideas on speciation in New Zealand parakeets,* Notornis 22: 110-121). There appear to have been no previous records of interspecific breeding among parakeets in unmodified situations on New Zealand's main islands.

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