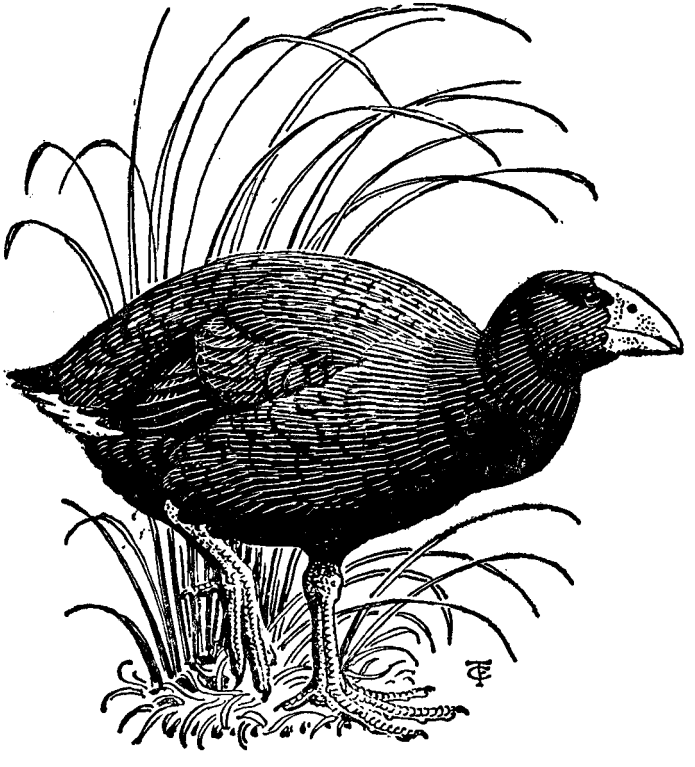
NOTORNIS

Journal of the Ornithological Society of New Zealand



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NOTES ON WHERO ISLAND AND OTHER ROOSTING AND BREEDING STATIONS OF THE STEWART ISLAND SHAG

(Leucocarbo carunculatus chalconotus)

By J. P. C. WATT

ABSTRACT

The adoption of Whero Island as a breeding station by the dimorphic Stewart Island Shag over the last 20 years is described. A review of other known breeding stations of this subspecies suggests that breeding sites are subject to periods of nontenancy. The relatively few records of the Stewart Island Shag indicate a distribution restricted to Foveaux Strait, and the Otago coast at Moeraki and near Dunedin. The total population is unlikely to exceed a few thousand birds.

INTRODUCTION

Whero (or Passage) Island at the entrance to Paterson Inlet, Stewart Island, must be one of the most intensively studied 0.2 hectares of sea bird habitat on the N.Z. coast (Richdale, 1942, c1944, 1963, 1965a, 1965b). Motivated by the scientific possibilities offered by this " unspoilt treasure of virgin New Zealand " Richdale spent an aggregate of 29 weeks camped on the island in the years 1938 to 1942, and for further periods totalling 67 weeks through to 1956-57. While largely a study that he pursued in his own time, grants from the Nuffield Foundation after 1952 enabled him to concentrate on the biology of the Muttonbird and on preparing manuscripts. The Southland branch of the Royal Society also assisted him, particularly with the provision of a hut. The absence of cats and rats on Whero, together with its compact size, made it an ideal field laboratory, and one from which predator impact on petrel populations on neighbouring islands could be gauged.

Over 3000 seabirds were estimated to be on the island in the early 1940's. Eight species were reported nesting: the Diving Petrel *(Pelecanoides urinatrix)*, White-faced Storm Petrel *(Pelagodroma marina maoriana)*, Broad-billed Prion *(Pachyptila vittata)*, Fairy Prion

(Pachyptila turtur), Sooty Shearwater *(Puffinus griseus)*, Southern Skua *(Stercorarius skua lonnbergi)*, and the introduced Starling *(Sturnus vulgaris vulgaris)* and Hedge Sparrow *(Prunella modularis occidentalis)*. In later years the Blue Shag *(Stictocarbo punctatus steadi)* and Stewart Island Shag *(Leucocarbo carunculatus chalconotus)* were added to the list. The five petrel species burrowed in 'loamy' soil of up to 0.45 metres formed under a plant cover comprising the woody tree daisy 'tete-a-weka' *(Olearia angustifolia)* which grew to 5 metres, punui *(Stilbocarpa lyalli)*, *Muehlenbeckia* sp., and sedge and *Poa* species. A description of the plant community and its relationship to nesting preferences of the various sea bird species is given by Richdale (1942, c1944, 1963).

ECOLOGIC CHANGES AT WHERO

Recent ecologic changes have greatly altered the appearance of Whero and have undoubtedly affected the nesting petrel populations. Stewart Island Shags, which during the early 1940's only roosted on the rocks to the north end of the island, were noted by Richdale to be breeding on these rocks for "some years prior to 1953-54." By 1956-57 the population had shifted and occupied about one third of

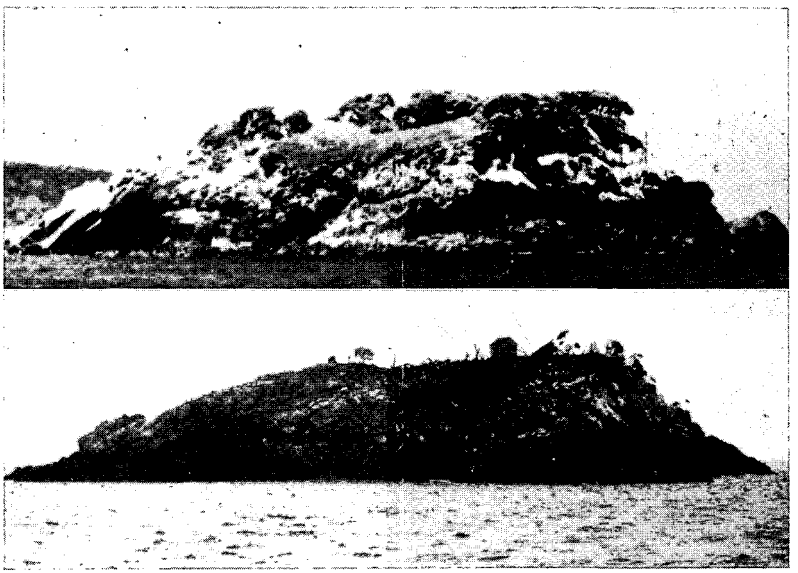

FIGURE 1 — Whero Island — north-west face. The upper figure was taken in January 1953, the lower in January 1974. Note the almost complete destruction of the tete-a-weka scrub through the actions of Stewart Island Shags. Richdale's hut, hidden in 1953, is now completely exposed. The sedge area (centre of photo) appears reduced in area.

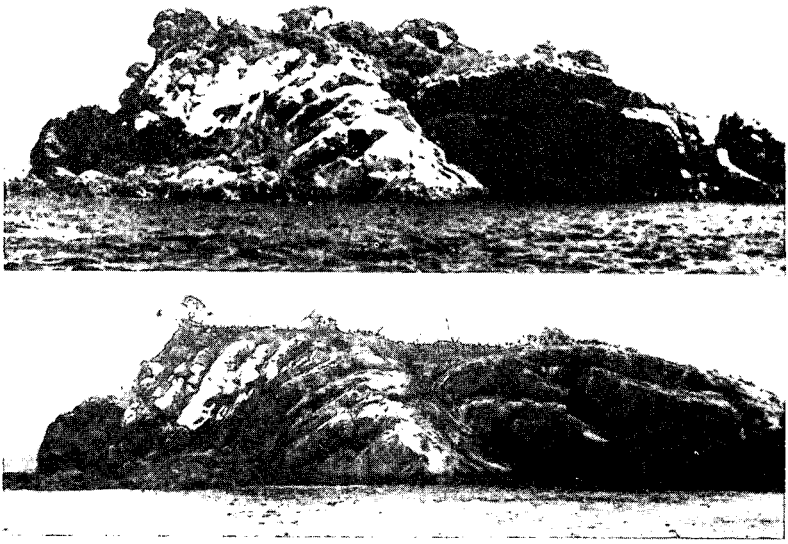

FIGURE 2 — Whero Island — east face. Upper 1953, lower 1974. Note complete occupation by shags.

