PATTERNS OF VARIATION AND DISPERSAL IN THE BUFF-BANDED RAIL (Gallirallus philippensis) IN THE SOUTH-WEST PACIFIC, WITH DESCRIPTION OF A NEW SUBSPECIES

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ABSTRACT

Geographical variation in the Buff-banded Rail (Gallirallus philippensis) in the south-west Pacific is reassessed in the light of the origin of island stocks and nomadism. Nomadism appears to have diluted divergent evolution on small islands and (sub) continental mainlands throughout the region, and from it lines of colonisation from mainland sources have been adduced. There appear to be no justifiable subspecies on mainland Australia, and others on islands in the Bismarck Sea are open to question; one new subspecies, *G. p. tounelieri,* is described from cays in the Coral Sea.

INTRODUCTION

The Buff-banded Rail *(Gallirallus philippensis)** is one of the most polytypic and dispersive of rails. From what seem to be source populations in Australia and New Guinea, it has colonised islands throughout the south-west Pacific, even the smallest cays, diverging in isolation there to a greater or lesser extent. Mathews (1911), Mayr (1938, 1949), Junge (1953) and Ripley (1977) have summarised much of the variation throughout the region. Different island populations towards the southern, eastern and northern periphery show parallel trends towards darkening of the dorsum and loss of the rufous pectoral band. Flightlessness, another well-known characteristic of rails on islands, is not evident except in New Zealand and islands nearby. Rather, the wings of most forms are rather attenuated, with the second outermost primary usually longest, pointing to use in long flights. The penchant of the Buff-banded Rail for dispersal appears to have led to re-invasions of islands, and consequent gene-flow may have slowed the rates of evolutionary change and modified its direction in different islands or archipelagos.

The interplay of these factors is considered in the following review of regional variation. Material for the study came from Australian State and Commonwealth museums (AM, ANWC, NMV, QM, SAW, WAM), the National Museum of New Zealand (NMNZ), the Canterbury Museum, Christchurch (CMC), the American Museum

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* In New Zealand called the Banded Rail, **Rallus philippensis** — Ed.

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of National History (AMNH) and the Musee national d'Histoire Naturelle, Paris (MHNP). It includes specimens gathered by de Naurois and CSIRO Division of Wildlife Research in the Coral Sea.

TABLE 1 — Measurements (in mm) of specimens of Buff-banded Rail from selected areas in the south-west Pacific (from material in Australian state and commonwealth museums, the National Museum of New Zealand, the Canterbury Museum, Christchurch, and the Musee national d'Histoire Naturelle, Paris). In samples of three or more specimens, only means ± one standard deviation are given; for breadth of breast band, range and mean (in parentheses) are given.

Locality	Sex	No.	Wing	Tarsus	Exposed culmen	Culmen/ wing ratio	Breadth of breast band
New Zealand	♂	3	137.3±0.6	41.6±1.9	34.9±5.2	.25±.04	0-15 (10)
	♀	3	130.7±2.5	40.9±4.4	33.2±2.1	.25±.02	5-18 (13)
Lord Howe Island	-	2	135,149	41,44	28.5,32.8	.21,.22	15
Norfolk Island	-	1	140	41	29.6	.21	13
South-western Australia north to 22°S	♂	8	142.9±7.3	40.3±3.0	30.8±2.1	.23±.02	0-20 (15)
	♀	7	138.8±11.1	40.5±2.7	31.3±3.2	.23±.02	10-20 (18)
North-western Australia (Kimberley Division to Gulf of Carpentaria)	♂	4	143.5±2.4	41.8±2.2	21.8±2.9	.11±.01	13-30 (20)
	♀	7	140.5±2.9	40.0±2.3	29.4±1.2	.11±.01	12-30 (19)
South-eastern Australia south of 26°S	♂	37	146.3±5.2	41.1±2.2	31.4±1.9	.21±.01	5-22 (16)
	♀	39	142.6±5.1	39.1±1.8	29.6±1.9	.21±.01	0-25 (16)
North-eastern Australia 18-26°S	♂	17	147.1±5.2	41.7±1.6	31.8±1.8	.22±.01	0-22 (14)
	♀	12	139.8±5.7	39.0±2.6	30.0±1.5	.21±.01	5-25 (15)
Islands in Torres Strait	♂	2	147,150	41,43	31.4,33.0	.21,.22	20,25
	♀	2	129,137	34,42	23.9,27.6	.19,.20	5,25
Islands of northern Great Barrier Reef (Raine, Chilcott, Pelican)	♂	5	133.2±8.0	38.8±1.6	31.2±1.2	.23±.01	10-25 (14)
	♀	6	130.2±4.8	37.8±1.0	28.6±0.4	.22±.01	6-20 (11)
Islands of Coral Sea (Willis, Chesterfield, Surprise groups) and southern Great Barrier Reef (Bunker Group).	♂	3	140.3±8.5	40.0±2.7	33.4±1.0	.24±.01	0-12 (6)
	♀	6	124.8±4.6	36.5±2.4	28.4±2.3	.23±.01	0-12 (5)
Central montane Papua New Guinea	♂	2	145,148	43,46	32.0,32.6	.22,.22	8,15
	♀	2	137,145	40,43	27.9,28.9	.20,.20	5,11

