MURUK

VOLUME 1 REPRINTED SEPTEMBER 1990

JOURNAL OF THE PAPUA NEW GUINEA BIRD SOCIETY

CONTENTS

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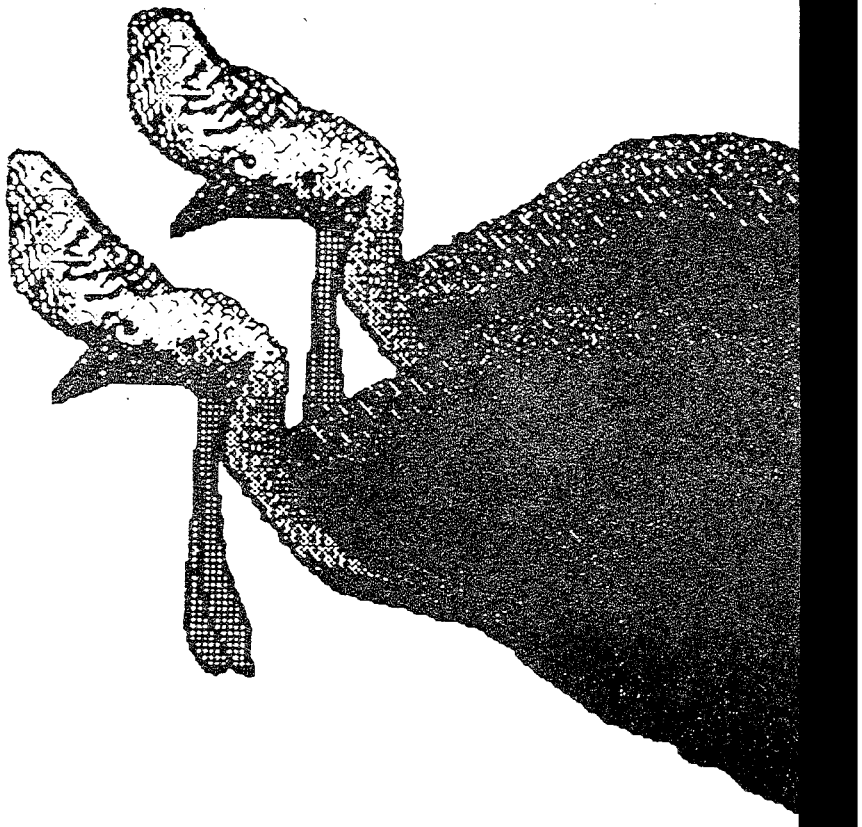

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EDITORIAL FOR REPRINT OF VOLUME 1

Volume One of MURUK first appeared in 1986, originally in an A4 format. Subsequently, the format of MURUK has changed to A5 and we have had lots of requests to reprint volume one in this style. We have, at last managed to comply with this request. All three parts of MURUK volume one are presented here in this special issue.

The order and content of the papers is largely unchanged from the original. I have omitted some of the PNG Bird Society announcements that are no longer relevant and corrected some typographical errors. I hope no others have crept in. Some bird names have been amended to agree with "Birds of New Guinea" by Beehler, Pratt and Zimmerman.

I have had a great deal of help in producing this reprint and would like to thank Mary George for typing in the papers, Mike Hopkins for technical assistance and editing and Elly Brown, Helen Fortune Hopkins, Will Glynn and Jenny Hicks for editing and proof reading.

Roger Hicks (editor)

MURUK Volume 1 reprinted September 1990

MURUK

VOLUME 1 NUMBER 1 FEBRUARY 1986

THE JOURNAL OF THE PAPUA NEW GUINEA BIRD SOCIETY

CONTENTS

WELCOME TO MURUK

MURUK is the long-awaited ornithological journal, published by the Papua New Guinea Bird Society

MURUK is the only ornithological journal covering the Papua New Guinea region, Irian Jaya and the Solomon Islands.

MURUK could not exist without the support of the Department of Environment and Conservation, which takes an active interest in the Papua New Guinea Bird Society.

MURUK continues the tradition of naming journals after flightless birds. It is also has a Papua New Guinea flavour, in that it is named in the most widespread language of the region, Pidgin...Muruk is the pidgin word for Cassowary.

CONTRIBUTIONS for publication should be typed, double-spaced on one side of the paper only and submitted to the Editor in triplicate. Papers should be concise, original and should include a summary and appropriate references. Clarity and good organization of material will be required. Details of a appropriate format are outlined in Emu. Journal of the Royal Australasian Ornithologists Union.

EDITORIAL

The Papua New Guinea Bird Society, during the two decades of its existence, has published a great deal of ornithological information in its official Newsletter. Unfortunately, but understandably, many authors who could have contributed to that publication chose to place their papers in other more widely distributed journals overseas. The Society now feels that an effort should be made to bring together in one journal all Papua New Guinean ornithological papers, thus avoiding the frustration and inconvenience of having the material scattered widely and often obscurely throughout the world. This is the first issue of MURUK, a quarterly journal, to be published by the Papua New Guinea Bird Society. It has come into being because of the a joint effort by the Society and the Department of Environment and Conservation who were also interested in consolidating papers on the birds of this region.

We hope that MURUK fulfils a need and encourage contributions of an academic or formal nature. If will be a journal dedicated to the sharing of knowledge about the unique birds of Papua New Guinea, as well as the other half of New Guinea, Irian Jaya, and the entire Solomon Islands region. Together they make up the 'New Guinea Region', an unique area, unsurpassed in its high percentage of endemics for such a relatively small part of the world.

This issue contains a paper questioning the current taxonomy of the Aplonis starlings, and a most interesting article on the co-operative breeding of Helmeted Friarbirds and Brown Orioles. The latter article raises many questions we hope to have answered in forthcoming issues of MURUK. Finally there is a report of a Black Tern at the Moitaka settling ponds near Port Moresby, the first record of this bird in the New Guinea region. We trust that you will find the articles interesting and topical, and hope that you will give this journal the support required for its success.

The Editorial Committee wishes to thank all authors who have contributed papers to date and we apologize for the delay in producing the first issue. We are optimistic that the next few issues will appear on schedule. For the long term the Society will continue to publish MURUK as regularly as possible when it receives appropriate papers. The continuing support of authors everywhere who have new material on the birds of the 'New Guinea Region' is needed.

The society Newsletter will henceforth become a bimonthly publication dealing solely with the activities of the Papua New Guinea Bird Society. Local members of the Society will receive both the Newsletter and MURUK as they are published. Overseas members will receive their Newsletters enclosed with MURUK on a quarterly basis.

Brian W. Finch, Editor

THE *APLONIS* STARLINGS OF THE SOLOMON ISLANDS

BRIAN W. FINCH

INTRODUCTION

The Solomon Islands are very well represented by the Starling family. There are only three genera present, one of which is introduced, but numerous species. The genus *Aplonis* has a greater abundance of species in the region than any other. Depending on the taxonomy followed there are no less than ten forms, which the author feels should all be recognised as individual species. This paper gives some unpublished data concerning these forms, and attempts to explain how so many different species can co-exist in these islands, whereas on the New Guinea mainland only two species occur over the major portion of the island with a very locally distributed third species confined to two major river basins.

THE GENUS *APLONIS*

The species of the genus *Aplonis* found in the Solomon Islands are as follows: *brunneicapilla, cantoroides, dichrous, feadensis, grandis, insularis, malaitae, metallica, tabuensis* and *zelandica*. These last two named species only enter the political Solomon Islands in the Santa Cruz Islands and represent New Hebridean avifauna not Solomon Islands; as such they are not discussed further in this paper, which deals with the Solomon Islands as a faunal region. The inter-relationships amongst the *Aplonis* species may be described by establishing three groups.

PROBABLE RELATIONSHIP BETWEEN THE SPECIES

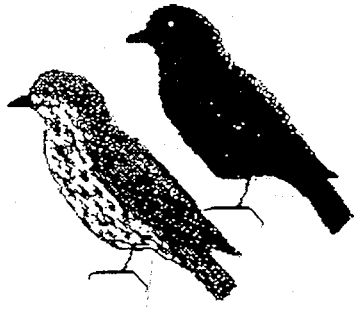
cantoroides	metallica	grandis
feadensis	brunneicapilla	malaitae
insularis		
tabuensis		
zelandica...	(?).....	dichrous

THE CANTOROIDES GROUP

Plump, stout-billed, short-tailed starlings are very widespread in the south-west Pacific. Two species are very widespread, *payanensis*, which extends into Malaysia from the Philippines and Borneo, and the familiar *cantoroides* found from the Moluccas to the Solomons. Over most of its range, this adaptable species has colonised small islands without changing in form; on some very small islands, however, the birds have differentiated from the ancestral stock sufficiently to warrant full specific status.

cantoroides

Over most of its range *cantoroides* is the most abundant starling but on some islands *metallica* occurs in far greater numbers. *Cantoroides* always nests in holes, usually in trees, but now it commonly uses man-made structures in which to nest and to roost. No other native starling in the region has shown this adaptability, nor has any other so readily accepted the change to an urban existence. This last move has most certainly led to a great increase in numbers, particularly in the large coastal towns. Although mainly a coastal or lowland species on the Papua New Guinea mainland, the species has moved into the montane towns of Goroka and Mount Hagen, each over 1700 m.



