NOTORNIS

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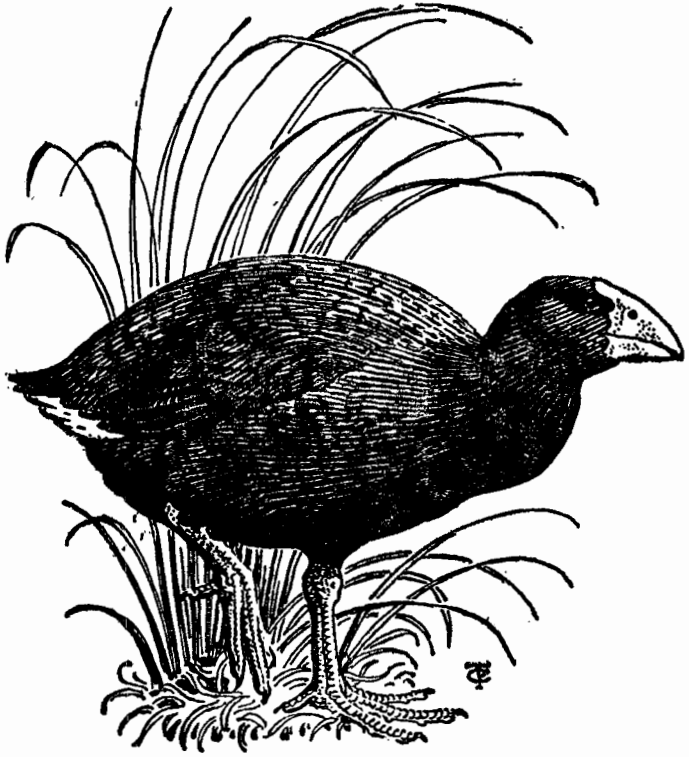

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THE DISPERSAL MOVEMENTS OF THE ROYAL ALBATROSS (Diomedea epomophora)

By C. J. R. ROBERTSON and F. C. KINSKY

ABSTRACT

An analysis of 122 recoveries of banded Royal Albatrosses of both subspecies, indicates a dispersal of non-breeding birds, with prevailing westerly winds from the breeding localities to winter feeding areas and then back to the breeding grounds. Evidence is given to show the progressive longitudinal movement of known age birds during the first twelve months of flight and the full circumpolar movement of this species in an easterly direction.

INTRODUCTION

The two subspecies of the Royal Albatross are known to breed only in the New Zealand region; *D. e. epomophora* at Campbell Island and the Auckland Islands (Enderby Island) and *D. e. sanfordi* at the Chatham Islands and Taiaroa Head, Otago Peninsula. Little credence is given to the presumed record by Dabbene in Murphy (1936) of breeding at Tierra del Fuego as it is based on the supposition that Royal Albatrosses found in the South Atlantic could not have come from the New Zealand breeding grounds and, therefore, must have originated from a local breeding population. The second-hand report of large white birds seen ashore, and nesting near Lake Cami in the interior of Tierra del Fuego has never been confirmed.

Because of difficulties in distinguishing between the Wandering Albatross *(Diomedea exulans)* and Royal Albatross at sea, Dixon (1933) combined all his sightings of the genus *Diomedea* and states that they are confined between 30°S and 60°S, being more common in northern latitudes in winter and in southern latitudes during summer. He noted the significance of the progressive shifting of the centre of abundance from West to East with each season as if the birds moved with the prevailing winds. Kuroda (1957) postulated that movements coincide with oceanic wind circulations and that there is no evidence to show any major movement against the wind in long distance movements. He further suggested a correlation between wind movements and deep oceanic currents producing major food sources at upwelling points.

Tickell & Gibson (1968) provided good evidence that Wanderers favour particular winter feeding grounds distant from their breeding colonies, but state that the theory of " eastward circumnavigation in the west wind zone " is still lacking factual support. They stated also that while there is little evidence to prove a westward migration,

a combination of the two may well prove to be the answer. They found that with Wanderers there was nothing to indicate any tendency to travel in one particular direction. However, Tickell (1968) suggested when referring to the New South Wales winter feeding area for the Wanderer and the similar South American area for Royals, that the difference in areas is probably a consequence of the positions of the banding stations and a similar predominantly easterly movement from each. This however, is based more on evidence provided from Royals than from Wanderers.

Though the Wandering Albatross is recognised as being circumpolar by Watson *et al.* (1971), they suggested that the Royal Albatross is probably also circumpolar although there are no confirmed reports for Africa or the Indian Ocean, and stated that there is no information to prove that *D. e. sanfordi* ranges as widely as *D. e. epomophora.* This latter statement is in conflict with evidence shown by Murphy (1936, 1950) as well as by Falla (1938) and Richdale (1939, 1965). Tickell (1970) stated that there is no reason, based on the speed of flight, why both Wanderers and Royals could not circumnavigate the Southern Hemisphere several times in a year.

Undoubtedly, the major problem in studying the dispersal movements of the Royal Albatross has been the hazard of identifying the species accurately at sea. Some 49 Royal Albatrosses of unknown subspecies have been banded in New Zealand coastal waters between 1956 and 1967. However, the extensive banding of the Royal Albatross at its breeding grounds and especially at Campbell Island during the 1960s has been designed, in part, to provide data on dispersal movements.

The total numbers banded in New Zealand since 1937 is shown in Table 1.

TABLE 1

ROYAL ALBATROSSES BANDED AT VARIOUS LOCALITIES

Locality and Period	Adults of Unknown Age	Non Flying Chicks
Taiaroa Head (1937-72)	42	85
Campbell Island (1943-70)	8012	12176
Enderby Island (1963-66)	53	-
New Zealand Coastal Waters (1956-67) subspecies unknown	49	-
	8156	12261
TOTAL	20417	

RESULTS

Up to 1972 some 2400 band recoveries of Royal Albatrosses were received (Robertson 1972*a*) with 123 of these being recovered away from the immediate banding locality. Sorenson (1954) recorded the details of a fledgling, banded on Campbell Island in 1943 and recovered at El Tabo in Chile during March 1944. This was the first proof that birds of the New Zealand population reached South America. In 1957 an adult bird of unknown age and subspecies banded in New Zealand coastal waters during 1956 was recovered at Huoicolla, Chile, and reported by Kinsky (1960). Because its breeding locality is unknown this record is not included in the analyses reported here. Since then, a further 121 recoveries from the three breeding localities have been reported to us, and these are of considerable importance in assessing the dispersal of both adult and immature Royal Albatrosses. Though the details of each recovery are not reported in this paper all records are held by the New Zealand National Banding Scheme.

Szijj (1967) suggested that an important factor in the lack of data on the Royal Albatross might be the scarcity of ship tracks crossing the South Pacific in winter. Although this is probably true, large parts of the range of the *Diomedea* species lie outside major shipping lanes. A large proportion of recoveries discussed here come from fishermen in the S.W. Atlantic which confirms this area as a major feeding ground for the Royal Albatross where for some parts of the year, especially the winter, they seem to be the major representative of the *Diomedea* species (Dabbene *in* Murphy 1936). However, returns from the Japanese tuna fisheries from the Indian Ocean have contributed substantially to the interpretation of the data given below. A recent increase of recoveries and sightings of the Royal Albatross in the Australian region where occurrences are still considered rare (Gibson & Sefton 1962; Rogers 1970; Simpson 1971) may indicate a change in habits, but is probably also attributable to improvements in techniques of identification.

The distribution of recoveries is shown in Fig. 1 and Table 2, where, for ease of interpretation, recoveries are grouped into 6 geographical regions.

Data from studies at Campbell Island and Taiaroa Head have shown that breeding adults successfully rearing a chick are as a rule absent from their breeding places for about 12 months before returning to breed again. Fledglings, following departure, are not seen at the breeding grounds for at least 4 years and more generally 5-7 years. Observations on Taiaroa Head (A. Wright *in litt.*) suggest that immature birds returning to the breeding area for the first time, following their departure as fledglings, have not been on land for the entire period of their absence. This is shown mainly by the unsteadiness and apparent weakness of their legs on landing for the first time, and throughout the first 2-3 days following their return, a feature not shown by adults after their one year absence.

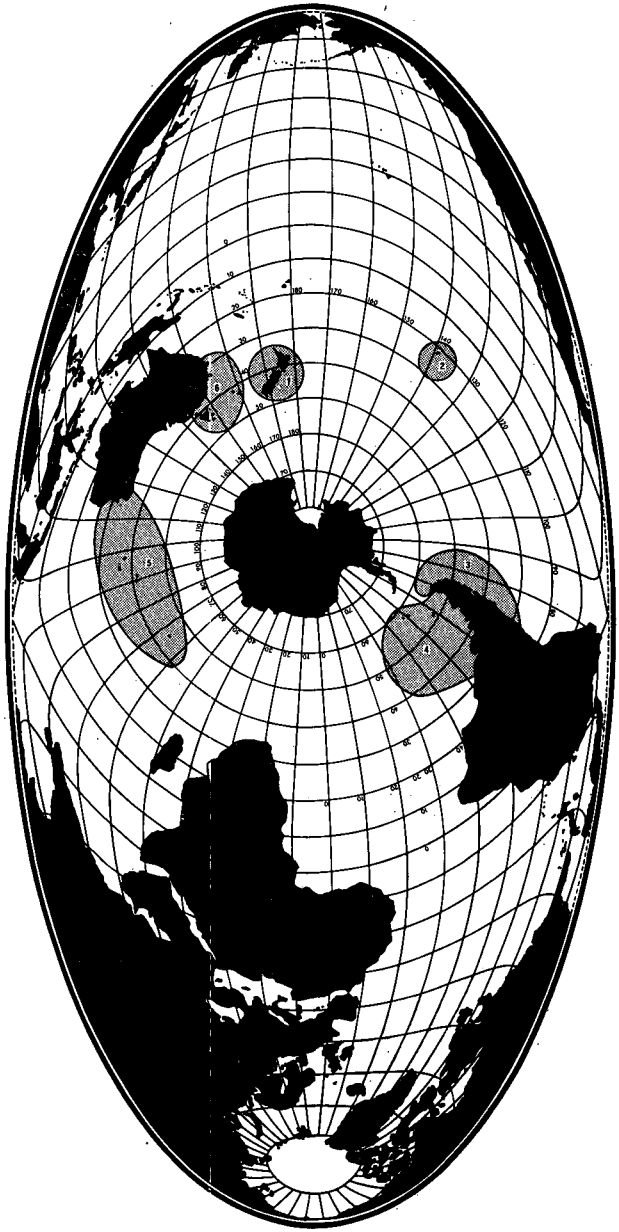

FIGURE 1: Geographical distribution of Royal Albatross band recoveries. (Numbers are shown in Table 2 and recoveries from Regions 2, 5 and 6 are shown).

TABLE 2

DISTRIBUTION OF RECOVERIES OF ROYAL ALBATROSSES
According to Geographical Regions shown in Figure 1

Region	Known Age Birds (Years Only)							Adults of Unknown Age	Total
	0-1	1-2	2-3	3-4	4-5	5-6	6-7		
1	8	1	1		1			20*	31
2	1							-	1
3	25	1	1					3	30
4	9	12	4	6			1	13**	45
5	1		1	1				3***	6
6				2		1	1	5	9
TOTALS	44	14	7	9	1	1	2	44	122

* Includes two sanfordi from Taiaroa Head
** Includes one sanfordi from Taiaroa Head
*** Includes one epomophora from Enderby Island

The most significant feature of Table 2 is the general relationship between the position of recovery and the age of known-age birds. the data assembled in Table 2 show a strong indication of a progressive increase in the age of birds recovered, starting from Regions 2 and 3 and progressing further east around the southern hemisphere to Region 6 (see also Fig. 1). Dixon's (1933) suggestion of movement with the prevailing winds is, therefore, supported by the progressive aging of known age Royal Albatrosses recovered along the route of the prevailing west winds. We suggest that most of the newly-fledged birds move from New Zealand to South America and thence to the S.W. Atlantic for a period before moving east with the prevailing westerlies back to the breeding grounds. The only major exception is one recovered dead near Perth, West Australia, during March or approximately 4 months after fledging.

The distribution, according to latitude and longitude, of recoveries of known age birds from Campbell Island less than one year after fledging is shown in Fig. 2. This gives further support to the hypothesis of movement with the prevailing wind, but also shows a marked northward movement during the summer across the Pacific which is in conflict with Dixon's observations for the *Diomedea* species. However, there is striking evidence to show a relatively brief stay in Chilean waters with a movement to the S.W. Atlantic by the winter. The recovery in Tahiti (Robertson 1972 *b*) possibly represents the extreme northward extent of the Pacific movement though the exact date of arrival is uncertain.

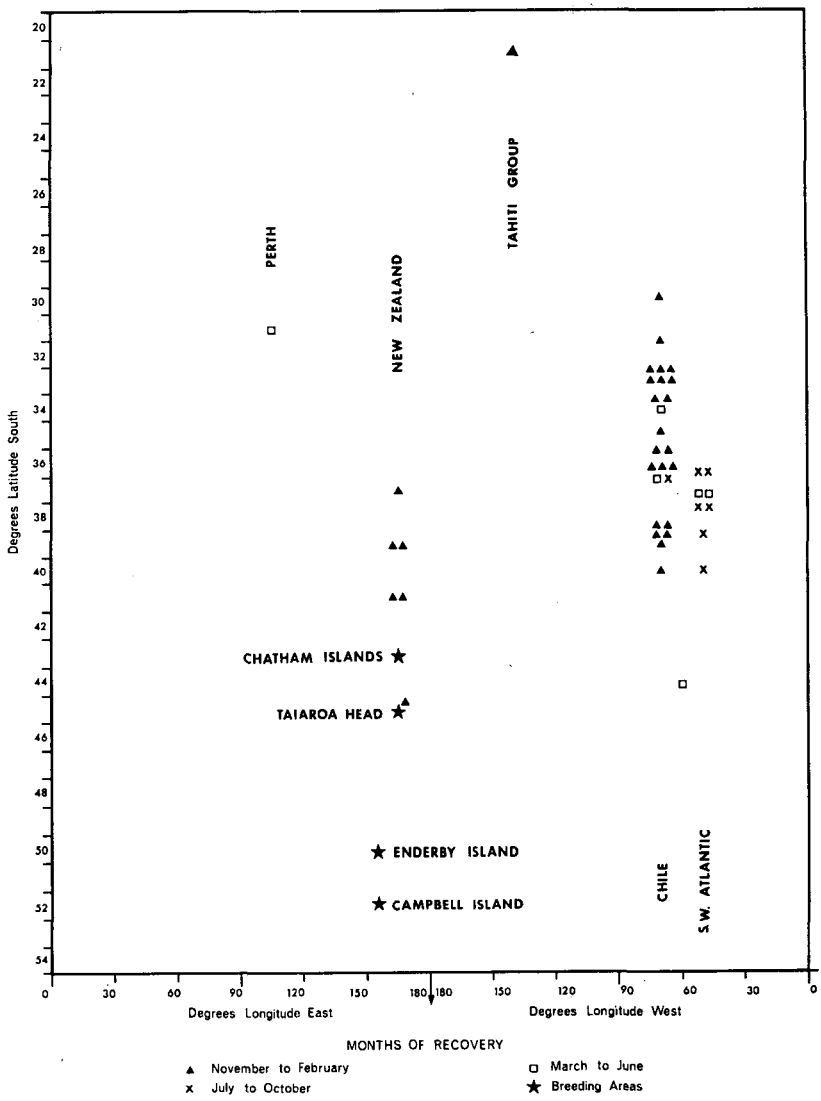

FIGURE 2: Distribution of Royal Albatrosses aged 0-1 years according to time and locality of recovery. (Refers to Campbell Island birds only).

Tickell (1968, 1970) produced evidence to support movements of 100-200 miles per day in adult Wandering Albatrosses and we have one record of an adult Royal which moved at an average rate of 91 miles per day from the time of banding on Campbell Island to live-recovery in Chile. As the departure date is unknown this obviously represents a minimum average speed. Six recoveries of fledglings from Chile during December indicate speeds at least equivalent to those already proposed. Hence, it is possible in the time period recorded, for the bird recovered near Perth to have arrived there by the full circumpolar route with the prevailing winds, although the possibility that it could have moved against the prevailing wind to West Australia as an exception cannot be discarded.

In the latitudinal and longitudinal distributions of birds according to time of year shown in Figs. 3 and 4 some general trends are suggested.

(1) The main range of distribution for adults and immatures is shown as between 30° and 45°S.

(2) In contrast to Dixon's (1933) observations for the *Diomedea* species there is some indication that the distribution is concentrated in lower latitudes during the winter, but this may be caused by movement around the southern tip of South America from the Pacific to S.W. Atlantic, and a possible bias in Dixon's observations caused by the generally more southerly breeding range of the Wanderer in summer.

(3) The concentration of immature birds between one and seven years in the S.W. Atlantic may be a reflection of human fishing intensity, but can also reflect a seasonal dependence on this feeding area.

(4) The contrasting latitudinal range of adults and fledglings in December and January must be balanced with their longitudinal position. These two months reflect an adult mortality in the New Zealand region during the early breeding period, while early fledgling mortality seems to be indicated by recoveries at the start in the New Zealand region and at the completion of the first Pacific crossing in Chilean waters.

(5) The longitudinal distribution of adults during autumn and winter shows a concentration in the New Zealand region and the S.W. Atlantic. This probably indicates differences in location between breeding and non-breeding birds.

(6) Immature birds returning for the first time to the breeding area generally do so from December to March, according to age, with subsequent arrivals earlier in the season. The longitudinal distribution in Fig. 4 indicates a movement pattern of adult and immature birds towards the New Zealand region from August to March which would further support the hypothesis of easterly movement in the westerly wind belt.

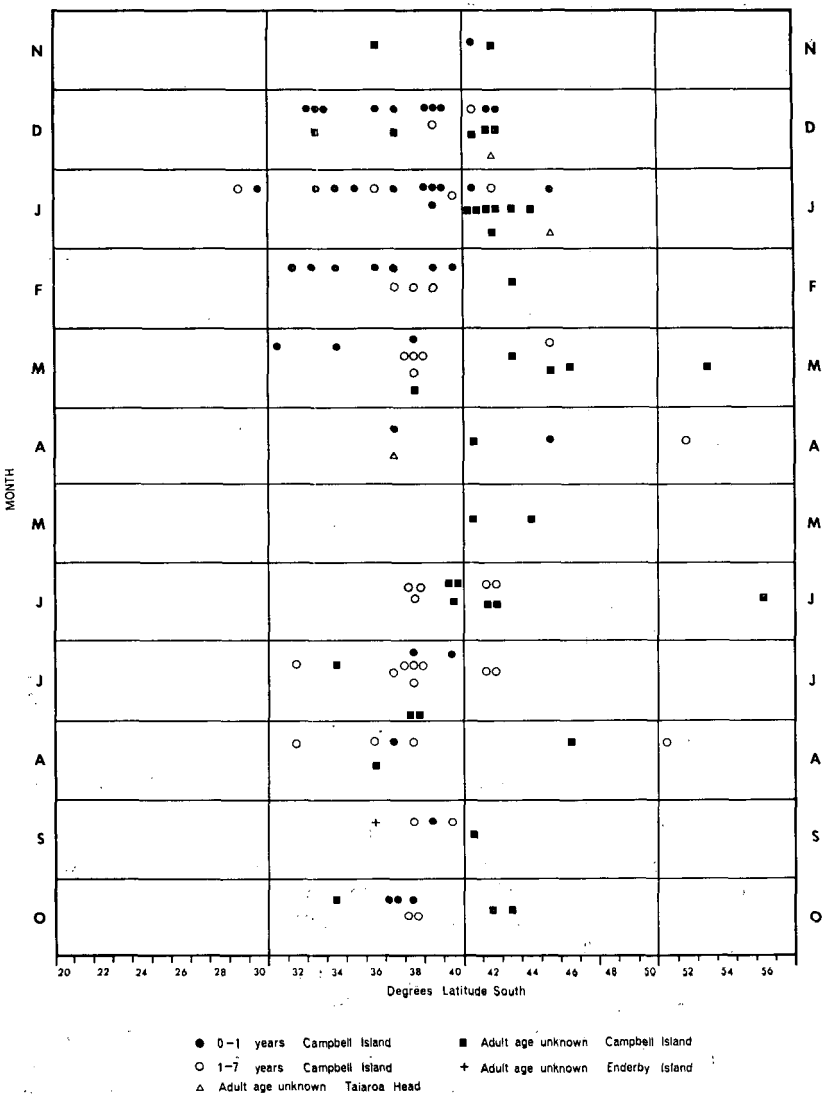

FIGURE 3: Latitudinal distribution of Royal Albatross band recoveries according to month and age when recovered. (N.B.: Tahitian recovery not shown).

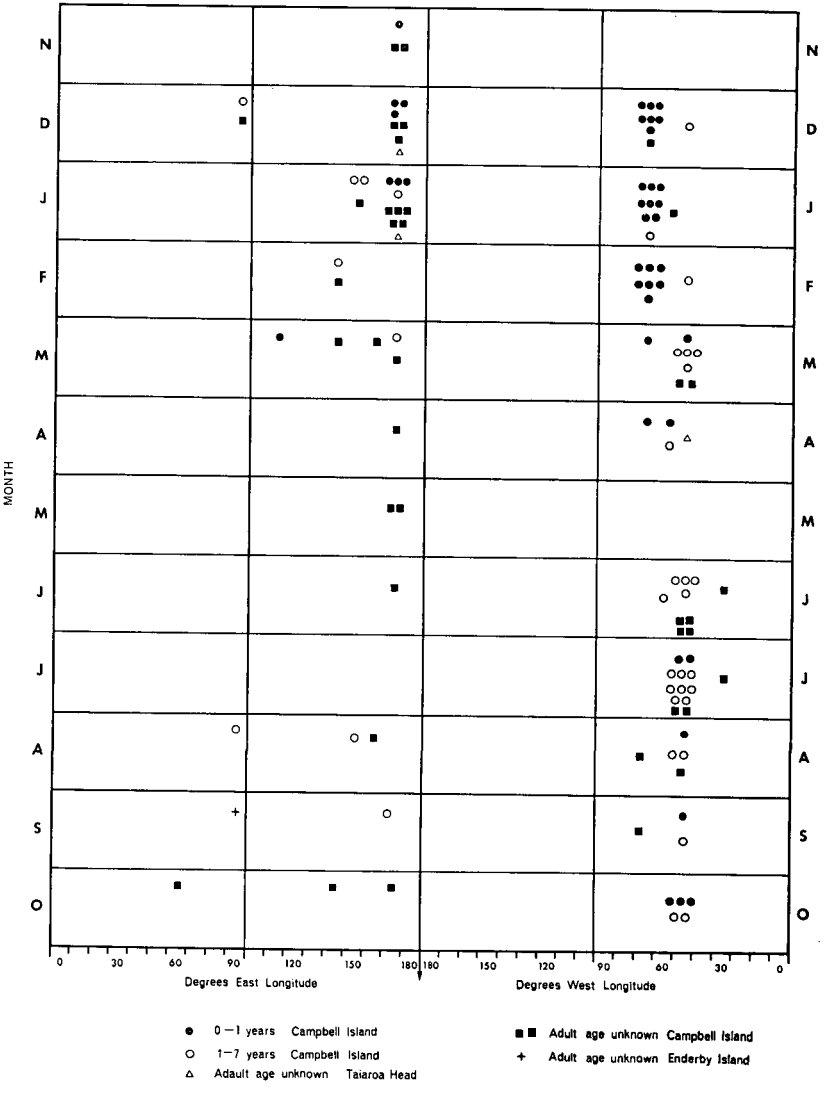

FIGURE 4: Longitudinal distribution of Royal Albatross band recoveries according to month and age when recovered. (N.B.: Tahitian recovery not shown).

(7) It has been stated that birds breeding successfully are not present on breeding grounds during the following year. The case of D13, a bird banded as an adult at Taiaroa Head in 1938 some 20 years before recovery overseas, is significant as it is at present the only record of movement to South America in the non breeding "holiday" year between two years of successful breeding. (Richdale 1965: 144, and in litt.).

The movements of failed breeding birds and immatures during the period from late summer to spring when they are not present at the breeding grounds are open to conjecture. Though more evidence is required on this point one record of a bird banded in March at Campbell Island as either an immature, or a failed breeder and later recovered in the S.W. Atlantic suggests a similar movement to that occurring in fledglings and successfully breeding adults going on "holiday". Further, the recovery of two birds under 3 years old (see Table 2) in New Zealand waters can indicate that full circumpolar wanderings may occur during the period before return to the breeding area, or that some immatures remain in New Zealand waters without wider dispersal. However, the evidence already presented does not enhance this latter view.

DISCUSSION

The recovery of banded Royal Albatrosses gives support to the observations of Dixon (1933) that the *Diomedea* species move with the prevailing winds during a circumpolar dispersal.

A graphical representation in Fig. 5 of Dixon's data (1933: Table 2) shows some match with the seasonal distribution of Royals obtained from banded birds. The major complication in comparison of the two sets of data lies in the fact that whereas Wanderers breed in a circumpolar distribution, breeding Royals are confined to only one geographical sector. Hence, if Wanderers do move with the prevailing winds to distant winter feeding grounds the combination of all *Diomedea* observations becomes clouded by the movements of Wanderers from different geographical areas. Gibson (1967) suggested that the range of measurements of captured Wanderers is sufficiently varied to show that the Australian region is visited by representatives of all breeding areas.

Accordingly, the recorded movement of Royals may lend support to any hypothesis on the movement of Wanderers in spite of the slight evidence of a reverse movement reported by Tickell & Gibson (1968). As these reverse movements are of only short distance, it is possible to rationalise them as local movements caused by adverse local climatic and feeding conditions.

There is little evidence in Royals to confirm Dixon's observations of a latitudinal movement according to season. This may indicate a difference between the movements of Royals and Wanderers emphasised by the more northerly range of the Royal Albatross (30°S - 45°S) shown here within Dixon's range for *Diomedea* of 30°S - 60°S.

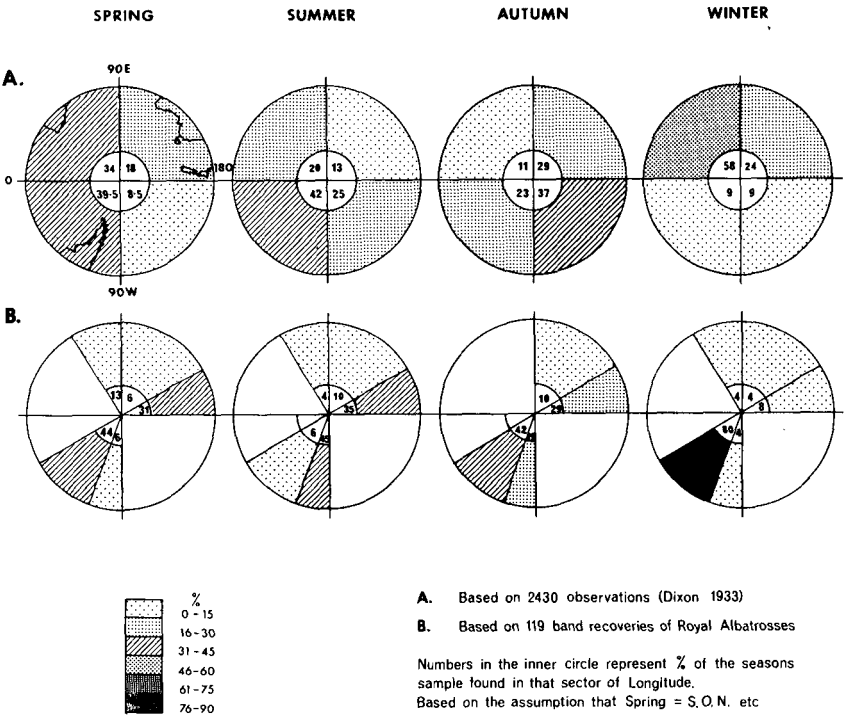

FIGURE 5: Percentage seasonal longitudinal distribution of *Diomedea* species

(A) For *Diomedea* spp. according to Dixon 1933 Table 2

(B) For *Diomedea epomophora* sp. based on recoveries of banded birds (in detail Fig. 4).

A major reason for the seasonal latitudinal movement in Wanderers however, would seem to be the concentration of birds round their summer breeding grounds in generally more southern latitudes than Royals.

The type specimen of an immature *sanfordi* collected off Chile in 1913 (Murphy 1936, 1950) and the recovery of an adult breeding bird (D13) from Taiaroa Head in the S.W. Atlantic indicate that *sanfordi* has a similar range to *epomophora*. The case of D13 also emphasises the circumpolar movement in the " holiday " year following successful breeding. The evidence shown for an annual circumpolar dispersal of immature non-breeders and adult failed breeders is not strong, but is supported by the absence of contrary evidence. We have no evidence to support Tickell's (1970) suggestion of several circumpolar movements within one year, but there is some implication, although tenuous, that this may not generally occur.

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A CONTRIBUTION TO THE NATURAL HISTORY OF THE FIJI PEREGRINE

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ABSTRACT

The history, distribution, and description of the Fijian race of the Peregrine Falcon, *Falco peregrinus nesiotes,* is given. Based on observations made on Joske's Thumb, a 1430 ft mountain rising from a rugged rainforest area a few miles inland from the south coast of Viti Levu, detailed statements are made on the behaviour of this species, including daily routine, nesting, and food. An analysis of pellets is tabulated and a list is added of other species of birds seen in the area, including many taken by the peregrines as food. This is the first detailed confirmation of the breeding status of the Peregrine in Fiji.

INTRODUCTION

The Fiji Islands mark the extreme eastern penetration of the almost cosmopolitan Peregrine Falcon into Oceania, the local race, *Falco peregrinus nesiotes,* also being found in the New Hebridies, New Caledonia and the Loyalty Islands. So little has been recorded concerning the Peregrine in Fiji that even its presence there has been doubted (Brown & Amadon 1968: 852).

This paper confirms the presence of the Peregrine in Fiji, summarises some of the few widely scattered and little known references to it, and deals with observations which I have made at Joske's Thumb in southern Viti Levu, where Peregrines definitely tried to breed in 1971, the first breeding record from Fiji. During the course of this study, part of a long term field survey of the Fijian raptors being undertaken by the Fiji Museum, information regarding Peregrine diet was gathered, revealing a high proportion of mammalian food in the form of the Flying Fox *(Pteropus tonabus tonganus)* or giant fruit bat. I have been hampered by lack of reference material, so the distribution notes should not be regarded as being fully comprehensive.

The Fijian name for the Peregrine Falcon is " *Ga-ni-vatu* " or " rock duck," although like many Fijian names it can quite probably be applied to other species in some areas, so should be used with caution. An early missionary dictionary (Hazelwood 1850: 314) describes the " Ganivatu " as a " Very large bird, perhaps fabulous, said to live in holes and eat men," indicating that the bird was rather dreaded and unfamiliar to the coast peoples among whom the missionaries lived. In the highlands of Viti Levu the bird was generally left alone, the Fijians being chary of climbing near its dangerously situated nests (Brewster, Document 24) and was venerated to a certain degree, being the totem of some of the fiercest mountain tribes.