ASSESSMENT

New Zealand

Divergence and invasion in the *philippensis* group of rails seem to have been most complex in New Zealand (cf Olson 1975 and *in* Ripley 1977; Ripley 1977: 70). There, the various forms of the Weka *(Gallirallus australis)*, as the sole survivors of some early radiation, represent the original stock. Their region of origin, like that of other possible members of the *Gallirallus* group of rails in the South-west Pacific, is obscure. Olson (1973), following Mayr (1949), showed them to be derivatives of the *philippensis* group that became large and dull in plumage, and lost the power of flight in parallel with the Takahe *(Porphyrio mantelli)**. The Buff-banded Rail itself, which we include here in *Gallirallus* after Olson (1973), apparently arrived later; and the evolutionary distance between it and the Weka is now too great to permit interbreeding and gene flow between them.

Buff-banded Rails on mainland New Zealand are morphologically closest to those in Australia, and, like so many other New Zealand birds (e.g. *Porphyrio p. melanotus* and *Zosterops lateralis)*, they probably came from there. Since their arrival, they have diverged subspecifically. Although they have the same dorsal and ventral pattern and tone as Australian populations, they differ in their longer and more slender bills (Table 1) and usually have narrower or incomplete rufous breast bands, duller chestnut collars and shorter longest secondaries. All of these characters vary, to the extent that occasional individuals barely differ from Australian birds in any way. It suggests that gene flow from Australia to New Zealand may be continuing.

The origins of now extinct satellite forms on Macquarie *(G. p. macquariensis)* and the Chatham Islands *(G. p. dieffenbachii* and *G. modestus)*** are more difficult to unravel because of the mixing of morphological characters in *macquariensis* and the very distinctiveness of *dieffenbachii* and *modestus;* we decline to guess. Traits combined in *macquariensis* were polymorphism, short bill and wing, dark dorsum, and broad rufous breast band, whereas *dieffenbachii* stood apart in its curved bill, extensive dorsal and ventral barring, short legs, and shortened remiges tending towards flightlessness. *G. modestus,* probably an earlier invader of the Chathams than *dieffenbachii,* acquired flightlessness and perhaps the colour pattern and small and slender-headed form of a true *Rallus* through neoteny (cf Ripley 1977: 96). For more general details, see Mathews (1911), Delacour in Mayr (1949), Oliver (1955) and Ripley (1977).

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* In New Zealand called **Notornis mantelli** — Ed.

** All three are included in the genus **Rallus** in New Zealand nomenclature —Ed.

Australia

Australian populations have been divided into two or three subspecies. Those in south-western Australia are said to be darker dorsally than those in the east (Mathews 1912), and smaller and more rufous on the hind neck (Ripley 1977); and those in northern Australia ranging to southern New Guinea are thought smaller than those in the south (Mayr 1938) and to have a narrower, deeper breast band of rufous (Mayr 1938, Junge 1953, Parker 1970). Our examination of much larger series from south-western and northern Australia than were available to previous revisers (Table 1) indicates firstly that there is no geographically consistent variation in Australian populations, and secondly that birds from these populations range north across Torres Strait to southern and western New Guinea (also Rand 1942; Junge 1953). All should be combined under a single subspecies *G. p. mellori* (Mathews) that includes as well *G. p. randi* (Mayr & Gilliard) from the Snow Mountains of Irian Jaya (cf Rand 1942; *pace* Mayr & Gilliard 1951).