Aplonis cantoroides

Whilst the species has invaded small islands, it has not successfully re-invaded the islands which now have insular species that have evolved from it in earlier invasions. Four other species in the Solomons region have probably evolved from *cantoroides*, and all are restricted to small islands in the region.

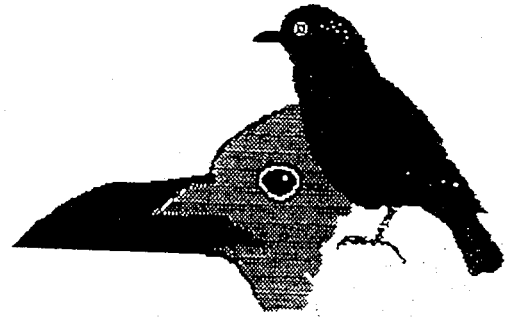
Typical *cantoroides* show a red iris in adult plumage, no coloured eye-ring; the immatures are heavily streaked on their undersides.

feadensis

Previously *feadensis* was considered to be more widespread, the reason being that one of the other races is now recognised as a separate isolated species. It is found only on the very small islands to the north-east of Bougainville and north of the south-eastern tip of New Ireland, and Ongtong Java off the north coast of Malaita. Although Rennell Island is given as part of the distribution for this species, there is another species endemic to that island, and this is discussed under *insularis*.

On Nissan Island where the author has had field experience with *feadensis* it was only noted in singles, pairs or small parties but not in flocks. Because there is no natural open country vegetation other than along the beach, the species has evolved into an arboreal forest inhabitant, feeding amongst the dense foliage of the trees.

A. feadensis is built much like *A. cantoroides*, from which it differs in being bulkier. The bill is more slender, almost thrush-like, with black feathering coming right down onto the culmen. The all dark iris is surrounded by a bright pale yellow eye-ring. Compared to *cantoroides* this species is almost totally without gloss, being a dull slaty-black. Immatures lack the heavily streaked underparts, and are merely a slightly duller version of the adult birds, with paler edgings to the breast feathers. In flight the species appears much broader winged, the beats are slower and the flight-pattern hesitant, nothing like the direct fast flight of *cantoroides*.



Aplonis feadensis

On Nissan Island the most abundant species of bird is the Nissan White-eye *Zosterops griseitincta*, an abundant species found in all types of vegetation throughout the island. This species has louder calls than most species of white-eyes, and a very pleasant Whistler-like warble. The Atoll Starling *A. feadensis* instead of having the loud ringing, sharp metallic notes common to *cantoroides*, has soft notes very similar to those given by the white-eye. The reason for this apparent mimicry is unclear, but the repertoire of calls is atypical for this genus. The most commonly given call is a loud rising slur:

weeeeee-eeeeee

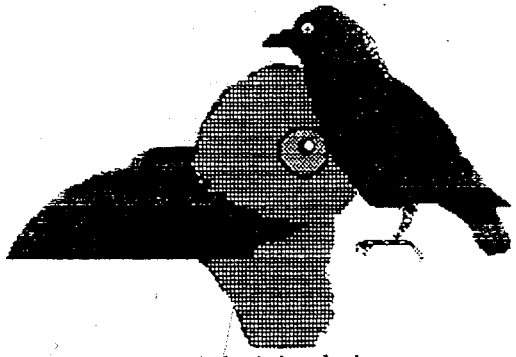
insularis

Confined to Rennell Island, south of the island of Guadalcanal, this species, for it is a species in its own right, was formerly treated as a race of *feadensis*. Reasons are given here why the author considers that it is not even related to that species.

On Rennell the bird was fairly common, usually encountered in pairs feeding in the forest canopy where it can be most silent and unobtrusive. It readily comes down low to feed in shrubs. In general appearance it is much like the previous species but has a very short tail, even for an *Aplonis*. It is wholly slaty-black with a greenish gloss on the back and sides of the neck. Compared to *feadensis* the bill is heavy, more like *cantoroides*, possibly even heavier and lacking the conspicuous feathering on the

culmen of the former. The upperparts of adults are uniformly slaty-black; the under parts are dull grey-black; the flight feathers show as a duller black and contrast a little with the rest of the wing; the entire iris is orange-yellow and there is no trace of an eye-ring. Immatures are more uniformly browner, lacking any gloss, and have a pale brown iris.

The calls are most distinctive. In flight the notes are a sharp metallic clinking "chink-chink" very like that given by the Orange-breasted Fig-Parrot *Cyclopsitta giuelmitertii* of the New Guinea mainland. The song however is a musical series of tinny notes like those of *cantoroides* but more varied. Some calls are similar to those of the Song Parrot *Geoffroyus heteroclitus*, also found on Rennell Island.



Aplonis insularis

Like *feadensis* this species is an obvious derivative of *cantoroides*, both having evolved independently following invasions of that species to the islands that they now occupy. Whether Nissan, Fead or Ongtong Java received the original invasion of *cantoroides* that evolved into *feadensis* is not certain, but from one of these islands the bird spread to the others as an already evolved *feadensis*. At some time *cantoroides* arrived on Rennell Island where a very insular form evolved into *insularis*. So sedentary is this species that it has not even managed to colonise nearby Bellona, which has no Starlings with which it would compete.

The lumping of these two forms under the umbrella *feadensis*, as Mayr (1954) and others have done, has surely been on the grounds that the two are similar in appearance, inhabit well off-shore islands and it was convenient to do so. Obviously no investigations were carried out in the field, and diagnostic features in both these species, such as eye-ring colour and iris colour, are lost in museum specimens. Mayr (1954), makes no mention of the yellow eye-ring on *feadensis* nor the orange-yellow iris of *insularis*. When *feadensis* was illustrated in Gould's monographs, the species was illustrated without a yellow eye-ring; nor did Rutgers make any mention of the fact, when he published his contributory text to Gould's paintings in Birds of New Guinea. The illustration, however, does show the thrush-like bill of *feadensis* as mentioned, whereas Mayr states that it has a heavier bill than *cantoroides*.

metallica

A. metallica is probably the most numerous and widespread Starling in the Solomon Islands, sharing the distribution of every other species apart from *insularis*. It is even present on the off-shore islands occupied by *feadensis*, although in much smaller numbers.

It is a highly social species, always in flocks, and nesting colonially in usually isolated trees, where the pairs build their woven pendant nests. No other species has a long graduated tail (but see *brunneicapilla*), nor the rich green-purple gloss.

Aplonis metallica

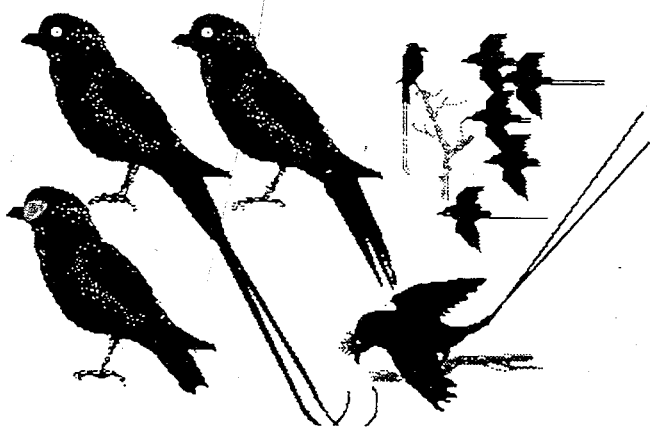
brunneicapilla

This species is undoubtedly the most striking of the whole genus, and the rarest starling in the Solomon Islands. It was previously known from only a few specimens from Rendova and Bougainville, and, until a breeding colony was discovered by Cain and Galbraith on Guadalcanal, the remarkable breeding plumage was completely unknown. They located breeding colonies in the hill-forest behind Honiara, where pairs had burrows in epiphytes attached to large rainforest trees. Birds with extraordinary long central tail feathers were then seen for the first time. The original birds that were collected were no-breeding individuals showing no trace of any elongated tall feathers; the most distinctive feature that they possessed was a pale iris. Thus the most diagnostic feature being unknown, the species was named the White-eyed Starling. To emphasise the obscurity of the species, Mayr states "...tail slightly elongated, bill highly arched. Iris white; bill and feet black. Differs from *metallicus* by the white eye, heavy bill, and short tail. Very rare and probably not colonial."