The name obviously stems from its cliff habitat and its compact body, Brewster saying that Fijians described the bird as being " Short-set and squat, with legs in the same proportion to the body as a duck's, and with broad outspreading talons." (Brewster 1922: 110).

DISTRIBUTION OF THE FIJI PEREGRINE

In the past Peregrines have been recorded with certainty from only the three largest islands of the Fiji Group (Fig. 1): Viti Levu (4,011 sq. ml.; 10429 km^2), Vanua Levu (2,137 sq. ml.; 5556 km^2), and Taveuni (168 sq. ml.; 437 km^2), all of which are rugged, volcanic islands with suitable breeding cliffs. The small island of Wakaya (3 sq. ml.; 7.8 km^2), some ten miles east of Ovalau (see Fig. 1), can now be added, as I saw an adult Peregrine in flight over sea cliffs there on 30 April 1971. Ovalau itself, a mountainous island, almost certainly has a Peregrine population, both my own informants and those of the late bird artist W. J. Belcher (Painting No. 24, 1925) claiming that it is present there. Belcher was also told that they occur on Beqa off the south coast of Viti Levu. During 1970 members of the Ornithological Society of N.Z. expedition thought they saw a Peregrine over cliffs near Vunisea, Kadavu, in the extreme south of the Group (Blackburn 1971: 154).

Records from Viti Levu are the most numerous, although even these are scanty. Most sightings have been near cliffs, but in September 1971 an adult Peregrine was seen perched in a kapok tree at Koronivia in the densely cultivated Rewa Valley (E. J. H. Berwick, pers. comm.), and within recent years one was seen perched on the old fire-station building in central Suva (R. Mercer, pers. comm.). During the early part of this century several sightings were made in the Suva Harbour area (Bahr 1912). It is quite possible that Joske's Thumb birds were involved in these sightings at Rewa and Suva, as Joske's Thumb is the nearest known Peregrine site.

Mountain sightings have occured at Narokorokoyawa (Ansdell 1882: 59), Nasoqo (Brewster Doc. 24), Namosi (Belcher, painting 24, 1925; Derrick 1951: 157) where a priest had a tame bird, and more recently in the Nausori Highlands (Blackburn 1971: 154). I have seen Peregrines at Joske's Thumb every year since 1969, and in November 1968 saw a pair of adult birds on rocks at the summit of Mount Korobaba (1408′; 429m) near Suva, five miles (8 km) east of Joske's Thumb, and have since found that they roost on the Korobaba cliffs occasionally. On Mt Koroimaia (2030′; 618.7 m) in 1971 I saw fresh mutes (droppings) on rocks, and was told that a pair of Peregrines lived on cliffs near the summit, and was given a graphic description of the birds and their flight (Tui Namataku, pers. comm.).

In view of this widespread distribution in both coastal areas and in the interior of Viti Levu, it would seem that most of the large cliff systems in Fiji are worthy of investigation, as they have probably supported Peregrines at some time.

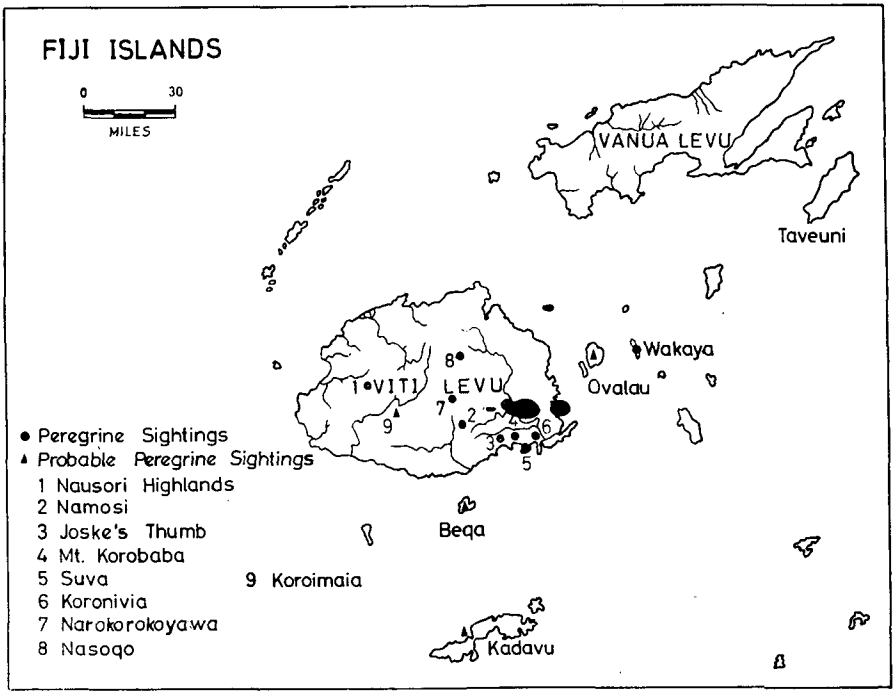

FIGURE 1 — Map of the Fiji Islands.

THE JOSKE'S THUMB PEREGRINES

Since early 1969 I have often seen individuals, pairs, and on two occasions trios of Peregrines in the vicinity of Joske's Thumb. During 1971 the Fiji Museum began a long term field study of the Fijian raptors, and as part of this programme I commenced work on Joske's Thumb, visiting the mountain at least once a week between 6 June and 26 September, after which the Peregrines left following their breeding failure. Regular trips are still made to the area so that studies can be resumed on their return.

Methods:

Most field observations were made with 10 x 40 binoculars although 8 x 30s were used in the first few weeks. Most of my time was spent on the seaward side of the mountain, on a rock knoll commanding fine views of favourite roosting and feeding ledges, the approaches to the eyrie, and a large expanse of open sky. Other observations were made from a bush-covered ledge near the eyrie, but here vision was restricted. I was unable, however, to stay in the area overnight on any occasion.

Identification of prey, mainly in the form of plucked plumage from kills, and cast pellets, was made by comparison with specimens in the Fiji Museum's small skin collection. The bulk of remains was identified, but the others will have to await the building up of more comprehensive skin and skeletal collections. Fur from pellets and other mammalian remains were identified by comparison with Fiji Museum specimens.

Habitat and Environment:

Joske's Thumb or Rama, a prominent Suva harbour landmark, is a 1450′ (442 m) volcanic plug three miles (4.8 km) inland from the southern Viti Levu coast (Fig. 2). It holds a commanding position, the mountains of the interior, including the known Peregrine site of Mt Voma, Namosi, being clearly visible from the summit, as are the broad, flat expanses of the lower Navua and Rewa Valleys, the last said in legend to have been formed by the lusty wingbeats of a godly Peregrine from Ovalau thrusting the hills apart (Brewster 1922: 111-112). On clear days the suspected Peregrine centres of Beqa, Ovalau and Kadavu are easily discernible.

The mountain juts starkly from a rugged rainforest area, the rock plug being but thinly vegetated, with large areas of bare, sheer cliffs, overhung in places to shelter dry ledges much favoured by the Peregrines as roosting, feeding and nesting sites, and littered with their mutes, kill debris and moulted feathers. Dense rainforest stretches away over the uninhabited upper Waimanu River valley only two miles (3.2 km) to the north, and across the higher ranges beyond; while to east and west it runs down the hills for miles (Fig. 3). A dairy farm lies only a mile (1.6 km) to the south, however, on what was originally a pandanus swamp stretching to the coastal mangrove belt. Patches of the pandanus swamp still survive. An area of intermittently cultivated native gardens interspersed with the light, stunted bush typical of areas subjected to frequent flooding extends up the valley of the Nailagosakelo Creek system, reaching still closer to the mountain and forming a narrow tongue into the dense rainforest area.

Rainfall is very heavy, certainly considerably heavier than that of Suva (c. 120″; 3048 mm) which averages at least a trace of rain on two out of every three days (Derrick 1951: 104). Strong winds frequently sweep the south and southeast faces above 500′ (152 m) and dense cloud often shrouds the cliffs.

Bird life in the native gardens and forest is rich and varied, the introduced species being entirely replaced by native ones as the true forest is met (see Appendix I). About the cliffs there is a variety of lizard species ranging from small skinks to a large rock gecko. A rat of as yet undetermined species is found on the cliffs, especially about Peregrine feeding ledges, while the introduced mongoose occurs in the forest about Joske's Thumb. The giant fruit bat or Flying Fox *(Pteropus tonabus tonganus)* has a haunt several miles east of the mountain, and flies through the Joske's Thumb area in large numbers during the late afternoon and early evening.

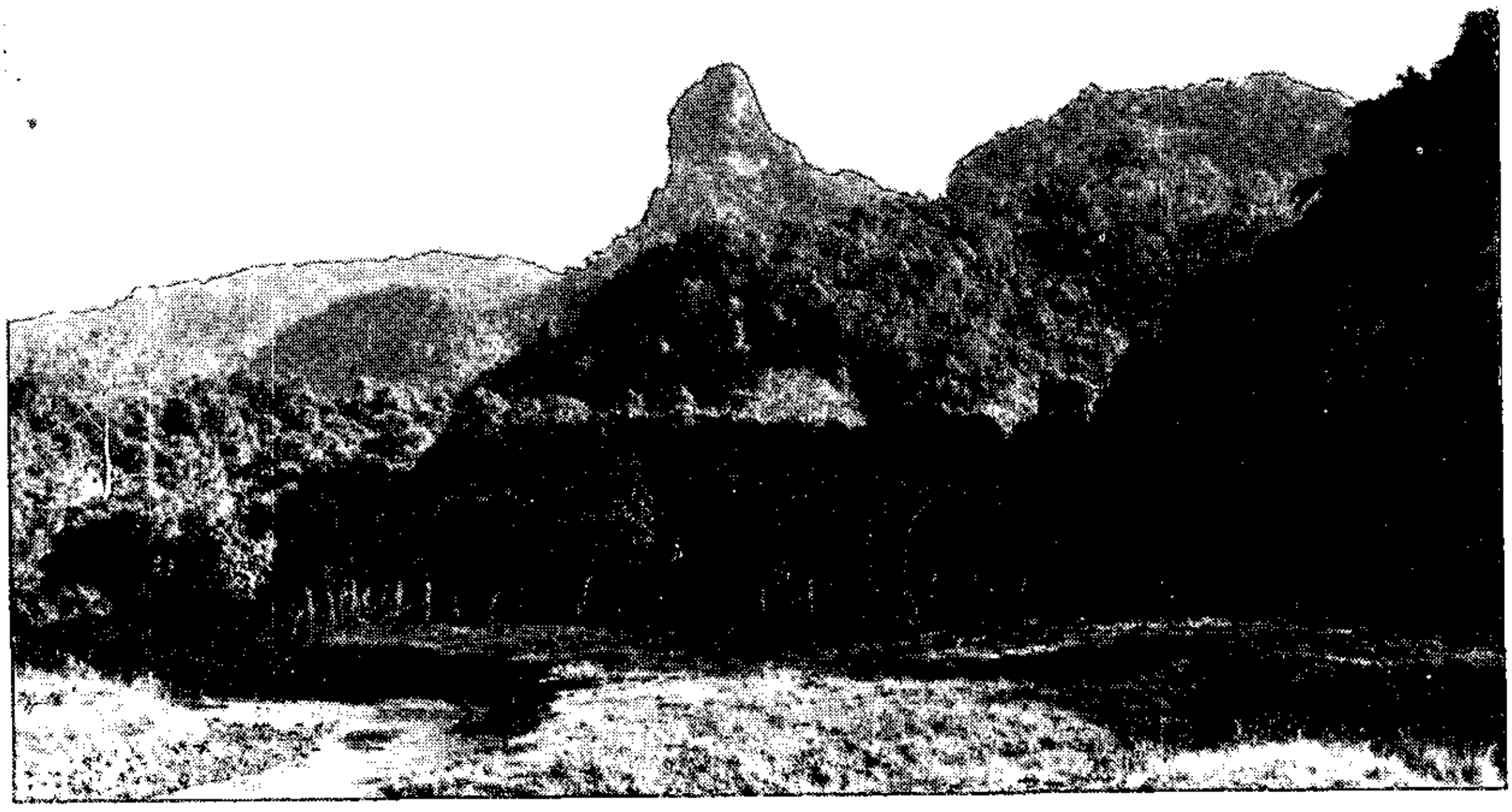

FIGURE 2 — Joske's Thumb from the dairy farm lying to the north.

Photo: F. Clunie

FIGURE 3 — Rain forest hill country to the west of Joske's Thumb over which the Peregrines do much of their hunting.

Photo: F. Clunie

FIGURE 4 — Rugged country to the east of Joske's Thumb over which the Peregrines hunt. The trees on the peak of the right hand crag are favourite roosts and soaring displays between Peregrines were quite often observed there. Photo: F. Clunie

Peregrines do not normally inhabit such densely forested zones, and are possibly only found in the Joske's Thumb and other forested areas in Fiji because of the suitable breeding cliffs. Indeed, the abandonment of the mountain by the Peregrines after their breeding failure, and the recent sighting of a Peregrine at Koronivia, might suggest that they prefer more open areas, and hunt them outside the breeding season.

DESCRIPTION OF THE FIJI PEREGRINE

A detailed description of the Fiji Peregrine is not generally available, so one of the Joske's Thumb birds should be of some aid to the field worker, especially since comparisons drawn recently with an Australian race (Blackburn 1971: 154) are slightly misleading. The Fijian race is much closer in appearance to *F. p. ernesti* of the New Guinea-Indonesia area, the major difference being that the former is not quite so dark, and has more of a rufous wash to the breast (Brown & Amadon 1968: 852).

Adult birds are very dark, almost black above, with a few brown lights to the plumage. Head and cheeks are black hooded with chin and throat light cream fading to a light pinkish-brown or rufous breast. Belly, flanks and thighs are grey, heavily barred with black, as are the underwing coverts. The eye is dark brown, the beak dark grey, and claws black; the cere, orbital ring and feet are yellow. As with other races of Peregrine, the female is markedly larger than the male.

FIGURE 5 — Overhanging cliff ledges, Joske's Thumb, favourite roosting and feeding places of Peregrine Falcons. Photo: F. Clunie

The male at Joske's Thumb was darker and more handsomely marked than the female, in which the rufous colouring of the breast was much more noticeable, extending down onto the barred belly. The cere, orbital ring and feet of the male were a bright orangeish-yellow, in contrast to those of the female, which were a pale lemon yellow.

I have not as yet seen an immature Peregrine at close quarters, the following description being based on W. J. Belcher's painting of a 10-month-old Namosi bird (Belcher painting No. 24, 1925). Back, head and cheeks as for adult; breast, belly and flanks a rich orangeish-buff, darkening downwards, with black streaking which becomes heavier downwards; thighs deep buff with black, arrowhead streaking; black tail tipped with white, and faintly barred with grey; eye dark brown; feet pale yellow; cere, beak and bare patch of skin 'bout eyes light grey.

GENERAL CHARACTERISTICS

It is not proposed to go into any great detail concerning daily routine and general habits, Peregrine Falcons having been studied so extensively elsewhere in the world, and the Fiji race merely echoing many of the oft-described behavioural traits.

Daily Routine:

The Peregrines usually spent much of their day perched singly or in pairs on commanding rock ledges, on small trees jutting out from cliff faces, or in open-foliaged trees in conspicuous positions (Fig. 4). Here they would gaze about, preen and occasionally doze off, often remaining for several hours at a time. One or both birds were normally perched in this way when I arrived about an hour after sunrise, and would remain for up to three hours or more. They could be found perching for extended periods at any time of day, typically standing one-legged with the other leg tucked up under the belly. Hunting seemed to take place at any time, the Peregrines being seen feeding on fresh kills in both early morning and in the afternoon. It was impossible to estimate how long birds spent hunting, however, as they were usually out of sight, and could well have perched for long periods elsewhere.

While perched the Peregrines often demonstrated their fine sense of vision, and each could follow the progress of its partner long after it had been lost to my view.

Flight:

The typical Peregrine flight of a succession of quick wing-beats followed by long glides with the wings extended was commonly witnessed, although long flights without gliding were seen frequently, and sustained soaring over the summit and valleys about the mountain took place occasionally. Flight control was almost uncanny, the birds often diving at speed with the wings half folded until only a few feet from the cliffs, swinging away or braking at the last moment, and apparently taking full advantage of air currents rising up the rock faces.

Comfort movements:

Whilst perched the Peregrines often preened and stretched extensively, scratching their heads most violently at frequent intervals. In flight too, the birds were sometimes seen to nibble at a foot or wing. Downy contour feathers which became stuck in the beak would be hooked free by the middle claw of one foot, and on one occasion the male bird was seen to hook at his beak like this while making belching motions a few seconds prior to casting. After feeding the birds would " feat " (or strop their beaks) on branches or nearby rocks.

Voice:

The Peregrines were generally silent when alone but extremely vocal in each other's company. This was especially true of the female, which would call to her mate whenever he was in sight. Sometimes her calls seemed inspired by movements on his part, often rising to

fever-pitch if he flexed his wings, but she would scream at him for no apparent reason just as frequently. She seemed aware if he flew off determinedly, as when hunting, and would not call after him, but if he was merely gliding about the cliffs she called whenever he strayed into her line of vision.

As with other Peregrines (cf. Brown & Amadon 1968: 852), the female's voice was lower-pitched than that of the male, both birds giving a harsh " kew " call, usually repeated several times and varying greatly in volume and speed of delivery. The female used this call most often, but also had a soft mewing call, and was capable of the high piercing " tchik!" much favoured by the male. On recognition and when presenting food he used a chittering call very similar to the creaking of a metal pulley. He also had a whistling " her-cheep " which he gave once while perched above the eyrie, and on one occasion, as I descended a cliff on the north face, flew straight at me uttering a soft " tchuk tchuk tchuck " before flinging away when only a few feet from my face. The chattering " hek kek ek ek ek ek " for which the aggressive Peregrine is so noted was used once by the female in attacking me.

Curiosity:

The Peregrines seemed extremely curious of humans and would rarely fly if I surprised them at close range until they had had a clear view of me, but would sit bobbing their heads, gazing intently at the bushes if I moved. Such curiosity was twice exhibited on the summit of the mountain in 1969. On both these occasions a companion and I sat quietly on rocks, and turning, were surprised to see an adult Peregrine staring intently at us from a dead tree not twenty feet away. The bird flew immediately on being seen.

NESTING

A single egg was laid by the Joske's Thumb Peregrines during 1971, but was broken prior to hatching. This is the first definite record of Peregrine Falcons attempting to breed in Fiji, and thus extends the breeding range some 500 miles (860 km) further east into Oceania than was previously known. The egg had a white shell speckled with olivish brown blotches. The clutch size is small for Peregrines, which normally lay between two and five eggs (Brown & Amadon 1968: 854). Indeed, Belcher (Painting 25, 1925) recorded that nests of the Fijian race normally contain three eggs, but he did not say where or how he came by this information.

Nesting has definitely taken place at Joske's Thumb in the past, as amongst the rubble on a sheltered ledge near the 1971 eyrie several old fragments of egg shell were found. In addition, groups of three or more Peregrines almost invariably consist of adult(s) and juvenile(s) (L. H. Brown, pers. comm.) so that trios seen in November 1969, and on 21 February 1971 can probably be taken as indicating breeding success in the 1969 and 1970 seasons.

The 1971 nesting site was located on an overhung ledge with sheer cliffs falling away beneath it to steep, jungle-clad slopes.

The ledge was well protected from rain and the prevailing south-easterlies, but was exposed to direct sunlight on fine afternoons. Several rocks fallen from the overhanging cliff lay scattered about the ledge, the largest one being propped up on several others, thus forming a miniature cave spacious enough to admit a mature Peregrine. The enclosed space offered total protection from the afternoon sun, and the egg was laid within it. The Peregrines did not make any perceivable scrape, the floor of the nest being littered with rough rock fragments. Old pellets, moulted Peregrine feathers, and feathers and a few bones from kills were scattered about the ledge, some obviously having lain there for a considerable time.

Unfortunately observations of the nesting birds were hampered by several factors:

(a) a rock outcrop hid the eyrie from my usual observation post, and a route to the eyrie ledge, from which the nest could be seen from under cover was not found until well into the nesting period.

(b) the true structure of the eyrie was not realised until I climbed to it following its desertion.

(c) the rocks of the eyrie ledge obscured my view of feeding and food presentations.

Defence of eyrie:

The eyrie was evidently selected some time in early June, display flights being witnessed in the morning of 12 June 1971 from the Nailagosakelo Creek. Through 8 x 30 glasses the anchor-shaped silhouettes of the Peregrines were easily discernible, flying to the southwest of the mountain. The flights consisted of long, shallow but fast gliding dives at the cliffs from several hundred yards out, the birds flinging up at the last moment, shooting up the cliff face, then flying back out to repeat the performance. Sometimes they tailed each other closely, but often only one was in sight, especially for the last few minutes, when a lone bird was seen. These flights took place near the eyrie, as did those of 20 June in which the male made sweeping, gliding flights, calling frequently. More definite developments occurred on 26 June, both birds being extremely active and vocal, and spending much time near the eyrie, singly or together. The female was seen diving at it,but pulled away at the last moment as the male swept round the cliffs, uttering a high, metallic, pulleying cry as he passed the nesting site. Both birds then flew off in company. The male later landed at the eyrie unobserved, for twice when the female flew past it his pulley cry arose from it, and when she landed there she was greeted by an excited pulleying and chittering. The male flew out a few minutes later, landing in a small tree jutting from the cliffs directly above the eyrie, where he began to preen. This little tree and a small ledge a few yards east of the eyrie, but hidden from it by a rock outcrop,were his favourite lookout posts throughout the nesting period.

By 27 June the female was firmly established at the eyrie, and an aerial food exchange was witnessed at 1 p.m. on this day. The male bird flew rapidly at the eyrie, uttering the pulley call, carrying his kill beneath his tail. Suddenly he spun around and made rapidly away, closely pursued by the female which had been waiting there. She flew a couple of feet above him and lowered her talons, but was ignored, whereon she flew beneath him and turning on her back again extended her talons. At this the male bird lowered his own talons, passing the kill to her in a neat manoeuvre in which both birds had a simultaneous hold on the carcase for a moment, before the female righted herself and flew screaming harshly into the eyrie with the kill, while the male landed in the small tree above it, where he sat gazing about, sometimes looking down at his mate, and quietly answering her cries.

On 4 July, the birds were very restless, spending much time perched in trees on the eastern face of the mountain, calling, but a week later they had settled down to a routine, with the female waiting at the eyrie for the male to bring in kills, and only venturing forth herself upon occasions, when the male would sometimes take up her vigil at the nest. Throughout the nesting period the inactive female was moulting flight feathers, while the active male was in perfect plumage.

The male usually announced his arrival at the eyrie by a high pulley call, to be greeted by the harsher cries of the female, their calls becoming quite hysteric at times. He would normally fly out from the eyrie within a few minutes of his return, taking up position on one of his lookouts where he would rest for varying periods, preening, gazing about and dozing off from time to time. Most of the kills he brought in were easily manageable, but one was so large as to slow him down and render his flight very heavy and clumsy. Usually he approached the eyrie from slightly below, swinging up into it over the last few yards of flight. Once, however, he was seen to stoop or dive down the cliffs at a very steep angle and at great speed, only spreading his wings to break his fall in the last few feet.

A change in the female's behaviour was noted on 24 July. On catching sight of the returning male she would fly out several hundred yards to meet him, then follow him to the eyrie. Here the usual hubbub of cries would arise, and the male would emerge after a few minutes, taking up position on one of his lookouts.

On this day I found a route to the ledge near the eyrie, and from then on could watch the activities there from the cover of dense bushes. The female would wait on a rock for the male to bring in a kill, usually remaining alert but practically motionless, and only preening or scratching her head infrequently. On sighting the male, which she could do at great distance, and long before I could, she would utter a few harsh " kew " calls and fly out to meet him, both birds returning together, with the male in the lead. The birds would call excitedly, the male with his high, chittering, pulley calls,

and the female with her harsher "kews." She would sit on a rock a few feet from him while he presented his kill. Unfortunately this ceremony was almost totally obscured by rocks but he seemed to bow slowly up and down, calling periodically, as has been noted for other races of Peregrine (Brown & Amadon 1968: 854). It is quite possible that he sampled his kills on these occasions, as he often feaked on a nearby rock before flying off to one of his nearby lookouts, accompanied by the screams of his mate. While the male remained in sight the female never touched a kill, but sat calling to him. If he perched in the little tree jutting from the overhanging cliff she would fling her head back, and gazing up at him, call almost incessantly for up to an hour, receiving only an occasional reply. When he passed from view, however, she almost invariably fell silent immediately, and would pass down among the rocks to feed, raising her head and gazing about every so often.

The egg was probably laid between 2 and 8 August 1971, for on the latter date the male was seen to relieve the female at the nest at 2.15 p.m. and clambered into the actual nest, apparently to incubate. He was seen to repeat this at 1.45 p.m. on 14 August. The female, however, was not seen to make any attempt to incubate or even enter the nest shelter, spending the bulk of her time perched on a nearby rock. The egg was apparently broken sometime between 14 and 22 August, although the female still roosted there occasionally and both birds could be seen on nearby ledges, until they left Joske's Thumb sometime after 26 September. Indeed, the female was seen to defend the ledge against a helicopter as late as 12 September and display flights took place near the eyrie on that day. The first display flight witnessed was in the form of a rapid pursuit of the female by the male, which she escaped by diving into a Casuarina tree, while he swept by pulleying excitedly. At 3 p.m. she was sitting in a small tree above the eyrie, quiet but alert, when she saw the male out to the east, and with a strident call flew with clumsy, laboured wing beats toward him. As he approached she swung about and darted in a barbed, gliding dive round the cliffs, with him in close pursuit, pulley calling.

The last sighting of the Peregrines at Joske's Thumb was at about 2 p.m. on 26 September 1971, when the two birds flew into the eyrie together, calling excitedly as they had done during breeding. After a few minutes the male emerged alone and flew to land in a tree below the eastern cliffs, where the birds had often perched when first occupying the eyrie.

Aggression about eyrie:

At 2.30 p.m. on 12 June 1971 I surprised the female Peregrine feeding off a bloody carcase on a ledge some sixty yards from the eyrie. She glared at me for several seconds from about thirty feet away, then spun round and flew out from the cliffs, still clutching her kill, for about a hundred yards, uttering two harsh "kew"

calls. She turned then, and came flying straight at me at speed, uttering a chattering " Hek kek ek ek ek ek ek." When only a few yards from me she swung clear and repeated the performance twice more before flying off in the general direction of the eyrie, and falling silent. As this threat display took place before the birds were firmly established at the eyrie, it was quite possibly a reaction in defence of her kill.

Despite precautions the male was twice disturbed at the actual eyrie, on both occasions in the temporary absence of the female, when he would relieve at the nesting site occasionally in the afternoons. On the first occasion he flew in to the deserted eyrie as I was tying back some reeds to gain a less restricted view. When he saw me he crouched down on his belly amongst the rocks and stared at me, absolutely motionless, as I beat a slow retreat out of sight.

On the second occasion he was secreted among the rocks of the ledge, probably feeding, when I again carelessly exposed myself. This time he took off, and flying back and forth above me gave loud, ringing calls, evidently trying to recall his mate. He was soon joined by the female, who gave a few loud " kews," soon after which the male fell silent and landed in a small tree jutting out from the cliffs about fifty feet (15 m) above the eyrie, where he sat quietly, very alert.

The female reacted in a similar manner when a helicopter circled the mountain on 12 September 1971. She was sitting on a ledge near the now abandoned eyrie, when the helicopter approached and began to circle the mountain at close range. As it came into view around the cliffs the female, which had been gazing in the direction of the sound, took off and flew out about thirty yards from the cliff, and began flying back and forth in front of the eyrie. The helicopter circled the mountain twice, and neither time did the bird try to escape or follow it, maintaining station across the approaches to the nesting site. As the helicopter moved away she flew back to the ledge on which she had been perched, called quietly a few times, then settled down again.

During the period in which the eyrie was being defended no other raptors were seen in the immediate vicinity of Joske's Thumb. They were quite possibly kept at bay by the Peregrines, which are typically very aggressive about the nest. After the eyrie's abandonment a large Swamp Harrier *(Circus approximans)* frequently hunted through the forest canopy at the foot of the mountain, and was once seen carrying a Pacific Boa *(Enygrus bibronii)* of some thirty inches (726 mm) length in its talons. The male Peregrine undoubtedly saw this Harrier on at least one occasion, but seemed to ignore it. No Goshawk was seen about the mountain itself, although an immature one was glimpsed infrequently in the native gardens.

FOOD

The following evidence was amassed during the course of the study from kills, feathers from kills and cast pellets, the bulk of the information coming from the last two. Nearly all of the material was of unknown age, some obviously dating back over a considerable period. The major collecting areas were the overhung, sheltered ledges on which the Peregrines spent so much of their time (Fig. 5).

In addition, a wealth of skeletal evidence was collected during archaeological excavations in sheltered holes high on the eastern cliffs, some of which contained the skeletons of human infants, possibly sacrifice victims, along with the remains of birds and Flying Foxes, evidently old Peregrine kills. A large shelter nearby was probably once used as an eyrie, and contained hundreds of bones. Unfortunately there is no adequate reference collection of skeletal material available, so identification will have to await the building up of such a collection, a project currently being undertaken by Fiji Museum. As the removal of the material from these holes or shelters was done by archaeological methods, it would have been recovered in chronological order, and may provide a record of Peregrine diet dating back well over a century. Comparison with bones from recent kills should determine whether these really are the remains of Peregrine kills. The absence of any crania, and the fact that Peregrines still roost and feed on some of these shelters suggest that they are.

Mr R. J. Scarlett of the Canterbury Museum, Christchurch, has kindly identified some bones, with the result that the White-throated Pigeon *(Columba vitiensis)* and a Petrel of uncertain sub-species (*Pterodroma hypoleuca* ?) can be tentatively added to the list of Peregrine prey. I have not as yet seen any petrels or petrel burrows near Joske's Thumb, but parts of the terrain are suitable (J. B. Smart, pers. comm.) and they may yet nest in the area, despite the presence of the mongoose.

Kills:

At 11 a.m. on 6 June 1971 I found the fresh carcase of a Jungle Mynah *(Acridotheres fuscus)* on a sheltered ledge low on the eastern cliffs. All flight and most contour feathers had been plucked at some other place. The bird was decapitated and had a deep stab wound high on the back, just to the right of the spine, evidently caused by a Peregrine talon. The left leg was broken but the skin unperforated, while the right leg was entirely missing, revealing the bowels which were untouched.

Near the Jungle Mynah carcase lay the skeletal remains of a Flying Fox, consisting mainly of wing and limb bones. The skull was missing. A pair of dry wings from another Flying Fox lay a few yards away, the flesh having been stripped from the long bones. Comparison with a stuffed specimen in Fiji Museum shows that the wings came from a bat with a wing span exceeding thirty inches (762 mm).

On 4 July a Flying Fox skull was recovered from a ledge beneath a plucking post on the southeast slopes of the mountain, where it had apparently lain for a number of days. The skin had been pushed down towards the snout, revealing the bare bone of the cranium, which was punctured on the left side by a jagged hole, with a smaller hole on the opposite side. The brain was gone.