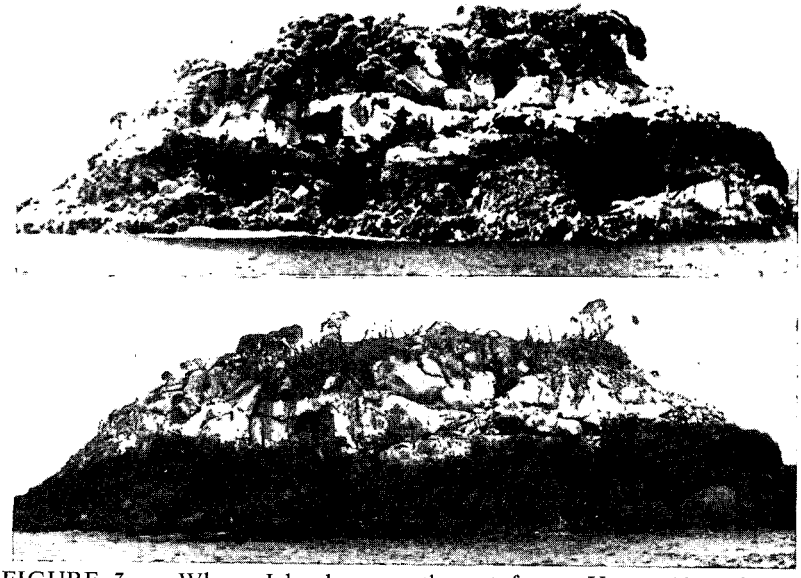

FIGURE 3 — Whero Island — south-west face. Upper 1953, lower 1974. Note sole living remants of tete-a-weka scrub cover in lower photo.

the more open sedge area on the west face with consequent serious disturbance to the nesting shearwaters (Richdale 1963). Thoresen (1969) infers greater disturbance by 1967 when on 12 January 1967 a brief visit indicated little evidence for the continued breeding of the Diving Petrel. By January 1974 the shags had completely taken over the island, killing the tete-a-weka and exposing Richdale's previously concealed hut. Figures 1, 2 and 3 show how the visual character of the island has changed in the 21 years between January 1953 and January 1974. The photos are matched pairs, being taken from essentially the same positions and showing three different aspects of the island. While the older tete-a-weka " sooner or later become riddled with the larvae of two species of beetle " (Richdale 1963), the complete destruction illustrated in the 1974 photographs is assumed to be a consequence of prolonged guano deposition at the roots which will cause eventual death of the entire organism (Gillham 1960).

DISCUSSION

There is probably no single simple reason for the invasion of Whero by the Stewart Island Shag. One or several factors may have been critical. An overall increase in the population could have contributed, but in the absence of census work this can only be a matter of conjecture. Disturbance at other breeding stations may have initiated a regrouping of the breeding birds. Stewart Island Shags at the Taiaroa Head colony readily desert their nests if there is even a mild degree of human disturbance. Dispersal from the well known (Guthrie-Smith 1914) breeding ground at Kanetetoe Island 7 km to the north-east of Whero could have been influenced by disturbance. Earlier this century ' guano ' was taken from Kanetetoe for local use as a garden fertiliser and more recently it is quite possible that the colony has been shot at or otherwise disturbed. On 2 January 1975 the author especially visited Kanetetoe to check on the nesting status of the shags and was surprised to find the rock abandoned. No landing was attempted but only 6 birds were present on the rock which is a little larger than Whero and free of any wooded vegetation. No nests were seen and the rock appeared surprisingly clean, perhaps the result of the abnormally high tides and strong seas in the spring of 1974. A photographic record was obtained which may supplement the late G. M. Turner's 16 mm film of the rock.

Adoption of new areas as breeding stations may be partly a natural progression from the use of a site for only roosting. Certainly the north end of Whero was used for some years as a roosting area before breeding commenced. Whero's location, directly in the flight path between Kanetetoe and the Paterson Inlet feeding areas, may have been fundamental to its progressive adoption as a roosting area. However, two other locations in the general vicinity of Kanetetoe have also become established as breeding sites in the last twenty years

suggesting that an apparent strategic location, such as exhibited by Whero, is not fundamental. In 1955-56 22 pairs were recorded breeding on Jacky Lee Island 6.4 km to the north of Whero, this number having built up since the 'early 1950's' when breeding was first noted (R. H. Traill pers. comm.). In 1968 breeding was also recorded on Zero Rock, 5.6 km to the north-north-east of Whero, when 19 pairs were counted (J. Cheyne pers. comm.). The current status of these two small colonies has not been checked.

Other roosting sites occur in Paterson Inlet and on the north-east Stewart Island coast. Small size and/or 'harbour' location however probably preclude the possibility of future adoption as breeding sites. Tamihau Island in Paterson Inlet, like Whero is another islet where vegetation is being killed back by roosting birds. Up to 400 birds have been recorded here, numbers increasing towards evening. Future nesting however is unlikely since Tamihau, unlike all other known breeding colonies, is not in the open sea. Other rocks frequented by roosting birds include Dirty Island, an islet near the west entrance to Glory Cove (Little Glory), Harry West Point, Bullers Rock at the Neck 1.6 km west-south-west of Whero, Fish Rock (near Mamaku Point), and Gull Rock further north near the Bungaree beaches. (R. H. Traill pers. comm. and personal observation).

Another consideration in the changes in breeding stations of the Stewart Island Shag is that change may be a quite normal event that may occur at regular intervals, say every 40 - 60 years. Prolonged use of one site may result in deterioration to the point where it becomes untenable. Sansom (1956) refers to the Papa-kaha rookery at the entrance to Bluff Harbour and notes that up to 1953 the rookery had been untenanted for many years. Reason to believe earlier tenancy however is vague. Another colony that appears to have been untenanted for a period is the Taiaroa Head colony on the Otago Peninsula. Though currently a strong colony of some 310 nests (September 1973), only attempted breeding was reported in 1940 (Richdale 1941). Records indicate a gradual build up since then. If the "large colony — built on a terrace at the foot of a small cliff on Otago Peninsula" reported by P. Seymour c. 1886 (Buller 1888: 159) was on the same site, a period of nontenancy is indicated some time prior to 1940. While Seymour's description is not an accurate one for the present location, no other site is known.

In terms of a longer time interval it is very probable that colonies have shifted from time to time as a consequence of natural factors. Richdale (1963) commented with reference to Whero that "in earlier days, judging by the large deposits of small flat oval stones regurgitated by marine birds such as penguins and shags the island was a breeding place for marine shags and was most likely bare of vegetation." Since at least some of these stones were found buried 0.3 m or so in the present soil the reference is probably to some period in the last few thousand years.

OTHER BREEDING COLONIES

With some stations showing a decline or abandonment, and with others an increase or readoption, it is appropriate to review the somewhat incomplete and inadequate knowledge of the breeding stations of the Stewart Island Shag. A list of all known breeding stations with notes on their reported status is given in Table 1. It is probable that other stations exist, especially around Ruapuke Island. The table indicates an apparent gap in distribution between the Otago Peninsula and Foveaux Strait (an exception is a report of two downy

TABLE 1

RECORDED BREEDING STATIONS OF THE STEWART ISLAND SHAG

Goat Island (Moeraki-Otago)	- 1962; breeding (1)
	- 1965; nest building, breeding unconfirmed (2)
	- 1974; 110 nests, October (3)
Taiaroa Head (Otago Peninsula)	- c. 1886; "large colony" - P. Seymour (4)
	- 1940; attempted breeding (5)
	- 1973; 310 nests, September (1) (6)
Gull Rock, Sandfly Bay (Otago Peninsula)	- 1966; c.60 nests (7)
Green Island (near Dunedin)	- c. 1959; reference to "a colony" (8)
	- 1968; 50 - 100 nests with young, November (9)
Kanetetoe Is. (Stewart Island)	- 1911; 400-500 nests (10)
	- 1932; "about 300 breeding" (11)
	- 1968; 30 birds (nesting?), December, (12)
	- 1975; found abandoned, January (6)
Jacky Lee Is. (Stewart Island)	- 1950's (early); breeding started (13)
	- 1955-56; 22 pairs (13)
Whero Is. (Stewart Island)	- 1950's (early); breeding commenced "some years prior to 1953 - 54" (14)
	- 1956 -57; population shifted and expanded (14)
	- 1960's; expanded over whole island (13)
	- 1974; c.200 - 300 birds, January (6)
Zero Rock (Stewart Island)	- 1968; 19 pairs nesting near top, December (12)
Papa-kaha (Bluff Harbour)	- prior to 1953, untenanted (15)
	- 1955; 90 nests (15)
Kuru-kuru (Centre Island)	- 1955; more than 600 nests (15)
Sealer's Bay (Codfish Island)	- 1934; c.60 nests - E.F. Stead (16)
	- 1948; "considerable nesting population" (16)
	- 1966; 64 nests (17)
	- 1972; no birds or nests seen, February (3)
The Knobbies (Codfish Island)	- 1966; "reason to believe a large colony" (17)
	- 1972; no birds or nests seen, February, (3)