In early 1985 Peter Kaestner was most fortunate to find an active breeding colony on the Buin road, south of Aropa on Bougainville. This was in a logged area, and the colony of some ten pairs was located in a large completely isolated tree that had been left standing. The author was most fortunate in visiting this colony very shortly after its discovery and this provided a unique opportunity to study this virtually unknown species.

The adults were bluish-black with a strong purple gloss to the throat and a bottle-green gloss to the back. The black bill was short, stout, but with a strangely arched culmen quite unlike any other species. The iris was conspicuously whitish, although the immatures were not so striking, and in many it was not very obvious that the iris was so pale. The most outstanding feature was the curious elongated central tail feathers, which extended as two long and very flexible pins up to three times the length of the outer tail feathers. The rest of the tail showed a slight graduation. Birds with tail wires were assumed to be adult males; the presumed females and immatures lacked the pin feathers and had lanceolated tails, rather than graduated, this being less obvious in the younger birds. This species appeared to lack streaked immature plumages, the young being duller versions of the adults, and lacking gloss.

Some adult birds lacked the pins, and others had broken wires, or only one streamer. These are presumably broken in the confines of the nest burrow when the bird is turning around, but it is also likely that the wires are moulted when the bird is no longer in breeding condition or has completed nesting. This would also explain that whilst adults had been collected before Cain and Galbraith found the first breeding colony, they showed no trace of the pin feathers.



Aplonis brunneicapilla

The location was inundated lowland forest, which probably remains water-logged throughout the year, although the logging operations may have upset the local water table; however the nesting tree was above the water-line. It was 20 m from the nearest patch of forest, completely in the open. The tree was very tall; for the first 15 m the trunk rose straight up and had no arterial branches at all and the upper part of the tree spread out into several stout branches, terminating in a fairly open canopy. The upper portion of the trunk and the major branches were densely clothed in masses of epiphytes of many kinds. The epiphytes had created their own soil-like environment, as the vegetation withered, or wind-blown detritus collected in the tangles. Dense stem and root systems formed mats around the vegetation and on the branches. The

starlings' nests were burrowed either in the soil around the larger epiphytes such as 'Staghorns', or in the dense tangles of roots. Some of these tunnels must have been fairly deeply located inside of the mass as birds with very long tail streamers disappeared completely from view.

At first light the birds would awaken and emerge from the nest tunnels, where all of the birds had roosted during the night, and sit around on the tops of the branches of a dead neighbouring tree, or close to the nest, where they would preen in the first rays of the dawn sun. Some would sing in a subdued fashion. After a short while the birds would collect as a flock or a series of parties, and fly out to collect food from the nearby forest. The birds would be away for some twenty minutes, then return as a flock to the nest site carrying food, which appeared to be berries, and wisps of plant material for the nest. The birds carrying food entered the nest tunnels; some birds that appeared to carry nothing, or had already deposited their load and were waiting for their mates to finish feeding the young, would sit outside the nest and preen and warble softly. when the young had been fed, the birds would wait until all were ready, then fly off as a flock to the feeding site. One such feeding tree was only 30 m away, and there the birds collected berries. Around the nesting tree the birds were always seen flying to it or from it, but a few hundred metres away a couple of parties were observed flying at a tangent to the colony suggesting that another nesting colony was located in the forest not very far away.

In all the respect the species lives a colonial existence. It breeds as a colony, it flies out to feed as a group, it feeds as a group, returns to the nest as a group and feeds the young as a group. Connected with this is the most complex pair-bonding display which was demonstrated by several adult males at the same time, near the nesting tunnels on neighbouring branches. These males selected a horizontal branch, lowered their heads and backs by flexing their legs, raised a short tufted crest from the base of the bill to the back of the crown, spread. At the same time the tail was pointed at an upwards angle, and the long tail wires, which were completely flexible, wafted up and down. For a starling this is a most unusual display. Some birds while performing would give a warble of sharp metallic notes, very loud and strong when compared to *metallica* which is what it most closely resembled. Many notes were very tinny, and now and again the birds would string the notes together into a rustling 'aluminium-foil-like' warble.

The birds showed no aggression when congeneric species either settled in their nesting tree or in a neighbouring tree, as was the case with a pair of Brown-winged Starlings *Aplonis grandis* which had their nest in a neighbouring tree and frequently used the white-eyed Starlings tree as a landing station when flying to or from their own nest. When a flock of *metallica* landed in the neighbouring tree there was likewise no aggression, and it was as if the *brunneicapilla* had not noticed them.

The affinities of this species are unclear. In the elongated tail feathers, colonial habits, metallic warblings and chinkings, it shows closest alliance with *metallica*. It is evidently not able to compete successfully, and has remained a very rare species wherever it is found. It is likely that it will eventually be found to occur on all of the major islands throughout the Solomons, and has so far been over looked when not in its striking nuptial plumage. That the Bougainville colony was only the second ever to be discovered, on an island has been fairly well covered ornithologically when compared to all of the other islands that make up the Solomon Islands, testifies to its rarity.

THE GRANDIS GROUP

The three starlings to make up this group are different from those so far dealt with in that they are larger and shaped more like a Myna and their primaries are brownish, contrasting with the rest of the wing. Two species build large stick nests placed openly in the branches of trees. The author is not sure about the nesting habits of *dichrous*. The last named is possibly not part of this group. The reasons for this conclusion are discussed under the section dealing with that species.

grandis

Grandis is a member of a group of the three larger species of starlings of the region. The other two related species (considered subspecies by some authors) are *malaitae* only found on the island of Malaita, and *dichrous*, only found on the island of Makira (previously known as San Cristobel). On all of the other islands apart from small offshore islets, Rennell island and the Santa Cruz group, it is *grandis* that will be found. It differs little on these islands, although its altitudinal distribution and social behaviour do appear to differ from location to location, but this may have seemed so only because of having a limited sample.

A large bulky starling lacking the crisp blackness in the plumage, or any noticeable gloss, in build it is shaped similar to the Eurasian Starling *Sturnus vulgaris* and like this species has a medium length slender bill, rather than the short, stout, almost crow-like bills of most *Aplonis* starlings. The throat has long dark lanceolate hackles with green/bluish gloss, and there are also some elongated feathers on the back of the neck and nape. In some lights the whole bird can appear streaky, in others the underparts look more dull dark brown than blackish. The outer primaries are obviously and diagnostically paler brown, contrasting with the rest of the wing. The iris is dark, the bill and feet blackish. Immatures appear as duller versions of the adults, but there is no streaked immature plumage in this group.

The birds on Bougainville travel in pairs, and would seem to pair for life. They liketo perch openly in the very tops of trees, where they sit for long periods. They are sluggish in their movements, their flight is laboured and hesitant, more like a Myna's than a Starling's and it is in flight that the brown primaries are most obvious. The nest is also

placed in the small branches at the top of a tree, a very bulky nest woven out of small sticks into a dome-shaped mass with an entrance in the side. Possibly the nests are added to in successive seasons, as some observed were small, whilst others of much larger dimensions were in use at the same time.

Aplonis grandis

Most calls recorded were shrill and high pitched, "shreenk", "shrip", "seeet", and in flight the birds often gave an un-starling-like "tip-tip" similar to the fight calls of some Eurasian Buntings *Emberiza sp*. The protracted song consists of a continuous string of warbles, chips, squeaks and other shrill notes, interwoven with a chatter. This song is very like that given by the Eurasian Starling, a fact that has been commented on by other authors writing about this species. Some notes are soft but others, interspersed amongst the ramblings, cannot be heard at all even though the bill is opening and closing as if the refrain was still pouring forth. There is possibility that part of the song is beyond the range of human hearing as has been suggested by another author (Hadden, 1981).

On Bougainville *grandis* is mainly a lowland species, but occurs in small numbers as high as Panguna and probably extends even higher. It does not associate in flocks; parties up to four are regular, this probably representing an adult pair with two fledged offspring. The general rule is that this species is to be found in pairs, but undoubtedly more must gather at fruiting trees.

Birds of Kolambangara, in the central Solomon Islands, were in no way any different from the birds seen on Bougainville.

The birds on Guadalcanal in the far eastern and of the Solomon Islands chain were very similar to the birds encountered elsewhere, but in the field their appearance was slightly smaller overall, whit a very slightly proportionately longer tail (not obvious), and the pale brown of the primaries more conspicuous. They were common from sea-level up to 1200 m at Vallecocha. As with other localities, the species was usually in pairs, but it showed a more ready inclination to gather socially into larger parties, and on one occasion over twenty were feeding at a fruiting bush. One call heard on

Guadalcanal but not noticed elsewhere was a high metallic and strident "zink" which was given frequently by birds as they fed, or remained perched on a branch. The call note was given with a convulsive jerk of the head, and had carrying power.