Adults throughout Australia are alike in plumage except for the breadth and intensity of the rufous band on the breast. This band, which is usually complete, pale rufous and 10-20 mm wide (allowing for vagaries in the preparation of specimens), varies individually rather than geographically (Table 1). It averages just as wide in the four specimens we have seen from Torres Strait as in 89 from southern Australia, and is no darker (*pace* Parker 1970). Moreover, it is rarely obsolete except in immatures which may be otherwise identified by their duller chestnut facial stripes and collars, duller white dorsal spotting, brownish (not red) irides, and duller bills; their primaries, however, do not seem to be appreciably more pointed than in adults (cf Fullagar & Disney, in press, for *Tricholimnas sylvestris*). Thus, the bright rufous nuchal area on the type of *mellori* Mathews from south-western Australia (cf Greenway 1973, Ripley 1977; not seen by us) may reflect only age. The backs and shoulders of adults are not very variable, and they are paler and more olive in tone than in other subspecies, and spotted more finely with white. Specimens that Mayr (1938) and Junge (1953) record from south-western New Guinea and the Moluccas, and others that we have seen from Torres Strait, are little darker than most Australian specimens.

There are no consistent geographical trends in size either (Table 1; *pace* Mayr 1938; Parker 1970). Birds from north-eastern Australia and Torres Strait are just as large as those from south-eastern Australia, and those in the west, although averaging a trifle smaller, overlap eastern birds widely. On the other hand, there seems to be much local variability, only some of which can be attributed to differences in age and wear within samples. The more limited material measured by Mayr (1938) and Junge (1953) from southern New Guinea and islands in the Arafura Sea, although averaging smaller, is similarly variable and falls within the range for the relevant sex in Australian series. We stress that females average smaller than males everywhere.

That variation in plumage markings and size is individual rather than broadly geographical suggests continual, if haphazard interchange between and within local or regional populations. Parker *et al.* (1980) have drawn attention to seasonal movements in southern Australia which, according to our data, seem to be part of a wider pattern of more irregular nomadism, responding perhaps to the seasonal and unseasonal appearance of surface waters and to the growth and die-back of suitable fringing cover.

All specimens and records from far-northern Australia mentioned by Deigan (1964) and Parker (1970) and others in the ANWC collection are from July to October when the rails are most often seen in southern South Australia. There are also records, including breeding, from other parts of northern Australia over the wet season, between December and May (e.g. Barnard 1914, Crawford 1972; H. B. Gill, pers comm.; specimens in ANWC, NMV, WAM). The proportion of specimens in Australian museums taken there in those months is one in four. This, curiously, is the very same as the proportion from south-eastern Australia, which the rails are thought to leave then (Parker *et al.* 1980).

The rails may simply be more secretive in summer months, after their main breeding (e.g. North 1913; Dunlop 1970). Dunlop found them to be fairly sedentary in permanent habitat on the central coast of eastern Australia, and Gill (1970) and Bravery (1970) record them throughout the year in north-eastern Queensland. Some, nevertheless, may disperse north during the first half of the year, reaching southern New Guinea and the Moluccas (cf Junge 1953: 16), notwithstanding that nearly all specimens have been taken there between July and September (cf Mayr 1938, Rand 1942, Junge 1953). That the rail commutes frequently between northern Australia and southern New Guinea is suggested not only by the circumstantial similarity between Australian and south-western New Guinean birds (cf Rand 1942, Junge 1953) but also by at least one record in January from the lighthouse rock of Booby Island in Torres Strait where, among nomadic rallids, *Porzana pusilla, P. tabuensis* and *Poliolimnas cinereus* have also been picked up in transit between Australia and New Guinea (specimens in QM).

New Guinea

In northern and eastern New Guinea, the Australian form is replaced by darker and more richly coloured rails (Gloger's rule). Their crowns and hind necks are much deeper chestnut, their backs blackish and more heavily marked with white, and their rufous breast bands deeper in tone, yet often obsolete as well. Of the three subspecies described (Mayr 1938, Mayr & Gilliard 1951), only two seem to be valid: *lacustris* Mayr with white-spotted mantle and completely barred belly in the northern lowlands, and *reductus* Mayr with white-barred mantle and unbarred mid-belly in the east. A third from the central mountains, *G. p. wahgiensis* (Mayr & Gilliard), was based on four specimens that were darker than *reductus,* smaller in wing and bill, and had broader rufous breast bands. Nevertheless, another four specimens from the Wahgi Valley and Mt Giluwe in AM and ANWC *(terra typica* of *wahgiensis)* bridge the supposed differences between *wahgiensis* and *reductus* almost perfectly (see Table 1). Affinity between populations in lowland eastern New Guinea (e.g. *reductus*) and those adjacent in the central mountain ranges (e.g. *wahgiensis*) is common (Mayr & Gilliard 1954).