(1) A. Wright (pers. comm.). (2) McKenzie (1965). (3) R. Nilsson (pers. comm.).
(4) Buller (1888). (5) Richdale (1953). (6) Author
(7) Poppelwell (1966) (8) Gillham (1960) (9) R.G. Cunninghame (pers. comm).
(10) Guthrie-Smith (1914) (11) Wilson (1959 (12) J. Cheyne (pers. comm.).
(13) R.H. Traill (pers. comm.) (14) Richdale (1963) (15) Sanson (1956)
(16) Dell (1950) (17) Blackburn (1968).

chicks at The Nuggets in March 1973 — G. Hamel pers. comm.), and no records exist for west of Centre Island. Oliver (1955: 221) quoted R. Henry reporting the Stewart Island Shag in Dusky Sound. A search of a transcript of the Records of Richard Henry's Service as Curator of Resolution Island, held by the Hocken Library, Dunedin, however, found reference only to "sea shags" which were almost certainly the Pied Shag *(Phalacrocorax varius varius)* or Little Shag *(P. melanoleucos brevirostris)*. More recent visitors to Dusky Bay and Preservation Inlet have also failed to report the species (Begg & Begg 1968, 1973, pers. comm.).

CONCLUSIONS

While certain sites appear to be favoured by the Stewart Island Shag for breeding, tenancy varies and some sites may even be abandoned for a period. Whero Island has recently been commandeered by the shags, while Kanetetoe has been apparently abandoned. Whether Kanetetoe remains untenanted for a period long enough for vegetation to reestablish and whether Whero will be abandoned at some time in the future remains to be seen. Tenancy and census of breeding stations of the species around the Otago and Southland coast deserves more simultaneous observation in the future than there has been in the past. If the recorded breeding stations are the only stations it must be concluded that there are only in the order of 1500 - 2000 nests at the moment, indicating a total population of only a few thousand birds.

ACKNOWLEDGEMENTS

The 1953 photos of Whero were taken by my father the late Dr Morris N. Watt with the cooperation of Mr Alfred Walmsley. The 1974 visit to Whero and the 1975 visit to Kanetetoe were made in the yacht *Tiercel* with the cooperation of Mr Robert Watt. I am grateful to Mrs G. Hamel and Dr L. E. Richdale for comments on an early draft of this paper, and to Mr Roy Traill of Stewart Island and others named in Table 1 I am most appreciative of the ready supply of information. Mr Ken Murray prepared the photographs for publication.

LITERATURE CITED

BEGG, A. C.; BEGG, N. C. 1968. Dusky Bay. Rev. ed. Pp. 1-240, pls 1-56, maps and figs 1-19. Christchurch: Whitcombe and Tombs Ltd.

BEGG, A. C.; BEGG, N. C. 1973. Port Preservation. Pp. 1-398, pls 1-108, figs 1-34. Christchurch: Whitcombe and Tombs Ltd.

BLACKBURN, A. 1968. The Birdlife of Codfish Island. Notornis 15 (2): 51-65, text fig. 1, pls. IX-XI.

BULLER, W. L. 1888. A History of the Birds of New Zealand. 2nd ed. vol. II. Pp. xvii plus 1-359, pls XXV-L, text illus. Pub. by the author, Westminster.

DELL, R. K. 1950. Birds of Codfish Island. N.Z. Bird Notes 3 (9): 231-235.

GILLHAM, M. E. 1960. Vegetation of New Zealand Shag Colonies. Transactions of the Royal Society of New Zealand 88 (3): 363-380, pls 15-16, text fig. 1-2, tables I-IV.

GUTHRIE-SMITH, H. 1914. Mutton Birds and Other Birds. Pp. 1-207, pls I-LXXVII. Christchurch: Whitcombe and Tombs Ltd.

McKENZIE, H. R. 1965. Stewart Island Shag **in:** Ornithological Society of New Zealand Recording Scheme files.

OLIVER, W. R. B. 1955. New Zealand Birds. 2nd ed. rev. and enlarged. Pp. 1-661, text illus, 12 pls. Wellington: A. H. and A. W. Reed.
POPPELWELL, W. T. 1966. Stewart Island Shag **in:** Ornithological Society of New Zealand Recording Scheme files.
RICHDALE, L. E. 1941. Stewart Island and Bronze Shags P. 8 **in** Summarized Classified Notes. Annual Report of the New Zealand Ornithological Society for the year 1940-41. [p. 41 of Reprint 1953, Reports and Bulletins (1939-1942) of Ornithological Society of New Zealand, " reprint of cyclostyled issues of Society," 98 pp.].
RICHDALE, L. E. 1942. Whero: Island Home of Petrels and Other Birds. Emu 42: 85-105, pls 8-9, 3 text fig, table I-VIII.
RICHDALE, L. E. (c. 1944). Wildlife in New Zealand No. 3: Whero: Island of Seabirds, Pp. 1-41, text illus. Dunedin: Otago Daily Times and Witness Newspapers Co. Ltd.
RICHDALE, L. E. 1963. Biology of the Sooty Shearwater **Puffinus griseus.** Proceedings of the Zoological Society of London 141: 1-117, pls 1-2, figs 1-4, tables 1-45.
RICHDALE, L. E. 1965a. Biology of the Birds of Whero Island, New Zealand, with special reference to the Diving Petrel and Whitefaced Storm Petrel. Transactions of the Zoological Society of London 31: 1-86, pls. 1-3, fig. 1, tables 1-43.
RICHDALE, L. E. 1965b. Breeding Behaviour of the Narrow-billed Prion and the Broad-billed Prion on Whero Island, New Zealand. Transactions of the Zoological Society of London 31: 87-155, pls 1, fig. 1, tables 1-32.
SANSOM, M. L. 1956. Two Nesting Colonies of Stewart Island Shags. Notornis 7 (1): 16-20, text illus.
THORESEN, A. C. 1969. Observations on the Breeding Behaviour of the Diving Petrel **Peleconoides u. urinatrix** (Gmelin). Notornis 16 (4): 241-260, fig 1-18, tables 1-3.
WILSON, R. A. 1959. Bird Islands of New Zealand. Pp. 1-202, illus. 1-91, 4 maps. Christchurch: Whitcombe and Tombs Ltd.

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SHORT NOTE

ROYAL ALBATROSS *(Diomedea epomophora)*

A paragraph was omitted from the section on Royal Albatrosses in Bartle (1974). This read:

" The numbers of Royal Albatrosses on trawling grounds remained relatively constant throughout autumn and at Cape Campbell between 10 and 20 birds normally came in to gutting. Some moulting individuals with distinctive plumage patterns could be seen day after day in the same area. Together with the observation of only small numbers (usually 1 or 2) seen off Point Gibson (Canterbury) where little trawling was carried out, this suggests that groups of Royal Albatrosses stay together on the trawling grounds for extended periods. It seemed likely that most of these birds were non-breeders, yet there was no seasonal decline in numbers as suggested by Robertson and Kinsky (1972)."

Recent observations by P. E. Roberts (pers. comm.) suggest that Wandering Albatrosses *(Diomedea exulans)* are more abundant than Royal Albatrosses east of the continental shelf waters of Cook Strait in autumn.

A BUSHMAN'S SEVENTEEN YEARS OF NOTING BIRDS

PART B — NEW ZEALAND PIPIT, GREY WARBLER, NORTH ISLAND FANTAIL AND SILVEREYE

By R. St. PAUL
(Edited by H. R. McKenzie)

NEW ZEALAND PIPIT *(Anthus novaeseelandiae novaeseelandiae)*

STATUS AND HABITS

Habitat

This pipit inhabits bare or partly bare ground from the seashore to above the tree line on the mountains but does not live in forest, dense scrub or rich pasture land. It particularly favours road cuttings in back country where motor traffic is scarce, also open tussock land, semi-desert flats and shingle and boulder riverbeds.