The skeletal remains of the wings and breast bone of an as yet unidentiged bird were found beneath a Casuarina tree on the northern side of the mountain, while from the ledge near the eyrie the leg of a small lory was recovered. This leg was far too lightly built to have come from a Collared Lory and had red feathers about the thigh, so must therefore have come from the rarer Red-throated Lory *(Vini amabilis)*, a bird I have not seen in this area.

Other kills were seen but defied identification, being plucked and decapitated carcases being carried or eaten by Peregrines. Evidence that the Peregrine hides or caches a kill and returns to it later was seen at 3.20 p.m. on 24 July when the female landed on a small ledge and gazed about for several seconds before walking to a small crevice into which she put her head, and pulled out a carcase with her beak. She then held it down with one foot, took a few beakfuls, then flew with it to the eyrie.

Feather evidence:

Although the Peregrines seem frequently to pluck their prey before bringing it in to the feeding ledges, the eyrie ledge and the ledge near it were littered with feathers from which a variety of prey was identified, ranging from tiny birds to those the size of a dove. On the other hand, the eastern ledges were extremely poor in feather material. The feathers of a large, as yet unidentified bird were recovered from a plucking post on the southeast slopes of the mountain.

Feathers collected from the eyrie resulted in the identification of the following species:—

Collared Lory *(Phigys solitarius)*; Golden Whistler, female *(Pachycephala pectoralis)*; White-rumped Swiftlet *(Collocalia spodiopygia)*; Red-headed Parrot Finch *(Erythrura cyanovirens)*; Orange-breasted Honeyeater *(Myzomela jugularis)*; Jungle Mynah *(Acridotheres fuscus)*.

Feathers from the ledge near the eyrie resulted in the following species being identified:—

Collared Lory; Golden Whistler, male; Many-coloured Fruit Dove, male *(Ptilinopus perousii)*; 2 White-collared Kingfishers *(Halcyon chloris)*; Wattled Honeyeater *(Foulehaio carunculata)*; Polynesian Triller *(Lalage maculosa)*; Jungle Mynah; White-rumped Swiftlet; Vanikoro Broadbill *(Myiagra vanikorensis)*; Red-headed Parrot Finch; Orange-breasted Honeyeater.

On both the above ledges several unidentified feathers were found.

From the ledge low on the eastern cliffs the feathers of the following species were recovered:—

Golden Whistler, female; White-collared Kingfisher, Collared Lory.

The feathers of at least one more Collared Lory were recovered from a large hole in the cliff above this ledge.

Pellet evidence:

In all, 49 cast pellets were recovered from the eyrie (14), the ledge near the eyrie (17), from a rock on the summit (13), from the ledge low on the eastern cliffs (4), and from a shelter high on the eastern cliffs (1). With the exception of the rock on the summit, all these are sheltered and overhung areas. Most of the pellets were of unknown vintage, some obviously being very old and badly battered. However, 25 were in good order, their mean and extreme measurements being:

Length	35 mm (12 mm - 61 mm)
Width	14.1 mm (8 mm - 19 mm)
Dry weight	0.81 g (0.25 g - 2.60 g)

The pellets varied somewhat, most being cigar-like or shaped like elongated tear-drops, while four were quite rounded. Flying Fox fur in pellets was always in good condition and easily identified. Miscellaneous skeletal fragments including claws, teeth, broken long bones, and vertebrae were found in most pellets and provided additional evidence. The feathers were usually badly broken down into crumbling black or grey fragments, but in a few cases survived extremely well and were identified as those of:

Collared Lory; White-collared Kingfisher; Many-coloured Fruit Dove; Golden Dove *(Ptilinopus luteovirens)* and Peale's Pigeon *(Ducula latrans)*.

A small unidentified fragment of beak, bird claws, including the entire foot of a Peale's Pigeon, and bird bones were found in various pellets. Grit similar to that of the feeding ledges was found in several pellets and was probably ingested while feeding, while vegetable matter in some of the pellets could well have come from the gut of prey. Insect remains found in one pellet could have come from the crop of prey, but the Peregrines probably take insects from time to time.

Pellet analysis resulted in a truly surprising predominance of Flying Fox remains, no less than 27 of the 49 pellets containing Flying Fox remains only, while a further 14 contained a bulk of Flying Fox material together with bird remains. Only 8 pellets contained bird remains with no trace of Flying Fox.

It is obvious from both the pellet and the limited kill evidence that the Flying Fox is one of the staples of the Joske's Thumb Peregrines. Their dietary habits are thus aberrant (L. H. Brown,

Area Collected	Pellet No.	Flying-Fox Remains	Bird Remains	Vegetable Matter	Insect Remains
Eyrie	1	*			
	2	*			
	3	*			
	4	*			
	5	*			
	6	*		*	
	7	*		*	
	8	*	*	*	
	9	*	*	*	
	10	*		*	*
	11	*	* A	*	
	12		*		
	13		*		
	14		*		
Ledge near Eyrie	15	*			
	16	*			
	17	*			
	18	*			
	19	*		*	
	20	*	*		
	21	*	*		
	22	*	*	*	
	23	*	*		
	24	*	* B	*	
	25	*	* C		
	26	*	* A & D		
	27	*	* B	*	
	28		*		
	29		* A		
	30		* B		
	31		* E		
Summit	32	*			
	33	*			
	34	*			
	35	*			
	36	*			
	37	*			
	38	*			
	39	*			
	40	*		*	
	41	*			
	42	*			
	44	*			
	44	*	*A		
Eastern Ledge	45	*			
	46	*		*	
	47	*	*	*	
	48	*	*	*	
Eastern Shelter	49		*		

KEY: A = Collard Lory; B = Kingfisher; C = Many Coloured Fruit Dove; D = Golden Dove; E = Peale's Pigeon

TABLE 1 — ANALYSIS OF PELLET CONTENTS

pers. comm.), other races of Peregrine subsisting mainly on birds. Lanner Falcons *(Falco biarmicus)* in Africa also eat fruit bats, but these are of the smaller genus *Eidolon* (Brown, pers. comm.). The aberrant feeding habits of the Peregrines at Joske's Thumb could well have developed in response to their rainforest environment.

It appears that almost any animal which flies over the forest canopy during daylight hours is liable to predation, kills ranging from the tiny Orange-breasted Honeyeater to the large Flying Fox. It is significant that birds such as the Collared Lory, which flies in small groups well above the forest canopy, and the White-collared Kingfisher, which is found throughout the bush, perching on conspicuous dead trees protruding above the canopy, should figure so prominently among the kills; such birds being particularly vulnerable to the Peregrine's hunting methods. The Jungle Mynah does not penetrate far into the true forest, so the Peregrines must hunt at least as far as the forest edge. With its white wing patches and habit of flying well clear of cover the Mynah must make a conspicuous target. Small birds such as the Orange-breasted Honeyeater could be taken almost anywhere about the mountain, as they are very common there, while the White-rumped Swiftlet is common everywhere. As might be expected from the Peregrine's manner of hunting, birds which stay close to cover do not seem to be taken commonly, although the high incidence of Golden Whistler kills is slightly puzzling in this regard. Pigeons are common and perch conspicuously, but Peale's Pigeons perched in a tree top did not fly up when a Peregrine passed overhead, and if this is a typical reaction, it should afford them some protection. Their place is perhaps largely filled by the lumbering and easily available Flying Fox, for the number of pigeon kills is surprisingly low. The Flying Fox is not strictly nocturnal, individuals being seen over the canopy in the middle of the day, flapping slowly about with the ruff of blond fur behind the head particularly conspicuous. With their slow flapping flight they must be an easy target for a stooping Peregrine.

Like Peregrines the world over, the Fiji falcons seem to take most of their prey on the wing, although it has been said that they take poultry sometimes (Brewster 1922: 110). The birds were often seen flying back and forth over the forest, usually two or three hundred feet above the canopy, but sometimes much lower, evidently hunting. At other times they would fly low over the cliffs, combing the bush on the less precipitous rock faces and about the summit. No actual kills were witnessed, although on one occasion the male launched himself from the rocks and went into a steep dive or stoop with barbed, partially folded wings. Unfortunately he disappeared behind intervening trees, but evidently killed as he took a kill into the eyrie a few minutes later. Another stoop of several hundred feet was also witnessed, the male bird coming down at tremendous speed at a sharp angle from near the summit, passing a few feet over my

lookout and into the valley beyond, with the sound of the wind in his wings clearly audible. Again the trees blocked my seeing the end result of this dive.

Peregrine diet probably also includes the occasional rat and lizard, as on one occasion one of the birds was seen to leap at and pursue something along a ledge, although it did not catch it. In 1969 a headless rat carcase with the belly eaten out of it was found on a ledge high on the eastern cliffs, and was probably a Peregrine kill, but was not closely examined at the time. Brewster considered the Peregrine an Osprey, as the Fijians insisted it ate fish (Brewster, Document 24). This is a persistent belief, still met with in the Namosi area today, and there may be some truth in it, as it is not entirely unprecedented for Peregrines to take fish (Brown & Amadon 1968: 854).

A list of birds seen within 1½ miles (2.4 km) of Joske's Thumb during my observations of 1971 is given as Appendix I. This not only provides a checklist of the local species but also indicates the range and proportion of species used as food by these Peregrines.

ACKNOWLEDGEMENTS

I am grateful to Kolinio Moce of the Fiji Museum staff, who prepared the map contained in this paper, and to Mr R. J. Scarlett of Canterbury Museum, who identified bone samples from the archaeological excavations on Joske's Thumb. My thanks also go to all those who by their personal communications helped me greatly in the preparation of the paper.

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APPENDIX I

BIRDS SEEN WITHIN 1½ MILES (2.4 KM) of JOSKE'S THUMB DURING 1971

* Positively indentified prey species

† Tentatively identified prey species

Reef Heron	*Demigretta sacra*
Fiji Goshawk	*Accipiter rufitorques*
Swamp Harrier	*Circus approximans*
Peregrine Falcon	*Falco peregrinus*
*Many-coloured Fruit Dove	*Ptilinopus perousii*
*Golden Dove	*Ptilinopus luteovirens*
Friendly Ground Dove	*Gallicolumba stairii*
*Peale's Pigeon	*Ducula latrans*
†White-throated Pigeon	*Columba vitiensis*
*Collared Lory	*Phigys solitarius*
Yellow-breasted Musk Parrot	*Prosopeia personata*
Fantailed Cuckoo	*Cacomantis pyrrhophanus*
Long-tailed N.Z. Cuckoo	*Eudynamis taitensis*
Barn Owl	*Tyto alba*
*White-rumped Swiftlet	*Collocalia spodiopygia*
*White-collared Kingfisher	*Halcyon chloris*
White-breasted Wood Swallow	*Artamus leucorhynchus*
*Polynesian Triller	*Lalage maculosa*
Island Thrush	*Turdus poliocephalus*
Fiji Warbler	*Vitia ruficapilla*
Spotted Fantail	*Rhipidura spilodera*
Slaty Flycatcher	*Mayrornis lessoni*
Fiji Shrikebill	*Clytorhynchus vitiensis*
Black-faced Shrikebill	*Clytorhynchos nigrogularis*
*Vanikoro Broadbill	*Myiagra vanikorensis*
Blue-crested Broadbill	*Myiagra azureocapilla*
Scarlet Robin	*Petroica multicolor*
*Golden Whistler	*Pachycephala pectoralis*
*Orange-breasted Honeyeater	*Myzomela jugularis*
*Wattled Honeyeater	*Foulehaio carunculata*
Giant Forest Honeyeater	*Gymnomyza viridis*
Layard's White-eye	*Zosterops explorator*
Grey-backed White-eye	*Zosterops lateralis*
*Red-headed Parrot Finch	*Erythrura cyanovirens*
Pink-billed Parrot Finch	*Erythrura kleinschmidti*
Pacific Golden Plover	*Pluvialis dominca*
Strawberry Finch	*Amandava amandava*
Indian Mynah	*Acridotheres tristis*
*Jungle Mynah	*Acridotheres fuscus*
Red-vented Bulbul	*Pycnonotus cafer*
Malay Turtle Dove	*Streptopelia chinensis*

FURTHER NOTES ON THE SPOTLESS CRAKE

By DON HADDEN

ABSTRACT

Further observations were made on the Spotless Crake during 1971. Three occupied nests were found containing 3, 3 and 5 eggs respectively. The incubation period at 2 nests was ascertained at 20-21 days. Observations, including the eating of the eggshell by the adult and feeding of the chick are described.

INTRODUCTION

Information on the Spotless Crake *(Porzana tabuensis plumbea)* was recorded by me in 1970 (Hadden 1970). Since that time further information has been obtained and this is set out below following the same headings as previously. The figures illustrating the present account are printed from colour transparencies and, therefore, lack some quality.

HABITAT

During 1971 two occupied nests were found in the swamp designated A (see Hadden 1970; 200) and the nest which will be referred to later as A-1 was found in the centre of the tiny patch of cutty grass *(Carex lessononia)* that can be seen in the lower left hand corner of Plate XXI of Hadden (1970). A third nest was located in a swamp near Ngaruawahia. This swamp is very similar to the Waingaro ones, being composed of a few small patches of cutty grass, with a few willows growing here and there. There is a paddock on one side which runs up into the Hakirimata Ranges and the other side has rows of houses, some of which have gardens right down to the swamp edge. It is quite built up and children from the surrounding houses play close to and sometimes even in the swamp. The houses adjoin the Waingaro Road and the swamp would be approximately 1 km. from the Ngaruawahia Post Office. Marsh Crakes *(Porzana pusilla affinis)* have also been seen in this swamp.

NESTS

The three occupied nests were all a little less than 1 m. from the ground, extremely well concealed and composed of the cutty grass found in the swamp. Nest A-1 was sent to Mr R. Lavers of Wildlife who passed it onto Mr B. Sneddon of the Botany Dept. Victoria University and the composition of the material was described as being *Carex lessononia.* While this was the bulk of the material, there was also one stem of Raupo *(Typha orientalis)* and some leaves of the fern *Blechnum cuppence.*

EGGS AND CLUTCH SIZE

One egg from the nest A-1 was measured by Mr H. R. McKenzie as 33 x 23 mm, this being a little larger than an egg measured in the same swamp 2 years previously. Nest A-1 and A-2 had 3 eggs and the Ngaruawahia nest 5 eggs.

Incubation and Hatching:

Two nests found in 1969 were incubated for 22 days before hatching, but in both cases clutches were complete when found and I suggested that incubation may thus be 25 days. This is not so as 2 nests this year, namely A-1 and A-2 (found another 100m up the swamp from A-1) were both under observation before the clutches were completed. Details are as follows:—

Nest A-1

On 3 September 1971 a search was made through the swamp, part of which is depicted in Plate XXI (Hadden, 1970). An unoccupied nest A-2 was located at the far end of the swamp and the nest in question, A-1, was found containing 1 egg at 4.40 p.m. The following day, 4 September, at 2.00 p.m. it contained 2 eggs and on 5 September at 3.10 p.m. there were 3 eggs. Despite extremely wet weather on the 6th and a flood on the 7th the nest came through unscathed because of its height. On 22 September there were still 3 eggs. However on 25 September at 11.15 a.m. the nest contained one dry chick, 1 wet chick with eggshell near it and 1 chipping egg. On 26 September the unhatched egg was still there and this one did not hatch. Assuming incubation to have commenced on the 5th, with the laying of the 3rd egg and to have continued until the 25th, this gives an incubation period of some 20-21 days.

Nest A-2

As mentioned above, this nest was found empty on 3 September 1971. I did not check it on the 4th but on the 5th it contained 2 eggs and on the 7th, 3eggs. It would appear then that the 1st egg was laid on the 4th the 2nd on the 5th and the 3rd on 6 September, this being just one day behind A-1. Hatching followed accordingly being 1 day later. On 25 September at 3.55 p.m. the 3 eggs were showing faint signs of chipping and at 10.15 on the 26th there were 3 dry chicks. Incubation was thus 20-21 days. The chicks stayed in the nest all that day and the next, 27 September, despite heavy rain on the 27th. I was unable to visit the nest on 28 September but on the 29th they had left. They thus stayed in the nest for at least 2 days and possibly longer. The chicks at all the other nests observed have left virtually as soon as dry.

Ngaruawahia nest:

This nest did not throw any light on the incubation period, but was particularly interesting because of its lateness. Despite thorough searching in previous years no occupied nests were found after September. However this nest was located on 27 November and on 5 December was hatching, there being 3 chicks and 2 chipping eggs. The following week on 11 December the nest was empty and presumably all 5 chicks hatched safely.

Clutch size:

Of the 6 occupied nests found so far, 4 have had 3 eggs, 1 2 eggs and the Ngaruawahia nest 5 eggs. As this nest was the only late one found, perhaps later clutches tend to be larger.

BEHAVIOUR AT THE NEST

Nest A-1:

A hide had been erected at this nest so on 25 September 1971 when the eggs were found to be hatching I entered at 12.30 p.m. It was a warm sunny day. Although my wife walked away from the hide the adult bird nevertheless called from behind the nest and the dry chick scrambled off and disappeared. However, the wet chick, lying on its side and being too weak to move at this stage, stayed put, although each time the adult called it made small movements like trying to lift its head up or moving its legs (Fig. 1). By 12.47 p.m. it could move its head easily, was a little drier and was even trying to stand up but with no success. The adult gave a bubbling call from behind and returned but just peered in and left. She (?) returned at 12.52 p.m. and incubated the chick which could be seen pushing around in her feathers. At 1.08 p.m. she pulled the eggshell from near her and ate it (Fig. 2). She left at 1.10 p.m., returned by 1.15 p.m. and incubated the chick again, which was very active at this stage and could be heard cheeping on occasions (Fig. 3). At 1.43 p.m. a faint 'harrng' was heard from behind the nest and the incubating bird became very restless, turning and turning the unhatched egg. She finally gave a sharp call and left at 1.45 p.m. Immediately after murmuring calls were heard which I assume to be the meeting of the 2 adults. (See No. 6 under VOICE in Hadden 1970: 203). The chick was now dry and fluffy. At 1.53 p.m. the adult returned, strtched its head through the back of the nest and fed the chick (Fig. 4). She then jumped onto the nest and incubated the chick with much wriggling and settling but left again at 1.55 p.m. and returning at 2.02 p.m. with more food. The chick pecked at it but did not eat it whereupon the adult came onto the nest and fed it to the chick. It still did not eat all of it so the adult ate it itself and left. The chick was even more active by this time, trying to climb out of the nest and so on but still tripping over its big feet. The adult returned at 2.13 p.m. and incubated until 2.43 p.m. when

FIGURE 1 — Newly-hatched and still wet Spotless Crake chick. Note large feet and legs. Photo: D. W. Hadden.

she left. At this time some cattle were mustered in an adjoining paddock and throughout the chick lay quite still until the return of the adult at 2.50 p.m. As she returned the chick pecked twice at her bill even though she was carrying nothing. She turned the egg but left at 2.53 p.m. whereupon the chick which only a few hours earlier had been quite wet, actually climbed up the cuttygrass stalks above the nest to a height of at least 15-20 cm but was back in the nest by 2.58 p.m. The adult returned at 3.01 p.m., left 3.05 p.m. and returned at 3.11 p.m. and sat low and still. At this point I unfortunately had to leave the hide and, as mentioned above, on my return the next day the chipping egg was still unhatched and cold.

Finally, although I could not accurately identify the food this seemed to be a spider and a cranefly.

FIGURE 2 — Spotless Crake eating eggshell. Note chick beneath. Photo: D. W. Hadden.

Ngaruawahia nest

At this particular nest it was interesting in that the birds were very silent. Although I had searched the swamp on a number of previous occasions, no crake calls were ever heard and it was just the discovery of the nest that confirmed their presence.

Observations from a hide erected there were limited, but some aspects of interest emerged. Firstly the adult returned to the nest within 3 minutes of my helper leaving, secondly she (?) quickly pulled grasses across with which to cover herself and thirdly she took no notice whatever of human voices (even mine from within the hide). Perhaps she was used to the voices of people living so close by.

FIGURE 3 — Spotless Crake and newly-hatched chick. Photo: D. W. Hadden.

Also of interest was the fact that she gave a water splashing display similar to the bird described previously. Again I did not see it so was unable to describe it.

As I approached the nest on 5 December, the day the three chicks had hatched, they scrambled off and were found swimming in the water below. I put them back in the nest but the adult called them off (after my companion had left me in the hide) and they could be heard squeaking and the adult making soft calling noises from behind the nest.

FIGURE 4 — Spotless Crake feeding chick. Photo: D. W. Hadden.

ACKNOWLEDGEMENTS

I would like to thank the farmers who allow me free access to their property and to Mr H. R. McKenzie for egg measurements and Mr B. Sneddon for identifying the nesting material.

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BLACK-BILLED GULLS EXTEND BREEDING RANGE NORTH

By N. M. GLEESON, SUSAN M. FOGARTY, J. L. PLAYER and H. R. McKENZIE

Observers working on the Miranda coast, Firth of Thames, have long hoped that the Black-billed Gull *(Larus bulleri)* would begin to breed there. Each year when the main flock of up to 850 wintering birds went south between late September and early November for breeding, probably at Rotorua, up to 20 would stay at Kaiaua, 5½ miles (8.8 km) north of Miranda, or else halfway at Taramaire ("White Bridge"). Most of this small summering party would be immature birds, with a few adults, which were obviously non-breeders. For 30 years there had been no sign of breeding until 9 November 1967 when R. B. Sibson and others noted one or two showing what may have indicated a breeding urge. In 1968 and the subsequent years the hopes of the watchers were realised.

The following account details subsequent events. The observers responsible for each set of notes are J. A. Brown (J.A.B.), Susan M. Fogarty (S.M.F.), N. M. Gleeson (N.M.G.), T. R. Harty (T.R.H.), J. L. Player (J.L.P.), and H. R. McKenzie (H.R.McK.) who organised the watching (except for that by N.M.G.) and wrote the manuscript.

THE 1968-69 BREEDING

When checking the large Taramaire White-fronted Tern colony on 14 December 1968 S.M.F. and J.L.P. found two bulky gull nests, right inside the tern colony, but widely separated from each other, each with a Black-billed Gull sitting on two eggs. H.R.McK. was called and the birds and nests were closely examined.

S.M.F., J.L.P., H.R.McK.

On 28 December 1968 the tern colony was undisturbed but there was not the slightest trace of the gull nests. It was thought that someone may have destroyed them, thinking that the birds were Red-billed Gull and would be inimical to the terns. However it seems more likely that the nests were blown away as they were loosely sited high on the large bank of purely large cockle shell, with no holding foundation, or else the eggs could have hatched and the chicks taken by the parents from the colony and lost to predators, although in such case some trace of the used nests could have been expected.

S.M.F., J.L.P., T.R.H., H.R.McK.

One bird was present on 29 December 1968 and four on 15 January 1969. Two adults and two immatures of the previous season were there on 23 January 1969 and four immatures at Miranda. No further nesting was attempted.

S.M.F., H.R.McK and others.

THE 1969-70 BREEDING

N.M.G. visited the tern colony on 6 December 1969 and found four adult Black-billed Gulls and three nests, two well constructed, with two and one eggs and one nest at a rudimentary stage. They were at the southern end of the tern colony, which stretched far along the shellbank.

Returning in February 1970, he saw a group of gulls, including two juveniles, at the tide edge. Although the young were well able to fly out of his range the adults made repeated diving attacks.

It was well that N.M.G. had gone to photograph the terns because the Papakura and Clevedon members who usually attend closely to the Miranda coast did not visit between 18 November 1969 and 18 January 1970, being pre-occupied with exciting avian events at Karaka. Close attention to a mixed flock of small waders near the northern end of the tern colony caused an Auckland party on 30 November 1969 and a South Auckland party on 18 January 1970 to miss the gulls about 200 yards away at the southern end of the mass of nesting birds.

THE 1970-71 BREEDING

3 November 1970, at Taramaire, 7 adult Black-billed Gulls present.

H.R.McK. and others

7 November, no nests but gulls fishing in lagoon inside the shellbank and White-fronted Terns congregating on the bank.

N.M.G.

17 November, 7 nests or part nests, closely grouped in edge of tern colony, eggs 2, 1. 17 birds present.

S.M.F., H.R.McK and others.

22 November, 8 gulls with 6 nests, 2 being rudimentary. Eggs 3, 2, 1, 1. Terns now nesting.

N.M.G.

6 December, 6 nests, 3, 2, 2, 2, 2, 1. One White-fronted Tern chick in colony.

N.M.G., H.R.McK. and others.

19 December, 5 running chicks, 3 small chicks in a nest, 2 nests of 2 eggs and an egg broken in a nest by a thrown beer bottle. Vandals had also killed a patch of 28 small tern chicks.

S.M.F., H.R.McK. and others.

31 December, 13 adults and 7 running gull chicks. 1 dead chick in a nest, 2 nests with eggs 3, 2. The 7 chicks were larger than the tern chicks.

S.M.F., H.R.McK. and others.

5 January 1971, 7+ adults and the 7 running chicks of 31 December 1970, but the nests of 3 and 2 washed out. The eggs were not found. They had been in a narrow strip of tern chicks which had been destroyed by a break-through of the tide in a storm.

S.M.F., H.R.McK. and others.

6 January, A note by N.M.G. reads " At my arrival before high water I found the gulls on the tide-line in a compact group with 7 chicks, able to swim and run actively but not to fly. They were being shepherded by 6 to 8 adults.

" As the wind backed up the rising tide the non-flying tern chicks were crowded onto the southern end of the shellbank where my camera was placed. The party of gulls was forced to come within 30 to 40 feet, but was uneasy and the adults kept flying at me. They were an interesting sight, lined up in a row watching me, the chicks appearing ' goggle-eyed ' in comparison with the adults (see Fig. 1).

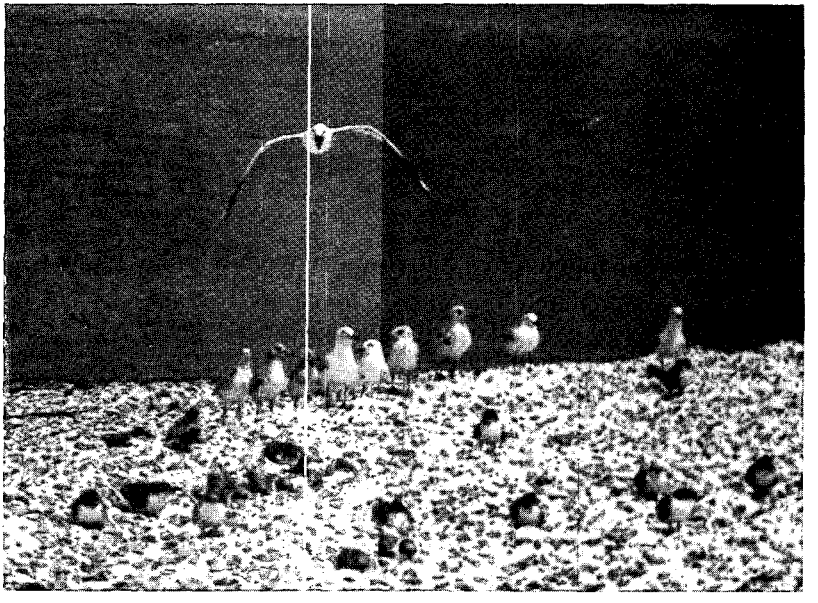

FIGURE 1 — Adult Black-billed Gulls shepherding young as rising tide drives them up from the mudflats on to the former nesting ground, Taramaire bank, Firth of Thames, 6 January 1971. Photo: N. M. Gleeson.

" About high tide the parents drove the chicks down to the edge of the water on the lee side of the bank, and, by appropriate movements and short flights over the water, persuaded five of the chicks to enter it and swim strongly towards the next shellbank, some 40 feet away. The adults flew slowly overhead, keeping pace with the swimmers (see Fig. 2).

" Two chicks remained and in response to further urging also swam across the intervening water, convoyed by a parent bird in the air, to rejoin their fellows on the further side.

" Throughout the whole period the birds had kept together as a compact group. While perhaps resembling the formation of ' creches ' in some species it appeared that nearly all of the parents remained with the chicks, so that the behaviour was probably more a continuation or extension of the colonial nesting pattern.

" It is interesting to note that when young of the 1969-70 colony were able to fly the gulls still kept together in a group over the mudflats, and, on approach, an intruder would be dive-bombed by one of the adults in an attempt to drive him away."

FIGURE 2 — A " convoy." Adult Black-billed Gull watching over two chicks swimming across channel between shell banks, Taramaire bank, Firth of Thames, 6 January 1971.
Photo: N. M. Gleeson.

THE 1971-72 BREEDING

20 November 1971, Taramaire, Black-billed Gulls nesting again with terns, 3 nests, 2, 1 and an empty nest.

N.M.G.

23 November, 20 adults, 9 nests, 2, 1, 1 and other nests partly made. Many eggs in the tern colony, with about 1700 birds present.

H.R.McK. and others.

30 November, nests and eggs of all gulls and terns washed out and lost. 2 gulls standing idly.

J.A.B.

18 December, Following the loss of nests on Taramaire shell-bank a new colony of some of both birds had been set up on No. 1 Outer Shellbank, one of two banks a quarter mile offshore and approachable only at dead low tide. With some tern nests were 4 Black-billed Gull nests, 3, 2, 1 and one nest unfinished. 7 to 9 adults were about the colony and a similar number, including some immatures, had a roost site further along the bank.

N.M.G.

28 December, The nests of 18 December gone, having been washed out by another storm and most of the terns had left. 4 adult gulls remained with two new and poorly constructed nests, one of which had an egg.

N.M.G.

Unfortunately no further observations could be made at this new site, which is difficult of access.

Breeding of this species had been reported previously only as far north as Gisborne and Rotorua so this extended range of 88 miles (140 km) from Rotorua is quite remarkable.

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SHORT NOTES ON FIJIAN BIRDS

NOTES ON THE PINK-BILLED PARROT-FINCH OF FIJI

The Pink-billed Parrot-finch, *Erythrura kleinschmidti* (Finsch, 1878), is confined to true rainforest on the high, rugged island of Viti Levu, Fiji. Little is known about this rare bird, which has been recorded only a few times since its discovery in the 1870s.

It has been reported from the Nadrau Plateau of Central Viti Levu (Mercer 1965: 25) at about 3,000′ (914 m) but other sightings have been made at much lower altitudes in rainforest near Suva, on the south coast. The Whitney Expedition collected specimens from the latter area in 1924 and 1925 (Mayr 1931: 10), while A. H. Martin saw it at about 300′ (91 m) at Lami, on the north shore of Suva Harbour (Martin, manuscript note). He recorded the egg as being light red with dark red spots (Martin 1936: 6). The late W. J. Belcher's painting of the Pink-billed Parrot-finch seems to have been done at Lami, as Mount Korobaba is featured in its background. It was painted in early 1925 (Belcher Painting No. 22) and is probably of birds collected by the Whitney Expedition.

During 1971 further sightings of the Pink-billed Parrot-finch were made in dense rainforest near Joske's Thumb, a volcanic plug northwest of Suva. Here, at 9.00 a.m. on 7 March 1971, one of us (F.C.) positively identified a lone bird which sat for several seconds on a small branch some eight feet (2½ m) above the track and not twenty feet (6 m) from him (300′ (91 m) altimeter reading).