Coral Sea

Buff-banded Rails on the cays in the Coral Sea west to the Great Barrier Reef are also rather different from those of mainland Australia, as pointed out by Parker (1970). Collectively they average darker dorsally than Australian and New Zealand populations (including their chestnut nuchal collar), have narrower to obsolete rufous pectoral bands, and, though small in wing like New Zealand *assimilis,* have rather shorter bills approaching Australian *mellori* (Table 1). Parker (1970) referred them to *G. p. yorki* (Mathews), but the type of *yorki* from Cape York Peninsula, like other specimens from Torres Strait nearby, falls more within the range of Australian *mellori.* Although small with a wing of 134 mm (M. K. Le Croy, pers. comm.), it is a female with the pallid tone and well-developed pectoral band of Australian populations. Accordingly, we treat our series from the Coral Sea as a new subspecies, naming it after a colleague of de Naurois, *Gallirallus philippensis tounelieri,* n. subsp.

Holotype, in Musee National d'Histoire Naturelle, Paris: female adult; Ile Longe, Chesterfield Islands; coll. R. de Naurois, 21 Sept 1975; measurements (mm): wing 127, tail 58, tarsus 33.3, exposed culmen 29.5.

Description (from 8 males, 12 females): Crown dull olive to hair brown, usually heavily mottled with black; chestnut facial stripe and nuchal collar duller and darker than in *R. p. mellori;* back dark, heavily mottled black on olive, with white spots usually smaller and sparser than in *R. p. mellori;* chestnut bars on outer vanes of middle remiges usually narrower than intervening areas of dusky black and often rounded into spots; ventrally like *R. p. mellori* but with variably narrower and darker rufous band on the breast (0 - ± 25 mm wide, mean ± 9 mm); wings (mm), males 123-150 (mean 135.9), females 121-138 (mean 127.5); tarsus (mm), males 36-42 (mean 39.2), females 34-41 (mean 37.2); exposed culmen (mm), males 29.8-34.3 (mean 32.0), females 27.2-29.7 (mean 28.5).

Distribution: Coral islets of Coral Sea (Willis, Chesterfield and Surprise groups north to south-eastern New Guinean archipelagos) and Great Barrier Reef (Raine Island south to Bunker group). The specimen described by Mayr (1938) from the China Straits at the south-eastern tip of New Guinea as being intermediate between the New Guinean subspecies *G. p. lacustris* (Mayr) and *G. p. reductus* (Mayr) fits better with this form morphologically and geographically. A female, it is small with a wing of 139 mm and approaches *tounelieri* in dorsal tone and markings and dull narrow rufous breast band. Its differences of a blacker mantle and completely barred belly, on the other hand, suggest gene flow from Papuasian populations.

Although there is a remarkable overall similarity between the specimens from all Coral Sea islets, there is also local variation among them, mainly in size and development of the rufous breast band. Such intrinsic variability may not be due just to the founder effect but also to occasional, overseas interchange between the populations on adjacent islet groups. This may even be augmented by additional gene flow from Australian, New Caledonian and perhaps even New Zealand sources. Evidence for interchange among local populations comes from the general morphological similarity between the specimens on the different islets and the erratic appearance of rails on cays along the Great Barrier Reef (H. B. Gill, pers. comm.). Such movements may well have contributed significantly to the rapid build-up in the population on Heron Island during the late 1960s (Cooper 1948, Kikkawa 1970; cf Macgillivray 1928). It leads us to suggest (after Diamond 1974, Ripley 1977: 16-19) that the cays of the Coral Sea are colonised by a rather mobile island 'tramp' subspecies.

Evidence for gene flow comes from the greater frequency of Australian *mellori* characters in specimens from cays on the Great Barrier Reef close to Australia, and of New Caledonian *swindellsi* characters in those further east towards New Caledonia. Specimens from the Great Barrier Reef, for example, often have slightly paler dorsa and more distinct pectoral bands than those on the Chesterfield and Surprise islands near New Caledonia, and vice versa; those from the Surprise Islands, furthest from the Australian coast and closest to New Caledonia, are the darkest of all (aff. *swindellsi*). The flow, nevertheless, does not appear to have been strong enough to affect the overall morphological integrity of the populations on the cays. In birds on Heron Island, for example, the rufous pectoral band averages much narrower and is more frequently obsolete than in those on the Australian mainland only 70 km away. Of 22 individuals observed in December 1979, 18 had variably narrow and incomplete bands and 4 lacked them entirely (L. L. Short, pers. comm.). Gene flow in the opposite direction, from the Coral Sea outwards, cannot be traced in our material, almost certainly because it is drowned in the larger gene pools on mainland Australia, New Caledonia and other chains of large land islands.