In appearance, the differences between *grandis* from the three parts of its range, western (Bougainville), central (Kolamabangara), and eastern (Guadalcanal), were insignificant. There was no obvious difference in overall size or structure, no noticeable cline in plumage colour, characteristic, or texture, no appreciable variation in the shade or extent of the pale brown of the primaries, no differences in the bill size or structure, nor any variation away from a dark iris.

It is the unvarying characteristics of this species throughout its range that persuade the author that the two forms, *malaitae* and *dichrous*, are not merely races of *grandis*, as they have been treated in the past. The former is an allied form but still a species in its own right, the latter is only doubtfully a close ally of *grandis*. The author's reasons for splitting these forms into separate species are given under their individual treatments.

malaitae

Aplonis malaitae

Malaitae is confined to the island of Malaita, lying roughly to the north of Guadalcanal, where it is and obvious representative of the *grandis* group, but differs from that species in several small but nevertheless important features, and one very important and conspicuous feature. This last difference, strangely not even mentioned by Mayr (1945), is that the iris, instead of being dark, is wholly whitish. Overall the bird is slighter than *grandis*, showing less brown on the primaries of the perched bird. The hackles on the back of the neck and the nape are longer, and hang as a shaggy beard from the throat, where the gloss is a shiny deep purple. The breast shows an oily green sheen, contrasting with the throat.

This species is often encountered in pairs, but readily gathers into parties. A feature not observed with *grandis* is that *malaitae* will readily associate with *metallica* at fruiting trees. It is common throughout the lowlands, extending up into the hills.

The song is similar to that of *grandis* being rich and varied, and it also shares the higher pitched notes, which may be beyond the human auditory range. Whilst very closely related to *grandis*, and a geographic replacement species, full species status for *malaitae* is warranted because the iris colour, smaller size, glossier, greener plumage, and long hackles on the neck and throat place *malaitae* apart from *grandis*, which has unvarying appearance throughout its distribution.

The fact that Mayr (1945) did not make any mention of the white iris on this species must mean that he was unaware of the fact. This is yet another example of taxonomic placements being decided on the basis of museum skins, with no field data. Museum skins lose features such as iris colour, eye-rings, bill and leg colour, or the original tone of any soft parts such as wattles, gape linings and bare patches of skin. So far in this paper *malaitae* is not the only casualty; we have seen it with *feadensis*, where there is no mention of any yellow eye-ring, and with *insularis*, where there is no mention of the complete lack of an eye-ring, nor any mention of the orange-yellow iris colour. Thus *feadensis* and *insularis* were lumped together as one form, and the same procedure has been applied to *malaitae* and *grandis*. In fact the entire treatment given in "Birds of the Southwest Pacific" (Mayr, 1945) is to be found in the section dealing with the Brown-winged Starling (*grandis*), where *malaitae* is treated as a race of that species. It reads, "....*malaitae* Mayr 1931 (malaita) smaller and with a greener breast".

dichrous

Aplonis dichrous

Dichrous is a very different bird from either *grandis* or *malaitae* in size, appearance, call, habits and bill structure. All of the features are treated in detail in the text that follows.

It is a much smaller bird than either of its so called close relatives, but treated here in the *grandis* group, for that is where it has been placed by other authors. It lacks that dull brownish cast, being a crisper black, with a shorter, stouter black bill, and a redder iris. In overall shape (but not posture), it more closely resembles *cantoroides* than *grandis*. There is a bright glossy spangling of purple on the breast and underparts. The

throat has short pointed hackles, not the long rangey lanceolate hackles of its "allies". The most distinctive single feature is that the entire flight feathers are pale brown, almost with a golden tinge in some lights, whereas in the last two species, the pale brown is confined to the outer primaries, leaving the inner primaries and secondaries blackish. This pale wing contrasts strikingly with the crisp blackness of the remainder of the plumage. The tail is also brownish rather than black (unlike the last two species) and noticeably squared and rather short.

The birds associate mainly in pairs, but also in small parties, and are found at all altitudes on the island. Unlike the other two species which move deliberately and somewhat clumsily, this species is very agile, coming right down in the foliage to feed within less than a metre of the ground, hopping nimbly amongst the slender twigs, or hanging by its feet to stretch itself out to reach an item of food. In great contrast to all other starlings, it showed no aversion towards joining mixed feeding assemblages, readily associating with such unlikely genera as *Monarcha, Rhipidura*, and *Pachycephala*. The calls recorded were high pitched squeaks and clinks like *cantoroides*, and a rising whistle!

Differences between *dichrous* and *grandis* are far more numerous than the resemblances, the only obvious feature that they share is the paler primaries, and even in this it is very different in the extent of the pale area, and the colour.

The inclusion of *dichrous* with *grandis* is certainly erroneous, and many current authors treat it as a full species. The fact is that it has probably not even evolved from *grandis* stock, but could have come from the east and not the west. Although the author has no field experience of *zelandica* from Santa Cruz and the New Herbrides, it would seem (based on descriptions) to be a far better contender as an ally of *dichrous*. In bill structure and body shape, this species is like a typical *Aplonis* starling.

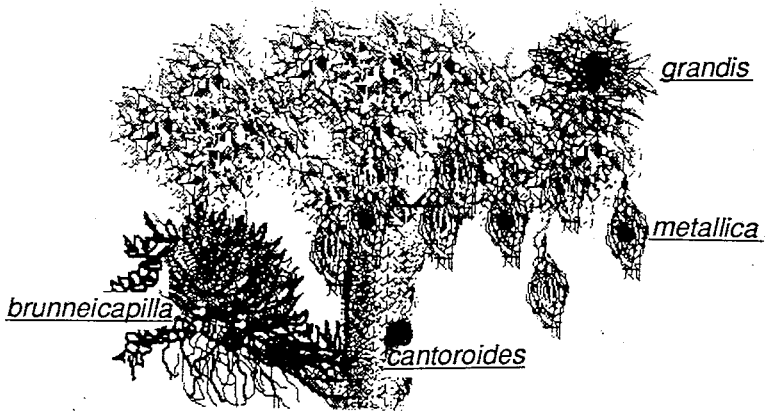
SUCCESSFUL SYMPATRY IN THE GENUS *APLONIS*

Through the greater part of the New Guinea mainland, two species of *Aplonis* are to be found. Both are common and they co-exist all around the coast, and along river systems. Both species require open country, but only the Singing Starling *A. cantoroides* is found in the dry savanna. Both are widespread and have colonised the major satellite islands, and a majority of the smaller vegetated islands. Whilst they may feed in the same trees, there is no competition when it comes to nesting, for the Singing Starling nests in already excavated holes or natural hollows in trees, and more recently in man-made structures. Whilst the species is solitary in its nesting habits, several pairs may nest in close proximity if there are a sufficient number of potential sites. The Metallic Starling *A. metallica* is a highly social species, and only nests in colonies, some of which are very large. Each pair constructs a neatly woven, pendant-shaped hanging nest, and the entire colony may have hundreds of these nests hanging from the higher branches all over the tree. Often the tree is an isolated individual in an otherwise fairly open area.

In view of the fact that the New Guinea mainland is the home for only two widespread species of *Aplonis*, it comes as a surprise to learn that some islands in the Solomon Islands, all of which have a fairly impoverished fauna typical of isolated island's host four species of *Aplonis* in complete sympatry. This presents a very interesting study for students interested in avian niches. Whilst a more detailed study for students interested in avian niches. Whilst a more detailed study of these birds is required, there is no doubt that a greater part of the success of their co-existence stems from their different nesting habits. It would be conceivable for all four species to nest in the same tree, without competing for sites. At the place along the road to Buin where the observations on the nesting colony of White-eyed Starlings were made, all four species of starlings were present, and all four were found nesting in close proximity.

There was no inter-specific aggression between the four species, even though they were at times present in the same vegetation; in fact there was a considerable tolerance. Perhaps they utilise different food resources, although all four were seen eating berries of the same appearance.

DIFFERENT NEST SITES UTILISED BY *APLONIS* STARLINGS



brunneicapilla

Only nests in holes which it must excavate itself at the bases of and amongst the packed root systems of arboreal epiphytes. Burrows are deep, and in most cases almost vertical. It would appear that this species favours isolated trees in which to nest, and will only do so as a small colony, as this is a highly sociable species.

cantoroides

Mainly a solitary breeder, though several pairs may nest in close proximity. Always nests in a hole, either in a tree or a man-made structure. The hollow issued as the nest site, but the species make no excavations itself apart from tidying up the hole.

grandis

A solitary breeder, which builds its bulky nest in exposed branches, usually in the top of a tree. The nest is a medium to very large (for the size of the bird), dome-shaped structure of small woven sticks and moss with a side entrance.

metallica

A colonial nester, favours isolated trees in which pairs weave their pendant hanging nest made from neatly woven strands of grass-like fibres.