Although F.C. was in the Joske's Thumb area regularly during the following months, no further sightings were made until 28 November 1971, when at 2 p.m. I.P. and F.C. saw at least two Pink-billed Parrot-finches only a hundred yards from where the previous sighting was made (270′ (82 m) altimeter reading). One of the birds moved about some twenty feet (6 m) up in the understorey, perching every now and then on small branches, then darting off again. Some mature and immature Red-headed Parrot-finches *(Erythrura cyanovirens)* were also moving about nearby, and an adult one perched near the Pink-billed Parrot-finch for several seconds. The birds were of similar length, but the Pink-bill had a noticeably stouter body. Through 10 x 40 binoculars F.C. saw the Pink-billed Parrot-finch feed on a small white flower some thirty feet (9 m) up in the understorey. While I.P. was watching this bird at close range, F.C. saw a second Pink-billed Parrot-finch in a densely foliaged tree some twenty yards (18 m) distant.

The large, flesh-pink bill, dark head, olive-green upperparts, lighter yellowish-green underparts, and bright red rump were all noted. The bill is the dominant field characteristic, being visible to the naked eye at quite long range, even in a poor light.

Nothing positive has been recorded about the food of this strange finch, although the suggestion that it "may feed on flower buds" (Mayr 1945: 148) seems to be confirmed by this most recent sighting. In the past the bird was usually described as inhabiting the mountain forest, but it would appear more accurate to say that it is found in rugged rainforest regions at both high and relatively low altitudes.

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SUNBATHING BY THE FIJI GOSHAWK

On the glary noon of 14 April 1971 I saw an immature Fiji Goshawk *(Accipiter rufitorques)* perched four feet off the ground in a tree in Government House grounds, Suva. When harassed by a Wattled Honeyeater *(Foulehaio carunclata procerior)*, the goshawk flew some fifty yards to perch in a densely foliaged tree. A few minutes later an adult goshawk flew from deeper in the grounds, and landed in the shade about thirty yards from where the young bird was sitting. It pecked about at the grass, apparently in search of insects. At this point the immature hawk flew down and, landing on the sun-lit lawn, lay on its belly and spread its wings to their full extent. The adult walked out into the sunshine and lay down in a similar position. Both birds remained like this for several minutes, after which the immature walked about a little, then stretched out again, while the adult flew into a nearby tree. The young hawk soon flew up to join the older one in the tree.

At 10.15 a.m. five days later, at the same place, an adult goshawk landed on a grassy bank below a low soapstone embankment, and lying on its belly, fully extended its wings. The hawk sunbathed for about ten minutes on this occasion.

Sunbathing was again witnessed on 24 April 1971 at 8.00 a.m. The night had been wet and stormy, but it was a fine morning. I saw an immature goshawk chasing an Indian Mynah *(Acridotheres tristis)* low over the lawns in the Suva Gardens, losing the mynah when it dived into some shrubs. Baulked of its prey, the goshawk flew from tree to tree, eventually being closely harasser by a pair of Vanikoro Broadbills *(Myiagra vanikorensis)*, when it flew off to a breadfruit tree in Government House grounds, near where the other sunbathings were seen. Perched on an exposed branch about ten feet from the ground, with its back to the sun, the goshawk spread its wings and sunbathed for about fifteen minutes, before flying off deeper into the grounds.

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LIZARD KILLING BY THE FIJI WATTLED HONEYEATER

The Wattled Honeyeater *(Foulehaio carunculata procerior)* of Viti Levu, Fiji, feeds largely on nectar and insects (Mayr 1945: 122; Mercer 1965: 22), but small reptiles may well be included in its diet.

On 4 June 1971 I saw a Wattled Honeyeater attack a six inch (152 mm) long green skink in a breadfruit tree outside Fiji Museum, Suva. The bird pecked at the skink several times, but the lizard managed to escape around the trunk.

At 7.45 a.m. on 20 October 1971 I saw a Wattled Honeyeater in a small mango tree in Gladstone Road, Suva. In its beak the bird held a struggling gecko by the midriff. It flailed the gecko's head violently against a branch several times, then flew off with the now limp reptile dangling from its beak.

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A HONEY-EATING FIJI RED-HEADED PARROT FINCH

The Red-headed Parrot-finch *(Erythrura cyanovirens)* has been recorded as feeding largely on grass seed and small grain (Mercer 1965: 24) and on flowers and buds (Mayr 1945: 123), while I have often seen it picking small insects off vines and dead leaves in the rainforest understory, in company with mixed groups of flycatchers and the rarer Pink-billed Parrot-finch *(Erythrura kleinschmidti)*.

At 6 p.m. on 24 April 1972, in Gordon Street, Suva, I saw a Red-headed Parrot-finch apparently honey-eating from the introduced White Ixora *(Ixora alba)*. It would pluck a flower, nipping the stem off at the base, then hold the base of the stem in its bill, the flower protruding like a cigarette, and evidently lick at the nectar — something I often did myself as a child. It would then drop the flower, pluck another, and repeat the process. I watched it for ten minutes or so, during which time it proceeded with this in a very practised and business-like manner, before flying off into the dusk.

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CLASSIFIED SUMMARISED NOTES

Compiled by A. T. EDGAR

Selected extracts from notes supplied to the Recording Scheme since compilation of CSN 1963-1970 (Supplement to *Notornis* 19). Correction of errors in that publication appear under Red-necked Stint and Black-fronted Tern.

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(E. & O. E.)

LITTLE SPOTTED KIWI *(Apteryx oweni)*

Raumati Beach, 19/6/72, one killed by a car; probably illegally brought from Kapiti Island; used to occur in Tararua Ranges but has not been reported in North Island this century (IGA).

YELLOW-EYED PENGUIN *(Megadyptes antipodes)*

Wellington West Coast, June 1972, 28 found dead on beach patrols between Turakina river and Palliser Bay, and a further 6 in July 1972 (IGA, JAF). Bluff Hill, Southland, 4/10/70, breeding colony of unknown size, probably not more than four pairs (RRS).

GENTOO PENGUIN *(Pygoscelis papua)*

St Kilda Beach, Otago Peninsula, 22/9/70, first N.Z. record (JTD & AW, see *Notornis* 20 (1), March 1973).

Tiwai Point, Bluff, Southland, one ashore 1/11/70; photographed and returned to sea (I. Mackintosh).

BLUE PENGUIN *(Eudyptula minor)*

Bay of Islands, penguins are sometimes entangled in fishing nets but when a net is being drawn in to the dinghy have been observed to escape by leaping a few inches out of the water to clear the top rope of the net (DEC). D'Urville Island, January 1971, an adult and chick 800 ft up a hillside almost at the top of a ridge, in a depression under an old farm gate which had been cast aside. Between the nest site and the rocky beach there were numerous alternative possible nest sites — boulders, bush, fallen trees in a pine plantation, large rocks. The chosen site was alongside a bull-dozed track used by cattle, sheep, dogs, farm workers and a land rover. 5/2/71, midday, a penguin feeding 150 yards offshore was attacked by two Black-backed Gulls and suffered a laceration about four inches long from the back of the shoulder to well below the flipper. When the gulls were driven off the penguin came ashore and went into a rock niche where the wound was exposed to full sunlight. I replaced the flap of skin and placed the penguin in a shady spot but it immediately returned to its original position and turned the wound to the sun again (ML).

WHITE-FLIPPERED PENGUIN *(E. albosignata)*

One banded at Motunau found at Karitane January 1971 (GH).

SNARES CRESTED PENGUIN *(Eudyptes pachyrhynchus atratus)*

Moulting bird found on northern side of Cook Strait, January 1972; recovered and finished moult in Wellington zoo; died May 1972; probably most northerly record (JAF).

SOUTHERN CRESTED GREBE *(Podiceps cristatus australis)*

Lake Heron, 12/12/71, at least 20 observed, northern and eastern arms of the lake; total population may be greater (RJP). Lake Ohau, 9/10/70, two pairs (P. Child). Lake Manapouri, 1/11/68, two (DAL). Lake Te Anau, 1970, on lagoons opposite Glade House (RRS). Waimatuku lagoons, southern Southland. one on 25/4/72 (MLB, RRS).

NEW ZEALAND DABCHICK *(Podiceps rufopectus)*

Muriwai Lakes, September 1971, 89 (SR). Gisborne-East Coast, Tiniroto, 30/4/72, a pair with two young about three weeks old (AB). Hawke's Bay, Lake Tutira, 9/10/68, a pair with young (J and MM); 23/10/67, small roadside lake between Blackhead and Porangahau, two adults feeding two young (IGA). Wanganui, Westmere Lake, two pairs with young 7/2/70; Kaitoke Lake, 23/2/69, three pairs, two with young; 15/2/70, eleven birds; Waipu Lake 14/6/70, one; Wanganui estuary 27/4/69, one with ducks (MFO'S). Manawatu, may turn up on quite small ponds e.g. two on Scott's Pond, Oroua Downs, October 1968; same month six adults on Dalrymple's Lake with three young, and eleven on Russell's Lake; frequently on Lake Omanuka and Lake Pukepuke. November 1968, two adults and two young at Otaihanga, near Paraparaumu (IGA). Waikana, one in 1971 (PCB). Lake Horowhenua, 40 in July 1971, none seen October 1971 - March 1972, 19 in June 1972 (EBJ).

BLACK-BROWED MOLLYMAWK *(Diomedea melanophris)*

Scott Point, 90 mile beach, 23/4/72, two immature birds; one squatting on wet sand, tired but dry; the other standing in the breakers, very wet and exhausted, wings spread like a shag. Both put in sacks,

taken to Pukepoto, dried and housed in a shed; fed with some difficulty, oil and chopped kahawai; recovered after a few days and took off to sea from a rise in the paddock (J. Morrison).

YELLOW-NOSED MOLLYMAWK *(D. chlororhynchus)*

Voyage Lyttleton-Wellington 5/6/71, two sightings, one 10 miles off Waiau mouth and the other off Kaikoura, without doubt the same bird. For much of the time it was within a chain of the stern; I obtained excellent views and relying on the Field Guide have no doubt about the identification (JRJ).

BULLER'S MOLLYMAWK *(D. bulleri)*

Stewart Island 15/1/69, 12 with 25 *D. cauta,* drifting or swimming as a group off Leask Bay to Ackers Point and beyond (IGA). Taiaroa Head 2/6/70, about 20, passing (J and MM).

WHITE-CAPPED MOLLYMAWK *(D. cauta cauta)*

Voyage Lyttleton-Wellington 18/5/71, 15-20 seen from ship, some sitting on water, others flying; did not normally follow the ship but occasionally did so (JRJ).

SALVIN'S MOLLYMAWK *(D. cauta salvini)*

Voyage Lyttleton-Wellington 1/2/69, 10-15 individuals seen, sometimes following ship, usually only one or two at a time; all appeared to be this subspecies (JRJ).

CHATHAM ISLAND MOLLYMAWK *(D. cauta eremita)*

Canterbury coast June 1971, tentative identification of several of this subspecies offshore from Canterbury and one as far north as Cook Strait where other *cauta* spp. were present in numbers (IGA). One found at Himatangi 4/7/71 (FCK).

LIGHT-MANTLED SOOTY ALBATROSS *(Phoebetria palpebrata)*

Palmerston North 11/10/68, exhausted bird hit telephone wires in city, looked after for two weeks by Mr C. C. Porter, then liberated in Hawke's Bay (IGA). June 1969, one stranded on farmland near Mataura, Southland, well grown juvenile in good condition; released. Glenary Station, Waikaia, another storm wreck, weak, subsequently died (RRS). Living birds seen flying in Wellington harbour 24/3/72 (PCH) and 5/6/72 (JAF), 8/6/72 (EWD).

NELLY *(Macronectes giganteus)*

Late July and early August 1971 about ten storm-wrecked on Far North beaches between south of Ahipara and Hukatere; three live birds cared for and released; one had been banded as a pullus at Macquarie Island in January 1971 (EM, HAF). September 1972, 30 feeding on a dead whale, first time I have seen Nellies inside Kaipara harbour (MW). Muriwai beach 18/7/71, one, banded as pullus at Kerguelen in January 1971 (SR). Kaikoura coast, 3/6/72, S. Sparrow saw a completely white bird (J. R. Jackson). Waikawa, Manawatu, 5/6/72, one banded as chick at Nelly Island, Antarctica, on 20/1/72 (IGA). Woolshed Bay, Otago, 38 inshore, feeding on a floating bullock carcase (D. Cook). Ocean Beach, Bluff, 280-300 offshore 23/1/69 (IGA).

ANTARCTIC FULMAR *(Fulmarus glacialoides)*

Foveaux Strait, 23/11/70, one captured at sea by a Bluff fisherman and brought ashore for identification (RRS). Live specimen at Newtown, Wellington, 19/7/72 (JAF).

CAPE PIGEON *(Daption capensis)*

Kaipara harbour, September 1972, with Nellies feeding on a dead whale (MW). Manawatu, August 1971, one found inland at Longburn (IGA). Wellington harbour, Moa Point, 30/8/70, 105; 27/9/70, 200 (J and MM).

GREY-FACED PETREL *(Pterodroma macroptera)*

Taranaki, burrows on an offshore island, Tongaporutu, 18/7/71 (WFC).

WHITE-HEADED PETREL *(P. lessoni)*

Southland, 10/5/70, one storm wrecked 10 miles inland at Mokotau, released Oreti beach (RRS).

MOTTLED PETREL *(P. inexpectata)*

Canterbury-Marlborough coast, 5/6/71, seen from ship, off Motunau-Waiau mouth 50; off Waiau mouth 20, one off Kaikoura and 7 off Clarence mouth. Dusky Sound, mid-February 1972, J. Hilton found nesting on all five islands of the Shag Island group; eggshells and old eggs found around the colonies (JRJ).

KERGUELEN PETREL *(P. brevirostris)*

Southland, Waimatuku, 30/6/69, one storm wrecked, released on sea (RRS). Pukerua Bay, Wellington, September 1972, one seen, being harried by Black-backed Gulls; one picked up dead at the same place a few days later (PCH).

FAIRY PRION *(Pachyptila turtur)*

Otago, 15 picked up dead in November 1971 indicates that there may be a local breeding population ,perhaps on offshore islands such as Green and Taieri Island (GH). Manawatu, dead birds at Himatangi beach on 12/12/70 had been banded as adults at Stephens Island in September 1968 and 1969. October 1971, a big wreck, 500 in 25 miles Rangitikei-Ohau river mouths (IGA).

GREY PETREL *(Procellaria cinerea)*

6/1/72, one alive but exhausted on a farm near Fielding; fed on sardines and taken to Dominion Museum for recovery and release (IGA).

BULLER'S SHEARWATER *(Puffinus bulleri)*

17/1/69, one in mid-Foveaux Strait, flying south-east (IGA).

SOOTY SHEARWATER *(P. griseus)*

Wanganui, hundreds off Castlecliff beach 6/5/70 (MFO'S). Lyttleton-Wellington, 1/2/69, seen all the way; 18/5/71, only seven seen on the journey (IGA); 24/12/71, only 8 at sea plus a few in Cook Strait (JRJ).

SHORT-TAILED SHEARWATER *(P. tenuirostris)*

October 14-22, 1968, large numbers storm cast on Southland beaches at Oreti, Riverton and Orepuki. A series of measurements taken in the field widens the range for New Zealand specimens for bill, mid-toe and tail (RRS).

MANX SHEARWATER *(P. puffinus)*

One picked up at Pukerua Bay on 26/6/72 is the first record for New Zealand (see FCK & JAF, *Notornis* 20).

FLUTTERING SHEARWATER *(P. gavia gavia)*

Whangamata, 24/8/71, about 1000 on water and at fish shoals (HRMcK); Waitarere beach, Manawatu, thousands flying north 11/2/70 (EBJ).

HUTTON'S SHEARWATER *(P. huttoni)*

Kaikoura township, March 1970, 13; March 1971, 10; captured, banded and released (JAC).

GREY-BACKED STORM PETREL *(Garrodia nereis)*

One found dead in Featherston Street, Palmerston North, 13/10/71 (IGA).

NORTHERN DIVING PETREL *(Pelecanoides urinatrix)*

Paekakariki, 1/8/71, a bird recovered which was banded at Trios as adult female on 26/7/62; age therefore exceeds 10 years, probably a record for the species (FCK).

RED-TAILED TROPIC BIRD *(Phaethon rubricauda)*

East Cape, February 1971, one alive but rather exhausted, reported by Mrs Keast (SR).

AUSTRALIAN GANNET *(Sula bassana)*

Sightings of immature birds, Bay of Islands, 25/7/71, three (DEC); Wanganui, 9/5/70 (MFO'S); Wellington harbour, singles on 31/5/69, 23/7/69, 24/8/69 (J and MM).

BROWN BOOBY *Sula leucogaster)*

Coromandel Islands, Gannet Rock, 19/3/71, one among gannets (SR).

BLACK SHAG *(Phalacrocorax carbo)*

Raglan harbour, colony in two karaka trees 1971 (DWH); Lake Karapiro, nesting on power pylons commenced 24/8/71 (JHS). Taranaki, small colony Lake Rotokare July 1971 (WFC). Tekapo river, December 1971, 4 nests in willow trees, one chick nearly flying; one nest had three young of different ages, the youngest about one week old (RJP). Awarua swamp colony, Southland, 6/9/69, 27 nests, 7 with eggs, 5 with young, some almost flying; 13/12/70, 30 nests, 4 still with eggs, many flying young and chicks in nest. Lower Waiau river, near mouth, Black Shags traditionally gather in May-July and feed on lampreys *(Geotria australis)*. In June 1970 the first birds arrived 15 minutes before daylight and started feeding, and about 40 were present by daylight; the birds work individually, moving downstream in the swift water; once a lamprey is caught the bird surfaces to swallow it. Half an hour after daylight many birds were already resting on gravel beaches and an hour after daylight all appeared to have had their fill. Though trout are abundant I have never seen them taken in these circumstances (RRS).

PIED SHAG *(Phalacrocorax varius)*

Skull Creek, Whangarei, 1/8/70, 60 nests, one with eggs, others with chicks of different ages and about 30 flying young; September 1971, 80 nests, many full clutches (AMM). South Auckland, Hingaia river, new colony in gum trees on the bank of a tidal river, 3 nests, 1971 (HRMcK).

LITTLE BLACK SHAG *(P. sulcirostris)*

Cape Reinga, one on a tree at Tapotupotu Bay 14/2/71 (MED); 30/1/72, 5 on Lake Waiporohita, 18 on Lake Rotokawau, Karikari peninsula; 20/6/71, 13 in Mangonui harbour; Kerikeri, a single bird which appeared on farm lake on 9/1/72 still had white ear flecks; 25/4/72, flock of 25 at same place, one in pale mottled brown immature plumage (ATE). Hawkes Bay, Ahuriri, 11 on 13/2/72, 74 on 15/4/72

(NBM). Wanganui estuary, mostly autumn and winter; 16 on 3/5/70, 50 on 14/3/71 (MFO'S). Lake Horowhenua, 19/9/70, 21 (J and MM); 8/5/71, 35; 27/7/71, one on a post just clear of water, head up and neck extended, wings drooped, tail raised and fanned; three others in the water, watching it (EBJ). Eastbourne, two in June and three in August-September 1969 (J and MM).

LITTLE SHAG *(P. melanoleucos)*

Whangarei harbour, numbers appear to have declined over recent years while Pied Shags are increasing (AMM). Opoutere, Coromandel, three counts in January-March 1969 total 13 pied phase, 3 smudgy, 30 white-throated (BB). Lake Horowhenua, 5/10/71, 3 pied, 30 white-throated; one pied mostly white on the back (EBJ). Lake Elterwater colony seems to be increasing (TJT). Southland, Lake Waituna 4/1/72, 50; Invercargill estuary 16/12/71, 80 (RRS).

STEWART ISLAND SHAG *Leucocarbo carunculatus chalconotus)*

Stewart Island, Leask's Bay, on Fish Rock 21/1/72, about 60, roughly equal numbers bronze and pied; a number of juveniles grouped together on a flat rock, like a nursery (MLB).

SPOTTED SHAG *(Stictocarbo punctatus)*

Waitangi, Bay of Islands, one on rocks with Pied Shags, June 1971 (GW). Skull Creek, Whangarei harbour, one dead December 1971 (AMM). Wellington West Coast, regular winter visitor in small numbers to the more rocky regions, rarely reported from Manawatu region even as a beach wreck; 24/6/72, eleven found dead Turakina mouth - Palliser Bay (IGA). Wellington Harbour, small numbers (up to 10) regularly throughout winter 1972 (EWD). First record of breeding, Wellington Harbour (Somes I.) 1/10/72 (JLK). West Coast, January 1972, nesting completed at 12th mile, Greymouth; Perpendicular Point, Punakaikai, 50 loafing or almost fledged on ledges, many empty nests (JRJ).

WHITE-FACED HERON *(Ardea novaehollandiae)*

Umawera (Hokianga) bred 1971; up to nine seen together (JAL). Bay of Islands 1971, 53 in Kerikeri Inlet (ATE) and 40 at Parekura Bay (WC). Tangaihe, south of Dargaville, 47 birds at nest colony, July 1971 (CDC). Hawke's Bay, Ahuriri, 15/4/72, 38 (NBM). Motueka, March 1972, a bird smaller than normal, with very pale plumage, bill and legs; face not pure white but rather yellowish (HH). Two Manawatu birds had tarsi light brick red in July 1971 (EBJ). Canterbury, 41 at Lake Wainono 13/2/72; sightings of singles at Lake Emma, Lake Heron, and 5 in north branch, Ashburton river (RJP). One at 2500 ft, Godley Peaks homestead pond; 36 feeding in a stubble field at Lumsden (P. Child). 200 at Invercargill estuary 16/12/71 (RRS). Stewart Island, has been breeding for some years but my first definite record is a juvenile with three adults at Kaipipi arm, 12/1/72 (MLB).

WHITE-NECKED HERON *(Ardea pacifica)*

Unconfirmed report of one bird, mid-February 1972, seen with a White Heron and nine White-faced Herons where Stoney Creek flows into Lake Benmore. It appeared to stand about three inches taller than the White Heron (J. A. Anderson).

WHITE HERON *(Egretta alba)*

Rangaunu Bay, June 1972, six (ATE). Rawene, one most years, May-September 1971 (ATE), up to 27/8/72 (GW). Kerikeri Inlet, one on 27/4/72 and on 12/8/72, the only sightings in ten years (ATE). Portland, 8/5/72, one (AMM). Dargaville, 1972, two in May, one near Omamari in July, one at Waihue October (CDC); Poutu, one May-July (MJB). Kaipara, 1972, 2 or 3 at Jordan's May (press report); birds present between Helensville and South Head May to September, 3 north of Helensville, 30th June; 2 north of Parakai July, one in August and September (SR, MW). One at New Lynn 16/8/72, one off Northern motorway 13/9/72 - 2/10/72 (SR). Mangere, 4/6/72, 4 (BB); Kingseat Creek, two on 25/7/71, 5/9/71 (HRMcK). Waiuku peninsula, one 25/6/72 (BB). Mataitai, Clevedon, one from 28/4/72, joined by another, left June 1972 (HRMcK); Firth of Thames, one in April (DWH) and May (BB). Waikato river estuary 13/5/72, 2 (JU), 28/6/72, 4 (BB); one at Marakopa 8/5/72 (press report) and 7 at Port Waikato 9/7/72 (SR). Tuakau, one in May 1972 (RCB). Lake Whangape, 30/4/72, 3 (HRMcK); single birds at Rangariri 1 and 17/7/72 (SR); Lake Waikare, 9/7/72, 11 (BB); Lake Hakanoa, 20/8/72, one (SR).

Matata, 7/7/72, 2 (SR). Gisborne, one at Muriwai lagoon April 1972 for a few days; then tidal flats at Gisborne till June, 2 on 26/6/72; one at Tiniroto 24/5/72 (AB). Taranaki, Bell Block, one on 8/5/71 (WFC). Manawatu, 1971, 2 at estuary, June (J and MM), 2 at Lake Horowhenua 28/9/71 - 2/10/71 (EBJ). 1972, one on 21/5/72 (JAF); one on nearly every visit to Lake Horowhenua from 10/6/72 to 18/8/72, two on 8/7/72 (EBJ); sightings of single birds at Paremata and Waikawa in May (JAF). Nelson, present 1972 (DWH), no details.

Marlborough, single birds at Lake Grassmere 15/4/69, at Lake Elterwater 18/4/68 - 28/5/69 and at Ward 13/5/69 and 5/6/69. 1970, two at Flaxbourne mouth in April, one near Blenheim in August. 9/5/71, one at Kaka Road, Ward (JAC, TYT). Clarence river bed 3 miles above St James Station, one present for some days in March 1971 (JRJ). June 1972, one at Grovetown and one at Blenheim. The Blenheim bird had been taking goldfish from ponds; captured by E. J. Sharpe and taken to Havelock, it returned to Blenheim within 24 hours (press report).

March 1971, one on a small lake at Ada Station, below junction of Ada and Waiau rivers (JRJ). Single birds at Lake Wainono in March 1971 and at Opihi on 10/7/71 and 29/11/71 (RJP). One at Benmore Lake February and July 1972 (J. A. Anderson). Wanaka, one 1970 (JA). Ram Island, Berwick, one in July 1970 (HS). April 1971, singles at Karitane (WTP), Merton (DK) and Leith valley (BW); two at Merton 30/5/71 (GH). Waikouaiti, 20/2/72, one (RJP); gravel pits near North Taieri golf course, June 1972 (GH). Southland, February 1970, one present for several days in Anderson Park, Invercargill, ate all the goldfish. May and June 1972, at least two birds in Lumsden district. One was found dead; a second dead bird near Invercargill in August 1972 (RRS).

LITTLE EGRET *(Egretta garzetta)*

Mangere Ponds, one in July and August 1971 (SR, P. Crombie). Manukau harbour south, 4 on 5/12/71, 19/1/72; two on 1/2/72, one with four inch head plumes (HRMcK); Waiuku, one in June;

Tuakau, two 19 - 25 May, one 28 June 1972 (BB, RCB). Firth of Thames, 14/5/72 (BB), June (DWH); Lake Waikare, 9/7/72 (BB), all singles. Hawkes Bay, Ahuriri, one in late 1971 and until 13/2/72 (NBM). Wanganui, Kaitoke Lake, one 25 April - 7 May 1972 (MFO'S). Nelson, Rough Island, two in January 1972 (FHB). Marlborough, June 1972, 5 (press report). Otago, Merton, 27 April - 23 May 1971, one. Waded along the edge of Waikouaiti river channel where it flows through tidal mudflats, stopping every so often to rake in the water first with one foot and then the other. After raking it would dart its head into the water and frequently a small worm-like object was lifted and swallowed. At one time it came out of the water and scuttled along the shore with its head tucked tightly down on its shoulders. When it stretched upright in alarm as we approached it appeared very slender about the neck and head. Besides the mudflats, it was seen once on a paddock close to the river and once on a small island, standing among some thistles (GH). One on 20/2/72 (RJP). Southland, at least three birds May - June 1972, at Winton, Invercargill and Gorge Road (RRS).

REEF HERON *(E. sacra)*

Onehunga, catching 4-5 inch flounders on three-quarter full tide (BB). Breeds on north side of Raglan harbour (DWH). Marlborough, Goose Bay, 14/12/69, 3 (JAC). Otago, two pairs near Taiaroa Heads, also seen at Karitane; numbers may be declining (GH). Southland 1970, sightings at Ocean Beach, Pahia and Bluff (MLB, RRS, LEH).

CATTLE EGRET *(Bubulcus ibis)*

Dargaville area. 1972, five at Tutamoe in March and at Mamaranui in April (LO). Five in a paddock at Dargaville fertiliser works 1-21 May, foraging around and moving among resting cattle, sometimes taking flies off their backs but not actually observed to perch on the cattle beasts; crickets appeared to be a staple diet. Perches included stumps, posts and macrocarpa trees. One bird was observed to have a sore left leg which got worse as the month wore on, the bird standing apart, hunched and obviously in pain. 21 - 26 May, birds moved a little north to the experimental farm; about 28 May four were reported at Tatarariki, south of Dargaville and an injured bird was seen across the river at Mititai in early June and until 20 July; if it was the bird previously seen it had made good recovery. 8 birds, four of them in breeding plumage, were seen at Tatarariki on 16/10/72, and according to the farmer had been there for some months (CDC, BC, RF). Auckland, Mangere, 4 on 27/5/72, 1/6/72; two on 16/6/72, 23/9/72 and 1/10/72 when one was assuming breeding plumage (SR). One south of Waiuku 20 - 28 June (HRMcK) and 1/7/72 (MED). Wanganui, one on a farm near Lake Kowhata, May 1971 (MFO'S). Manawatu, report of one at Lake Pukepuke July 1971 and one reported a year later by a farmer at Tiakitahuna had been in the area for a considerable period; said to associate with pigs (IGA). Reported from Nelson May 1972. Marlborough, June 1972, three (press report). Near Outram, July and August 1971, one in a paddock for about six weeks (GH). Invercargill Borstal farm, one on 14/7/71, 28/9/71: one at Invercargill 6/6/72 and 25/8/72; an unconfirmed report of six birds with cattle at Waimahaka in June, and one found dead at Gorge Road July 1972 (RRS).

NANKEEN NIGHT HERON *(Nycticorax caledonicus)*

Wellington, January 1972, one perched on an aviary in which three birds of the same species are held; it was extremely shy and flew up into tall pine trees nearby; full adult plumage (FCK). January 28 - 30, harassed by magpies (RSS).

AUSTRALIAN BITTERN *(Botaurus stellaris)*

Dargaville, August 1971, one in a rushy paddock, head and neck in the freeze position, neck feathers fluffed out, moving along with four or five bouncing steps as if trying to take off (CDC). Waiuku, 5/12/71, booming 1900 - 2000 hours (MED). Opoutere, 7/4/69, one feeding in a small creek crouched and waited with bill submerged; caught a small fish, moved a few paces and repeated the procedure; head tilted to watch downstream side and possibly its own shadow (BB). Kyburn river, Central Otago, 15/12/70, jumping and falling display (TJT). Franz Josef glacier, March 1969, after a three hour climb up from the base of the glacier, a dessicated specimen (skull, some bones and feathers) found lying on ice; seems to indicate a possible movement from West Coast to Canterbury or vice versa (FCK).

In November 1944 bittern were plentiful in Mossburn area and it was quite common to disturb half a dozen when mustering cattle in a 300 acre river paddock. One day seven bittern circled over a particularly wet area of swamp, about 150 ft up in the air, each following another in a fairly tight circle, moving clockwise; this went on for about 15 minutes during which the birds called continuously, seldom more than a second between calls. About the same time of year I disturbed a bittern from the margin of a small backwater; on the grassy verge where the bird had been standing were five small trout (4 - 6 inches); these were lined up an inch or so apart, heads all pointing in one direction. The fish had apparently not been regurgitated but taken from the water and arranged in this manner to be eaten later (IAM).