Peripheral island groups in the South-west Pacific

The morphological characteristics of populations on islands to the east and north of the Coral Sea have been reviewed in detail by

Mathews (1911) and Mayr (1938, 1949). From material we have seen, *G. p. sethsmithi* (Mathews) of Vanuatu and Fiji is most like Australian populations in its general colour and markings while approaching Coral Sea birds in its reduced to obsolete pectoral band. It is, nevertheless, bounded geographically by much darker forms with more heavily black-barred ventral surfaces on New Caledonia (*swindellsi* Mathews) and in the southern Solomons (*christophori* Mayr). This patchwork pattern of variation suggests that these populations within and surrounding the Coral Sea were derived, at one time or another, directly or indirectly from Australia and not eastern New Guinea. Mayr (1938) also concluded that the birds in the Solomons arrived from the south, probably from Vanuatu.

Further southwards, we have seen one specimen from Norfolk Island (type locality of *norfolkensis* Mathews) and another two from Lord Howe Island in AM and ANWC. All three are indistinguishable in colour, markings and measurement from Australian *mellori* (Table 1). Judged from the accounts of Hindwood & Cunningham (1950) and McKean *et al.* (1976), Buff-breasted Rails are not permanent on these islands; those birds that have been found there are apparently episodic immigrants from Australia and, perhaps, New Zealand.

Eastwards are the outlying forms *G. p. goodsoni* (Mathews) and *G. p. ecaudatus* (J. F. Miller) in Samoa and Tonga respectively, apparently differing from each other mainly in size and in depth of dorsal tone (cf Ripley 1977, Kinsky & Yaldwyn 1981). There may be some inter-island movement among them, judged from the build-up in numbers in Niue Island from the late 1950s onwards (Wodzicki 1971) and the apparent variability of local populations: compare the conflicting characters described by Mathews (1911), Murphy (1924) and Ripley (1977) from different series of specimens. Birds on intervening Nuie are closest to *goodsoni* (Kinsky & Yaldwyn 1981). This form, despite the likelihood that it is derived from sources in southern Melanesia (e.g. Fiji, Vanuatu), approaches still darker forms in the eastern Bismarck Archipelago, particularly *G. p. meyeri,* in its bright chestnut crown, white-barred mantle and loss of the rufous pectoral band (cf *G. p. reductus* of eastern New Guinea). Perhaps the most likely explanation is not gene flow from the Bismarck Archipelago — which would be buffered by populations from the Solomons south to New Caledonia — but random fixation and selection within the small founding colonies originally reaching the islands.

Bismarck Archipelago

As Mayr (1949) has pointed out, the smaller islands of the Bismarck Archipelago appear to have been colonised from New Guinea. All forms from these islands have the rich, dark tones of New Guinean birds: deep chestnut napes, blackish dorsa with a tendency to white barring on the mantle, large white spots on shoulders and wings, and deep rufous pectoral bands. Differences between them are in fact so slight that the five or six subspecies distinguished among them by Mayr (l.c.) need further study and confirmation. In the limited material available to us, the tone of the crown and nape, the form of the white marks on the mantle, the presence of black barring in the rufous pectoral band, and size all vary individually within samples from each island group. Even the widths of black-and-white bars on the ventral surface and the rufous-and-black bars on the primaries seem unreliable because they tend to differ most between samples from neighbouring islands: compare *G. p. meyeri* of New Britain and Witu with *G. p. lesouefi* of New Hanover and the Hibernian Islands.

The slight inter-island variation that there is is of the chequer-board type, making it difficult to trace the routes of dispersal through the Bismarck Sea by morphoclines. Nevertheless, traits grouped and tabulated by Mayr (1949, Table 1) indicate that populations in the Admiralty, Ninigo, Anchorite and Hermit Islands in the western Bismarck Sea — *admiralitatis* Stresemann, *praedo* Mayr and *anachoretae* Mayr — are all inter-related. According to their combination of characters, they were probably derived from sources in northern New Guinea, but whether from *lacustris*- or *reductus*-like forms, or both, is not clear. Despite the geographical proximity of *lacustris* today, tendencies toward unbarred bellies and white-barred mantles in the island samples suggest at least some gene flow from *reductus* to the east.