CONCLUSION

Hopefully this paper, whilst it has not conclusively reformed the taxonomic placements of the species treated, nor given them the thorough coverage that they deserve, will kindle and interest in this most interesting and sorely neglected group. The suggestions of revising the taxonomy are ventured in the hopes that another will take up the task and work on the group in the field.

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SECOND RECORDED INSTANCE OF THE BROWN ORIOLE *ORIOLUS SZALAYI* NESTING IN THE SAME TREE AS THE HELMETED FRIARBIRD *PHILEMON BUCEROIDES*

GEORGE E. CLAPP

INTRODUCTION

The author reported the Brown Oriole *Oriolus szalayi* nesting in the same rain-tree *Saman samanea* as the Helmeted Friarbird *Philemon buceroides* in Popondetta in 1982 (Clapp 1982b). Between 2 May 1982 and 5 June 1982 more than eleven hours of observations were carried out. Nesting in each case was aborted by an unknown agency, in the case of the honeyeater at the nesting stage and in the case of the oriole still apparently at the incubation stage. Twenty-eight antiphonal duets by *Philemon buceroides* during the observation period confirmed the data in Clapp (1982a) on duetting in *Philemon buceroides* and confirmed that duetting in this species is performed by a mated pair. During the period in question not a single instance of direct aggression between the two species was observed. The possibility was raised of a dominance hierarchy between *Philemon buceroides* and *Oriolus szalayi* with the former being dominant. The bearing of the data on the striking similar appearance of

O. szalayi and *P. buceroides* was discussed and the conclusion reached that the data supported the rejection of Cody's (1974) proposal that interspecific aggression has caused the convergence in appearance. The present paper documents the second instance of Brown Orioles nesting in the same tree as a pair of Helmeted Friarbirds.

CIRCUMSTANCES

On 10 April 1983 Brown Orioles and Helmeted Friarbirds were noticed both nesting in the same tree, in the high covenant housing area in Popondetta, Oro Province, Papua New Guinea. It was evident from the state of the nests that the friarbirds must have commenced building first. The tree used for nesting was an Erima, *Octomeles sumatrana.*

The nests were typical for each species, the *Oriolus* nest was a medium shallow saucer suspended from a fork let from a lateral branch and situation near the very bottom of the canopy about one third of the way towards the bole; the *Philemon* nest was a deep cup suspended from a forklet from a lateral branch and situated approximately two-thirds of the way up the canopy and halfway in towards the bole. The *Oriolus* nest had a wispy tail of vegetable material hanging from the bottom and the *Philemon* nest, although not having one to start with, developed a wispy tail later. The two nests were both on the same side of the tree and were some eight or nine metres apart vertically.

OBSERVATIONS

The bulk of the observations was carried out on 28 separate days within the period 10 April 1983 to 25 May 1983 inclusive. There was a total of 31 hours and 22 minutes observations. Observations were made on 10-12 April inclusive, 16-18 April inclusive, 21-26 April inclusive, 1st May, 3-8 May inclusive, 10 May, 12 May, 14-15 May, 18-19 May, 21-23 May inclusive and 25 May.

NESTING OF WHITE-BELLIED CUCKOO-SHRIKE *CORACINA PAPUENSIS* IN SAME TREE

On 21 April the author noticed that a pair of White-bellied Cuckoo-shrikes *Coracina papuensis* was also nesting in the same tree used by the Friarbirds and Orioles. The author was not able, however, to follow the progress of this breeding attempt (two nests were difficult enough to watch simultaneously, three would have detracted from the value of the observations) and the last note was that on 21 May the *Coracinas* were observed sitting on the nest, which was situated near the top of the canopy, on the same side of the tree as the other two nests.

THE NESTING RECORD

The initial observations of nest building started on 10 April and both the Brown Oriole and the Helmeted Friarbird were building on this day. Both and definitely finished building by the end of 16 April; both were seen sitting on 17 April. The Friarbird was

first seen definitely feeding young on 5 May, and the Oriole was first seen definitely feeding young on 12 May. In both species, both male and female fed the young. The Oriole hatched two chicks as did the Friarbird. In each case the stronger chick emerged from the nest for the first time on 22 May, the Oriole chick being the first out of the nest at 12:41 and the Friarbird chick being out from the nest for the first time only a few minutes later. Each species definitely had one chick which was out of the nest and moving around fairly strongly on 22 May. On 23 May there was no sign of the Oriole chick but the Friarbirds were seen to be feeding one chick still in the nest while one chick was out and about.

Unfortunately it was not possible to carry out extensive observations on 23, 24 and 25 but on 25 May there was no activity from either the Orioles or the Friarbirds in the nest tree and it is assumed that by that time all four chicks had fledged. Certainly on 25 May two adult Friarbirds were seen with two fledgelings in the garden next to that in which the nest tree was situated and subsequently the adult Friarbirds were seen on later dates with their two juveniles. However it is not known what became of the Oriole chicks as they were not seen subsequent to the 22 May.

For the Helmeted Friarbird there is insufficient information to give the interval between finishing the nest and the laying of the eggs. It is however reasonable to assume that for the Friarbird incubation time is about 18 days and nestling time is about 18 days. As the Brown Oriole was seen to put the last touches to its nest on the 16 April, and as it was seen definitely sitting on 17 April, there may well be less than a day's interval between finishing the nest and laying the first egg. There is insufficient information in the case of the Brown Oriole to estimate the length of either the incubation or nestling time.

THE EVENTS OF 22 MAY 1983

There is no doubt this was the most significant day in the whole period of observations and it is worth recounting the events of this day in some detail.

First observations started at 11:45. Immediately it was noticed that one of the Brown Orioles was giving a different call; it was almost a double note, a slurred 'tschew' call. The similarity of this call to the Helmeted Friarbird's foraging/contact call was remarkable. The other Oriole was giving the usual rollicking call. The author considers it significant that this 'tschew' call had not been given by the Orioles during the whole period of observations, from 10 April, until it was heard for the first time on 22 May. This call has been heard from Brown Orioles in other localities and at other times but whether or not as part of a breeding situation is not known. The Oriole making the rollicking call approached to within one metre of the Friarbird's nest with no reaction from the perched Friarbird.

Observations ceased briefly at 11:50 and recommenced at 11:53. Then one Oriole came to the nest tree with food and another was calling continuously. One Oriole (whether the one with food or not is unfortunately unclear from the notes taken) approached to within one metre of the Friarbird nest. The other Oriole also came up to the vicinity of the nest but not as close. At 12:01 a Friarbird approached and chased the Oriole away from the nest. The Oriole with the food came down to another lower perch and the other Oriole went into a nearby tree. At 12:04 the Oriole with the food went to its nest and fed a chick. After some non-significant events it was noted at 12:13 that the Friarbird nest contained a chick moving around in it. Between 12:18 and 12:19 both the Oriole and the Friarbird fed their respective chicks. An Oriole which had arrived at the nest tree with food at 12:15 did not feed its chick at the nest until 12:36. At 12:22 the Friarbird came to its nest and fed its chick. At 12:27 the Friarbird chick was fluttering up on to the rim of the nest; it fluttered its wings and then went down into the nest again. At 12:36 the Friarbird came to its nest and fed a chick. At 12:41 an Oriole was calling and one Oriole chick was out of the nest, while the other stretched its neck up in the nest. Shortly afterwards (no more than three minutes at the most), the stronger of the two Friarbird chicks was up on the branch which held the suspended nest. At 12:53 the Friarbird came to the nest and fed its chick and at 12:58 both the Oriole and the Friarbird went to their respective nests and fed their chicks. Observations finished at 12:58.

Observations started again at 15:44 when it was noticed that an Oriole was moving all around the Friarbird nest at a distance of about two metres, uttering the previously described 'tschew' call note (harshly), and interspersing it with the normal Oriole rollicking call (medium strength). The Oriole fledgeling at this stage was sitting on a limb next to the Oriole nest, whilst the other adult Oriole was in the lower canopy of the nest tree. There was no sign of the adult Friarbirds or the Friarbird fledgeling. At 15:49 an Oriole was not far from the Friarbird nest when a Friarbird called and came to feed its young. The Oriole moved down level with its own nest while the Friarbird fed its chick. Then followed some non-significant events. At 15:51 a Friarbird adult usurped the perch where an adult Oriole was sitting, thus exhibiting Friarbird dominance over the Oriole.