GLOSSY IBIS *(Plegadis falcinellus)*

Auckland motorway late May 1972, unconfirmed report of one bird (MJB). Waiuku, 20 - 23 June 72, two; one had a rough growth on the front of tibio-tarsus joint, about blackberry size. Seen to take what looked like an acorn-sized chrysalis (HRMcK). Wanganui, Turakina valley, 7/5/71, one shot, immature in good condition; in Dominion Museum (FCK). May 1972, reports of one in Nelson and seven at Westport. Canterbury, 29/12/71, one at Lake Wainono; also present 13/2/72 (RJP). Southland, 20/5/71, 2 at Pahia; 22/5/71, 3 at Invercargill estuary; 26/9/71 and 6/10/71, two at Waimatuku mouth; 7/10/71, one at Waituna; Jan 72, one in Awarua swamp. Lake Brunton, one shot 6/5/72 (RRS).

ROYAL SPOONBILL *(Platalea leucorodia)*

Orewa, one early July - 4 September 1971 (SR). Waitemata harbour 19/9/71 (SR, P. Crombie). Waiuku, Waitangi Falls, one through winter and spring 1971 (WLR). Mangere ponds, one 20/12/71, 6/2/72 - 23/4/72 (SR); Kingseat 21/6/72, one (RCP); 2/7/72, one at Kingseat, one at Puketutu (HRMcK). Miranda, one on 8/1/72 (SR). Hawke's Bay, Ahuriri, 13/2/72, one; 15/4/72, 4 (NBM). Taranaki, Waitotara mouth, October 1970, one (DGM);

Waitara mouth, one 20/11/71 till at least 19/12/71 (WFC). Wanganui, Whangaehu estuary 1/1/71, 3; 6/5/71, one (MFO'S). Manawatu estuary, maximum 1971, 29; 29/4/72, 30 (IGA). Waikawa, winter 1971, one (PCB); Lake Pauatahanui, 30/10/71, one (J and MM). Nelson, Rough Island, June 1972, 5; 8 other birds at Motueka same day (BRK). Waikouaiti, 20/2/72, one (RJP).

MUTE SWAN *(Cygnus olor)*

Te Pohue Lake, road Napier-Taupo, 12/2/71, 3 adults (J and MM). Wanganui, Virginia Lake, 8; one or two pairs breed every year (MFO'S).

BLACK SWAN *(C. atratus)*

Lake Heron, 7/11/71, a swan standing on a nest which had been built by a Canada Goose in September 1970, had four downy cygnets about two weeks old beside her and 5 more in the water alongside; in the nest were 5 swan eggs, cold and dirty, three containing a dead chick and two infertile. About a mile away were seven swan nests in an area of niggerheads, with 20 abandoned eggs mostly outside the nests, eight of the eggs were infertile and 12 contained dead chicks (ML). Lagoons between Waihola and Waipori, 25/5/70, large flocks, more than in March - April and larger than any flocks seen at this time of the year for 10 years (HS). Southland, main breeding areas Waituna Lagoon and Lake George; Invercargill estuary and Awarua Bay are not breeding areas, swan found there during breeding season are generally non-breeders. Isolated pairs breed on other coastal lagoons. Poor breeding success 1971/2 season (RRS).

CANADA GOOSE *(Branta canadensis)*

Poutu, Kaipara, two in May 1972 (MJB). 3 at Mangere 4/12/70 (HRMcK), one at Miranda 4/77/71 (PF). Paremata Inlet, one appears resident with swans Nov 70 - May 71 (JAF); Lake Pauatahanui, August and October 1971 (J and MM). Lake Elterwater, November 71, 12 (TJT); Kaikoura, 23/4/71, low cloud, 30 passed over heading for Mt Fyffe (MC). Lake Heron, October 1970, adult with 13 young, two still downy, not more than 2 - 3 weeks old, eight in various stages of development and three almost mature; the group stayed together, no other adult being present. September 1970, pair building a nest among dried bulrush stalks, depth of water about 5 ft; the nest, a platform of frost-dried stalks and leaves of bulrush, snow grass and tussock, was about 3½ ft diameter and supported my 9½ stone weight. Three young were reared (ML). Waituna lagoon, Southland, 14/2/72, 79; the largest flock recorded in this area; local breeding success in 1971/2 summer seems to have maintained the apparently resident population (RRS).

PARADISE DUCK *(Tadorna variegata)*

Ward, 1970/71, pair hatched 8, five reached flying stage; 1971/72, hatched 10, flying stage 7 (TJT).

MALLARD *(Anas platyrhynchos)*

Whangarei, still outnumbered by greys except in the Town Basin (AMM). Mangere Ponds, February-March 1972, about 1200 ducks died of botulism (SR). Manawatu, a duck with ducklings flew straight up at a harrier, bill neck and body in one vertical line at least six feet above the water (EBJ).

GREY DUCK *(A. superciliosa)*

Waerenga, greys pushed out by mallard for two years but started to return in 1972 (MPD). Virginia Lake, Wanganui, a grey duck fossicking at my feet had lost the outer end of its upper mandible and the tongue was plainly visible; as it poked around over the lawn the tongue was rapidly flicked to and fro, the amount of movement being small and the tongue did not actually protrude (EBJ). Hawke's Bay, Ahuriri, 15/4/72, 12 greys, 3735 mallard (NBM). Waikouaiti, May 1971, 69 true greys, 881 mallard/greys (GH).

GREY TEAL *(A. gibberifrons)*

Mangere ponds, a record 270 in early 1971 (RBS). Volcanic Plateau, 14/9/71, one pair had eleven ducklings (RGM). One at Waikanae lagoon and several parties of up to 12 on stock ponds in Wairarapa, 1971/2 summer (JAF). Lake Elterwater, February 1972, 20 (TJT). Otago, Ram Island lagoon, particularly numerous May 1970 (HS). Waikouaiti, 30/5/71, 512 (GH). Lake Macgregor, December 1971, two pairs, one and two young (RJP).

BROWN TEAL *(A. aucklandica chlorotis)*

Northland east coast, Punaruku 6/3/72, 7: 3/2/72, Helena Bay 17, Mimiwhangata 11, Whananaki 22 (CSK). Little Barrier, Titoki Point, one on 14/11/71 (MED). Auckland, Mangere Ponds, one in December 1971 (SR), two in March 1972 (HRMcK). Waikanae, Lake Waimea, 5/4/69, 4 (J and MM). These birds may have come from Kapiti. Lake Te Anau West arm, Lake Te Au, January 1953, 12 (RRF).

NEW ZEALAND SHOVELER *(A. rhynchotis variegata)*

Lake Horowhenua, a record 162 on 24/10/71 (EBJ). Catlins, only one bird (shot) in 4 years (D. Cook).

BLUE DUCK *(Hymenolaimus malacorhynchos)*

Ruakituri river, pair with 4 young, approximate hatching date 3/11/71. Tahunga, 26/12/71, immature, dark plumage and dark bill; keeping company with a grey duck; twice put up from under a grassy bank at the same spot (AB). Waiawa river, Urewera, 6/4/70, six (DAL). Kaimanawa Forest Park, three on Waihaha stream, one at junction of streams near track leading to top of Umukarikari ridge, August 1971 (RGM). One in a pool near foot of Tasman glacier, May 1970 (RJP). Clinton watershed, 12 pairs, June-Oct 70 (RRS).

NEW ZEALAND SCAUP *(Aythya novaeseelandiae)*

Muriwai Lakes count, Sep 71 76 (SR). Volcanic Plateau, May 71, Hamurana 380, Mokoia 550, Okareka 200, Rotomahana 400, Rotoiti 30, Green Lake 20, Okataina 30, Tarawera 17 (GW). One white and one mottled on Rotoma, Nov 70 (MED). Taranaki, Lake Mangamahoe, 1/5/71, 95; 29/8/71, 72 (DGM); Wanganui, single birds on Kaitoke Lake 9/9/69, Waipu Lake 14/6/70 (MFO'S). Hawke's Bay, Long Range lake, north of Porangahau 1971/2 (JAF).

AUSTRALASIAN HARRIER *(Circus approximans)*

Eating thrush eggs (DWH) and nestling sparrows (WB); drowned an adult S.I.P. Oystercatcher but when disturbed failed to lift it from the shallow water (AW). Exposed nest in bracken, 3 eggs, Mt Aspiring, 2000 ft a.s.l., 4/11/69 (JA). December 1971, 17 in 27 miles of Tekapo riverbed (RJP). In 1958 there was in Southland a bounty for each pair of harrier feet brought in. A bird

shot had no feet, about one-third of the tarsus was missing and the stumps were completely healed. Though not a large specimen the bird was in average condition; its crop was well filled with carrion, apparently mutton (RRS).

NEW ZEALAND FALCON *(Falco novaeseelandiae)*

Gisborne, December 71, pursued by tuis (AB). Tararuas, reported in Akatarawa and Hutt Valleys early 1972; at this time of the year young birds are dispersing and liable to turn up in any suburban area; 1971 reports of individuals at Turakarae, Eastbourne and Wairongomai (JAF). Taking pigeons (domestic and native) in Marlborough (JAC), Otago (GH) and Southland (RRS). Hunting brown creeper (JRJ), blackbird (TJT), fantail and finches (IAM). Mated pair attacking man (RRS).

NANKEEN KESTREL *(F. cenchroides)*

Poutu, Dec 71, one, ignored by three harriers (MJB). August 72, injured bird at Warkworth cared for by G. J. H. Moon, later released; one frequenting a high ridge at Kawakawa Bay, Clevedon (HRMcK). Three miles from Palmerston North, August 1971, probable sighting; smaller than a harrier, pointed wings; facing a 20 m.p.h. wind, drifting slowly backwards about 50 ft up; length about 12 inches, white underparts (HAR). Rakaia river, Canterbury, near salmon trap; report that two birds frequented the area for two years; observer has seen kestrels in Australia (RJP).

CHUKOR *(Alectoris chukar)*

Marlborough, June 70, 11 on top of Dog Hill, Ward (TJT), May 72, 15 on Mt Fyffe, Kaikoura (JAC). Mt Aspiring, Otago, Feb 70, some at 6000 ft a.s.l. (JA).

BROWN QUAIL *(Synoicus ypsiliphorus)*

Waiuku, Whiriwhiri Nov 71, Maioro June and July 72 (MED). Coromandel, 1971, Whangamata (BB), Pauanui road, Tairua river tidal area, Hikuai-Kopu road through heavy bush (HRMcK). Manawatu, Sept 71, 5 at Pohaninga (EJC); Feb 72, first record from Otaki (PCE).

CALIFORNIAN QUAIL *(Lophortyx californica)*

Kinleith exotic forest July 1970, 83 sightings at 38 localities (RGM). Ward, a clutch of 10 chicks a few days old on 8/11/68 dwindled to 3 flying strongly by 11/12/68 (TJT).

PEAFOWL *(Pavo cristatus)*

Occurs in small numbers in a few valleys in Wanganui East, e.g., Longacre valley Dec 68, 3; Makirikiri valley July 70, 6 (MFO'S).

BANDED RAIL *(Rallus philippensis)*

Bay of Islands, Parekura Bay (WC), near Opua and Paihia (GW) and Kawakawa (ATE). Whangarei, recorded in about eight localities around harbour, 1971 (AMM) and inland at Wheki valley (WC). Waipu Cove, summer 1970 (RWJ). South Auckland, Parakau Creek, Waipipi Feb 69, six on mudflats; 1971, near Karioitahi, Awaruiti, Rangariri (MED). Opoutere, Jan 69, 8 adults 6 chicks (BB). Gisborne, rare; one brought in by a cat at Whatatutu, 1972 (AB).

WEKA *(Gallirallus australis)*

Motukiekie, Bay of Islands, 1972 April (DEC) and June (AJG). Release in Egmont National Park 1970 (DGM). D'Urville Island,

January 1972, of seven wekas living round a house five showed loss of feathers about the face and neck, the smallest bird being most affected. On 27/1/72 the largest bird stood perfectly still for 2 - 3 minutes while the smallest bird, generally not tolerated for more than a moment, preened the neck and feathers of the larger bird, which then performed a similar service to the smaller; mutual preening was later observed several times between different birds (ML). Wekas disappeared from Taramakau and Otira valleys in the early 20s. 40 Western Wekas were liberated in the area in October 1965; reported sightings 1965 - 1968 and one in Otira township Aug 71 (press report). At that date they appear to be established adjacent to Arthur's Pass National Park on the true right of Taramakau river from Inchbonnie corner to opposite the mouth of Pfieffer Creek, also heard calling further up the valley and there may be a few tame birds at Inchbonnie (CNC). Stewart Island, Old Mill Creek, Nov 68, a weka swam across about 20 ft of water and returned to the bank he had left (RHT).

MARSH CRAKE *(Porzana pusilla)*

Regular in small numbers at Ram Island lagoon, an area of sunken peat once farmed but now mostly water with extensive beds of *Carex secta, Festusa ?arundinacea, Juncus gregiflorus,* flax and groves of Crack willow *(Salix fragilis)* (GH).

Not yet a rare bird in Southland but always difficult to find when looked for; seen at relatively frequent intervals in the course of wandering about marsh and swampy areas. Sightings recorded in at least 16 localities. Invercargill estuary, one sighting in jointed rush *(L. simplex)* out on mudflats; another sighting, August 71, in sparse shore-line vegetation; this bird, flushed in calm weather, made a single sustained flight of 162 yards (RRS).

SPOTLESS CRAKE *(P. tabuensis)*

Ram Island lagoon, Berwick, June 70, a small rail, probably this species, rose within 3 - 4 ft, flew weakly for 20 ft and dropped into cutty grass. A similar bird seen on two occasions in March - April 1968 (HS).

PUKEKO *(Porphyrio porphyrio)*

D'Urville Island, Jan 72, two pukekos moving through the top of tall kanuka trees making short leaps from branch to branch, sometimes aided by wing flaps and occasionally pecking at something in the foliage; they then flew up the valley and over a saddle, probably to a lagoon about 900 m. away; two days later two birds flew in and landed on the same trees where they preened and pecked as before; what may have been the same birds seen on another occasion among open scrub and perched in a ngaio tree. An Ashburton farmer reports that pukeko sometimes perch high in pines and eucalypts (ML); perching in willows and other lakeside trees and bushes is relatively commonplace (ATE).

AUSTRALIAN COOT *(Fulica atra)*

Manawatu, Hokowhitu lagoon, 3 seen by J. Cook, Sept 71 (IGA). Wanganui, Virginia Lake since 1967, stable at about 60 adults in winter. Westmere Lake, one in 1969, 9 in 1971; so far no evidence of breeding. Kaitoke Lake 23/2/69, 2 (MFO'S). Hawke's

Bay, Long Range Lake, north of Porangahau, summer 1971/2 (JAF). Lake Elterwater 19/2/72, pair with two young (TJT). Lake McGregor, 3/12/71, adult with two young (RJP). Lake Heron, Sept 69, a coot displayed marked hostility to a grebe nesting nearby; as summer wore on hostility diminished. No aggression shown to swan, Canada Goose, ducks and scaup. When feeding a coot was frequently followed by several grey ducks; when the coot surfaced from a dive trailing water weed from its bill the ducks converged and took some of the edible material from the coot (ML).

SOUTH ISLAND PIED OYSTERCATCHER
(Haematopus ostralegus finschi)

Whangarei harbour July 70, 540; July 71, 510 (AMM). Manukau harbour July 71, 17,471; July 72, 13,794. Albinos, one in July, two in December 71; one March - July 72. Kawakawa Bay, July 71, 140. Firth of Thames June 71, 2,214; June 72, 3,435 (HRMcK). Aotea harbour August 71, 285, one banded as juvenile at Nelson, August 69 (J. H. Seddon). Taranaki, January 72, 58 at Timaru road beach, 14 at Oakura mouth (DGM). Wanganui, regular visitor in small numbers (7 - 11) especially on northward passage (MFO'S). Marlborough, Upper Flaxbourne river, first pair seen in this area 1969; December 70, 5, one pair brobably breeding (TJT). A bird banded at Heathcote estuary Feb 71 found at Dunedin Oval March 71 — unexpected north-south autumn movement (GH). Middlemarch, a pair hatched young in September 70 and another brood, thought to be the same pair, hatched midsummer (Mrs Illingworth). Southland, 1969, main egg laying September 17 - 28; two nests each of two eggs Oct 25 and 30; nests on paddocks, stubble, riverbeds, shingle beach of lake and one on the roof of a maimai. An Ardlussa farmer discing a paddock was avoiding a running chick when the parent settled on his head and beat about his ears with its wings (RRS).

GREY PLOVER *(Pluvialis squatarola)*

Farewell Spit 5/10/71, one (BDB).

PACIFIC GOLDEN PLOVER *(P. dominica fulva)*

Rangaunu Bay, nine on 27/6/71 (MH). 1971/72 season, maximum numbers so far recorded, Parengarenga, 150 (March, ATE); Whangarei, 8 (November, AMM); Kaipara, 10 (March, SR); Manukau, 47 (December, HRMcK); Tauranga, 7 (January, JHS); Hawke's Bay, Westshore, 30 (February, JAF); Manawatu, 11 (December, EBJ); 2 at Lake Ellesmere February, 3 at Wainono March (RJP); Invercargill, 79 (December, RRS).

NEW ZEALAND DOTTEREL *(Charadrius obscurus)*

The following additional localities have been recorded:— Kawhia, Te Mohe bank, 7/8/71, six (JHS); Ohiwa harbour, 25/8/71, six; Matata lagoon, 26/8/71, four (TRH); East Cape, Hicks Bay, Xmas 71, two pairs (DWH); Canterbury, Lake Wainono, one on 25/10/71, one on 13/2/72, identification carefully checked (RJP). Turakina beach, Wanganui, 19/11/66 and 13/12/66, three (MFO'S).

BANDED DOTTEREL *(C. bicinctus)*

Cass river delta, 10/4/71, 75 still present, 55 in a flock (RJP).

MONGOLIAN DOTTEREL *(C. mongolus)*

One at Miranda 29/3/71 (HRMcK).

LARGE SAND DOTTEREL *(C. leschenaulti)*

Manukau, singles recorded 19/1/71, 3/3/71, 16/4/72 (HRMcK). Firth of Thames, two birds between Taramaire and Miranda December 70 - February 71; many sightings of two birds November 71 - March 72; one, the larger bird, in colour by 22/7/72, the other did not colour (HRMcK, JHS).

ORIENTAL DOTTEREL *(C. veredus)*

Waipu Cove, 27/11/71, one; stood for some time by a New Zealand Dotterel (AMM). Reef Point, south end of 90 mile beach, one on 26/1/72 (CSK).

BLACK-FRONTED DOTTEREL *(C. melanops)*

Northland, off Pukenui wharf, Houhora, 7/12/70, three, feeding at a shallow pool back from the edge of the tide, with Sharp-tailed Sandpipers (PL). Weldon's Gap, Awhitu Peninsula, one on beach 14/12/69, not seen again (DAL). Farm dam, Karaka, one 10/5/72 - 6/6/72 (DAU). Waipawa, Hawke's Bay, one early 1972 (JAF). Kaituna mouth, Bay of Plenty, one on 9th and 28th August 70, feeding in soft black mud; did not associate with stilts; orbital ring seen (P. Latham). Manawatu river near Palmerston North, two, first observed 7/12/71 (IGA). Lake Wairarapa, pair present 13/9/70, 15 and 22/11/70, nest, 3 eggs (J and MM). South Canterbury, Opihi river mouth, 6 pairs on 9/10/71, nests on consolidated shingle with grass between the stones, one nest 3 eggs, the other pairs one and two young. A bird seen at Washdyke lagoon 27/5/72 may have come from Opihi, where the river had been in flood (RJP). Southland, Waimatuku mouth, two on 29/4/72; previously seen here in 1962 and 1970; no other sightings and no evidence of breeding (RRS, MLB).

WRYBILL *(Anarhynchus frontalis)*

Manukau, 11/7/71, 867; 2/7/72, 405. Firth of Thames, 27/6/71, 2,980; 18/6/72, 3,410 (HRMcK). One at Bowentown entrance, Tauranga harbour, 18/1/72 (JHS). First Opoutere record, one on 14/1/69 (BB). Hawke's Bay, Ahuriri, Feb 72, 3; seems to be occurring more frequently (NBM). Taranaki, two in January and two in February 72, probably the same birds (WFC). Wanganui estuary, January 67, 3; Turakina beach January 68, 3; March 69, 4; October 70, 3 (MFO'S). Manawatu estuary 1971, up to 22 (J and MM), 18/3/72, 20 (RSS); Waikawa, two in August and September 70 (J and MM) and in 1971 winter (JAF). Canterbury, Lake Wainono, 7/10/70, 51 in breeding plumage feeding on mudflats (P. Child); 1971, less than in previous years (RJP). Otago, Hunter Valley, four on 9/9/71 is the first record for this area; Matukituki, 3/10/71, 7 birds on 9 miles of riverbed, two nests each two eggs, first breeding record for Central Otago (P. Child). Southland winter census 22/8/71, 3; one at Waituna 21/10/71 (RRS).

LONG-BILLED CURLEW *(Numenius madagascariensis)*

1971/72 season, 3 at Parengarenga (Sept-Nov); 2 Dec-March. Firth of Thames, 9 (Nov); Farewell Spit, 13 (Oct); Aramoana, 2 (Feb-March), one (April); Southland, two (Oct and Jan) (ATE, HRMcK, BDB, RJP, MLB).

ASIATIC WHIMBREL *(Numenius phaeopus variegatus)*

1970/71, up to 6 at Manukau, 17 in Firth of Thames and one at Manawatu estuary. 1971/72, 44 birds in Far North, 12 at Parengarenga and 32 at Rangiputa, 1 - 3 Nov (JHS). By that date there were also 10 at Farewell Spit, 5 Oct (BDB) and 3 in Southland, 31 Oct (SLL). The Far North birds shortly afterwards left that area, destination unknown; subsequent records are 9 at Whangarei, 13 Nov (AMM), 2 at Manukau, 20 Nov (SR), 2 at Firth of Thames, 7 Nov (HRMcK) and 5 in Southland, 4 Jan (MLB). One whimbrel sp. at Firth of Thames on 18/6/72 (HRMcK).

AMERICAN WHIMBREL *(N. p. hudsonicus)*

One at Parengarenga 2/11/70 (JHS) and one at Pollok Spit, Manukau, 15/11/70 (DAL).

LITTLE WHIMBREL *(N. minutus)*

Two at Greenpark, Lake Ellesmere, 6/2/72 (RJP).

ASIATIC BLACK-TAILED GODWIT *(Limosa limosa)*

Three at Jordan's, Kaipara, 28/3/71 (RBS); one at Firth of Thames 14/2/71 and 19/2/72 (HRMcK).

HUDSONIAN GODWIT *(L. haemasticta)*

One at Parengarenga 12/12/71 (CSK) and 20/1/72 (ATE). One at Wanganui estuary Oct - Nov 68 (MFO'S). Manawatu estuary, one on 2/2/71 (underwing well seen, EBJ).

EASTERN BAR-TAILED GODWIT *(L. lapponica)*

An " off-white " bird has been seen in Manukau area at intervals from Oct 70 to March 72. Winter counts, Manukau 4/7/71, 4,179; Firth of Thames 27/6/71, 652; corresponding figures for winter 1972 were 1,721 and 375. Some counts for 1971/72 season are Parengarenga 2,000 (ATE); Rangiputa 2,000, Houhora 300, Nov (JHS); Whangarei, c. 2,000; Manukau, Dec, 22,062, Firth of Thames, Nov, 8,667 (HRMcK); Kawhia 407 and Aotea harbour 240, Aug (JHS); Bay of Plenty, Bowentown 3,000, Katikati 240, Jan (JHS); Ahuriri (Hawke's Bay) Nov, 375 (NBM); Manawatu, Nov, 375 (EBJ); Farewell Spit, Oct, 12,000 (BDB); Southland, Aug, 627; Dec, up to 3,000 (RSS). Canterbury, one seen far up Rakaia river near salmon trap, with S.I.P.O., Nov 71, by D. Geddes (RJP).

LESSER YELLOWLEGS *(Tringa flavipes)*

Canterbury, Lake Wainono, 13/2/72 and 26/3/72, one; call heard; once landed within 10 ft of me (RJP).

GREENSHANK *(T. nebularia)*

Canterbury, Opihi, 9/10/71, one (RJP, JRJ); Ashley mouth, 26/2/72, one (MLB, MMD).

MARSH SANDPIPER *(T. stagnatilis)*

Hawke's Bay, Ahuriri, 12/2/72, one, present for some time (JAF).

SIBERIAN TATTLER *(T. brevipes)*

Single birds, probably *brevipes*, at Parengarenga 20/1/72 (ATE), Whangarei 18/3/72 (AMM), Manawatu 17/2/71 (IGA) and 18/3/72 (RSS), Aramoana, Dunedin 5/5/71 (GG), 4/3/72 and 5/4/72 (RJP). Manakau, Karaka, one Jan 72, three, two in full colour, 16/4/72 (HRMcK); Wellington 14/2/72, one (MJI). Farewell Spit, 5/10/71,

one (BDB). Unconfirmed report of a sighting on Tasman river bed, Mt Cook, December 71 (per JRJ).

TEREK SANDPIPER *(Xenus cinereus)*

1971/72 season, one at Parengarenga March (ATE), 3 at Whangarei 27/3/71 and one in May, July and September 71; two Nov 71 - March 72 (AMM). One at Ruakaka Jan 71 (RWJ); Kaipara, one in March and April 71 (RBS); Karaka, one in March and April 72; Firth of Thames, one on several dates 20 Jan - 16 May 71, and one in Dec 71, Feb - March 72 (HRMcK). Manawatu estuary, one on 26/3/72 (JAF) and 25/4/72 (J and MM).

TURNSTONE *(Arenaria interpres)*

Winter 1971, 60 at Parengarenga, one at Rangiputa, 27 at Manukau, 15 Thames; 12 at Lake Grassmere and 10 at Kaikoura, 224 in Southland (ATE, MH, HRMcK, JAC, RRS). Parengarenga numbers rose to 900 in Jan 72 (P. Child), Rangiputa from 300 in Nov (JHS) to 1,000 in Dec 71 (CSK), Houhora, 40 in Nov 71 (JHS). Odd birds at Whangarei (AMM) and 11 at Waipu, Nov 71 (RWJ). 1971/72 maxima at Manukau and Firth of Thames respectively, 270 and 130 (HRMcK). 51 at Bowentown, Tauranga, Jan 72 (JHS). Greenpark huts, Lake Ellesmere, 14 on 6/2/72 (RJP).

KNOT *(Calidris canutus)*

Winter 1971, unusually large counts of 5,585 at Manukau and 2,013 at Firth of Thames; corresponding figures for winter 1972 were 999 and 465, and for summer 1971, 6,470 and 5,500 (HRMcK). Other large counts in 1971/2 season were Farewell Spit, Oct, 18,000 (BDB); 800 at Parengarenga and 2,000 at Houhora, Nov, (JHS); 2,700 at Whangarei, Nov (AMM); odd birds in Taranaki and at Manawatu estuary up to 45 in 1971 autumn and 24 in spring (J and MM).

GREAT KNOT *(C. tenuirostris)*

Firth of Thames, one, well spotted, March 1971; two in February and March 1972. Karaka, Manukau, 16/4/72, one in very good plumage (HRMcK).

SHARP-TAILED SANDPIPER *(C. acuminata)*

1971/72 season, Parengarenga, 30 (Jan), 16 (Apr); Rangiputa, 8 (Jan); Whangarei, 11 (Dec) (ATE, CSK, AMM). Manukau and Firth of Thames, 14 and 7 (HRMcK). Kaituna cut, March, 9 (RSC); Ahuriri, H.B., February, 8; singles at Wanganui Oct - Nov and Manawatu March (MFO'S, RSS). 2 at Lake Ellesmere and 8 at Lake Wainono, February (RJP); Southland, 12 in August (RRS).

PECTORAL SANDPIPER *(C. melanotos)*

1971/72 season, Parengarenga, one in December, two January and March (ATE, GE, GW). Ahuriri, H.B., 3 in February (JAF); Kaituna cut, 26/3/72, one with 7 sharp-tailed (JHS); Lake Wainono, December, 3 with pied stilts (RJP); Invercargill estuary, December, 2; Lake Waituna, January, one (RRS).

BAIRD'S SANDPIPER *(C. bairdi)*

Firth of Thames, one 23/11/71 - 22/12/71 (HRMcK).

CURLEW SANDPIPER *(C. ferruginea)*

1971/72 season, 5 at Parengarenga, Nov. (JHS); four at Manukau, January (TRH); up to 16 at Firth of Thames (HRMcK); one

at Ahuriri, H.B. (NBM); 4 at Turakina beach, Wanganui, Nov (MFO'S); 25 at Lake Ellesmere, December, and 3 in February (RJP); 3 at Southland, Lake Waituna, January (RRS).

WESTERN SANDPIPER *(C. mauri)*

Firth of Thames, two sightings, February 1971 (HRMcK).

RED-NECKED STINT *(C. ruficollis)*

Correction, *Notornis* Supplement to Vol 19, page 53, Lake Wainono (RJP), sightings of 13, 5 and one stilts, delete 69 and substitute 70 for the year recorded.

1971/72, Parengarenga, 2 on 28/5/71; 30 in January and 25 in March 72 (ATE); Rangiputa, Nov, 6 (JHS). Manukau and Firth of Thames, many counts, up to 12 in each locality (HRMcK). Ahuriri, H.B., one in Feb (NBM). Lake Ellesmere, 24 in December (RJP); Southland, 34 at Lake Waituna in October (SLL).

SANDERLING *(C. alba)*

Firth of Thames, 18/3/72, one, coloured (HRMcK). Lake Ellesmere 19/12/71, one (RJP). Southland Lake Waituna, 4/1/72, 3 (RRS, MLB, SLL).

PIED STILT *(Himantopus himantopus)*

Taramaire, 19/2/72, a juvenile chased, caught and swallowed a small silvery fish in water half an inch deep (HRMcK).

BLACK STILT *(H. novaezealandiae)*

Kawhia harbour, Te Kapiko and Opeope rocks, 7/8/71, 141 pied stilts and 15 blacks, of which seven pure black, red eye; eight with variable white smudgy streaks on underparts, two of these with only odd white feathers at vent. Behaved as a separate part of the flock; after wheeling with the flock they formed up together and flew off as a separate flight. Call a harsh barking " yap yap " cf. pied stilt's high pitched " yip yip " (JHS).

SOUTHERN SKUA *(Stercorarius skua lonnbergi)*

Manawatu, one seen feeding on a dead sheep near Foxton beach 24/6/72, approached very closely by H. Robertson (IGA). Off Lake Wainono 12/4/71, one attacked a Black-backed Gull (RJP).

POMARINE SKUA *(S. pomarinus)*

Ponui, 10/12/67, two (HRMcK). Mahurangi Island, off Whitianga, 18/12/71, one (TRH). Manawatu, Oct 68, 4 at estuary (IGA). Canterbury, St Andrews coast, one, with Arctic Skuas; most distinctive difference was size (RJP).