Flight

Its flight is similar to that of the Skylark but is more " bouncy " and jerky. It must travel long distances and at some height to get to some of the places where it is found but it does not soar like the lark.

Nesting

The site is usually on the upper edge or the side of a bank or steep slope, in rough tufty vegetation, often by a quiet road with little traffic. The nest may be from 6 to 30 cm down in the growth but not partly sunk into the ground like that of the Skylark. It will breed from just above high tide mark to well above the tree line on the mountains.

Food

It appears to eat only insects, grubs and other small life. It will sometimes leap a foot or so in the air when catching flies. The human being is quickly recognised as an agent for the provision of food. As I walked to work one would go along with me and shriek until I put down my tools and chopped a rotten log for it, when I would leave it gorging itself on the various small creatures exposed. Two pipits, with up to four chaffinches and two hedgesparrows would attend me at work each day for grubs, Huhu *(Prionoplus reticularis)* and others. The Pipit cannot deal with this large grub unless it is broken up for it but the Chaffinch can do so. When the steam hauler was bringing out logs through the cutover it would be followed by Pipits and when it was stopped for the " ropey " to change the block they would hop onto the log for food and even follow it right to the mill. It will work along the timber tracks into the heavy podocarp forest but retreats to the open for the night.

In the back country of the Waiau it was found in the odd rough clearing in the forest to which it had probably penetrated by following up the shingle beds of the larger streams in pursuit of flies. It may possibly fly directly over the forest.

Song

The very sharp chirp, rising to a small shriek when uttered urgently, is the common call. The full song appears to be seldom heard. I have heard it only once, in the hills of Moumoukai in the Hunua Ranges but never in all the hundreds I have had in Tihoi and Minginui areas or elsewhere. Reg. Bell of Pirongia (pers. comm.) has heard it only twice, once from the top of a big stump in a clearing on Pirongia Mountain and once from the ground. A. Blackburn (pers. comm.) has known only one. It was on Hen Island (Taranga) and flew over the sea from the boulders singing heartily. H. R. McKenzie (pers. comm.) has heard it only once, singing from the top of a bracken frond on Moumoukai Hill Road on the edge of the Hunua Ranges. We four elderly observers have been familiar with the bird all our lives so it seems that song is rare indeed.

ANALYSIS OF MONTHLY CHARTS

(Brackets = total birds seen plus estimate of birds heard only).

Proportion seen to heard: 1 seen to 1 heard and not seen.

TIHOI

The total of birds seen from May 1944 to April 1946 was 1280 (2560).

Count days per month averaged 25.4; days seen 9.7; days not seen 15.7.

Daily counts of birds ranged from 0 to 80. (Some very high counts on tussock country).

Count days totalled 609 and the total birds seen 1280, giving an average of 2.1 (4.2) per day.

Notes on Analysis

It appears odd that I had 80 in one day and that the daily average was only 2.1. The high counts were on days when I was not in the bush, as in May when I would be shooting over the tussock land. Taking it all round Tihoi (and Arataki) kept remarkably even monthly numbers, giving no indication of seasonal movement.

MINGINUI

The total of birds seen from part 1946 to part 1961 was 7789 (15,578).

Count days per month for 170 months averaged 24.9; days seen 11.4; days not seen 13.5.

Daily counts of birds seen ranged from 0 to 50.

Count days totalled 4239 and the total birds seen 7789, giving an average of 1.8 (3.6) per count day.

Notes on Analysis

Here, as with Tihoi, I saw the largest numbers when not in or about the bush. Most were on the river flats when I went shooting and fishing. Another prolific area was the mile or so I walked when working at the Mangamati bush through the favoured tussock and small scattered tea-tree. When working in or about the Minginui bush there would be only the few along the roads through the cutover and often none at all. There was no noticeable fluctuation in numbers.

Throughout the years the Pipit seemed to be declining but my visits to its favourite haunts were so irregular that I could not prove this. Before European settlement its chief enemy would be the New Zealand Falcon, which takes a heavy toll. The Harrier may have taken a few chicks and the introduced Polynesian rat *(Rattus exulans)* may have taken eggs, but now it has to suffer from cats, stoats, polecats, hedgehogs, the ship rat *(Rattus rattus)* and, since 1958 at Minginui, the Myna. Another predator, the Australian Magpie, had not arrived in the area in 1961.

WAIAU

The total of birds seen on hunting trips from 1946 to 1961 (from 1 to 24 days per month for parts of 47 months was 85 (170).

Count days per month averaged 5; days birds seen 1.3; days not seen 3.7.

Daily counts of birds ranged from 0 to 42.

Count days totalled 235 and the total birds seen 85, giving an average of 0.36 (0.72) per count day.

Notes on Analysis

The extremely small average count per day in the Waiau was due to my hunting in the bush and finding only a few pipits in some clear spaces.

GREY WARBLER *(Gerygone igata igata)*

STATUS AND HABITS

Habitat

The Grey Warbler, one of the most common native birds, has adapted itself to introduced flora in New Zealand and can be seen as readily in gardens, hedges and exotic trees as in its native bush and scrub. It is usually the first to respond to a lure call.

Flight

As it moves quickly through branches and leaves it flicks from side to side and is seldom seen to be still. When seeking insect life on small twigs it often hovers somewhat like a hummingbird. In sustained flight it dips very little. In courtship or play its evolutions are extremely volatile.

Nesting

The hanging domed nest with the hole in the side is well known and may be found from 30 cm to 6 m or so above the ground in moderately thick cover. Two broods in a season is usual. The first

brood escapes the Shining Cuckoo but the second is often parasitised by that bird and the eggs or tiny chicks destroyed, ejected by the young cuckoo. However it maintains its numbers without apparent decline or fluctuation.

Food

Grubs, caterpillars and insects and their eggs or larvae form its diet. The taking of any fruits, or flora of any kind, if known, would be rare.

Song

Its shrill trilling, sometimes described as cricket-like, is almost its only utterance and it has the unusual habit of breaking it off suddenly when it is apparently not complete. In anger or distress it makes a shrill twittering, which may change into agitated song.

ANALYSIS OF MONTHLY CHARTS

(Brackets = total birds seen plus estimate of birds heard only).

Proportion seen to heard: 1 seen to 3 heard and not seen.

TIHOI

The total birds seen from May 1944 to April 1946 was 2562 (10,248).

Count days per month averaged 25.4; days seen 20.8; days not seen 4.6.

Daily counts of birds ranged from 0 to 21.

Count days totalled 609 and the total birds seen 2562, giving an average of 4.2 (16.8) per count day.

Notes on Analysis

These figures, taken from the monthly chart, indicate an even spread throughout the year. The species does not flock. Numbers are up somewhat in the spring but are quite well maintained in comparison with other birds throughout the winter. G. E. Sopp and H. R. McKenzie (pers. comm.) have reported that after a heavy snowstorm and gale in the winter of 1956 in the Aniwaniwa Valley, Lake Waikaremoana, the Silvereye and the Rifleman were almost wiped out, the Fantail and Whitehead reduced by c50% and the hardy little Grey Warbler apparently not reduced at all.

MINGINUI

The total birds seen was 14,843 (59,372).

Count days per month for 170 months averaged 24.9; days seen 22.5; days not seen 2.4.

Daily counts of birds ranged from 0 to 20.

Count days totalled 4239 and the total birds seen 14,843, giving an average of 3.5 (14) per count day.

Notes on Analysis

The notes in regard to the spread throughout the year at Tihoi will apply also to Minginui.

WAIAU

The total birds seen on hunting trips to the back country from 1946 to 1961 (from 1 to 24 days per month for parts of 47 months) was 2716 (10,864).

Count days per month averaged 5; days seen 4.9; days not seen 0.1.

Daily counts of birds ranged from 0 to 25.

Count days totalled 235 and the total birds seen 2716, giving an average of 11.6 (46.4) per count day.

Notes on Analysis

It will be noted that the top counts per day for Tihoi, Minginui and Waiau were 21, 20 and 25, while the averages per count day were 4.2, 3.5 and 11.6. The reason for the high average of 11.6 for Waiau was that, although I did not see more than 25 on any one day I did see more per day through being so much more on the move while hunting and fishing. When working I covered very much less ground.