At 15:58 the Oriole fledgeling was not visible and the parents, also invisible, were calling in a nearby tree. Both Orioles were seen near the Oriole chick just after 16:03 and the unusual 'tschew' call was being given.

After 16:15 a Friarbird came to the nest tree and fed its fledged chick. Shortly afterwards an Oriole came to the tree with food, the Friarbird fledgeling moved near to it and there was an encounter which the author did not observe clearly but which may have been the Oriole feeding the Friarbird chick. The Oriole then flew away and finally the Friarbird chick flew also. At 16:26 and again at 16:28 when the Friarbird came to

feed its chick in the nest there was an antiphonal duet with one bird on the nest rim and one in another tree.

At 16:40 the Friarbird fledgeling was seen on the top of the raintree. The 'tschew' call was being uttered by an Oriole. The two Orioles were then seen very near to the Friarbird chick. Then one of the Orioles came and sat right next to the Friarbird chick. Only a Friarbird call in the vicinity made it move, but both Orioles still stayed nearby. At this stage it was clearly seen that it was an Oriole that was uttering the 'tschew' call - the Friarbird fledgeling was apparently silent. Shortly afterwards all the birds flew.

Between 16:47 and 17:00 the Oriole fed its chick at the nest twice and the Friarbird fed its chick at the nest once. Between 17:00 and 17:17 there was feeding of both chicks by Friarbird and Oriole, also some antiphonal duets by the Friarbirds, in this case just after feeding and leaving the nest area. At 17:16 it was noticed that there were definitely two Oriole chicks in the nest. Observations finished at 17:21 but at 17:27 there was an instance of vicious aggression by the two Friarbirds against an Accipiter spp.

POSSIBLE ANTIPHONAL DUET BY *ORIOLUS SZALAYI*

On 21 April an instance was noted of possible antiphonal duetting by the two Orioles. The possible duet consisted of a pair of calls by Bird A - a long clear upslurred and then downslurred whistled call with a shorter call at the end; this was followed instantaneously by a somewhat shorter pair of calls by Bird B - an upslurred call with an approximately equal duration downslurred call. This pattern was repeated several times perfectly. After that the calls were also given again but clashed. So perfect were the initial several instances of Bird B's calls following those of Bird A, and given the fact that on several other occasions the author heard possible duets in *Oriolus* (i.e. outside of the scope of this paper), that this is believed to be at least an incipient antiphonal duet.

ANTIPHONAL DUETTING BY *PHILEMON BUCEROIDES*

During the period of observations the author recorded 52 antiphonal duets by *Philemon*. Of these eight duets spread over four separate days, were initiated by the bird with the higher pitched tone (Clapp 1982b), whilst seven duets spread over six separate days, were started by the bird with lower pitched tone. One instance was noted of a bird changing its notes halfway through an antiphonal duet but still inter leaving them (Clapp 1982b). Several instances were noted of antiphonal duets being performed while one bird was on the nest and the other elsewhere (Clapp 1982b).

During the same period 150 bouts of solo calls were noted, but a bout here is only a term of convenience, as the field notes were never intended to indicate the exact number of solo calls, and a bout as used here could be anything from one call to many.

AGGRESSION

During the period of observations the following instances of definite aggression were recorded. Five instances of Willie Wagtails *Rhipidura leucophrys* pursuing Helmeted Friarbirds from nearby trees into the Friarbird/Oriole nest tree. One instance of two Willie Wagtails harassing a Helmeted Friarbird which was in its nest; eventually the *Philemon* left the nest and was chased by the wagtails into a nearby rain-tree (on the same day, 24 April, the author twice noted two wagtails fiercely attacking another small unidentified bird nearby). One instance on 16 April of a White-bellied Cuckoo-shrike *Coracina papuensis* buzzing an Oriole in the nest tree; it is interesting to note that a Friarbird immediately came close to inspect the situation and that the Cuckoo-shrike did not persist with buzzing. One instance on 22 April of a Helmeted Friarbird attacking a large lizard near its nest; the second Friarbird came to the vicinity but did not join the attack and the lizard retreated. One instance on 22 May of two *Philemon* chasing off an *Accipiter* spp. so viciously that they beat it to the ground momentarily and then sent it off altogether. One instance of an *Accipiter* spp. chasing a Brown Oriole which had stolen nesting material from the hawk's nest in a nearby Klinkii Pine tree; the hawk desisted because of harassment by two Willie Wagtails. Two instances of aggressive posturing by the *Philemon* towards the *Oriolus*, both on 24 April and both shortly after the *Philemon* had been chased into the nest tree by the Willie Wagtails, indicating a possible spillover of aggression. Lastly one instance on 22 May of the *Philemon* aggressively chasing off an *Oriolus* from the vicinity of its nest.

In addition there were four clear-cut instances of dominance exhibited by the *Philemon* over the *Oriolus*, expressed by the simultaneous taking over by the *Philemon* of the perch that the *Oriolus* was on, as the *Oriolus* moved out submissively. One of these took place on 23 April, two on the 24 and one on the 22 May. There was also a less clear cut instance on 21 April.

FEEDING THE YOUNG

A) *Philemon buceroides*

Between 5 May and 23 May inclusive, covering nine separate days, there were 32 definite observations of adults feeding young. Of these most were merely noted as 'food', two were definitely large praying mantis, three were definitely large unidentified insects, one was listed as an insect, and one was almost certainly a cicada.

In addition there were nine presumed feeding instances observed. On two other occasions the adults were seen to catch a large green praying mantis but is not known whether they were subsequently fed to the chicks. On one occasion an adult Friarbird hunted for eight minutes, ignoring small ripe figs near it, before it finally caught the presumed cicada and fed it to the chick.

Intervals between successive feedings varied widely and randomly ranging from one minute to 53 minutes, and in such a way that it would be quite misleading to quote any

average. Elapsed time between when the adult bird was first seen with the food and when it fed the chick was in most cases very brief and on only one occasion did it reach two minutes.

B) *Oriolus szalayi*

Between 12 May and 22 May inclusive, covering five separate days, there were 16 definite observations of adults feeding young. Of these, most were merely noted as food, three were almost certainly fruit (small globular, reddish objects held in the open break), and two were probably small grubs or caterpillars. There were also four presumed feeding instances observed.

Intervals between successive feeding varied widely, ranging from one minute to 55 minutes, and in such a random way that it would be inappropriate to quote any average.

Of great interest was the elapsed time between when the adult bird was first seen with the food item and when it actually fed the chick. On twelve occasions these elapsed times were excessive: they were 15, 8, 19, 29, 45, 2 1, 12, 21, 4, 13, and 10 minutes respectively. With the other feeding occasions there was no appreciable elapsed time. During these extraordinary intervals between arriving with food and feeding it to they young, the adult bird would continually shift from perch to perch, approach the nest, retreat, approach again, retreat, and so on. On several occasions the adult bird waited until the other oriole arrived in the vicinity again before feeding the chick. It is in fact worth noting one instance in detail.

At 07:48 on the 15 May an adult Oriole flew into the nest tree with food, apparently fruit, in its beak. At that stage the bird was on the same side of the tree as its nest. At 07:56 an Eclectus Parrot *Eclectus roratus* flew overhead and called, at which the Oriole shifted its perch over to the other side of the tree. At 08:01 a sneeze by a person going along the road also apparently startled the Oriole. At 08:15 the other adult oriole flew into the nest tree and perched below and to the right of the Oriole's nest (the nest being on the left hand side of the tree from the observer's viewpoint). At 08:32 the first Oriole with the food finally moved to the nest and at 08:32:15 it fed the chick, flying away at 08:33. There was a total elapsed time of 44 minutes during which the Oriole with the food was constantly shifting its perch, on a number of occasions moving nearer to the nest then away from it.

Another extraordinary incident worth noting in detail occurred on 22 May. At 16:15 an adult Friarbird came to the nest tree with food, fed the Friarbird chick and flew away. It should be noted here that the Friarbird chick was out of the nest. Then an Oriole came to the nest tree with food at approximately 16:16. The young Friarbird came near to the Oriole. There was a brief 'encounter' which the author did not see clearly because

it was so quick and unexpected, but the Oriole then flew away out of the tree. The encounter was not an aggressive move, the birds came together briefly. Later the young Friarbird also flew away. The 'tschew' call given by the Oriole was heard again at 16:20. After the 'encounter' the Oriole that had arrived in the nest tree with food in its beak should normally have gone to feed its young but did not do so, instead it flew away. The author is quite certain that the identification of the Friarbird chick was correct, as the Friarbird had fed it earlier. The balance of probabilities is therefore that the Oriole fed the Friarbird chick.