ARCTIC SKUA *(S. parasiticus)*

Bay of Islands, December 71, counts of 12 - 20 (DEC). Hauraki Gulf, 1/11/71, 12, scattered (ATE). Reports from several coastal areas including 4 seen together on one occasion at Wanganui (MFO'S), 5 at Manawatu estuary 12/4/71 with c. 1000 White-fronted Terns (J and MM), and from Southland, 3 at Oreti estuary and one at Toetoes harbour in February 70 (RSS). Late birds, Eastbourne, 2/5/70 (J and MM), Bay of Islands 17/5/71 and 13/6/71 (DEC).

LONG-TAILED SKUA *(S. longicaudus)*

10/11/71, Bay of Islands, probable sighting; like Arctic light phase, but central tail feathers extimated to project 4½ inches beyond rest of tail. Cap black, back grey rather than brown, underparts white but belly grey; flight rather tern-like. It was flying low over

the water, on a windless day, but at one time swopped up to 50 - 60 ft, " changed gear " at the top of its rise, stopping in mid air with some quick foot movement, and swooped down again to just above water level (DEC).

BLACK-BACKED GULL *(Larus dominicanus)*

There are lone pairs on the coast which may nest at virtually any time of the year. There are synchronised colony breeders both on the coast and inland. Terrain for nesting can vary from cliffs to tidal mudflats, from subalpine scrub to lowland valley swamps (GH). Ashburton river colony, Sept/Oct 70, great variation in nest construction. Along the edges of sandbanks nests often no more than an unlined bowl scooped in the sand; nests situated on mud, stones, grass or riverbed vegetation varied from small flat constructions with minimum lining and rims, through small mounded nests with the eggs laid in a shallow depression, to mounds up to 18 inches high made of small sticks, grasses, grass roots and some binding mud, with the egg chamber a depression about 9 inches across and lined with lambs tails. Local farmers use rubber rings for tailing and gull nesting sites can often be spotted from a distance by the mass of brightly coloured rubber rings lying on the islands (ML).

RED-BILLED GULL *(L. novaehollandiae)*

Ward beach, Marlborough, 8/5/69, 2 - 300 birds feeding actively on kelp fly maggots, close to shore line (WB).

BLACK-BILLED GULL *(L. bulleri)*

Lake Rerewhakaitu 31/10/70, 300, two mating (RWJ). Lake Taupo, Easter 1972, 60 at Tongariro outlet, 30 along Taupo foreshore and small numbers scattered round lake, mainly on the eastern side; good proportion of immature birds (JHS). Foxton 11/4/70, a bird banded Waihopai river near Blenheim on 25/10/66 (IGA); birds returning after seasonal absence, February (EBJ). Wenganui, generally a few present at Turakina beach, 30 in March 69, 75 in February 70 (MFO'S). Waikanae 6/5/72, 6 (CAF); Pukerua Bay, first for season 15/4/72 (JAF).

BLACK-FRONTED TERN *(Chlidonias hybrida)*

Correction: *Notornis,* Supplement to Vol. 19, page 60; delete the entry from " Manawatu estuary " to "(E.B.J.)" and substitute — Manawatu, Lake Horowhenua, two on 26/8/65; Hokio beach, one on 18/4/68 (E.B.J.).

Wanganui, Turakina beach, one on 14/5/68 and 27.....6/70 (MFO'S).

WHITE-WINGED BLACK TERN *(C. leucopterus)*

Portland, Whangarei, one on 3/12/71 (AMM). Karaka, 30/11/71, two; Firth of Thames, 1971, one in June and November, 3 in December; 1972, one in January, two in February (HRMcK). Bay of Plenty, Maketu, one Jan 72 (JHS). Ahuriri, H.B., 1972, 8 on 13 Feb; 12 (two in breeding plumage) 15 March (NBM). Manawatu, one on 30/11/71 (EBJ) and on 18/3/72 (RSS). Marlborough, Ure river mouth, one on 18/12/71 (JAC). Canterbury, Lake Wainono, 25/7/71, one; 29/12/71, 4; 13/2/72, one. Lake Ellesmere, 6/2/72, one; Opihi mouth 29/10/71, one; Cass river 7/11/71, one in breeding plumage (RJP).

CASPIAN TERN *(Hydroprogne caspia)*

Bowentown entrance, Tauranga harbour, 18/1/72, 75 birds; downy young, juveniles and some nests with eggs chipping (JHS). Ahuriri, H.B., 49 in 15/4/72 (NBM). Farewell Spit 4/10/71, 80 adults, 22 nests with 1 - 3 eggs, colony may be 40 - 50 pairs, laying just started (BDB). Canterbury, no longer breed at Washdyke, but I have seen or know of pairs on Waitaki, Hakataramea, Hopkins, Cass, Godley, Tekapo and Rakaia rivers (RJP). Southland, Lake Waituna, 4/1/72, breeding, 2 eggs (RRS).

FAIRY TERN *(Sterna nereis)*

Kaipara, April 72, five, one being juvenile, at Tapora (SR).

LITTLE TERN *(S. albifrons)*

All available information sent to FCK who is preparing a paper.

WHITE-FRONTED TERN *(S. striata)*

Lake Taupo, 14/4/68, two birds, exhausted after a storm (MFO'S). Additional breeding records have been received including a pair attempting to nest in Day's Bay, Wellington, 1971 (JAF), and on 15/1/72 nesting on a reef at Gough Bay, Banks Peninsula, which has been a roost for many years (JRJ).

GREY TERNLET *(Procelsterna cerulea)*

26/5/72, 3 miles east of Ariel Reef, where an upwelling current attracts many petrels and shearwaters to feed on plankton, a reliable observer saw 12 birds, behaving much in the manner of storm petrels; from his detailed description the birds were without any doubt Grey Ternlets (AB).

N.Z. PIGEON *(Hemiphaga novaeseelandiae)*

Kiripaka, Whangarei county, many birds found dead in October 71, cause unknown, but may have been weedkiller on pastures (KR). Common on Whangaparaoa Peninsula winter 71 after years of absence (SC). One sighting in Kinleith exotic forest, July 70 (RGM). Eating gum leaves, August (ATE); coming to guava and puriri Aug - Nov, guava and holly April - May (HRMcK).

N.I. KAKA *(Nestor meridionalis septentrionalis)*

Museum specimen from Poroti, west of Whangarei (JFD). Brookby, March 72, one stayed three weeks in a patch of native trees in settled country; Clevedon, Nov 71, two pairs (HRMcK); Redhill, Papakura, June 69, one fed on pohutukawa, kohekohe fruit, small catkins and on datura, splitting flower stalks with its billing, making loud cracking noises, to get sap (BB). Score Road, Gisborne, one in June 72 in a native plantation, far from its normal habitat (AB). Virginia Lake, Wanganui, Oct 67, one (MFO'S). Upper Hutt - Waikanae, Akatarawa road summit, Jan 71, 3 (JAF).

S.I. KAKA *(N. m. meridionalis)*

Nelson, a few in the head of Mackley river, common in the head of Ngakawau river, Buller (JRJ); Lake Rotoiti, Nov 70; many on Cedric Jan 71 (PJ); Takaka hill, west side July 69 (JAC). Otago, one on hillside of Leith valley, Aug 70; July 70, Blue Mountains, close to Beaumont, one (BW).

KEA *(N. notabilis)*

About 1960, D. McMillan, Ngakawau, Bulller, lost several racing pigeons and eventually found a kea eating one; kea shot, no

more losses. Autumn 72, J. Hilton reported keas at Breaksea Sound eating seaweed *Hormosira* (JRJ). Clinton watershed, 1970, plentiful throughout, most in head basins (PJS).

CRIMSON ROSELLA *(Platycercus elegans)*
Two reported at edge of Tararua Forest Park near Eketahuna by H. Elder, Sept 71 (IGA).

EASTERN ROSELLA *(P. eximius)*
Awhitu Peninsula, Kohekohe, Jan 70 (MED); Papakura (BB); Waimangu range, Orere (SF). Moumoukai manganese mine road, Oct 71 (TRH). Dunedin, Leith valley, still come in small numbers to feed on flowering wattles in early spring (JWF).

RED-CROWNED PARAKEET *(Cyanoramphus novaezelandiae)*
Rare in Tararuas; Jan 71, one at Akatarawa road summit, Upper Hutt - Waikanae (JAF).

YELLOW-CROWNED PARAKEET *(C. auriceps)*
Upper Hutt - Waikanae, Akatarawa summit, 3; Mt Holdsworth track, 4, 1971 (JAF). Cascade Creek, Southland, pair feeding young on nest 31/1/70 (J and MM).

LONG-TAILED CUCKOO *(Eudynamis taitensis)*
North Auckland, Feb 72, Whangapararoa, one in pines (SR); Whangarei, calling by day and night for a few days (AMM); March 72, two noisy birds at Kerikeri (ATE). Clevedon, Oct 70, calls from bush 2140 - 2220 hrs, bird not moving (HRMcK). Nelson, Gowan River - Lake Rotorua, 25/4/69 (JAC); Canterbury, Otaio gorge, 1/2/70, 0615 hrs, ten in a flock flying north (RJP). Alexandra town area, one seen 8/4/71 (P. Child).

MOREPORK *(Ninox novaeseelandiae)*
Tasman Sea, 33° S, 155° E, in heavy rain and a 30-knot westerly wind, 10/8/72, 2200 hrs, an owl, thought from the description to be the Australian ssp, landed on deck exhausted, and was eventually lost at sea; numerous moths alighted on the vessel at the same time. Report from Weather Forecasting Service (DVM).

SPINE-TAILED SWIFT *(Chaetura caudacuta)*
4/12/71, one dead on Himatangi beach, Manawatu (IGA); 9/12/71, one picked up on a farm nine miles from Whakatane, Bay of Plenty (JFA).

N.Z. KINGFISHER *(Halcyon sancta)*
Far North, Waiharara, March 72, one with a live goldfinch in its bill (GW); Waiuku, May 70, carrying what appeared to be a mouse (MED); Waingaro, Nov 71, attacked a Californian Quail walking in paddock near house (DWH). Mangonui harbour, Aug 70, 30 on mudflats (ATE). Kerikeri, 15/1/71, 5 eggs in nest hole; 18/1/71, nest empty, shells on ground; the pair may have nested again as there was a very young bird on a wire on 26/3/71 (DEC). Te Atatu beaches, regular observations 1968 - 71, normally only up to 5 listed September - April, but in winter up to 8 (May), 19 (June), 23 (July) and 13 (Aug) (AM). Southland coastal areas, 16 birds recorded in 1965 at 12 localities; 1968, 12 birds at six additional localities (RRS).

KOOKABURRA *(Dacelo gigas)*

Otago, one reported at Anderson's Bay 17/2/71; at Sawyers Bay in April, and irregularly through most of winter and spring (GH).

WELCOME SWALLOW *(Hirundo tahitica)*

Increasing and spreading in Northland. Dargaville district, 1971/72 season, 234 occupied nests counted in the strip of land between Tutamoe and Poutu, not including the coastal area. Besides culverts, bridges and cowsheds, nests were found in an old car, an old truck, and built round a projecting nail in an old letter box (LO), in a concrete tank and on a plastic bottle used as a cowshed lampshade (CDC). Flock of 100 at Kaipara March 72 (SR). Sightings at Orewa (MED), Whangaparaoa (SC), Te Atatu (AM); 30 at Albany Ponds Feb 72; Long Bay, young ex nest late November, second clutch 22 Dec 71; Mangere, nested spring and summer 1971 (SR); up to 50 over ponds in winter (BB). Manukau census July 71, 72 birds (HRMcK). Bred at Pollok, sightings at other localities in Waiuku peninsula (MED). Breeding reports from Clevedon, Whakatiri, Te Hoe, and Mangitangi (HRMcK), Onewhero (DMW) and near Pokeno (HSRC). Firth of Thames, few nests but many sightings; count from Miranda to Thames 27/6/71, 49 birds (HRMcK); 28/5/72, about 300 over pools in heavy rain at Miranda - Kaiaua, more than ever seen before (BB). Sightings at Te Kohanga, near Port Waikato (DAL), Naike (DWH), and 10 at Waimai Dec 71, probably breeding (SR). Sighting 12 miles south of Matamata, Dec 70 (PL); winter flock of 50 at Te Rore, near Te Awamutu (press report). Bay of Plenty, Jan 72, pair at Mount, several round Tauranga harbour, six at Kaituna cut, numerous around Thornton (JHS). Gisborne, Muriwai lagoon, 2 in 1971; May 72, 8 at Coop's lagoon, Muriwai, 4 at Tolaga Bay, 15 at Centennial Marine Drive and later many on pastures on the landward side of the drive (AB). Hawke's Bay, Ahuriri, 13 in Feb and 31 in April 72 (NBM); 1972 report from Dannevirke (IGA). Taranaki, further reports from coastal areas north of New Plymouth, and from Inglewood, Oeo and Auroa (D.G.M.).

Wanganui, 4 at Turakina beach Oct 67; 1969, 4 at Kaitoke Lake and one at Kowhata Lake; winter 1970, sightings at Ratana and at Waitotara beach where another was seen in winter 72, also again at Kaitoke Lake, where in 1971 there were two deserted nests (MFO'S). Manawatu, 1971/72, nesting reported at Otaki, Turakina, Tiritea and many places in between; now occurs from Waikanae to Wanganui, and have been seen in Hutt Valley (IGA). Wairarapa, 2 at Pirinoa Nov 71 (J and MM), one to three seen at Lake Ferry, Palliser Bay, on various occasions Nov 70 - May 71 (JAF). West Coast, near Barrytown, four on a floodgate near a bridge, 5/1/72 (JRJ). Marlborough, 23/8/69, 10 at junction of Wairau river and Spring Creek (JAC); 8 at Lake Elterwater Feb 72 (TJT). South Canterbury, nest sites used in 1970 near St Andrews and Otaio were used again in 1971, when another pair reported nesting in a cowshed near Otaio; on 19/1/72 a used nest was found 22 miles inland, 600 ft a.s.l., between Ashburton and Methven and 2 adults and three flying young were seen. Lake Wainono, flocks April - September, 40 in June and 30 in September; one seen a mile south in November. Opihi, 8 in July and 7 in Sept 71; south side of Rakaia mouth, 5 in July 71. Bridges between Timaru and Waimate checked without result; birds

may be using buildings, etc., for nest sites (RJP). Every winter for 3-4 years considerable numbers seen, especially at Waihola, and in 1970 80 were recorded at Balclutha. In 1971 winter birds seen in many localities including the first record from Waikouaiti, in May: a small flock was still present over a pond at Henley in November (GH). Southland, flocks in several places May - August 71, including 6 at Te Anau in June; two birds at Waimatuku mouth in September, two at West Plains in October, but a search for nests yielded no result. Two birds at Thornbury in Feb 72 and two at Lake George in March; a flock of 30 at Gorge Road inMarch, and many sightings elsewhere in April 72 (RRS). A flock of nine at Waimatuku mouth on 23/4/72 perched on driftwood and were very reluctant to move, as if they had recently arrived; some of them had throats more golden than rufous (MLB).

N.Z. PIPIT *(Anthus novaeseelandiae)*
Puhoi, July 72, one with a large swelling on left tarsal joint; ran and flew but appeared to rest every few minutes (RSC). Tararuas, Mitre Peak, 5153 ft a.s.l., 5/4/72 (JAF). Rangitata river, extent of territory apparently 100-150 yards (ML). Catlins, July 70, flock of 26 circling and milling round above a turnip field, calling steadily (GH). Taieri plain round Outram, only in winter; first seen 26/4/71 (GG).

HEDGE SPARROW *(Prunella modularis)*
Mitre Peak, Tararuas, 5153 ft a.s.l., 5/4/72 (JAF).

N.I. FERNBIRD *(Bowdleria punctata vealeae)*
Pollen Island, one in tea tree (AM); Whitford, in saltmarsh ribbonwood and rushes (HRMcK); Raglan, rushes on mudflats (DWH); Mercer, mixed willow and tea tree swamp 7-20 ft high (DAL); Tokaanu, in scrub (MFO'S); Mt Tongariro southern slope, in scrub above bushline 3000 ft a.s.l. (DAL). Manawatu, Lake Pukepuke, 1971 (IGA).

S.I. FERNBIRD *(B. p. punctata)*
Otago, Takahopa bridge, 5/5/70, single bird in rough pasture and lupins beside car park (GH). Ram Island, Berwick, numerous in heavy Carex swamp areas (HS). Southland, Hokonui ranges, March 71, a good population on tops at about 1600 ft a.s.l. (RRS).

BROWN CREEPER *(Finschia novaeseelandiae)*
Mid-Canterbury foothill beech forest very few 1971 (RJP). Otago, Takahopa township, April 71, singing quite vigorously but not in full song; day chilly, half overcast (GH). Southland, numerous at Aparimu hut (LEH); Gorge road, occasional sightings of resident birds (SLL); Clinton watershed, small flocks throughout (RRS). Edwards and Jacky Lee Islands, January 72, probably the most common bird; constant chatter and twitter, also a penetrating song, melodious and trilling, as insistent as a chaffinch (MLB).

YELLOWHEAD *(Mohoua ochrocephala)*
Reported in headwaters of Rakaia and Rangitata (RJP). JRJ has filed a series of past records.

GREY WARBLER *(Gerygone igata)*
Waingaro, 1970, albino around for some weeks (DWH).

N.I. FANTAIL *(Rhipidura fuliginosa placabilis)*

A black bird reported Lake Pukepuke, Manawatu, 1971 (IGA).

S.I. FANTAIL *(R. f. fuliginosa)*

Marlborough, Ward, nest of black and pied partly constructed 17/8/69, abandoned after light rain (TJT). Nelson, Apr 72, one held a moth between foot and perch while it tore the moth apart; twice the moth was dislodged and dropped but caught within 18 inches of fall. The bird had previously spent much time and effort trying to brush the moth apart by scraping it across a branch with its bill; ref. *Notornis* 18, p. 201 (FHB). One feeding on pine forest floor among pine needles, Aug 71. In Oct 71 parent fantails chased a bellbird as it approached 50 yards from three fledgling fantails sitting like lovebirds on a branch in manuka scrub; the fantails followed the bellbird 20 ft over and 100 ft beyond the fledglings (JRJ). Outram, May 71, one with white wings and tail; the rest of the normally dark parts of the plumage were uniform pale fawn; it was flitting among elderberry bushes and twice alighted on the ground where some periwinkles were growing (GG).

YELLOW-BREASTED TIT *(Petroica macrocephala macrocephala)*

Stewart Island, Kidney Fern Arm, 14/1/68, feeding three chicks, 4 times in 10 minutes (MLB).

SOUTH ISLAND ROBIN *(Petroica australis australis)*

Nelson, Wangapeka track April 71, feeding on berries of lawyer *(Rubus parvus)* — JRJ, who has filed a series of past locality records. Lake Ohau, parent feeding chick 12/1/72 (WTP). Clinton valley watershed 1970, a few, widely scattered (PJS).

STEWART ISLAND ROBIN *(P. a. rakiura)*

Edwards and Jacky Lee Islands, 21/1/72; sharp demanding song (MLB).

SONG THRUSH *(Turdus philomelos)*

Eating berries of cotoneaster and pyrocantha, Kerikeri (ATE). Whangarei, 1971, a nest with 4 eggs was deserted but later three eggs were laid on top of the fourcold eggs (PS). Ashburton, 15/8/71, a pair building in a Jasmine vine on the side of a broken down shed, using dry grass and a dry cabbage tree leaf; heavy rain soaked the nest and stopped building. Five days later the birds took the nest to pieces and dropped all the material inside the shed; by 3/9/71 a new nest was almost completed, using all the old material they had dropped, though there was no shortage of other material nearby; 3 chicks were reared (ML).

BLACKBIRD *(T. merula)*

Whangarei, 1971, nest practically on the ground (PS). Waiuku, 15/10/71, 5 eggs laid on bare dirt in garden; male jumping up and down in one spot, possibly to disturb grubs and worms; 20/7/71, one flying up and pecking at a car bumper for several minutes (MED). Ardmore, 4/5/72, female flying with beak full of nest material; Auckland, Mt Eden, male blackbird twice seen to come to a thrush's nest in an almost leafless climbing rose bush and feed nearly feathered young thrushes (HRMcK).

SILVEREYE *(Zosterops lateralis)*

Waitakere, Auckland, June 1972, one with head and primaries bright yellow, tail pale yellow, back and upper wing coverts buff,

sides of breast as normal (SR). Tararuas, Mitre Peak, 5153 ft, April 72 (JAF). Wellington, Oct 71, another silvereye found with pox infection (PCB). Ward, May-June 70, 3-400 in turnip paddock (TJT). Nelson, late January 72, bird A arrived in branches of an elm about 15 ft up, and remained still; it then turned half left and bowed deeply, head below level of perch, head back and tail in a straight line; slowly recovered to original position, turned half right and bowed as before. Bird B arrived and perched 12 inches above A, showing signs of agitation. A continued bowing performance for some time with pauses between bows; B appeared concerned, hopped from branch to branch never more than 18 inches from A, and watching it; after a longer pause than usual A fluffed its feathers, shook them back into place and both birds flew off through the trees (FHB).

BELLBIRD *(Anthornis melanura)*

Singles sighted Bream Head Feb 72 (AMM), Whangaparaoa August 71 (SR), Moumoukai (Clevedon) Nov 71 (HRMcK). Nelson, Lake Rotoiti, feeding young on ground, Nov 70 (PJ). Rakaia, August, taking nector of *Grevillea rosmarinifolia* (JRJ). Stewart Island, Bellbirds come first to flowers of native fuchsia; Tuis come later and Bellbirds recede; seen on astelia and ornamental fuchsias, blue gums, rata, flax; pick insects from near and on ground as might Pied Tits (OS).

TUI *(Prosthemadera novaeseelandiae)*

Manawatu, Feb 69, coming back to farms after raising young in the hills (IGA). Nelson, April 70, three Tuis, one sleek and composed, while the other two kept up an agitated follow-my-leader movement, hopping from branch to branch with feathers fluffed out and uttering the cluck call, first one and then the other. This call is a single low-pitched note repeated 6-7 times at fairly regular ¼-½ second intervals (FHB). My first sighting at Lake Alexandrina, one in willows, Jan 70 (RJP). Middlemarch, not seen in 20 years but one in Nov 71 (Mrs Illingworth). Upper residential part of Leith valley, plentiful, but absent spring and early summer; seems not yet to be adapting to exotic plantations and gardens, generally confined to the few areas of native forest around the city (GH). Stewart Island, Ackers Point, spring 70, at 1600 hrs 80 birds arrived as a flock, flew low overhead and settled, some on manuka and gorse; excited, twittered and fluttered, later dispersed to trees. Other flocks reported, Greenvale (100), Golden Bay (100) in fuchsias, some settled on ground; Horseshoe Bay (60). Could this have been an invasion from the mainland (OS).

YELLOWHAMMER *(Emberiza citrinella)*

Nov 68, pecking at its own reflection in hub cap of a car (DWH). 5 miles ESE of Cape Campbell, 1550 hrs, 3/6/72, weather fine, wind SSE 25 knots, one flying 5-10 ft above sea, first to south, later to north and close alongside ship (JRJ).

CIRL BUNTING *(E. cirlus)*

Gisborne, a pair, 25/10/71 (AB).

GREENFINCH *(Carduelis chloris)*

Eating pyrocantha berries, May, Kerikeri (ATE). Jan 72, two sightings in Arthur's Pass National Park, the first I have seen there (JRJ).

GOLDFINCH *(C. carduelis)*

D'Urville Island, Jan 72, a nest in a tool box on the floor of a shed which housed the motor for driving a circular saw, and was open at one end; a second box placed at right angles on top of the tool box formed a roof and the nest was well hidden underneath the top box, placed in the curled end of a dried octopus tentacle which had fallen into the box and formed a circle about 75 mm. across; the nest was made of sheep's wool with three pine needles and five macrocarpa twigs woven into the outside layer. Two young were reared. Plenty of good alternative nest sites in the area, but presence of a semi-wild cat and seven wekas may have been the reason for selection of this unusual nest site (ML).

REDPOLL *(Acanthis flammea)*

Tararuas, Mitre Peak, 5153 ft, 5/4/72 (JAF); Waitarere, 10 with yellow polls 29/1/69 (J and MM).

HOUSE SPARROW *(Passer domesticus)*

Clevedon, a white bird probably 6½ years old in 1972 (HRMcK); the Levin cinnamon bird apparently disappeared at age 6 (EBJ).

STARLING *(Sturnus vulgaris)*

Instant nest site selection at Invercargill; a pre-fabricated annexe room, transported 5 miles from the builders arrived on back lawn late afternoon 13/10/70. Part of the tiled roof had been left unfitted for ease of handling in transport. Within half an hour of the contractors finishing work for the day two starlings were vigorously engaged in carrying nest material and placing it under the tiled roof (RRS).

ROOK *(Corvus frugilegus)*

One present 3 miles north of Dargaville for about three weeks July - August 70 (CDC). April 71, one off Poutu, flying north over the sea above a flight of oystercatchers (RF). Waiuku, no reports 24/9/70 to 2/7/72 (MED). Miranda, 16/11/69 to 28/2/71, up to 18 seen, appearing sporadically; up to 5 nests but only two seem to have raised young (HRMcK); Mangitangi, according to farmer one or two birds present for many years, up to 6 in 1965; 19 on 19/8/71 (DAL). Mamaku-Rotorua highway, 1715 hrs on 17/9/72, two birds seen at Tarukenga; flew across road and circled a grove of eucalypts before alighting; positive identification (EJC). Manawatu, 1971, Cheltenham colony survives, September; others located in Waitotara area (IGA); 11 rooks near Palmerston North reared 13 young in a grove of gums (EJC). Pirinoa, Wairarapa, 6/11/71, 14 (J and MM). Marlborough, 24/3/70, one chased by Starlings near Lake Elterwater (TJT); winter 1972, one near Kaikoura (JAC). Otago, Middlemarch, 5 in 1968, 8 - 11 in 1971; fed on oats put out for sheep in winter (Mrs Illingworth); Sutton, said to have bred for five years in a group of poplars and pines a mile north of railway station, increasing from 2 to 16; 11 rose from willows on 29/11/70. The most southerly colony so far recorded in New Zealand. Poisoning around Christchurch seems to be correlated with a general dispersal and small rookeries set up elsewhere (GH).

SHORT NOTES

FURTHER OBSERVATIONS ON THE MERCURY ISLANDS

Until the early 1960s, little was known, and even less had been published, about the birds of the Mercury Islands Group. However, a number of accounts have now appeared (Edgar 1962; Skegg 1963; Thoresen 1967). The present note records some of the observations of a King's College Bird Club party, which visited the Group in mid-December 1965. The party was led by Mr R. B. Sibson, and comprised Mr J. A. F. Jenkins, Mr D. V. Merton, seven members of the King's College Bird Club, and the writer.

The party spent seven days on Red Mercury Island. Pycroft's Petrels *(Pterodroma pycrofti)* were found to be occupying burrows in all parts of the island. Evening banding efforts were concentrated on the slope behind Rolypoly Bay. On three successive nights, six members of the party banded 22, 26 and 35 Pycroft's Petrels, along with other birds, in less than two hours. This is very many more than could have been caught around Dragon's Mouth Cove, Hen Island, or even South Cove, Big Chicken Island, in the same time. Two new birds were added to the " island list." A Reef Heron *(Egretta sacra)* was seen around the island on two successive days, and a Long-tailed Cuckoo *(Eudynamis taitensis)* was found, dead, in the valley behind South Landing.

Four members of the party spent the night of 20-21 December on Kawhitihu (Stanley I.). After nightfall, it was not possible to move far from the campsite, which was located near the middle of the western side of the island, some way down from the central ridge. Pycroft's Petrels and Sooty Shearwaters *(Puffinus griseus)* were discovered breeding. The Pycroft's Petrels did not appear to be in as great a numbers as on the slope behind Rolypoly Bay, on Red Mercury Island. Nevertheless, there was little difficulty in catching six of them for banding. The Sooty Shearwaters were the first recorded breeding in the Group. Four were caught for banding, and it was estimated that there were a couple of dozen pairs breeding on the slope below our campsite. Two other additions to the " island list " were Morepork *(Ninox novaeseelandiae)* and Song Thrush *(Turdus philomelos)*.

On 15 December the boat taking the party to Red Mercury Island passed close to Flat Island. 60+ pairs of Black-backed Gulls *(Larus dominicanus)* appeared to be nesting, along with c. 200 pairs of Red-billed Gulls *(Larus novaehollandiae scopulinus)*. Red-billed Gulls were also seen flying towards Whale Rock, where they may have been breeding.

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P. D. G. SKEGG

New College,
Oxford, U.K.

★

DIVING BEHAVIOUR OF GANNETS AND SHEARWATERS

Late on the evening of 4 May 1972, in a flat calm, a wide stretch of water off the southern shore of the Bay of Islands was patrolled by scattered single Gannets *(Sula bassana)* fishing mainly for anchovies and pilchards; they flew 3 - 5 feet above the water, shallow-diving at intervals. Several flocks of Fluttering Shearwaters *(Puffinus gavia)* were feeding normally or resting on the water, but some of the gannets were attended by a single shearwater, some by two and one by four shearwaters. These shearwaters flew below and behind, or sometimes underneath the gannet; each time the gannet dived so did the attendant shearwaters. Sometimes gannet and shearwater entered the water together, at other times the shearwaters dived a fraction ahead of the gannet, which went in on top of them; occasionally when the gannet made as if to dive but checked before actually doing so, the shearwater's momentum carried it into a brief dive followed by a quick recovery and hurried flight to catch up with the gannet.

D. E. CALVERT

Inlet Road,
Kerikeri

★

A PALE SHORT-TAILED SHEARWATER

An unusually pale Short-tailed Shearwater *(Puffinus tenuirostris)* was picked up on Muriwai Beach, Auckland west coast, on 12 December 1971. The following features should be noted in particular (see Figs 1 and 2): Pronounced white chin, underwing coverts off-white and underparts of body, and especially upper breast, very pale grey.

SYLVIA M. REED

4 Mamaku Street,
Meadowbank,
Auckland, 5.

FIGURE 1: An unusually pale Short-tailed Shearwater from Muriwai Beach, Auckland, 12 December 1971.
Photo: T. J. Bayliss

FIGURE 2: An unusually pale Short-tailed Shearwater from Muriwai Beach, Auckland, 12 December 1971.

Photo: T. J. Bayliss

LETTERS

The Editor,
Sir,

CONSTITUTIONAL PROCEDURE AT THE AGM

The original constitution of the Ornithological Society of New Zealand undoubtedly served its purpose.

Drafted in the 1950s this constitution was effective in its time and place and adequate for those days.

However, the OSNZ has progressed far in the last twenty years. We should ask ourselves whether the original constitution as drafted is adequate for the present day, and if not, what should be done to modify it for modern requirements.

The Council who represent the members of the Society considered this point most earnestly and brought forward the constitution adopted in Christchurch.

It is understandable that members who formulated the original constitution would be loath to have it superseded but time marches on and what was sufficient in the 1950s is not necessarily so in the 1970s. No doubt the present constitution will be adjusted again in the future just as the original one was amended from time to time to meet changing conditions.

Mr Cunningham mentions that he " fought tooth and nail against certain proposed alterations to the constitution." That is his prerogative especially as he was the drafter of the original constitution, but it is more than doubtful if his presence in Christchurch would have prevented the new constitution being adopted.