NORTH ISLAND FANTAIL *(Rhipidura fuliginosa placabilis)*

STATUS AND HABITS

Habitat

This dainty little bird, equally at home in native and exotic growth, lives here in deep forest, second-growth bush, scrub and rough clearings. In winter it flocks loosely in the more open but less exposed areas, as about Minginui Village. In heavy cold wind it keeps tightly to low growth but in fine weather in winter it is partial to the open streambeds where insects are plentiful, while in summer it frequents the tree tops largely, when not engaged in breeding.

Flight

The flight is quick, fluttering and gyratory, but when moving a distance, as across a field, it flies directly with its tail folded in like an ordinary bird and held straight out behind it. Strangely enough, when it moults it can gyrate just as well with no tail at all. The moult here is in June and July, also partly into August, a very cold part of the year.

Nesting

The nest, with its well known " tail," is built fairly low down, often on a slender branchlet which waves up and down with the wind. I have seen the Fantail on the ground gathering small rootlets for binding into the nest with cobweb. The bird on the nest watches an approach very closely but sits tightly and can sometimes be touched. In one case I noted a nest with three eggs in the operational area of a Long-tailed Cuckoo but when I returned a little later the Fantails had left and the eggs were gone. The cuckoo or a rat may have taken them.

Food

The atmosphere largely governs feeding. As the sun gets stronger the Fantail goes even to the tops of the highest trees, 46 m or more. As the sun sinks the bird keeps above the upward moving shade where the insects are still active. When the barometric pressure is high the insects are high and when it is low they are low. Feeding is mostly the taking of insects in the air but it will search under leaves or twist round under branches to get caterpillars or some such. I have seen it picking up insects from the ground and also grit from a sandy patch. It sometimes follows Whiteheads and other feeding flocks of birds for the tiny insects they disturb.

One I watched feeding its young out on the edge of a tractor road. It brought along a large blowfly which one of the chicks could not take so it put its foot on it, pulled half of it off for the chick and ate the other half itself.

Song

The song is a squeaky chatter, not very musical and is made from a perch. A single " pip " is often used when hunting.

ANALYSIS OF MONTHLY CHARTS

(Brackets = total birds seen plus estimate of birds heard only).

Proportion seen to heard: 1 seen to c10 heard but not seen.

TIHOI

The total birds seen for the two years May 1944 to April 1946 was 3071 (33,781).

Count days per month averaged 25.3; days birds seen 21.8; days not seen 3.5.

Daily counts of birds ranged from 0 to 26.

Count days totalled 609 and the total birds seen 3071, giving an average of 5 (55) per count day.

Notes on Analysis

It will be noted that " days not seen " per month is 3.5 whereas for Minginui it was 1.2 and Waiau 0 (almost). The difference was due to my having to cross so much tussock country when going to and from work at Tihoi. Where there are no shrubs or trees there will be hardly any fantails. This also accounts for the ratio of " daily counts of birds seen," 0 to 26 for Tihoi. 0 to 50 for Minginui and 0 to 40 for Waiau.

MINGINUI

The total birds seen from 1946 to 1961 was 34,705 (381,755).

Count days per month for 170 months averaged 24.9; days birds seen 23.9; days not seen 1.0.

Daily counts of birds seen ranged from 0 to 50.

Count days totalled 4239 and the total birds seen 34,705, giving an average of 8.2 (90.2) per count day.

Notes on Analysis

The " days not seen," i.e. 1.0 per month, would be accounted for mostly by some tussock being crossed on the way to the Mangamati Bush. The route from my hut at Prentice Bros' mill to the Minginui Bush had fantails practically all the way.

The high figure of 50 for Minginui was due to sunny winter weather on the open river flats with their odd hawthorn trees, patches of scrub and side gullies of light bush.

WAIAU

The total birds seen on hunting trips for parts of 47 months was 3814 (41,954).

Count days per month averaged 6; days seen 6.

Daily counts of birds seen ranged from 0 to 40.

Total count days were 235 and the total birds seen 3814, the average being 16.2 (178.2) per count day.

Notes on Analysis

The " days not seen," i.e. 0, the average 16.2 and the top count 40, give a true showing, partly in summer but mostly in autumn, of the heavy bush, with odd scrub-edged small clearings and the upper bushed river courses. On only 2 days of the 235 count days were none seen.

SILVEREYE *(Zosterops lateralis lateralis)*

STATUS AND HABITS

Habitat

As the Silvereye ranges from sea level to the tops of the Urewera mountains its wandering habits make it somewhat difficult to study. It is at home in tall forest, scrub, hedges and city gardens but makes little use of pasture land. Fairly low tight growth is preferred for sleeping quarters.

Flight

Undulating less than the finches it moves through the trees and bushes in pairs, small parties, and, often, in flocks so large that the birds cannot all be seen at once, making counting difficult. They proceed by leapfrogging, continually overtaking and passing each other, keeping in touch by a " peep " call. I have not seen sustained flight at any great height or for a long distance in this area though of course its ability to cover long distances is well known.

Nesting

Here they do not nest much over 488 m, building their flimsy home low down in small trees or shrubs. Breeding is very successful as indeed it needs to be to make up the heavy losses of this species through predation and sometimes bad weather. Considerable losses are caused by the young exploding from the nest when disturbed.

There have been some years in which, for no apparent reason none bred about Minginui and it was not even seen.

Food

Hunting for insects and their eggs and larvae, especially scale insects in season, is busily carried out among leaves and branches. Though the Silvereye has not a brush tongue, nectar is avidly sought. Fruits are taken by swallowing the small ones whole and pecking large ones. Fats and table scraps are appreciated, but it does not approach humans for food in the wild as do the New Zealand robins.

Easily approached, it was at times exploited for food by the Maori. When big flocks were feeding on a low shrub, such as *Coprosma tenuifolia,* common in the beech forest, with its massed bright fruits, he would knock the birds down with a stick, often two or three at a time. Certainly this was true of parts of the Lake Waikaremoana area.

Song

The full song, in spring and summer, is a trilling warbling which may be said to resemble that of the Blackbird, but in miniature. The " peep " is used a great deal for keeping in touch. It is a delightful experience to hear the whisper song, audible at only a few feet. One may wonder where the sound is coming from and then find the bird almost within touch.

ANALYSIS OF MONTHLY CHARTS

(Brackets = total birds seen plus estimate of birds heard only).

Proportion seen to heard: 1 seen to 3 heard and not seen.

TIHOI

The total of birds seen from May 1944 to April 1946 was 16,413 (65,652).

Count days per month averaged 25.4; days seen 21.9; days not seen 3.5.

Daily counts of birds ranged from 0 to 230.

Count days totalled 609 and the total birds seen 16,413, giving an average of 27 (108) per count day.

Notes on Analysis

The charts for the 24 months at Tihoi show peaks of 96 and 50 per day for the two April months and from there they scale down to 13 and 5 per day for the two December months, then climb back up to the April peak. It may be that the April peak, consisting largely of young birds, is formed by a movement down from the higher country of the northern end of the Hauhungaroa Range, numbers then decreasing through the death of old birds, plus the weaker young ones, from May to August. The continued decline from October to December could be due to scattering to breed, followed by the rise from January to April due to their flocking to the lower levels again.

However a period of two years is not enough to enable definite conclusions to be drawn. In the light of later experience at Minginui the returning birds may not have been the same ones.

MINGINUI

The total of birds seen from part 1946 to part 1961 was 85,078 (340,312).

Count days per month for 170 months averaged 24.9; days seen 16; days not seen 8.9.

Daily counts of birds ranged from 0 to 400.

Count days totalled 4239 and the total birds seen 85,078, giving an average of 20 (80) per count day.

Notes on Analysis

Minginui at first followed the pattern of Tihoi. Throughout 1946 to 1953 and again in 1955 the peak was mostly in March-April, numbers then descending usually to almost nil by December, gaining a little in January and building up again to the peak figures for March and April. These were the " good " years, one of which, 1950, as an example, is shown in Table 1.

1954 had the usual numbers from January to July, after which there was not one bird seen to the end of December. 1955 was normal but 1956, 1957 and 1958 were just as bad as 1954, i.e., no Silvereye being seen for the four or five months of all the spring and early summer. These I am calling the " bad " years. 1956 is given below as one of these. All of these bad years had high counts from February to June, which might suggest either emigration or a high winter mortality as a result of a very high population level.

1959 and 1960 were patchy but altogether much lower than the 1946-1953 years, perhaps indicating a general decline, though they were quite good from February to May. 1959 is shown in Table 1 as one of the two patchy years. It was noted that the figures per count day for any one month vary greatly from year to year. This applies also to the years not shown in the table.