AMOUNT OF TIME SPENT IN THE NEST TREE

During 7% of the total observation period only an Oriole or Orioles were present in the nest tree, for 17% of the time there was only a Friarbird or Friarbirds in the nest tree, for 67% of the time individuals of both species were present and for 9% of the time neither adult Friarbirds nor adult Orioles were apparently present. The Oriole, however, did spend considerable time perched in a close neighbouring tree slightly below the level of its nest, so the stated time for the Oriole being present at the nest site may well be misleading.

DISCUSSION

The first point to be made about these observations of *P. buceroides* and *O. szalayi* in the proximity nesting situation is that they indicate a connection between the mimicry by *O. szalayi* of *P. buceroides*, not only with general feeding assembly advantages, but with anti-predator advantages for both species. They complement the feeding situation observations mentioned by Diamond (1982).

The fledging time appeared to be the significant event towards which everything was leading. Although hatching did not appear to be closely coordinated between the two species, the initial fledging of the stronger chick of each species occurred within minutes of each other on 22 May; at 12:41 for the Oriole and no more than a few minutes later for the Friarbird. This can be regarded as remarkable timing, particularly as it can be presumed there were at least several days between the hatching of the two species' eggs.

Also significant is the 'tschew' call, so similar to the foraging/contact call of the Friarbird, which the Oriole only started giving on 22 May, the day when the chicks of both species first fledged. It is possible that this mimicry is to accustom the young Friarbird to accepting the Oriole as another parent 'Friarbird' very early in its life. The normal rollicking Oriole call was interspersed with the 'tschew' call. Subsequently the Friarbird chick which it grows up to be an adult might be inclined to accept the Oriole as an 'honorary conspecific' because of the auditory and visual conditioning. Certainly the 'tschew' is the closest Brown Oriole call to any call of the Helmeted Friarbird. Another Oriole call is a long drawn out whistle that recalls the general

quality and character of a Friarbird cell. Of course, in tone and volume the Brown Orioles songs are similar to those of the Helmeted Friarbird, even if the character of the songs are different.

Two of the favoured perches of the Friarbirds were: 1) on a level with the Oriole nest but at the rear of the nesting tree and 2) slightly above the level of the Oriole nest and four or five metres to the right. Both perches were considerably below the Friarbird nest. Proximity of the Friarbird to the Oriole's nest would be advantageous to the Oriole, giving better anti-predator insurance to the latter's nest, as the former would be alert to predators. As yet there is no explanation as to why the preferred Friarbird perch is below instead of level with its own nest. One may also consider the possibility that the Friarbird, by deliberately stationing itself near the Oriole nest and away from possibility that the Friarbird, by deliberately stationing itself near the Oriole nest and away from its own nest, may be using the Oriole nest as a 'sacrifice'. If a potential predator sees the Friarbird sitting close to the Oriole nest it may not notice the Friarbird nest and in any subsequent absence by the Friarbird such a predator might turn its unwelcome attention to the nest which the Friarbird was apparently guarding.

Increased protection for the Friarbird's nest could occur when only one bird, an Oriole, is present in the nest tree, and as that bird resembles a Friarbird, then both nests are apparently protected by a bird that has a pugnacious reputation. This would be advantageous to both species.

Both species would also derive greater protection from predators because there is greater immunity by being part of a group, in this case a loosely knit 'group' (see Bertram in Kress & Davies, 1978). The mimicry of the Friarbird by the Orioles makes it seem that there are more than two Friarbirds. Before hatching it would appear that there are not two but four 'Friarbirds', and after hatching it could conceivably appear that there were eight 'Friarbirds'. So potential predators which are aware of the Friarbirds' pugnacity would tend to leave the 'Friarbirds' alone when it sees an apparent 'group' of them. Vocal mimicry would further enhance this deception. Again both species would benefit.

In this context we should note that the *O. szalayi* mimicry of *P. buceroides* in New Guinea is not perfect (Diamond, 1982). Mimicry of *P. subcorniculatus* by *O.forsteri* on Ceram in the Moluccan Islands is almost perfect, so the group appearance argument would be more applicable there. Unfortunately we do not know whether these two species practice proximity nesting on Ceram.

The observed percentage of time spent at the nest by the two species would provide a distinct advantage to the Oriole if it nests in proximity to the Friarbird. If for 17% of the time there are only Friarbirds present in the tree, then for that amount of time there

Oriole's nest would gain protection that it would not otherwise have because if the Friarbirds were not present then there would be no birds guarding the nesting tree. For the same reason there is some advantage to the Friarbirds when only Orioles are present (7% of the time) and both species gain from the 'group' anti-predator deception during the 67% of the time that both Friarbirds and Orioles are in the nesting tree.

Diamond (1982) postulated that the advantages to the Oriole, in the Oriole/Friarbird mimicry situation in Australasia are first, that the mimic (Oriole) escapes attacks from the larger species (Friarbird) that might otherwise drive it off, and second, that the mimic, by resembling the larger bird, may derive higher status in the eyes of smaller species and may succeed in scaring them off with less effort because of its appearance.

However this appears to be only part of the solution. Anti-predator protection probably does play an important role in this mimicry situation, particularly with regard to protection of eggs and young. At the same time the author believes that there is an unsolved aspect to this puzzle, and that is the relationship between the young Friarbird and the adult Orioles, also possibly the relationship between the young Orioles and both the young and adult Friarbirds. We have observed that there is a relationship but we do not yet know enough about it nor can we formulate a theory as to its meaning.

Wallace (1863, 1969 in Diamond, 1982), may have been partially right when he theorized that mimicry was an answer to predation by birds of prey, but he should have used the more general term 'predators'. It is well known that nests in tropical areas are much less successful than nests in temperate areas in part because of the high level of predation by snakes, lizards, raptors and other birds and animals.

During these observations the Helmeted Friarbirds fended off at least two potentially serious predators: one *Accipiter* spp. and one large lizard. There can be no doubt that at least some potential predators would be wary of attacking either the bird itself or the nest of a bird that resembled a Helmeted Friarbird, if once that predator had been attacked by a Friarbird.

What is the overall significance of these observations? It is probable that we are looking at an evolving situation. The Brown Oriole does not always nest in close proximity to Helmeted Friarbirds but it appears we have a special proximity nesting arrangement in which there is both visual and vocal mimicry, and from which both species may derive some advantage. There appears to be an element of timing so that both species fledge their chicks at the same time.

The extreme nervousness displayed by the Orioles in feeding their chicks at the nest, as shown in the long elapsed time between the adult first appearing with food and subsequently feeding it to the chick, cannot be explained at this point. There was

definite alternating behaviour, presumably caused by a conflict of underlying tendencies. Several times the Orioles would approach almost to the nest with the food and then retreat again. Certainly the phenomenon needs explanation. Could it be that the resemblance of the Oriole chick to the Friarbird chick induces an approach/fear conflict in the adult Oriole?

The data on antiphonal duetting by the Helmeted Friarbird reinforce data already collected (Clapp, 1982(a); Clapp 1982(b)). It is assumed that the higher, pitched and lower pitched birds are female and male respectively although there is no hard evidence to support this assertion. At any event it is clear that either male or female may initiate an antiphonal duet, as the number of instances of duets initiated by either lower or higher pitched calls were approximately equal (seven versus eight).

Last, the author agrees with Diamond (1982), that we need more data from field studies on the interactions of Friarbirds and Orioles. As well as general field studies on the *Oriolus/Philemon* complex, it would be particularly enlightening to have field data of species in places where the mimicry is almost perfect, such as on Ceram in the Moluccan Islands. Particular attention needs to be paid to nesting of the two species in circumstances where they practice proximity nesting. Crucial observations would be of the young just before and after fledging.

The author extends his thanks to Professor J.M. Diamond of UCLA for assistance.

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BLACK TERN *CHLIDONIAS NIGER* AT MOITAKA SETTLING PONDS, CENTRAL PROVINCE - FIRST RECORD FOR THE NEW GUINEA REGION

BRIAN W. FINCH

On 18 May 1985 the author was accompanied by Tim Murphy (visiting from Brisbane), Eric Shackleton and David Cormac (visiting from Melbourne), and we were calling in at Moitaka at 16:00 hrs on the off-chance that something of interest might be there. In view of the date, nothing out of the ordinary was expected.

Immediately on getting out of the vehicle BWF checked a party of terns feeding at the in-flow pipe of one of the new ponds. Amongst the Whiskered Terns *Chlidonias hybrida*, and Gull-billed Terns *Sterna nilotica*, was bird that was immediately recognised as a black Tern *Chlidonias niger*, and BWF drew attention to it. The bird was in complete immaculate breeding plumage.