A society whose membership is spread over the whole of New Zealand is seldom able to express itself vocally at an Annual General Meeting where numbers rarely exceed ten percent of the membership who therefore express their confidence in Council by postal ballot and entrust to them the business of conducting the affairs of the Society in a fair and equitable manner.

I do not see the point to Mr Cunningham's claim that members have " surrendered control of their own Society to the ruling Council." Surely it is a fact that members are elected to Council to conduct the affairs and business of the Society for the benefit of all and for the progress of ornithology.

Frankly, I cannot see that disruptive hair splitting over procedural matters will advance the study of ornithology.

NORMAN MACKENZIE

Pakowhai
RD3
Napier

Mr J. M. Cunningham, to whom this letter was referred, replies as follows —

The Editor,

Sir,

My good friend Norman Mackenzie says that " disruptive hair splitting over procedural matters " will not advance the study of ornithology. This being so, why did the Council introduce disruptive and highly contentious matters at three Annual General Meetings in a row until they were passed as part of a package deal of an entirely new constitution on which members had to vote for the complete passing or rejection of it ?

J. M. CUNNINGHAM

" Illawarra,"
5 Kotari Road,
Days Bay,
Wellington
30 October 1972

(This Correspondence is now closed. — Ed.)

The Editor,

Sir,

MIGHT NORTHERN SHOVELERS IN NEW ZEALAND BE ESCAPES ?

The report of three drake Northern Shovelers, *Anas clypeata,* collected or observed in New Zealand in different years during May or August was surprising (Kinsky & Jones 1972), for in those months one would expect males in breeding dress to be on or near their breeding grounds. The fact that the New Zealand birds showed no sign of moult led the writers to suggest that, having strayed so far, they had remained long enough in New Zealand to adapt to the Southern Hemisphere moult cycle. It would be useful to learn from southern zoo keepers and aviculturists how long it takes northern *Anas* ducks in captivity to shift their moult cycle. Considering that occurrence of Northern Shovelers in New Zealand would be the most southern recorded, one wonders why the writers did not mention the possibility that these ducks might have escaped from captivity, and moulted thereafter.

E. EISENMANN

Chairman, AOU Check-list Committee

Department of Ornithology,
The American Museum of Natural History,
Central Park West at 79th Street,
New York, N.Y. 10024, U.S.A.

8 October 1972

REFERENCE

KINSKY, F. C.; JONES, E.B. 1972. Northern Shovelers *(Anas clypeata)* in New Zealand. Notornis 19 (2): 105-110, 1 fig.

Mr F. C. Kinsky, to whom this letter was referred, replies as follows:—

The Editor,

Sir,

Thank you for giving me the opportunity of replying to Dr E. Eisenmann's letter.

Dr. Eisenmann's concern that the Northern Shovelers *(Anas clypeata)* recently found in New Zealand could have escaped from captivity and that this possibility was not mentioned in our report in *Notornis* is fully understandable. However, this very important point was fully considered when the report was written and the possibility of the birds having escaped from captivity was rejected, mainly for the following reasons:

(a) Under existing laws the introduction to New Zealand of any live animals for any purpose is strictly prohibited except under special permit issued by the Ministry of Agriculture and Fisheries which, particularly in the case of gamebirds and wildfowl, is never issued without prior consultation with the Wildlife Service of the Department of Internal Affairs.

Following the recording of Northern Shovelers in New Zealand, investigations proved that no live birds of this species were ever brought into New Zealand under permit.

(b) New Zealand is much too small a country for any zoo, aviculturist or any private person to introduce, hold and breed any foreign waterfowl, brought into the country legally or illegally, without the fact becoming known to either Wildlife personnel or any other interested person.

Finally, I am in full agreement with Dr Eisenmann's statement that " it would be useful to learn . . . how long it takes for Northern *Anas* ducks in captivity to shift their moult cycle." Unfortunately, however, nothing has been done in this respect in New Zealand as yet and I can only express my hope that opportunity will be afforded for some competent student to conduct such an experiment in the not too distant future.

F. C. KINSKY

Dominion Museum,
Private Bag,
Wellington
11 November 1972

The Editor,

Sir,

BIRDS OF FIJI: PRESERVATION OF SPECIES OR SPECIMENS?

I read with interest the item entitled " news from the Dominion Museum " in the June issue of *Notornis,* the first paragraph of which deals with the possibility of a joint Dominion Museum - Fiji Museum study of the Fijian avifauna involving the collecting of specimens and the formation of permanent study collections.

The importance of gaining an understanding of the " systematic status of the birds of Fiji, their variation from island to island and estimates of relative abundance," is not questioned, neither is the need to form a permanent study collection in the South West Pacific. The Dominion Museum is to be congratulated for taking the initiative in this as it is certainly in New Zealand's interest that its premier museum gains in significance and importance in this region.

However, it would be of interest to have more information about the proposals as it is a matter of concern that the possibility exists that rare or even extremely rare species may be sought and slaughtered in the name of science. Is this possibility real? Which is more important, the preservation of species or specimens? This is a problem which faces a number of biologists. Ideally it is to be hoped only relatively common species will be collected and that the rare species will be captured alive, used for breeding purposes, and eventually on death, be preserved in collections. Will members of this joint venture be advising the Fijian Government about reserves and other measures necessary for the preservation of the rarer species?

G. W. RAMSAY

274 Hampden Street,
Nelson
26 July 1972

The Director of the Dominion Museum (Dr R. K. Dell), to whom this letter was referred, replies as follows:—

The Editor,

Sir,

Thank you for the opportunity of replying to the letter from Dr G. W. Ramsay on the proposed Dominion Museum - Fiji Museum joint study of the birds of Fiji.

Since the publication of the news item mentioned, a formal agreement between the Dominion Museum and two organisations of the Government of Fiji has been signed covering the conditions under which this joint project is to be carried out. The Fijian organisations involved are the Fiji Museum and the Government's environmental and biological conservation authority, the National Trust for Fiji, acting on behalf of the Director of Agriculture. The problems outlined by Dr Ramsay in his last paragraph were all considered and discussed during the negotiations leading up to the signing of this agreement. The number of specimens of any one species that can be taken and the localities at which collections can be made in any one area are very carefully regulated; a number of rare species have been specifically excluded from being " sought and slaughtered in the name of science "

(as Dr Ramsay so charmingly puts it!); a representative of the Trust is to take part in all fieldwork; and, the Trust can stop the collecting of any species in any area at any time, can stop all collecting in an area or add species to the "totally protected" list at any time. No breeding or aviary work is contemplated during this project, but information obtained will obviously be borne in mind as the Trust and the Fijian Government consider adding to their existing reserve system and carry out further measures necessary for the conservation and preservation of birds as well as other animals and plants. Biological collections obtained during this project are to be shared equally between the Fiji Museum and the Dominion Museum.

The first field trip under the agreement has recently been completed. Mr F. C. Kinsky and Mr W. Spiekman of the Dominion Museum accompanied by Mr F. Clunie of the Fiji Museum, representing the National Trust of Fiji, Mr A. Blackburn and Mr L. Henderson of New Zealand spent the period from 20 September to 13 October on Taveuni Island of the Fiji group. Most of the different habitats on the island were investigated up to a height of about 2,500 feet.

R. K. DELL
Director, Dominion Museum

Dominion Museum,
Private Bag,
Wellington
10 November 1972

The Editor,

Sir,

RECORDINGS OF NEW ZEALAND BIRDS

I enclose a list of bird species that I have recorded or have had recorded on magnetic tape over the last few years. This list is complete and in the order in which the original recordings were made. In some instances more than one recording of a species is available and in every case the time and place are known. As you know, some of these are now available on commercial discs; more will follow.

As I do not have the equipment to analyze the tape recordings made up till now, I have decided to make copies of all my tapes available to any serious student of ornithology currently engaged in research in this field. Those who may be interested can contact me at the address shown below. I should add that this list is being added to as time passes and should reach the 100 mark in a few months time. Any person who would like to contribute recordings to this collection is asked to write to me for further details.

LESLIE B. MCPHERSON

P.O. Box 21 - 083,
Edgeware,
Christchurch
13 October 1972

LIST OF RECORDINGS HELD BY L. B. MCPHERSON AS AT 12 OCTOBER 1972

House Sparrow; Starling; Song Thrush; Goldfinch; Tui; Red-billed Gull; Shy Mollymawk; Stewart Island Weka; Black Oystercatcher; Sooty Shearwater; South Island Saddleback; Erect Crested Penguin; Peafowl; South Island Pied Oystercatcher; Southern Black-backed Gull; South Island Pied Fantail; Black-billed Gull; Blackbird; Budgerigar; Rock Dove; Rainbow Lorikeet; Indian Ring-necked Parakeet; Baraband Parakeet; White-backed Magpie; Leadbeater's Cockatoo; Crimson Rosella; Little Corella; Spotted Shag; White-flippered Penguin; Canada Goose; Barbary Dove; Paradise Duck; Californian Quail; melanistic mutant Pheasant; Silver Pheasant; Cockatiel; Peach-faced Lovebirds; Bourkes Parakeet; Reeves Pheasant; Western Weka; Black Swan; Common Fowl; Helmeted Guinea Fowl; Grey Partridge; Chuckor; Brown Quail; Red-crowned Parakeet; Yellow-crowned Parakeet; Pied Stilt; Yellowhammer; Mallard, Cherry Finch; Java Sparrow; Grey Warbler; Rook; Skylark; Cape Barren Goose; Kea; Northern Variable Oystercatcher; South I. Fernbird; Bellbird; Pukeko; Turkey; Mute Swan; Shore Plover; Chatham I. Oystercatcher; Southern Skua; White-fronted Tern; Chatham I. Snipe; Gannet; Indian Myna; Chinese Ring-necked Pheasant; Yellowhead; Brown Creeper; Westland Black Petrel; Morepork; Mottled Petrel; Fairy Prion;Snares Crested Penguin; Snares I. Snipe; Southern Diving Petrel; Buller's Mollymawk; Snares I. Cape Pigeon; Grey Duck; Redpoll, Little Owl; Kingfisher; Antarctic Tern.

ESSAY REVIEW: Bird Bones for Beginners

By J. C. YALDWYN

R. J. SCARLETT. *Bones for the New Zealand Archaeologist.* 69 pp., 329 figs. Canterbury Museum Bulletin No. 4, Christchurch, 1972. $2.00.

Ever since the reviewer was at school (more than 25 years ago) and New Zealand prehistoric sites such as Wairau Bar and Pyramid Valley started to become part of a local natural historian's language, a growing band of archaeologists, spelaeologists and those interested in the subfossil history of New Zealand birds have been asking for a handbook to the identification of bird bones. What they wanted was a sort of osteological Peterson, Alexander or Falla, Sibson & Turbott that would take all the hard work out of identifications and free the worker from complete dependence on memory and a big comparative collection.

Well, here it is at last: Ron Scarlett's unique blend of osteological skill, know-how and perception presented to us in a book-sized manual (8 x 10 inches, soft-covered) on the identification of bones from New Zealand prehistoric sites. The book deals primarily with bird bones (294 of the 329 figures) but dog, rat, seal and tuatara bones are also covered. Though designed for the identification of archaeological material, it is intended that it should be equally useful for the determination of non-archaeological or " subfossil " bird bones.

Coverage:

Ron Scarlett of the Canterbury Museum follows in the osteological footprints of former Directors Julius von Haast and Henry Forbes, and from long experience is very much " aware of the problems concerning bones that confront the field archaeologist " (preface). He has set out to provide archaeologists " and others who have occasion to identify bones" (p. 25) with a manual " directed specifically to their needs " (preface). As it is " impossible to illustrate every bone of every bird . . . . which may be found in New Zealand middens," he has " selected birds representing each group except the cuckoos (which have not yet been found in New Zealand archaeological sites)" and given illustrations and measurements of the main bones (usually femur, tibia, metatarsus, humerus, ulna, radius, coracoid, scapula and sternum). He gives the moa " scant treatment, as two standard works on this group are available " (preface). The " scant treatment " must refer to the number of illustrations only (one figure each of a *Pachyornis mappini* femur, tibia and metatarsus) as the text on this group (pp. 20 - 22 and caption to fig 5) contains some of the most important statements about moas published since the " two standard works " referred to by Scarlett, Archey's Auckland Museum Bulletin *The Moa* (1941) and Oliver's Dominion Museum Bulletin *The Moas of New Zealand and Australia* (1949).

In the Canterbury Museum manual there is a useful section (pp. 1 - 2) on the excavation, removal and repair of bones, which the

author justifiably regards as " elementary " but *very necessary* as " few things infuriate the laboratory worker more than to receive bones for identification, then to have the job made more difficult than necessary, because they have not been handled with care . . . When I see bones or artifacts carelessly packed, I suspect the standard of archaeological work is generally low." Page 2 has a very important section on measuring bird bones, explaining precisely the method followed by Scarlett. In this branch of applied osteology where bone dimensions are so widely given and quoted, it is important to know how such figures are obtained. Archey (1941: 13) gives the details of the measurements he used, but Oliver (1949) unfortunately does not. To quote Scarlett again " it does not matter which method is followed, *provided that one states where the measurement is taken* " (author's italics). After reading this section your reviewer now knows how others measure the " width of the shaft " the " M " of a bird limb bone ! Measurements throughout the text of Scarlett's manual are given in centimetres where most workers would expect to find millimetres used. The same figures are involved naturally, but a decimal point is used in every dimension (69 times on page 15 for example). This involves more typesetting, is not easy to follow with the eye and introduces the possibility in future work of the misplacement of points by human error in manuscript, printer's proof or published page. My strong advice to users of this manual, and to scientists in general, is to use millimetres wherever possible (at least for dimensions under 1000 mm, i.e. 100.0 cm).

A straightforward section on the skeleton (pp. 3 - 4) explains clearly and precisely all the technical bone names used in the text and indeed covers " about all the osteology which a field worker need master." For more detailed information the user is referred to a useful bibliography (pp. 26 - 28). Unlike many contemporary osteologists Ron Scarlett has always used the full technical terms *tibio-tarsus, tarso-metatarsus* and *carpo-metacarpus* (all strictly correct in birds) where Archey, Oliver and others would use the deliberately shortened, more familiar forms *tibia, metatarsus* and *carpus*. Echoing Scarlett's words on measurements, one could say that it does not matter which series of terms is used, provided that one realizes that the full terms are strictly correct and then uses either the full terms (as Scarlett does) or the shortened forms (as your reviewer does), but does not mix the two.

The main body of the text follows (pp. 4 - 22) where " typical birds of each group " are discussed from an osteological point of view, the size ranges of their limb bones are given and the bone illustrations for each selected species are listed. There are usually at least 9 figures for each illustrated species, but some such as the Yellow-eyed Penguin and the etxinct Eagle *Harpagornis* have as many as 14 figures. The 22 main New Zealand orders and families represented in local archaeological and subfossil sites are dealt with. These range from kiwis to wattle-birds, and include among others

petrels, ducks, rails, parrots, crows and moas, but exclude groups of small birds such as swifts, wrens, warblers, flycatchers, etc. Apart from the section on moas, where all recognized species are listed but not dealt with in detail, 68 species, subspecies or geographical forms of New Zealand birds are discussed and their measurements tabulated, 31 of these being illustrated as representatives of their systematic groups. This is a truly magnificent and representative coverage and quite unlike any other practical manual on the identification of bones (bird, mammal or fish) known to the reviewer.

Finally, we have what must be regarded as the most important part of the manual, the 33 full page plates with their 319 individual drawings and 15 photographic figures accompanied by 8 pages of detailed explicit captions. The first two plates show a variety of bird bones with labelled parts and standard measurement positions indicated; plates 3 - 4 show humeri; plates 5 - 6 other wing bones; plates 7 - 10 coracoids, scapulae and some crania and mandibles; plates 11 -1 9 sterna (pls 11 and 12 are bound in reverse order in my copy); plates 20 - 26 leg bones, mostly in associated species sets of femur, tibia and metatarsus; plate 27 pelves, and plates 28 - 33 assorted tuatara and mammal bones. The drawings throughout appear adequate and are relatively clear, but differ greatly in quality. Plate 1 for example contains 7 superb figures and stands out in comparison with other plates, while plate 9 (note plate numbers appear only in the caption lists) is coarse and shows rough penmanship.

Scales for drawings:

The one great criticism of this book, however, must be levelled against the lack of direct information on the scales at which the illustrations have been reproduced. The only mention of scale in the entire text that I can see is on page 25 " ever-increasing costs have limited the illustrations that could be included. Some have had to be reduced in size, although as many as possible are reproduced in the actual size." This is tantalizing of course as using actual-sized drawings to identify individual bones directly would be absolutely ideal for the user. Scales are *not* given with the captions to the figures where *they should always appear in any scientific work* if not on the plates themselves. The three photographic plates (27, 32 and 33) have scales included, but the other 30 plates do not. The only way to check the scales at which bird bones have been drawn is to check the dimension range for the particular bone involved as given in the text against the actual size of the figure on the plate and see if the figure has been reproduced " actual size " or has been reduced ! For example the White-capped Mollymawk has a humerus ranging from 310 to 317 mm in length (p. 6); the drawing of this humerus in fig. 1 is about 170 mm long, therefore the figure has been reduced to a little more than half size. On the other hand the range for the Yellow-eyed Penguin humerus (p. 5) is given as 65 to 79 mm and the drawing of the humerus (fig. 18) is about 78 mm long, so figure 18 has been reproduced actual size (as has the whole of plate 3

presumably?). No dimensions are given for moa, mammal and tuatara bones in the text so there is no way of checking from information available in this book the scales at which bones of these groups have been drawn.

Does it work ?

As this book sets out to be a manual on the identification of bones from New Zealand archaeological sites it is only fair to see if it can be used in the way it was intended. At first sight it appears as if all those distinctively " New Zealand " bones, or characteristic local traps depending on which side of the identification one is, giving or receiving, are figured on the plates and in many cases discussed in the text. For example we have the shield-like *kakapo sternum* (figs 150, 151) with its " distinctive . . . rounded oblong shape, and very shallow keel "; the M-shaped *kiwi sternum* (figs 184 - 186) with " keel . . . represented by slight bulge only "; the *penguin metatarsus* (fig. 238) " this squat, almost oblong bone could not be mistaken for the bone of any other bird "; the elongate and parallel-sided *Aptornis* (extinct large rail) *coracoid* (fig. 89) which fooled the reviewer utterly when first found in a Wairarapa cave deposit; the splayed *parrot metatarsus* (figs 228, 229, 232) once seen, never forgotten; the *shearwater tibia* (fig. 268) with its extraordinarily elongated cnemial crest; the serrate *tuatara jawbone* or *mandible* (fig. 303) where " the teeth arise directly from the bone . . . without sockets," and the narrow-shafted *dog femur* (figs 315, 316) superficially resembling, in the bird-orientated New Zealand scene, the femur of a slender-legged " bird " about the size of an extinct Eagle or an *Aptornis*. But this is not enough, can the book be used for the determination of ordinary run-of-the-mill bird bones, those without obvious distinctive features that stand out immediately on preliminary examination ?

To attempt to answer this question of use your reviewer tried to identify from scratch an assorted series of 18 different, known but randomly selected bird bones, some freshly prepared, some archaeological and some subfossil. *All except one were identified readily,* though several minor misprints, textual errors and extensions to size ranges were found during this exercise. Thus the weka humerus and metatarsus; the Paradise Duck humerus; the Grey Duck coracoid; the extinct Swan femur, tibia and humerus; the shag tibia; the kiwi femur, and the extinct Crow humerus were straight forward identifications from the illustrations and fitted within quoted sizes ranges. On the other hand the following bones could be identified from the illustrations, but in each case some value judgement had to be made or some problem arose when using textual information: the Red-billed humerus was 75mm long and a perfect miniature of the Black-backed Gull humerus in fig. 22 and within the size range quoted for the former of 70 - 75mm; the extinct Crow metatarsus from the South Island was 74mm long and very slightly above the quoted range of 65 - 73mm for mainland bones (but within the range of 72 - 77mm for

Chatham Island bones); the extinct Eagle humerus was 208mm long and below the quoted range of 216 - 238mm; the extinct Coot humerus is illustrated in fig. 24 not " fig. 25 " as quoted in the text; the size range for the *Gallirallus australis 'hector'* metatarsus given as 6.525 to 6.10cm is either reversed or in error; in the White-capped Mollymawk the size range of the femur quoted as 17.6 to 18.5cm should surely read 7.6 to 8.5cm, while the tibia size range quoted as 31.0 to 31.7cm is completely wrong (the drawing of the tibia in fig. 215 is about 179mm long and is presumably actual size as the associated femur and metatarsus drawings in figs 214 and 216 are within the corrected and quoted size ranges respectively); the Muttonbird *(Puffinus griseus)* humerus was 104mm long and closely matched the illustration for this species in fig. 20 which is about 105mm long, the range quoted, however, is 110 - 112mm yet the other figures on this plate are drawn actual size; finally the Blue Penguin *(Eudyptula minor)* femur at a length of 53mm appeared reasonably close to being a small version of the Yellow-eyed Penguin femur in fig. 236 with a stated range of 77 - 87mm, but no measurements are given for the small *Eudyptula* penguins.

The one failure in this identification exercise was a Blue Penguin tibia 81mm long. It did not appear to match anything on the plates but came close (especially in the distal end) to being a miniature form of fig. 201 which is the extinct Swan tibia with a size range of 183 - 202mm (note swan figs 200 - 202 are wrongly listed in text as 230 - 232). It did not appear as a smaller edition of the Yellow-eyed Penguin tibia of fig. 237 (the only penguin tibia illustrated) with a range of 109 - 134mm, as it differed strongly in the distal end (though similar at the proximal end). Unfortunately for the uninformed user Blue Penguin bones are common in many coastal archaeological sites.

It appears then that for identification purposes the illustrations are indeed very good *if used with care, common sense and thought,* but the user must be on the constant lookout for misprints and textual errors. I think this manual could be *dangerous* if used superficially by an archaeologist or ornithologist who was uninitiated into the basic problems and methods of bone identification. On the other hand it is obviously an important working tool for those actually working on and interested in the identification of bird bones in the New Zealand area.

Scarlett the osteologist:

One of the important and delightful aspects of this book is the light it throws on the osteological knowledge, methods and philosophy of Ron Scarlett himself. His succinct comments on bone measurements (p. 2) have already been discussed in this review while his remarks on the classification of birds (p. 4) could be echoed by many. The difficult to describe kiwi femur is skilfully characterized on page 5 as " curved, and ' twisted ' throughout the shaft " while the

matching tibia is usefully described as being " straight, with little or no ' bridge ' over the foramen at the distal end." It is well known that the bones of the different genera and species of New Zealand shags are very similar and show a wide variation in sibe range within each species but rather surprisingly Scarlett now adds that " individuals with the longest wings are not necessarily those with the longest legs " (p. 9). Scarlett's statements on the variability, wide range in size and the synonymy of the extinct Rail *Aptornis otidiformis* (p. 12) summarize the results of his long-term unpublished study of this distinctive bird. The characteristic ' ralline curve ' of a rail femur is discussed on page 14 as is the differences between the rather similar rail and duck metatarsi (figs 209, 210). On the same page he mentions " a great proliferation of ralline forms in New Zealand . . . a few thousand years ago " and knows of undescribed species from scattered bones; in fact he finds that " the rails are a fascinating group, to the osteologist, but not an easy one with which to work." Pages 20 - 22 on the classification of moas are very important and should be read by anyone with an interest in the systematics of this group. Ron Scarlett's classification is " based on a very extensive acquaintance with Moa, and on [his] present knowledge of their bones and distribution. It is also the simplest " when compared to those of Archey and Oliver " (p. 22). When trying to identify individual moa leg bones Scarlett has found that measurements alone are unreliable " as the legs of different species can be of similar size " and with " broken bones the task is even more difficult," but he has " found that the blood vessel markings on tibio-tarsi are a considerable help, when visible, in distinguishing fragmentary material, as although they vary somewhat between individuals, there is a constant pattern for each genus " (p. 20). He has more to say on this new use for blood vessels on page 22 and in the caption to fig. 5.

One minor but theoretically important concept used by the author three times in this work would find little or no support from other workers in his chosen field. This is the idea of being able to make specific or subspecific separations of bones on geographical distribution alone. It appears on page 14 for the weka " the subspecies can only be distinguished as bones by their geographic distribution," on page 4 for the kiwi "the bones of the large Kiwi are not easily separated to species, except by geographic distribution " and on page 19 for the kokako ' the New Zealand [should read North Island] and South Island subspecies cannot be separated as skeletons, except by their geographic location." If one follows this through one is making the assumptions that the geographic ranges of the forms under discussion were the same in the past and that the named forms (differences presumably based on plumage or external colours, certainly not on size as this would be reflected in the skeleton) actually existed in the past at the time the bones under consideration were deposited (probably safe assumptions in the case of most archaeological material but unsafe when dealing with subfossil bones). In other

words the systematic labels have been put forward to indicate some present-day external differences which can be linked with present-day geographical distribution and one cannot work backwards to the systematic label from the geographic distribution alone.

After commenting on the ingenuity of the Maori in the utilization of bone for artifacts Ron Scarlett has this to say about fieldwork in his own beloved discipline " one of the joys of archaeology is that the next stroke of the trowel may reveal something rare and beautiful. It is that thought, I think, that keeps many of us patiently working under a blazing sun or in freezing cold, and the New Zealand archaeologist experiences plenty of both " (p. 25).

Errors, ommissions and comments:

There is an unusually large number of misprints and examples of bad editorial work in this bulletin; in fact it is clear that the proofs could never have been seen by the author. Apart from those mentioned already in this review one finds " *Pteredroma* " for *Pterodroma* on page 7, " *Pelecanoider urinatric* " for *Pelecanoides urinatrix* on page 8, " *novae hollandiae* " as two words on page 8 but correctly written as one word on page 15, " secual " for sexual on page 14, " *lönnbergi* " on page 15 when the Rules of Zoological Nomenclature state that a diaeresis must not be used in a scientific name, capitalization of specific names twice on page 15, " *Staigops* " for *Strigops* on page 17, " agreemtn " and " Swam " for agreement and Swamp on page 20, " *forstoi* " for *forsteri* on page 23, " Soothy " for Sooty in caption to fig. 46, and " ulna " and " femur" transposed in the captions to figs 311 and 312. Figs 306 and 310 are not illustrations of the Southern Fur Seal despite their listing on page 23.

The spacing between paragraphs, headings and within tables of measurements differs radically in various parts of the text (compare page 17 where the table at the top is double-spaced, that in the middle partly double-spaced and that at the bottom single-spaced with page 15 where the spacing is even and good) and sometimes becomes confusing to the eye (there is a larger gap between " Radius " and " Coracoid " in the table at the top of page 17 than between the section on the Kakapo and that on the South Island Kaka on the same page; the first paragraph of text on page 10 is dealing with *Cnemiornis* in the first line, yet the table which follows without a break gives measurements of *Chenopis*). On most pages paragraphs start with an indented line (as on page 11 for example) but on some they do not (page 20 for example). The method of indicating the number of individual bones measured to give the size range quoted for a skeletal element changes midway through the text (compare page 13 with page 19) and the only key to the method used in the later tables is given in the lower table on page 16. There is no contents page.

As the book will primarily be used for the identification of individual unassociated bones the user will find those plates devoted to one skeletal element only (e.g. pls 3 - 4, humeri) easier to use than

those with several different elements illustrated, especially plates 20 to 24 with associated sets of leg bones. The association of the femur, tibia and metatarsus of each species together on the one plate would be a help if part or whole skeletons were being identified but is frustrating and confusing to the eye when attempting to make direct comparisons while holding a single unassociated leg bone in the hand. Annotation of the plates in this manual is recommended. Your reviewer found that the addition of generic names alongside drawings, adding straight lines linking the three leg elements of each species on plates 20 to 24, putting scales or reminder marks on plates with drawings reproduced less than actual size, as well as adding the occasional Peterson-type arrow to indicate some morphological feature found useful or distinctive greatly increased the usefulness of these plates. May I say that it helped bring the bare bones of this osteologcal atlas into systematic and more useful " life " ? The Starbrite-type, dimple-surfaced paper used throughout the book is of high quality but not easy to write on with ink or soft pencil.

With the qualifications listed above I would have no hesitation in recommending this book for those *seriously* interested in the identification and study of prehistoric bird bones in the New Zealand area.

Postscript:

By coincidence a book along very much the same lines as Ron Scarlett's manual, but dealing with European Mammal bones, was recently reviewed in *Nature* (Vol. 238, August 25, 1972, p. 474) and has been drawn to my attention by the Editor of *Notornis.* It is a bilingual (English/German) *Atlas of Animal Bones for Prehistorians, Archeologists* [sic] *and Quaternary Geologists* drawn by Otto Garraux and published by Elsevier, Amsterdam, London and New York, 1972. The reviewer, I. W. Cornwall (himself the author of a book *Bones for the Archaeologist* referred to by Scarlett in his text and bibliography), had this to say about the new atlas, " the illustrations do not pretend to be complete, but are confined to the principal bones . . . [of] domestic species and those usually hunted for food or fur, as well as . . . representative members of their orders . . . they should enable some opinion to be formed, even by non-osteologists " as to whether the remains belong to illustrated species or members of the same group. Cornwall considers that " within its chosen limits, this book fills a decided gap in the literature available to workers in the field, and may confidently be recommended to them."

By one of those unexplained quirks the study of animal bones has become distinctly better documented and more straightforward in both hemisphers at almost exactly the same time.

Dr J. C. Yaldwyn,
Dominion Museum,
Wellington.

REVIEWS

MCKENZIE, ROSS. *In Search of New Zealand Birds. How and where to find them.* Pp. 1 - 256, text – figs 1 - 53, jacket photos 1 front and 5 (A - E) back, maps 1 - 46, and key maps on end papers. A. H. & A. W. Reed, Wellington, *&c.,* 1972. $6.50.

MARSHALL, JANET; KINSKY, F. C.; ROBERTSON, C. J. R. *The Fiat Book of Common Birds in New Zealand.* Vol. 1, Town, Pasture & Freshwater Birds. Pp. 1 - 94, pls 1 - 40. 1972. A. H. & A. W. Reed, Wellington, *&c.,* 1972. $1.75.

1972 is a year to be remembered in New Zealand ornithology, the year when two first-rate books on New Zealand birds appeared virtually hand-in-hand from the same publisher within a few days of each other. They will be used in the same way as companions and complementary to one another. Let me at once congratulate A. H. & A. W. Reed Ltd on this achievement. The demand for popular natural history books in New Zealand, particularly for the needs of schoolchildren and their teachers, is so great that I fear that publishers have had it all too easy in this boom period of production which has, regrettably, included the appearance of a number of ill-conceived, inaccurately written or crudely illustrated books which have quickly found themselves in the hands of those ignorant of their shortcomings. Whether publishers note reviewers' comments I am never sure but Reeds may believe me when I say that they have rendered a good service in providing these two volumes, adequately compensating for any less worthy natural history publications for which they may have been responsible.