TABLE 1 — Monthly averages of birds seen per count day.

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1950	16.3	21.8	18.5	19.7	37.3	32.0	31.0	18.7	6.1	6.6	2.1	2.5
1956	4.9	12.1	59.0	77.0	26.0	10.0	0.5	0.0	0.0	0.0	0.0	0.0
1959	0.9	49.5	79.0	105.0	11.0	3.1	0.4	0.8	1.2	0.1	0.07	0.0

The breeding season figures of the earlier years are what could be expected but what of the barren ones, when birds were not even seen ? I certainly did not miss counting them. It seems almost impossible that they should stay for winter and spring higher up than Minginui. Careful study of the daily temperature charts I kept does not seem to account for rises and falls in annual or seasonal numbers.

It is particularly notable that there was a complete absence at Minginui for from four to five months in the winter and spring (including the breeding season) for four of the later years and an almost complete absence for the same period for the last two complete years.

The only simple explanation for the whole confused record is that the species can be strongly nomadic regardless of climate or season so that the population of an area like Minginui may be continually changed, even when numbers seem reasonably stable. A. Blackburn (pers. comm.) has drawn attention to the fact that large and small flocks of Silvereye pay short visits to offshore islands, such as Cuvier.

Snow occurs at Minginui at up to —6.7°C (44°F) and sometimes is followed by up to —29.4°C (—21°F) of frost. Stormy cold wet weather can be just as serious. The Silvereyes driven down by the snow suffer a great deal from snow blindness and it is pitiful to see them wobbling weakly around. Some recover but most just died, providing a great feast for cats and other predators. The bush roads are lined with the little green bodies. When such disasters occur re-population must come about largely through flocks moving in nomadically from elsewhere, not necessarily from any one direction.

WAIAU

The total of birds seen on hunting trips from 1946 to 1961 (from 1 to 24 days per month for parts of 47 months) was 17,482 (69,928).

Count days per month averaged 5; days birds seen 4.5; days not seen 0.5.

Daily counts of birds seen ranged from 0 to 600.

Total count days were 235 and the total birds seen 17,482, giving an average of 74.4 (297.6).

Notes on Analysis

The total of birds seen is high in relation to the figures for Minginui as most of my hunting trips occurred in the months when the Silvereye is most numerous. Odd trips later in the year produced very little in comparison.

REFERENCE

ST. PAUL, R. 1975. A Bushman's seventeen years of noting birds, Introduction and Part A (Bellbird and Tui). Notornis 22 (2): 122-130, 1 fig.

ERRATA FOR PART A

Page 127, Minginui, para. 2, should read: " Count days per month for 170 months averaged 20.5; days birds seen 19.5; days not seen 1.0."

Page 129, Minginui, para. 2, should read: " Count days per month for 170 month averaged 20.1; days birds seen 20.0; days not seen 0.1."

NESTING OF KOKAKO (Callaeas cinerea wilsoni) AT TE RAUAMOA

By HAMILTON JUNIOR NATURALISTS' CLUB
(Edited by H. R. McKenzie)

ABSTRACT

This nesting record covers the period from nest building to hatching so is fortunately complementary to the record of hatching to fledging at Moumoukai, in the Hunua Ranges (McKenzie 1951) and to a further record there of building to hatching (St. Paul 1963), thus giving a reasonably full account of breeding.

INTRODUCTION

A summer course of the Hamilton Junior Naturalists' Club was held during December 1965 and January and February 1966 at its lodge at Te Kauri Park, near Te Rauamoa, on the Te Awamutu-Kawhia road on the south side of Pirongia Mountain. It was led by Mr K. L. Davis, assisted by Messrs F. C. Corlett, R. C. Vail and others. Much attention was given to study of the North Island Kokako *(Callaeas cinerea wilsoni)* in the bush about the lodge. Songs, calls and behaviour were carefully studied and documented and diligent search was made for nests. When at last a nest was found the leaders and members of the Club spent many whole and part days on organised watching and the taking of notes.

NESTING RECORD

20/1/66: A party proceeded to a point in the bush known as "the old pa site." Spaced out in the hope of observing nesting activity they played tape recordings of Kokako calls between 0920 and 1016 hours. Two birds were seen closely, one of them at about 2 m. Three called nearby and others distantly. The taped calls produced much response, especially to the low organ like notes.

22/1/66: The weather was changeable, with some heavy rain, but several calls were heard between 0930 and 1104.

23/1/66: At 1140 F. C. Corlett and Miss Madeline Geelan observed a Kokako gathering lichen from a fallen tree by the track leading to the pa site. It moved away as the rest of the party approached. It was seen to have darker colouring than usual and to have a yellowish bill. In the afternoon the party spread out again to watch for movement indicative of nest building. Calling was now sparse generally. A Kokako perched in a Tanekaha tree *(Phyllocladus trichomanoides)* was noted by all the party to have a red or scarlet bill. It appeared to be a sentinel, quietly keeping an eye on the party and not responding to taped calls. At 1554 another Kokako fluttered noisily from a nearby Heketara tree *(Olearia rani)* and flew

to a tree about 9 m away. It was the dark plumaged bird with a yellowish bill. At 1557 it flew off down the valley, where the red-billed one had already gone. They had not returned by 1645. Two girls climbed a tree each and were of the opinion that there was a part nest in the Heketara tree.

25/1/66: With F. C. Corlett and R. C. Vail a party went to the site at 1010. No birds were present. By use of a ladder it was found that the nest had been further built up. It was in the upper crown of the Heketara, the branches of which were laced with rata vine (*Metrosideros* sp.) and was 4.5 to 5.5 m from the ground. It consisted of small sticks woven with a lichen and stems of the epiphytic orchid *(Earina mucronata)*, with, scattered in it, fresh Filmy Fern *(Hymenophyllum dilatatum)*. The site was light bush on the top of a dry ridge. The vegetation on this ridge was generally dominated by Kamahi *(Weinmannia racemosa)*, Tanekaha *(Phyllocladus trichomanoides)* and to a lesser extent Whauwhaupaku or " Five-finger " *(Pseudopanax arboreus)*. Below the ridge a species rich forest dominated by Tawa *(Beilschmiedia tawa)* and Rimu *(Dacrydium cupressinum)*, with a heavy understorey of Karapapa *(Alseuosmia macrophylla)*.

26/1/66: Calls, presumably from the owners of the nest, were heard but the birds were not seen.

27/1/66: More work had been done on the nest. Both birds were seen, one of them once on the ground behind the fallen log below the track.

29/1/66: No sign of the birds during a short visit.

1/2/66: P. J. Devlin, the Club supervisor, who was now co-ordinating observation work, having invited H. R. and Mrs McKenzie to his home in Hamilton, took them on this day to the nest site to help to plan how to make the nest secure from predators, they having had experience with Kokako nests at Moumoukai, in the Hunua Ranges. PJD climbed a nearby tree, the bird having left the nest, and he saw one egg (about noon).

5/2/66: Tin sheathing was put on five slender tree trunks, including the nest tree, and vines, etc. were tied back to prevent vermin climbing up them or jumping across to the nest. The tin sheaths were about 1 m long and fitted to the trunks about 1.2 m from the ground. PJD reported now two eggs in the nest, one stone grey with fawn spots and one fawn with brown splotches.

6/2/66: Still two eggs. Both birds were studied and noted to be about 0.5 m long. The sitting bird, almost certainly the female, had a yellowish bill and seemed to be of a dark greenish colour. The male had a red or scarlet bill and was of a dark greeny-grey colour.

9/2/66: Watching was routine. The birds sang at times. When the hen was moving the eggs her tail stood straight up. This happened often throughout incubation.

11/2/66: As usual the sitting bird moved frequently. The bill of the male had now faded to reddish brown.

12/2/66: Watching was routine. The pair met in a tree and touched bills.

13/2/66: 0732. The male came onto the edge of the nest and bent forward, the female responding by bending her head backward and vibrating her feathers and body. After this ten-second caress the male dropped away down the gully. The whole process appeared to be a show of affection from each to the other. No food was passed to the female.

17/2/66: The hen bird was now very restless, moving about and fluttering her wings quite often. The male came to her and they touched bills. The bill of the male was now dark. There were still two eggs in the nest.