Rails from New Britain, New Ireland and fringing islands in the eastern Bismarck Sea also seem to be inter-connected to one another and derived from adjacent parts of northern New Guinea independently of those to the west. They are particularly heavily barred with black and white across the lower ventral surface, and have vestigial rufous pectoral bands clearly barred with black, traits which seem to be correlated. Two forms are involved: *meyeri* Hartert from Witu and probably New Britain close to New Guinea, and *lesouefi* Mathews to the north on New Hanover, New Ireland (?) and the Hibernian Islands (Mayr 1949). Judged from the intermediacy of *meyeri* in barring on the wings and ventral surface, this group was derived from *reductus* in north-eastern New Guinea and terminates in small, dark and heavily barred *lesouefi*.

DISCUSSION

The present distribution of the Buff-breasted Rail in the south-west Pacific has been derived by dispersal from two sources: Australia and northern New Guinea. Australia is the primary centre. Rails from there still reach the Moluccas, southern New Guinea, and Norfolk and Lord Howe Islands; and, directly or indirectly, they have colonised New Zealand, Macquarie Island, the Chatham Islands, New Caledonia, cays in the Coral Sea, Vanuatu, the Southern Solomons, Fiji, Samoa and Tonga. Northern New Guinea is a minor centre, from which the birds have spread no further than the Bismarck Archipelago and islets in the Bismarck Sea. The precipitous central cordillera of New

Guinea, its great spine ranging from 3000 to 5500 m high, divides Australian and northern New Guinean populations and appears to be an important barrier to dispersal.

One general and unremarked pattern throughout the region is a tendency for distant populations to look more like one another than those on adjacent islands. An example is *G. p. sethsmithi* of Vanuatu and Fiji, which resembles Australian *mellori* more than *christophori* and *swindellsi* flanking it in the southern Solomons and New Caledonia. The latter two, moreover, approach each other morphologically more than they do intervening *sethsmithi.* In the Bismarck Sea, Mayr's (1949: 10-11) and our data show that several samples from adjacent islands share more traits with distant forms on mainland New Guinea than they do with one another. Thus *"praedo"* of the Admiralty Islands, although small, has the barred belly and narrow breast band of *lacustris* of mainland New Guinea, whereas *"anachoretae"* of the nearby Anchorite Islands has a plain belly like New Guinean *reductus,* is large in size like New Guinea *lacustris,* and has a much broader rufous breast band than any of these forms.

Some of these disparities and similarities undoubtedly result from random fixation and selection in the original founding populations. Nevertheless, the consistency of morphological links with mainland populations suggests sporadic gene flow from there as well, reaching each island independently. Some adjacent island groups in the Bismarck Sea could have been colonised directly from New Guinea mainland, rather than by interchange between each other. Even so, Coultas (in Mayr 1949) found Bismarck Sea rails to be much more abundant on tiny sand cays and islets used by colonially breeding seabirds than on main islands; and observations from these islets since (H. L. Bell, pers. comm.) indicate that the rails fluctuate dramatically in numbers from time to time. Populations there, it seems, may have the same nomadic ecology as those in the Coral Sea, and wander from island to island as seabirds are breeding, exploiting the pickings and perhaps breeding then. Here, as Salomonsen (1976) predicts, "insularization" may beget the colonisation of islands generally. In such circumstances, gene flow can be expected to be haphazard throughout the region, the characteristics of populations on particular islands being continually sifted, augmented and recombined according to the effects of irregular bottlenecks in numbers and frequent chance immigration. To recognise subspecies among them may prove to be rather misleading.

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SHORT NOTE

TERNS PERCHING ON WIRES

In a valuable chapter on Black-fronted Terns, *Clidonias albistriata (sic),* Edgar Stead mentioned that occasionally they use most unexpected perches. " One day in June, I saw a Black-fronted Tern sitting on the post of a wire-fence around a ploughed paddock, while nearby another was actually sitting on the wire, balancing itself by spreading its wings every now and then." On another occasion at Lyttelton Harbour, he saw eight sitting on posts and four on the top wire of a fence which ran some distance out into the water.

During the winter of 1952 in the Bay of Plenty, Bernard Sladden paid special attention to the visiting Black-fronted Terns between May and August. On 19 July, he was watching as " 15 alighted on top of the battens of a fence "; but none actually on the wire. Latham (1981: 229-230) also noted this preference for fence battens as an inland roost in the Bay of Plenty.