Ross McKenzie, author of the first book to be discussed, is a well-known bird man and staunch member and supporter of the OSNZ in all its activities and throughout its existence. He acknowledges Mr R. B. Sibson in his dedication as his ornithological " godfather." Mr McKenzie, himself, has been and is such a godfather to dozens of members of the OSNZ and to many other unaffiliated bird watchers and nature lovers in New Zealand. And not only in New Zealand for Ross McKenzie has been an unrivalled, almost unique, guide to many visitors to this country, ranging from a good many of the " greats " of overseas ornithology to those coming simply as tourists with an appreciation for the natural beauties and attractions of New Zealand. Indeed, it was from the suggestion of a distinguished American visitor that this book was born. If there was an award for whoever had done most to introduce New Zealand birds and their haunts to the world, then I think we would be hard put not to back Ross McKenzie. True, others have written more profound papers and sat on more committees or achieved ornithological eminence in other ways, but the author of this guide book represents the best of the amateur tradition in New Zealand bird study; each of us knows full well what contact with H.R.McK. (even if only by correspondence) has meant to us. Now we can share this with a wider audience. I recall my first meeting with him when, as a somewhat raw 18-year-old student eager to sit at the feet of the great, I tagged along with him on an OSNZ trip to Kapiti Island. On that day, and subsequently when I rashly became a Regional Organiser, I learned not only the value of a telescope but was introduced to the solidarity, integrity

and forthrightness (and this no lavish praise) that has characterised his words and ways. But this review is not of the man, but of the book. We know the quality of the man; the book measures up in every way.

Mr McKenzie's book is attractively printed, setting a fine standard of typography and layout; the many maps are well drawn, surprisingly detailed but clear; the photographs (perhaps not always up to the standards of Moon and Soper) relieve the text well and provide, in a way, two books in one; and the text, itself, is encyclopaedic, a bird watcher's guide to " how and where to find them."

Key maps show the division of New Zealand in numbered geographic regions, those areas one might be covering in a good holiday, and the text is related to them so that quick reference can be made to any area of interest. For each such region its background, whether city environs or country district, is briefly stated, geographically and historically as well as birdwise; a list of the relevant Automobile Association and Lands & Survey maps is conveniently provided; accommodation available is noted and birds of special interest are tabulated. The traveller is then guided along the roads (and tracks) in a fashion reminiscent of an AA itinerary, but with the ornithological highlights and interests described in blow-by-blow detail; truly " how and where to find them." One could give examples of how particular regions are treated but it would spoil the reader's pleasure to reveal some of the unusual, and often characteristically humorous, turns of the writer's hand. It will be better to get out and use it !

One can find errors, mis-spelling of place names and so on, perhaps also a lack of depth of treatment of places one especially knows, but these are trivial complaints for what the book gives us. Armed with Ross McKenzie's book in one hand and Errol Brathwaite's *Companion Guide* in the other (not forgetting the binoculars around one's neck and notebook and pencil somewhere else), those of us who think we know New Zealand and its birds may well have a more pleasant and profitable holiday than we would ever have imagined, while those who know not New Zealand and its avian pleasures will not wish for a better, friendlier or more informative guide.

Thank you, Ross McKenzie !

Fred Kinsky and Chris Robertson, also from within our fold as members of the OSNZ, have, with their artist Janet Marshall (who appears on the title page in full status of a joint author, and rightly so), done a fine piece of work. It is, however, not because we know the authors from the pages of *Notornis* or because one of them is President of the OSNZ that we speak highly of their efforts; the book stands on its own merits and will do so for a long time to come. Indeed, if ever there was a much-needed little, inexpensive guide to what we might see around us, this is it. And it is a cheap Christmas present if ever there was one !

This Fiat book, modelled on Nancy Adams' successful volume on trees, is simply enough constructed and is the forerunner of a second volume dealing with mountain, bush and shore habitats (for which we eagerly await). In 80 pages and 40 plates, some 43 species are dealt with, usually with one species to an opening, coloured figure on the left and simple text on the right. Each species is illustrated carefully and quite pleasingly in its colours, not so harsh and much

bolder than those of the " Field Guide," and with a peculiar attraction that overrides any feeling of inaccuracy of stance, proportion or colouration. Briefly listed on the facing page are " Field Characters," " Distribution and Habitat," and " Breeding " and the conciseness of these entries is commendable. Pedants may find something to quibble over here and there but for those who demand detail or want to know the exceptions, the " For Further Reading " section will lead them to Oliver's " New Zealand Birds " or to the "Annotated Check-list." The species in this first volume of " Town, Pasture & Freshwater Birds " include White-faced Herons, Mallards, Skylarks, Pipits, Hedge Sparrows, Redpolls, Magpies and so on, with such lesser-known, but none-the-less easily seen species as the Cirl Bunting, the Australian Coot, and the Spur-winged Plover. A reviewer in a city newspaper (*Evening Post*, Wellington, 7 Nov. 1972, p. 24) who extolled the virtues of this " excellent book about birds " laments the exclusion of the Tui and the Bellbird " which are both more commonly seen nationally than some of the 40 birds included . . ." One cannot have everything in one's own backyard and what is " common " in my garden set on the forested slopes of eastern Wellington Harbour is not even the same as two other ornithologists find in their own gardens a few hundred yards up and down the road respectively. However, Ross McKenzie's book comes into its own now, providing the key to " how and where to find " these " common " birds and the search for them can be readily extended into something quite exciting stimulated from the possession of the little Fiat book.

Use of the Fiat Book of Common Birds will make us richer and wiser in knowing what is around us and it will be the answer for those who have longed for " something " to tell them what " it " is in their garden or on their holidays not so far from the urban sprawl; to echo the words of the writer of the preface, Dr R. A. Falla, Chairman of the Nature Conservation Council — " The readers of this book may be assured that every one of the birds figured and described has something to contribute to their enlightenment and enjoyment."

E. W. D.

D. L. SERVENTY, V. N. SERVENTY, & JOHN WARHAM. *The Handbook of Australian Sea-birds.* Pp. 1 - 254, figs 1 - 127, col. pls 128 - 142. A. H. & A. W. Reed, Sydney, *&c.*, 1971.

It is a regrettable practice among professional ornithologists to submit the results of their researches for publication in the widest possible spectrum of journals. As a result, the literature of the sea-birds of the Australasian region has for too long been scattered among a multiplicity of books, reports and journals (not all of them ornithological) throughout the English-speaking world, often unknown and too often inaccessible to all but workers in museums and universities. To have all this work summarised in a single volume could not fail to be a welcome event; for such a volume to be produced by three workers pre-eminent in recent research in this field makes the volume a landmark in the literature of Australasian birds.

Following a two page preface, which explains the scope and purpose of the book, with acknowledgements of help received, the

main text is in five sections. Section I, " The Geography of Australian Sea-birds " (18 pages) briefly surveys natural regions in the oceans, Australian marine provinces, characteristics of the water masses around Australia, the physiographical habitat, and the environment during and since the Pleistocene. Section II, " The Sea-bird Fauna " (16 pages) discusses the categories of Australian sea-birds, and some aspects of the biology of Australian sea-birds. Section III, " Research on Australian Sea-birds " (three pages) briefly describes the historical background and current programmes, with suggestions for future programmes and valuable advice on methods. Section IV, " Sea-bird Conservation Problems in Australia " (four pages), draws attention to the damage done by the armed services, whose need for gunnery and bombing targets is an ever present danger to breeding populations of the sea-birds.

Section V, " The Systematic Account of Australian Sea Birds," covers the Penguins, the Albatrosses, Shearwaters and other Petrels, Frigate Birds, Tropic birds, Cormorants, Boobies and Gannet, Pelican, Skuas, Gulls, Terns, and Noddies, in all 104 of Australia's 715 birds.

Each account includes a brief but adequate description of the species, including any differences owing to sex or age, with measurements of series of specimens (in millimetres), and notes of flight, behaviour, etc., likely to aid identification at sea. A most useful feature is the addition, in many species, of length, and wing-span in inches, and weight. Other headings in each account are status (in Australia), voice, display (where known), breeding (season, nest, egg, and nestling), food and breeding distribution. The accounts vary in detail according to the status of the bird concerned.

The comprehensive bibliography contains 349 references, ranging over a century in time, and by no means all in English. The reader can be reasonably confident that any significant information omitted was unknown at the time the book went to press.

The photographs are well selected and well printed. The sketches are all useful, though uneven in quality, those of the grey petrel and Wilson's storm petrel being perhaps the least satisfactory. The authors have succeeded in achieving a combination of brevity with lucidity and readability, but the inexperienced should beware of reading contradictions into the text which are only apparent. For instance, the statement that " At sea the shy albatross may be seen to be larger than other mollymawks which are often present and it appears as a rather bulky, short-bodied bird," is not easy to reconcile with the measurements of length, wingspan and weight cited for this species and the black-browed mollymawk.

Anyone with a casual interest in sea-birds will enjoy reading this book; every person with a serious interest in the subject will surely want to own it; and it should be on the shelves of every school library, at least down to intermediate level. Of the 105 species of sea-birds on the current New Zealand checklist, all but 16 are covered in the book, and of these all but two penguins, one petrel and one gull are uncommon.

D. H. B.

[Reprinted, with kind permission, from *The Press,* Christchurch, 1 July 1972, p. 10. This book has also been reviewed by M. J. Imber, in the *Proceedings of the N.Z. Ecological Society* 19: 175 - 176, 1972.]

Birds of Fiji in Colour. Painted by W. J. Belcher with ornithological notes by R. B. Sibson. 54 unnumbered pages including 24 coloured plates. Auckland and London: Collins, 1972. $3.60.

It is pleasing that a selection of the Belcher paintings has at last seen the light of day, and the publication of this slim volume will surely stimulate an interest in the fascinating, albeit restricted, avifauna of the Fiji Islands, and perhaps serve as a prod to the authorities in Fiji to provide sadly needed reserves for its preservation.

There are 90 of Belcher's accurately painted bird pictures held by the Suva Museum, and one could wish that more of the beautiful and truly endemic species such as the Red-throated Lorikeet, red-breasted Musk Parrot, Silktail, and Slaty Flycatcher had been chosen in place of the more widespread species such as the Reef Heron, Golden Plover, White-collared Kingfisher, Pacific Swallow, and White-breasted Wood-Swallow. As Mr Bruce Palmer points out in his introduction, four paintings were stolen by an American visitor to the home of Belcher's widow, and of course these were of Fiji's most beautiful birds, including some of the *luteovirens* doves, which Casey Wood in 1926 described as " the chief glory of the Fijian avifauna."

It is unfortunate and rather disappointing that the plates have lost some of their original brilliance and good colours by reproduction, giving a wrong impression of some birds. For example, the blackish Giant Forest Honey-eater is actually a bright olive green, the clear yellow of the Golden Whistler appears as an unattractive buff, and the bright green plumage and vivid green bill and eye patch of the Velvet Dove are quite lost in reproduction.

The text is eminently readable and suitable to a publication of this kind, although one cannot help disputing some of the author's assumptions. For instance, the coughing sound made by Peale's Pigeon is not connected with the " digestion of pulpy fruits " as he suggests, but is definitely a note of warning or surprise. *Layard's White-eye* is not confined to the highlands, nor are forest clearings the most handy places in which to find them. We have found that both this species and the Grey-backed are present at all levels, and frequently in mixed flocks. Light in style and content, we cannot regard the book as an " invaluable work of reference " as suggested by Mr Palmer, nor do we think that such was the author's intention.

One could be mildly critical of the layout of the book, for the unnumbered pages do not make for easy reference, and to have had the text facing the relevant plate would have been preferable.

There is an almost complete lack of illustrations of Fijian birds, and as a popular introduction to some of them, this book is an admirable beginning. With New Zealand's increasing interest in and responsibility to the rest of the South-West Pacific, ornithology must not be overlooked or disregarded; and this book of fine plates by a New Zealand artist, and interesting text by a New Zealand ornithologist, is a valuable contribution towards developing a real interest in Fiji's birdlife.

F. C. K. & A. B.

NOTES AND NEWS

KAJ WESTERSKOV HONOURED

" Dr K. E. WESTERSKOV, associate professor of zoology at the University of Otago . . . has had a rare distinction conferred upon him by fellow scientists in his native Denmark. He has been elected a Corresponding Fellow of the Danish Ornithological Society, of which he was a council member before coming to New Zealand in 1952. The society has only 12 Corresponding Fellows, of whom the best known to most New Zealanders is Peter Scott.

" A prolific writer, Dr Westerskov is internationally known for his work on the partridge and the pheasant. Of his four books and 100 papers and articles, the most popular in non-academic circles is " Know Your New Zealand Birds." Dr Westerskov was employed by the Wildlife Division until he joined the university staff in 1964."

Source: Reprinted from *The Otago Daily Times,* 3 August, 1972, page 10.

RESEARCH REQUEST

Jo Knight, of the Zoology Department, University of Canterbury, is experimenting with a new method for testing the age of birds based on a study of stained and ground sections of their bones. She has already examined the skeletons of Red-billed Gulls of known age collected by Dr Jim Mills during his work at Kaikoura and she now wants to try a variety of species. Any members able to help are asked to write to her at the Edward Percival Marine Laboratory, P.O. Box 11, Kaikoura.

INTERNATIONAL ORNITHOLOGICAL CONGRESS

The 16th International Ornithological Congress will be held in Canberra, A.C.T., from 12 - 17 August 1974. It will be sponsored jointly by the Australian Academy of Science and the RAOU. Professor J. Dorst of Paris is President and Dr H. J. Frith of Canberra is Secretary-General.

The congress theme will be " The Two Hemispheres," this being the first International Ornithological Congress held south of the equator, and comparisons and contrasts will be developed between the Northern and Southern Hemispheres, " each of which presents a tale half told, in each of which we are seekers in common of the whole story of birds." Four main subjects will be built around this theme and there will be also at least 12 symposia by invited speakers and general sessions for offered papers.

This will be an important occasion for any NZ ornithologists, whose presence in Canberra could add immeasurably to the success of the Congress, and this advance warning is given for those who might be considering going to Canberra in 1974. Further details are available from Mr A. BLACKBURN, 10 SCORE ROAD, GISBORNE. It is hoped that some kind of discount travel can be arranged for NZ participants and, to help planning, would intending travellers, even if only tentative, please write to Mr Blackburn as soon as possible ?

A MANX SHEARWATER IN NEW ZEALAND

"It is not often that the Wellington Region can claim a new bird species for the country. We should therefore congratulate Mr T. C. L. Symmes on finding New Zealand's first Manx Shearwater *(Puffinus puffinus),* beach-wrecked near Pukerua Bay on 25 June. The Manx Shearwater breeds on islands along the west coast of Britain and the only other Australasian record was of a bird which had been banded on Skokholm Island (Wales) and was washed ashore in Australia in Nov. 1961. Birds migrate from the North to South Atlantic and presumably the odd one gets far enough south to be whisked into the Roaring Forties and round the Southern Ocean."
Source: FOWLER, J. A. (ed.). Newsletter, Wellington Branch, Ornithological Society of New Zealand, July 1972.

REGIONAL NEWS

Northland: A beach count of 100 New Zealand Dotterel is the best since 1940. *Gisborne:* A Kaka has been visiting an urban plantation. *Wanganui:* Coots, 9 counted on Westmere Lake; Spotted Shags, 5 on 27 May, the largest number on record for Wanganui. *Taranaki:* Beach patrols in 1971 yielded 130 birds of 16 species; other birds reported, Common Sandpiper (3rd for NZ), Wrybill, Little Tern, Black-fronted Dotterel, Spoonbill. *Wellington:* A Little Grey Kiwi was killed by a car at Raumati Beach on 19 June, perhaps a bird removed from Kapiti Island; a Giant Petrel bearing an Australian band was found at Waikawa on 5 June, and a Southern Skua was seen feeding on a dead sheep near Foxton Beach on 24 June; the first report of Welcome Swallows in the Hutt Valley comes from two birds seen at the Silverstream Bridge on 11 June; a field meeting at Lake Horowhenua resulted in the sighting of the following, White Heron (1), Bittern (1), Dabchick (18), and Little Black Shag (7); June was an "extraordinary" month for beach patrollers in which 250 birds of 31 species were found along 150 miles of beach, including 27 Yellow-eyed Penguins, 10 Spotted Shags, and a small wreck of Fluttering Shearwaters (61).

KIWIS' ACTIVITY IN CAPTIVITY

The Otorohanga Zoological Society Inc. has recently made a survey of 48 hours of activity in their Nocturnal Kiwi House, from 9.00 a.m. 23 June to 9.00 a.m. 25 June. The survey was divided into twenty-four 2-hour shifts and was carried out by 17 members of the Zoological Society. Three individuals of the North Island Kiwi *(Apteryx australis mantelli)* were observed and a very detailed report has now been compiled. We are indebted to Barry Rowe, President of the Otorohanga Zoological Society, for sending it to *Notornis;* a copy is available in the OSNZ library for the benefit of our members. With the current controversy about the export of kiwis to overseas zoos it is refreshing to see such local studies being made.

WILDLIFE SERVICE SOUND LIBRARY

It may not be known generally that the Wildlife Service has issued a catalogue of its holdings of natural sound recordings. A surprising range of birds, some 143 species and subspecies, is listed including a number of rarely-visited species such as the Auckland Island Teal and the Black Robin of Little Mangere Island. Under certain conditions these recordings may be borrowed or tapes made on request. Further information will be given readily by the Wildlife Service. Readers of *Notornis* may like to note that an article on natural sound recording written by Mr J. L. Kendrick of the Wildlife Service will appear in an early issue next year.

Reference: Information Section, Wildlife Service, Department of Internal Affairs, Wellington. *Sound Library Catalogue.* No. 1. October 1971, 23 pp.

WILDLIFE 1971

Once again the Wildlife Service of the Department of Internal Affairs has given the interested public a clear account of what it is and what it does. *Wildlife 1971 — a review,* recently issued, is the third such publication detailing the work and achievements of the Wildlife Service. A great many aspects of interest are shown ranging from the Black Swans of Lake Ellesmere, the small rails at Pukepuke, the survival of the Kokako and the Takahe, petrels, rats, albatrosses, ducks, reserves and surveys, a host to interest the OSNZ reader.

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BIRD MAPPING SCHEME

BIRD MAPPING SCHEME

Would contributors please send all remaining lists for 1972 to their Regional Representative (address in back of *Notornis*) as soon as possible. All cards should reach the recording office by 31 January 1973 to ensure an earlier appearance of the annual report. Any queries concerning the scheme should be sent to regional representatives or to Mr P. D. Gaze (Ecology Division, DSIR, Box 30466, Lower Hutt).

FROM THE EDITOR'S DESK

In this issue we have devoted considerable space to a review of an important new manual dealing with bones, largely of birds, and their identification. Any manual, by its very name designed as something to be used, deserves to be examined and reported upon in a critical fashion, and we are fortunate in being able to present such a review written by Dr John Yaldwyn, a man of many parts, at home in the diverse fields incumbent upon a museum man, and hence ably qualified to assess the value and significance of this particular work.

That the present is the key to the past has become a rather hackneyed expression but there is no doubt that our knowledge of the origin, development and distribution of our bird fauna could owe much to a blending of what we have discovered about both living and fossil birds in New Zealand (1). Members of the OSNZ, dedicated though they may be to the study of the living bird, may, none the less, find some satisfaction in having the value and limitations of a study in this field of interest shown to them. I have tried already to indicate something of the unique role of birds in the economy of the Maori in contrast to the mammalian food resources revealed in European and North American archaeological sites (2) and there is still a great deal to be done to develop this theme.

Your reviewer and your editor became interested together in subfossil and archaeological birds as schoolboy archaeologists digging under the expert eye of Dr Roger Duff, in Von Haast's early Maori middens at Redcliffs near Christchurch, cycling out from school with spades and sacks over the handlebars and returning loaded with fascinating booty, bones rather than artifacts, and this well before the current archaeological enthusiasm in New Zealand. Although the bones of mammals and moas predominated at this site, we became excited at what the small birds might tell us from their remains. However, for both of us, what I have previously spoken of (3) as " multifarious, imperious duties " (using the words of Henry O. Forbes, one-time Curator of the Canterbury Museum and pioneer in the " palaeornithology " of New Zealand, in excusing his distractions and tardiness in working up his own work at Redcliffs), befell us, and our ways and occupations left us but little occasion to develop this interest. We unwillingly emulated Dr R. A. Falla who had inherited the mantle of H. O. Forbes and had made studies of small birds from the classic sites of Wairau Bar and Pyramid Valley (4, 5) but who also found the duties of office a deterrent from such interests.

It is all the more pleasing, therefore, that Mr R. J. Scarlett, now osteologist at the Canterbury Museum, has been able, due to the informed direction of that museum, to emerge from his many and colourful interests, experiences and hobbies to devote himself single-mindedly, with neither diversion nor distraction, to characterise the birds of New Zealand as shown by their skeletal remains. Some space, as has been said, is devoted to this review because Mr Scarlett's book, in its field and in its wide application and interest to several

disciplines each involved in unravelling our past, is as important as the handbook of Falla, Sibson & Turbott is to the living ornithology of New Zealand.

Indeed it has been a particular relief to one of us to see this manual appear and to be able to abandon his own oft-attempted and much-frustrated efforts to produce such a volume, an ambition which he misguidedly has noted in print (6) and which may have hindered others so minded.

The next stage is to use this tool of identification to interpret the New Zealand birds of the past and the deposits in which they occur in terms of what we know of the needs of birds of to-day. Woefully, such attempts for the New Zealand scene (or for most other places as I have previously (2) demonstrated) clearly shows how shallow and superficial our knowledge of modern birds really is. I make no apology for using the pages of *Notornis* to say something of this fascinating and hopefully fruitful field of study and interest. Perhaps this manual and its potential use for the interpretation of both of the past and the present will be a challenge to us to get out and look at what is around us *now!*

References: (1) FALLA, R. A. 1955. New Zealand bird life past and present. *Cawthron Lecture Series* No. 29. Nelson: The Cawthron Institute; (2) DAWSON, E. W. 1963. Bird remains in archaeology. Pp. 279-293 *in:* BROTHWELL, D. & HIGGS, E. (eds.). *Science in Archaeology. A comprehensive survey of progress and research.* 595 pp. London: Thames & Hudson; (3) DAWSON, E. W. 1958. Rediscoveries of the New Zealand subfossil birds named by H. O. Forbes. *Ibis* 100 (2): 232-237; (4) FALLA, R. A. 1941. The avian remains. Pp. 339-353 *in:* Preliminary report on excavations at Pyramid Valley swamp, Waikari, North Canterbury. *Records of the Canterbury Museum* 4 (7): 325-353; (5) FALLA, R.A. 1942. Bird remains from moa-hunter camps. *Records of the Canterbury Museum* 5 (7): 43-49; (6) DAWSON, E. W. 1969. Bird remains in archaeology. Pp. 359-375 *in:* BROTHWELL & HIGGS, *q.v.*, revised and enlarged edition, 720 pp.

ABOUT OUR AUTHORS

FERGUS CLUNIE is the Assistant Director of the Fiji Museum. He is 24 years old, born and educated in Suva and has lived all his life in Fiji apart from a year in Auckland. His activities have been mainly with the Fiji Museum's programme of archaeological work but over the past two years he has developed an interest in birds and has been able to spend a great deal of his time alone in the bush and, accordingly, has made some unique observations on such rarely-seen species as the Pink-billed Parrot Finch. He has recently published a most useful and informativve guide to Fijian raptors (*Fijian Birds of Prey.* Fiji Museum Educational Series No. 3. 14 pp., 6 pls, 1972).

DON HADDEN has been Regional Representative for the OSNZ in Waikato since 1969. His main interest is bird photography which occupies most of his spare time and has won him medals at photographic salons throughout New Zealand. He also exhibits internationally. Mr Haddon is 28 years old, married with two children, and has been Head Teacher of Waingaro Primary School since 1967 but has just moved to Martinborough. Readers will recall his previous article on the Spotless Crake in *Notornis* 17 (3): 200-213, September 1970.

NOEL M. GLEESON, E.D., B.D.S., joined the Society at the end of the 1939-45 war. He says the Society and the Auckland Museum have taught him most of his knowledge of birds. Regrets that dentistry has taken much of his time from bird watching. Is Immediate past President of the NZ Dental Association. One of our leading bird photographers, he has concentrated very successfully on what may be termed " real life " studies especially of the Pied Stilt and White-fronted Tern. The action pictures he has obtained of these and other birds are valuable indeed. His lectures in this respect have been greatly appreciated by Auckland members of the OSNZ and others.

SUSAN M. FOGARTY is a third year student in the Department of Geography, University of Auckland. She has been a very active member for her eight years of membership of the OSNZ, with a particular interest in waders, but has also worked on Kokako investigation and as an ornithologist with university study parties has camped and studied birds on the Mercury and Alderman Islands, Stewart Island and various parts of the Auckland Province. She has done nest recording regularly. A recent visit to Australia gave her the acquaintance of many of its birds.

JOHN L. PLAYER began his interest in birds before he left England. Particularly he has studied the birds of the Hunua Ranges when working there and has helped in the Kokako investigations. He has taken part in other local work and the activities of the Society.

H. R. (Ross) McKENZIE is a foundation member of the OSNZ, was Vice-President two years, President for a three-year term, then Hon Treasurer for eight years and has been Regional Represent-

ative, South Auckland, for 19 years. For 21 years he has organised summer and winter censuses on each of the Manukau Harbour and Firth of Thames, also several camp-out expeditions on the North Kaipara Peninsula and a survey of the Kaipara Harbour, besides other Society field activities, such as Brown Teal and Kokako surveys and field study courses. He has contributed many notes and some articles for *Notornis* and edited some for other members. In travels from Cape Reinga to Stewart Island with his wife Hetty, who is also very well-known for her activity in the Society, a point has been made of visiting every member possible and talks have been given at places from Whangarei to Invercargill. His book, *In Search of Birds in New Zealand: How and Where to Find Them* (A. H. & A. W. Reed Ltd) has just been published. It is a guide to visitors and holiday-makers to the birds throughout New Zealand.

J. C. YALDWYN was born in Wellington in 1929 and lived his boyhood days on the bush-clad hills above the rocky shores of the eastern side of the harbour at Point Howard. In these pleasant surroundings he developed an early interest in natural history, strengthened by school days in Christchurch and association with the next door Canterbury Museum, which led to studies in zoology under Professor L. R. Richardson at Victoria University from which he graduated M.Sc., Ph.D. in 1960, joining the staff of the Dominion Museum as a zoologist. Following a year on a Fulbright Grant at the Allan Hancock Foundation, University of Southern California, Los Angeles, he was appointed Curator of Crustacea at the Australian Museum, Sydney, in 1962. He rejoined the Dominion Museum as Assistant Director in 1969. He is a long time member of the OSNZ, a foundation member of the N.Z. Archaeological Association and a life member of the Polynesian Society.

John Yaldwyn's main research interests are in the distribution and relationships of marine invertebrates, especially decapod crustaceans, but he also works on subfossil bird bones and on the identification of faunal remains in general from archaeological excavations. His main studies in these latter fields are on the avifauna of the Martinborough cave deposits in the Wairarapa and on the bone material from the Tairua archaeological site, Coromandel. He is fascinated by the biological problems of isolated islands and has studied birds on the Cook Strait islands (with Bill Dawbin and Brian Bell), on the Auckland Islands, on Macauley Island in the Kermadecs (with Gordon Williams and Brian Bell), on the Swain Reefs in the Great Barrier Reef, on isolated cays in the Coral Sea between Queensland and New Caledonia, on Samoa, and on Niue Island (in 1971 and 1972). Dr Yaldwyn is immediate past president of the N.Z. Marine Sciences Society, Chairman of the Biology Section and Council Member of the Wellington Branch of the Royal Society of New Zealand and of the Art Galleries and Museums Association of New Zealand. He is also the author of two successful books published by A. H. & A. W. Reed, *Australian Seashores in Colour* (with photography by Keith Gillett), 1969, and *Australian Crustaceans in Colour* (with photography by Anthony Healy), 1970.

CORRECTIONS

BARLOW, M. L. *et al.* 1972. Breeding data on the Spur-winged Plover in Southland, New Zealand. *Notornis* 19 (3): 212-240.

Due to editorial carelessness, the following errors appear in this important paper. Errors in photographed tables must be considered to be the author's responsibility but, in this instance, the tables were retyped, editorially, for publication. We very much regret this lapse.

Table 1 (p. 218. For December 1968 rainfall, *read* 1.96 *not* 1.98; for 1967 total, *read* 40.16 *not* 40.18.

Table 2 (p. 219). For minimum thickness, females, *read* 2.8 *not* 2.9; for maximum length, males, *read* 18.7 *not* 18.9.

Table 4 (p. 223). For all years, 0 - 10 yards, *read* 125 *not* 127.

Page 229. Line 8, read Fig. 8 *not* Fig. 6.

Table 7 (p. 231). Under " Hatched " lines 1 and 2, *insert* " 13/9/65 " for Nest No. M. 4/65 and " 18-19/9/65 " for B. 5/65; to last line for B. 9/67, *add* " to " before " approximately."

Table 9 (p. 234). In heading of table, *read* " Unhatched " *not* " Unmatched."

Table 12 (p. 239). In right hand column, *add* " No " above " further data " and *change* " 37 " below *to* " 27."

HARPER, PETER C. 1972. The Field Identification and Distribution of the Thin-billed Prion *(Pachyptila belcheri)* and the Antarctic Prion *(Pachyptila desolata).* *Notornis* 19 (2): 140-175.

A transposition of pages and page headings occurred during the final proofing and printing of this paper. These should read as follows:—

Printed	page	158	should	be	159
„	„	159	„	„	161
„	„	160	„	„	162
„	„	161	„	„	163
„	„	162	„	„	164
„	„	163	„	„	158

Printed page 161, 7th line, 2nd paragraph: Table 1 should be Table 3.
3rd paragraph, 9th line: Fig 6 should be Fig 10.

For those members particularly desiring a correctly paged copy of Mr Harper's paper, a limited number of corrected reprints is available, free of charge, from the Editor.

REGIONAL REPRESENTATIVES

FAR NORTH: A. T. Edgar, Inlet Road, Kerikeri
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WEST COAST: Vacant
OTAGO: Mrs. J. B. Hamel, 42 Ann Street, Roslyn, Dunedin
SOUTHLAND: R. R. Sutton, P.O., Lorneville, Invercargill

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LITERATURE AVAILABLE

From all bookshops:

Annotated checklist of the birds of New Zealand. (OSNZ) $4.95
A field guide to the birds of New Zealand, by R. A. Falla, R. B. Sibson and E. G. Turbott, 2nd rev. ed. $5.00

From B. D. Heather, 10 Jocelyn Crescent, Pinehaven, Upper Hutt:

A biology of birds, by B. D. Heather. $1.33

From B. A. Ellis, 44 Braithwaite Street, Wellington 5:

Field guide to the waders, by H. T. Condon & A. R. McGill. 75c

The following are available from Mrs. H. R. McKenzie, P.O. Box 45, Clevedon:

Back numbers of Notornis at 75c (Vols 2-13) and $1 per part (Vols 14-19). Complete sets available.

OSNZ Library catalogue, 70 pp. 50c

Banding reports, Nos 8-14, 50c each.
Nos 1-7 are incorporated in early issues of Notornis.

Kermadec Expedition, 1964, by A. T. Edgar. 45c