19/2/66: The male came in and fed the female. Both heads were visible and food could be seen passing from one bill to the other. The sitting bird was very restless and sitting up higher than before. 1156: The male fed the female as before. Next it appeared that the male was feeding something down in the nest while the female was just standing by. In the feeding process the male seemed to regurgitate food from its crop or to use some similar process. This was preceded by a " talk " between the pair when the male arrived. It was noted that the male had three different routes of approach and three others for departure. 1610 - 1620: While both birds were away T. Harrison climbed up the tree and looked into the nest. He saw two small steel-grey chicks. When he made a movement in the foliage above the nest they opened their beaks. 1623: The male flew into the nest and standing in it fed its young. 1748: The male fed the female, then the chicks. The food was definitely berries.

20/2/66: 1633 The male came onto the nearby Tanekaha tree, after bounding with long hops along the track, hopped into the nest tree and stood above the female. He then moved to the nest and fed the female, then the chicks. Much feeding like this was watched this day. The male " cluck-clucked " as he fed, for up to five minutes at one feeding. The female kept changing position in the nest and seemed to spread her feathers and tail to protect the chicks from the rain and wind. At 1722 the male, after feeding the chicks, ran up and down branches, climbed up the Tanekaha tree and caught and ate a cicada, sitting wriggling his tail. The male again approached the nest but the female was making clucking noises all the time and seemed every five minutes or so to lift her head high in order to produce more food.

21/2/66: Observation started at 0540 in intermittent heavy and light rain. Feeding of the female and chicks by the male continued but later the female also gathered food from " Five-finger " and both fed the chicks, with much chattering. Watching ceased at 0800 and

was resumed at 1622. Feeding continued and it was noticed that all movement at the time was sub-canopy. At 1726 the male, after feeding the young, dropped onto the track and bounded along it with hops of 1.2 to 1.5 m. This was a thrilling sight, really magnificent. At 1809 the first part of a scaffold was raised on the other side of the track to aid observation and photography, work on this ceasing at 1900.

23/2/66: 0715. There was no sign of the birds so the tree was climbed and the nest was found to be empty and to have a large hole in the bottom of it. There was no sign of the chicks on the ground.

DISCUSSION OF BREEDING RECORDS

The beginning of the Te Rauamoa nesting was at the time of year when the young have usually left the nest so perhaps the pair had lost an earlier clutch of eggs. This is perhaps likely since this clutch was of only two eggs, whereas three eggs is nearly always to be expected. However it could be possible that they had already raised an early brood.

The date building was started could have only been a day or so before 23 January 1966 when the nest was seen to be at a very early stage. The first of the two eggs was seen on 1 February 1966, so the building could be expected to have been accomplished in about eight or nine days, provided the bird laid as soon as the nest was finished.

For the laying period it can reasonably be assumed that the egg seen at noon on 1 February was laid that morning. As no further visit was paid until 5 February when the second egg was seen, the date of its laying cannot be determined but may be presumed to have been on 2 or 3 February, one or two days after the first.

Incubation could be expected to have started on 3 February and the two chicks were seen on 19 February so this could mean a period of 16 or 17 days.

If building was 8 or 9 days, laying 2 or 3 days and incubation 16 or 17 days the building to hatching in toto would be from 26 to 29 days.

A fairly satisfactory full record of breeding is achieved when this part record of breeding is added to the hatching to flying described in 1950 at Moumoukai in the Hunua Ranges south-east of Auckland (McKenzie 1951). In this case the chicks when found were estimated to be 2 or 3 days old and if this was so their fledging was at 27 or 28 days. The fledging was counted from the leaving of the nest tree. For about the last four days the chicks hopped about the branches but most likely roosted in the nest at night. The parents insisted almost always in making them return from the branches to the nest to be fed during this period. The definite leaving was witnessed by

J. W., R. and R. B. St. Paul. Adding this 27 or 28 days would give a full breeding time of 53 to 57 days.

An account of building to hatching at Moumoukai (St. Paul 1963) is not so clearly defined as the one at Te Rauamoa, the date of laying not being obtained, but it has definite value in regard to the building to hatching period. Nest building in an early stage was observed on 1 January 1962 and the bird was sitting on 8 January. That newly hatched chicks were taken on the night of 30 January was evident, JWStP finding the newly hatched eggshells on the ground below the nest and the bird making only a brief visit and not returning. This building to hatching period would thus be 30 days, which is very close to the estimated 26 or 29 days of the Te Rauamoa building to hatching.

PREDATION OF THE NEST

Nest damage

The loss of the chicks and the damage to the nest have not been explained. A cat goes in over the top of a nest and it is unlikely that it could have made its way upwards through the cup of green branches and the sticks of up to a quarter of an inch forming the nest base, even if it could have surmounted the tin sheathing on the trees. The nest site having been made conspicuous by the trampling of the large number of watchers, the scaffolding and the tin on the trees a hunter or vandal may have found it and maliciously pushed a stick or piece of timber through the bottom of the nest, at the same time bending a corner of tin and making scratches on it, which some have suspected a cat may have done but may have been done with a piece of timber. Pieces of the nest were lodged on the lower branches of the tree. This would hardly be the work of a cat. In any case the loss was a regrettable tragedy.

Predator Prevention

Traps were set at Te Rauamoa but no baits were taken. Domestic cats which had been abandoned would almost certainly have taken the bait, being used to the smell of the human hand. Wild-bred cats are more wary, though the first one will often take a bait and be caught but the " fear-smell " left by it will keep subsequent ones away. HRMcK (pers. comm.), with others, claims to have amply proved this. Tinning the tree where possible, putting a wide ring of strong-smelling disinfectant round it and treating traps and baits with smoke are good deterrents to vermin.

UNUSUAL BILL AND WATTLE COLOURING

Bill colouring

Records of unusual bill colours of breeding for the Kokako seem to be something new. However the evidence of it in this area is indubitable, the bill colours of this pair having been observed by many watchers. The red or scarlet colour of that of the male, first

seen on 23 January 1966, at the beginning of nest building, had faded to a reddish brown on 12 February and was the normal colour, black, on 17 February while there were still two eggs in the nest. The bill of the female, also first seen on 23 January 1966, was yellowish and this was noted up to 6 February, but on 20 February it was definitely normal. Both birds could of course have had unusually coloured bills for some time prior to 23 January. During camps in 1964 and 1965 other birds with unusually coloured bills were seen by members of the Club and by Messrs Reg. Bell and Ray Vail (pers. comm.), but the fact that this was unusual or abnormal was not at the time realised and notes were not taken. J. W. St. Paul (pers. comm.), in over seventy years of close observation of the species, has never seen such a coloured bill in any part of the Hunua Ranges, nor have the many Ornithological Society members when making numerous observations in the area, so if there have been no instances of its having been noted elsewhere it could be a local incongruity. On the other hand it may indicate the early stages of breeding, perhaps in odd cases only.

Wattle colouring

On 24 January 1969 Roger Day and ten members of the Hamilton Junior Naturalists' Club (R. Day, *in litt.*) saw two Kokako. The first was an exceptionally fine looking bird, in good physical condition. Its colour appeared to be a rich black. As well as the unusually dark colouring the most striking feature was the orange-yellowish wattles, which made a deep contrast. The second bird was called up and the difference between the two was amazing. This one was a light bluish grey all over and the wattles were a very deep blue. This was on McKenzie Track, Te Kauri Park, Te Rauamoa.

Apparently the only other report in the literature of other than blue wattles on the North Island Kokako is that of Sir Walter Buller (Buller 1888), see Turbott (1967)—

"I ought to add that, in the summer of 1867, one of these birds (Kokako) was seen by Major Mair at Te Mu, near Lake Tarawera. He followed it for some distance, in the low scrub, and got near enough to obtain a good view and to observe its bright orange wattles."

Another case is that of a Kokako skin in the Auckland War Memorial Museum. The record reads "*Callaeas cinerea wilsoni* (Bonaparte 1851) AV 6.29. Loc. Kopaki, Te Kuiti (found dead on road). Collector, Mr Hone, Kopaki, per unknown person to M. McCluskie, Waihi (Taxidermist). Date Oct. 1969. Skin. Wattles pale orange yellow." The outer primaries of this skin are in moult. This and the date may be taken to indicate that the orange yellow wattles had nothing to do with breeding.