The other observers and the author were all familiar with this species in its usual range, and everyone agreed on the identification. After we had watched the bird for several minutes it flew off towards Waigani Swamp and did not reappear.

The following day (15:00 hrs), Tim Murphy and the author returned to Moitaka, this time accompanied by Paulene and Bob Kibble. The Black Tern was located amongst the other terns on the muddy spit which used to be the bank between the two larger tanks,but which has now been removed. This three-hundred metre long strip of muddy hummocks is very attractive to birds and they cannot be disturbed on foot. These ideal conditions have caused other palaearctic species to remain much later than normal: fifty Common *Sterna hirundo*, four Little Terns *Sterna albiforns*, five white-winged Black Terns *Chlidonias leucoptera*, one each of Black-tailed Godwit *Limosa limosa*, and Pectoral Sandpiper *Calidris melanotos*. The last named was particularly unusual for the time of year and the only individual member of all of the above-named that was in nuptial plumage (apart from the Black Tern).

After a short while the Black Tern flew from the spit with a party of Whiskered Terns to feed at the in-flow pipe at the place where it had first been discovered. After feeding for about fifteen minutes, the bird flew back towards and over us, and rested again on the spit.

DESCRIPTION

The head and entire underparts down to the lower belly are immaculate black; undertail coverts to vent, and a slight tracing on to the hind flanks are white. The mantle, entire

wing area, rump and tail are uniform pale slate. In the strong sunlight the bird showed a most attractive bluish cast when seen from some angles. The underwing was wholly greyish-white contrasting starkly with the black of the underparts in a straight line demarcation. The underwing coverts were very pale greyish-white, whilst the undersides of the flight feathers were darker. The undersides of the first few primaries were a much darker grey. When the bird was seen from front-one or nearly so, a narrow but very conspicuous white line could be seen along the leading edge of the wings from the body to the carpals. The blackish bill was long and slender, the feet reddish and the tail quite obviously forked.

HABITS

When feeding, the birds showed much more grace than the Whiskered Terns, dipping and swooping from a greater height, and when rising it traced more gentle arcs than that species. The wings, which appeared broader and fuller, seemed to enable a greater precision of movement. Sometimes the bird would dash about madly zigzagging all over the area, playfully diving at and being dived at by other terns for no apparent reason but in away that was typical of the *Chlidonias* terns. The whole effect was that of a more graceful flyer than all other terns present.

Although the White-winged Black Terns preferred to rest rather than feed and did not allow for a direct comparison, nuptial plumaged birds had been seen recently. Whilst they are more graceful "bouncier" flies that Whiskered Terns the author gained the impression their wing strokes are shallower than this Black Tern's and their swooping more abrupt. When resting the Black Tern favoured raised clods of mud rather than flat ground.

COMPARISONS WITH WHITE-WINGED BLACK TERN IN BREEDING PLUMAGE

In spite of the close relationships between *C. niger* and *C. leucoptera* and the difficulty in separating the two species (except in juvenile plumage, when *leucoptera* has a very dark saddle), the differences in breeding plumage are many.

BILL: The black bill of *niger* is longer and more slender than the short, almost Little Gull-like, red bill of *leucoptera*. It is the short bill of *leucoptera* that always reminds the author of a small gull (particularly Little Gull *Larus minutus*) when observing the resting bird. The winter head pattern only enhances the resem blance. The slender bill of *niger* combined with the solid black crown in winter plumage is in every way typical of terns.

WINGS: The underwing of *leucoptera* is extensively black on the coverts, showing as an extension of the black underparts; the line where the wings join the body is indistinct. The undersides of the flight feathers are stark whitish with grey tips. The underwing of *niger* is the reverse: there is no black on the underwings at all, and the contrast where the wings join the body is startling. The underwing

coverts are greyish white, whilst the undersides of the flight feathers are darker. From the upperside *leucoptera* has wholly white wings apart from some greyer edging to the flight feathers. This is sharply contrasted against the black back and mantle, which is as black as the head and underparts. This in turn contrasts with the pure white rump and tail. The entire upper surface of *niger* is bluish-slate, and the back of the head merges into the slaty grey of the upper back.

RUMP AND TAIL: The rump and tail of *leucoptera* are pure white, contrasting sharply against the black of the back and mantle. The tail is shallowly forked. Because the entire upper parts of *niger* are more or less uniform, the bird is subtle when compared with the arresting black and white of *leucoptera*. The tail of *niger* is more deeply forked.

DISCUSSION

Black Terns are a very long way out of their normal range when they visit the Australia Region. Their breeding range is widespread in North America, but in Eurasia is mainly confined to Europe and extending to the Upper Yenisei and Russian Turkestan (Vaurie, 1965). Records east of the line are very few. There is a single sight record from Delhi in India, which Ali & Ripley consider as doubtful (Ali & Ripley), 1968). There have been a few records in Japan, which could relate to the North American race *surinamensis*. There is also a record from Hong Kong, where yet again the author considers the record doubtful (Webster, 1976).

The entire North American population winters in South America, whilst the Western Palaearctic population *niger* winters entirely in tropical and sub-tropical Africa. Up to the present, three individuals have found their way to the Australasian region, all to Australia. There are two records for New South Wales: Tuggerah Lakes, September 1958, and Kooragang Island, Newcastle, January to March 1968: and one for Western Australia at Lake Joondalup, December 1973. All of these records related to birds in non-breeding plumage, (Pizzey, 1980). This most attractive individual at Moitaka constitutes only the fourth record for the Australasian Region, and the first to be discovered in full breeding plumage. The extensive white on the vent and undertail coverts suggests that this individual is a member of the Western Palaearctic race *niger*.

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BOOK REVIEW

The birds of Papua New Guinea including the Bismarck Archipelago and Bougainville. Volume 1; by Brian J. Coates, 1985. Adelaide: Dove Publications. Pp 464. ISSN 0 9590257. Price in P.N.G. K70.00.

This magnificently illustrated book treats the birds of political Papua New Guinea, the first to do so. Volume 1 takes us through the non-passerines, dealing with 377 species of the 740 which will be covered by both volumes. Volume 2 will also include summaries of the birds of Irian Jaya and the Solomons.

The opening chapters introduce the characteristics of the bird fauna of the Papuasian subregion and its origins; the physical features, climate, and vegetation of Papua New Guinea; a listing of habitats with their representative bird species; and some miscellaneous notes of features of the avifauna. In the systematic section for each species there is a description, a summary of its distribution, notes on habitats, altitudinal range, ecology and breeding, and a listing of recorded subspecies. For nearly all species there is a map showing the probable distribution (shaded), with particular sightings or specimens shown by spots. Finally there are indices and a good bibliography. The whole is sumptuously illustrated with almost 500 colour photographs and a further 44 line drawings. There are maps on the front and back covers, showing places mentioned in the text. Topography of Papua New Guinea and the Port Moresby region.

I found the opening chapters useful, though the vegetation section is a direct summary from Paijamans (1967). The species reports vary from short accounts to long discussions several pages in length. The depth of coverage varies with the extent of the author's experience with that species. The notes are uniformly well written and interesting. Of particular value are the distribution maps, not previously available in any book about PNG birds. Occasionally there are errors, for example the maps for the Slate-breasted Rail and that for the Bare-eyed Rail appear to be reversed.

A long standing irritation for non-professional birders is the lack of standardisation of English names. It seems a shame that the author has in some cases used names which will be different from those used in the forthcoming field guide (Beehler *et. al.* 1986) which, it is to be hoped, will set the standard.

It is for the photographs that this book is most to be valued. The coverage varies, Port Moresby birds being generally better represented. Some species are given wide spreads, such as the Thick-billed Group Pigeon with nine pictures on pages 42, and 295-300. But one can see that the author would have found difficulty in leaving out any of his best shots. Some species photographs are disappointing, for example the

pictures of Brown and Black-billed ('Bar-tailed') Cuckoo-Doves on page 264 are not very useful in assisting identification. In all 232 species, about 60%, are photographed, and it would be unreasonable to expect the author to delay publication while waiting for wider coverage. The bulk of the pictures are of excellent quality and are beautifully reproduced. However, I found the method of labelling the plates extremely irritating. The small reference numbers at the corners of pages mean that they eye has to travel to three different places and back to verify the caption and the picture.

The book is a little difficult to categorize. It remains a very personal account, relying heavily on the author's own experience. It is emphatically not a field guide. Few would be capable of carrying it out of doors, let alone rich enough to risk exposing it to the weather. I think that it succeeds in two ways, firstly as a 'coffee table' book for browsing through a beautiful record of Papua New Guinea's unique avifauna, and secondly as a comprehensive reference book for the region. It will certainly be a welcome addition to any ornithologist's library and I look forward avidly to Volume two.

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