I. G. Crook (pers. comm.), in his part in the special studies of Kokako by the Wildlife Service of the Internal Affairs Department about Rotorua and the King Country (central North Island), states

that, although he has seen no orange or yellowish wattles, some of the young Kokako he has seen have had fairly pale purplish wattles, quite distinct from orange or yellow. The Moumoukai chicks of December 1950 (McKenzie 1951) when found on 2 December at the age of 2 or 3 days, were observed by R. J. Fenton and F. Murray to have " small round wattles, pinkish lavender "; on 7 Dec., E. G. Turbott — " wattles purple, edged with bluish "; 10 Dec., EGT — " inside of mouth purplish pink "; 14 Dec., RJF — " wattles pale pinky blue, the pinkish tinge contrasting with the bright blue of the parent "; 19 Dec., A. T. Edgar — " wattles of young birds at this stage . . . . are a pale blue, rather purplish on the underside "; 21 Dec., FM — studied the mouths of the chicks carefully and found " that from the principal fuchsia red area tonings of blue and mauve showed toward the outer edges, particularly in the neighbourhood of the wattles, while deep down the throat the tone merged with yellow." Since there is only the thickness of the skin between the inner throat and the wattles it is not surprising that the purplish tinge should show through into the wattles. J. W. St. Paul (pers. comm.) states that the fledged young he has seen in the Hunua ranges had wattles of a brighter blue than those of the adults. It seems then that there is at least occasional variation of wattle colouring in individuals and perhaps in different broods.

The wattles of the Kokako are usually appressed to the chin but there can be exceptions. Alan Vail (pers. comm.) in January 1964, in Te Kauri Park, Te Rauamoa, saw and sketched an adult with wattles hanging down. On 19 February 1966, when an observer was trying to see into the nest, the female, about 3 m away, became very agitated and it was noted then that her wattles were hanging down. This was not noted of this bird at any other time. It may have been caused by agitation, exhaustion caused by breeding strain, or something more remote. The wattles hang down in death and some artists, working from skins, have been misled by this.

The Te Kauri Park chicks were destroyed before observations of their wattles were obtained. The Moumoukai chicks of 1950 (McKenzie 1951) showed hanging wattles as follows: 7 Dec., EGT — " wattles . . . . forming the angle of the gape and spreading outwards where they could be most prominent and effective as a food-guiding mechanism in feeding "; 10 Dec., EGT — " wattles cobalty, more red at angle, still flexible, but bending round distinctly into the adult position." 14 Dec., RJF — " whereas the wattles of the adults are fairly closely appressed to the throat those of the chicks stand out somewhat "; 19 Dec., ATE — " wattles lie close to the neck of the adult, like scales, ... while wattles of young birds at this stage hang down and are a pale blue." No further notes were made. It appears that this feature, like the wattle colouring, could be variable.

FEEDING

Insect feeding:

It is interesting that insect feeding was noted. On 6 February 1966 the female Kokako flew to the nearby Tanekaha tree and was seen to be feeding on something on the bark on the branches and trunk, but not going near the leaves. On 20 February the male climbed up a tree and caught and ate a cicada, wriggling his tail as he did so, as has already been mentioned. On another occasion a cicada made a distress call, apparently having been caught by a Kokako which was on the tree. Feeding insects to the chicks was not seen.

On three occasions during the 1964 to 1966 studies a Kokako was seen on the ground turning over leaves with feet and bill as if seeking food. No insect food was seen by the observers. There were no berries on the ground. Apparent feeding on the ground and in the bark of trees was noted by M'Lean (M'Lean 1912). I. G. Crook (pers. comm.) has records of Kokako feeding on the ground at Rotoehu Forest, Rotorua area. In regard to Kokako not now being seen to feed on the ground at Moumoukai J. W. St. Paul (pers. comm.) holds the theory that the ground feeders known to him in the earlier days were eliminated by vermin and that the more arboreally inclined survived.

Feeding the young:

At one time the female was making clucking noises continually and seemed every five minutes to lift her head high as if in order to regurgitate more food for the chicks. This she did while still sitting in the nest. As passerines do not usually regurgitate she may have been holding food in her throat and giving them a little as they needed it. The birds feeding the young at Moumoukai (H. R. McKenzie pers. comm.) approached with the throat distended or almost pouched with food, right up into the bill.

The study of the Kokako at Te Kauri Park, Te Rauamoa, is being continued.

ACKNOWLEDGEMENTS

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LITERATURE CITED

BULLER, W. L. 1888. A History of the Birds of New Zealand. 2nd ed. London: The Author.

McKENZIE, H. R. 1951. Breeding of Kokako. Notornis 4 (2): 70-76. pls. XIII-XVIII.

M'LEAN, J. C. 1912. Bush Birds of New Zealand. Emu XI: 223-236, 1 text-fig., pls. XXII-III.

ST. PAUL, R. 1963. Observations of Kokako nest. Notornis 10: 180.

TURBOTT, E. G. 1967. Buller's Birds of New Zealand. A new edition of Sir Walter Buller's A History of the Birds of New Zealand. Christchurch: Whitcombe & Tombs.

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DIETS OF NESTLING STARLINGS AND MYNAS AT HAVELOCK NORTH, HAWKE'S BAY

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ABSTRACT

Nestling foods of Starlings *(Sturnus vulgaris)* and Mynas *(Acridotheres tristis)* from an orchard, in North Island, New Zealand, are compared to determine the extent of overlap in the use of food resources during the breeding season.

INTRODUCTION

Starlings *(Sturnus vulgaris)* and Mynas *(Acridotheres tristis)* compete for nest sites in Hawke's Bay (Wilson 1973). The larger and more aggressive Mynas destroy most of the accessible Starling nests within their territories. However, it is not known if these two sturnids also compete for food, especially during the breeding season; to take different foods would have some survival value for both. Starlings are open country birds capable of probing for food, whereas Mynas prefer to feed near human habitations, do not probe as much, and scavenge. It seemed likely therefore that these two species, which breed and feed in the same area, would gather different foods.

To test this hypothesis the nestling foods of both species were determined by examining the gizzard contents of 19 Starling and 16 Myna nestlings collected on the afternoon of 23 December 1974 from nest boxes at the DSIR Research Orchard in Havelock North (39° 39'S, 176° 53'E). Some of the boxes had small (45 mm diameter) entrances which admitted Starlings but not Mynas.

MATERIALS

The ages of the nestlings ranged from 3-16 days for Starlings and 3-18 days for Mynas, and came from 7 broods (1, 2, 3, 3, 3, 3, 4) and 10 broods (1, 1, 1, 1, 1, 2, 2, 2, 2, 3) respectively. The gizzard contents were preserved immediately in 70% alcohol and examined later under a stereomicroscope. Arthropods were counted and earthworms, fruits, and other materials were noted if present.

RESULTS AND DISCUSSION

Table 1 shows that while both species fed their nestlings a wide range of foods, Coleoptera, Lepidoptera, Dermaptera, and Isopoda were eaten more by Starlings than by Mynas, and Hemiptera, Diptera, Odonata, Hymenoptera, spiders, and snails more by Mynas than by Starlings. Orthoptera were recorded only in Starlings, and millipedes in Mynas.

TABLE 1 — Frequency and percentage occurrence of insects, spiders, isopods, millipedes, and snails in Starling and Myna nestlings.

	Starling n = 19		Myna n = 16	
Food items	Freq.	%*	Freq.	%*
Coleoptera	19	61.3	11	32.5
Hemiptera	13	11.3	15	24.8
Diptera	10	6.6	10	14.2
Lepidoptera	15	11.3	6	9.6
Odonata	1	0.5	5	3.6
Hymenoptera	4	1.2	2	5.0
Dermaptera	4	1.4	1	0.4
Orthoptera	2	0.3	0	0.0
Spiders	3	1.4	4	3.6
Isopoda	7	2.1	2	1.8
Millipedes	0	0.0	1	0.9
Snails	9	2.1	6	3.2

* Derived from total numbers in Table 2.

Earthworms (Table 2) were present in all Starling gizzards but in only 7 Mynas. Remains of apple *(Malus sylvestris)*, peach *(Prunus persica)*, and nightshade *(Solanum nigrum)* fruits were recorded in several Mynas but not in Starlings. Cherry *(Prunus cerasus)*, maize *(Zea mays)*, and grass seeds were recorded only in a few Starlings but in no Mynas. Pieces of egg shell and rubber bands were found only in some Mynas (Table 2).

Although the diets of Starling and Myna nestlings overlapped considerably, there were differences in proportions and also in species composition of food eaten (Table 2). Mynas are more prone than Starlings to feed near taller grass (e.g. road verge), and this difference is reflected in the diet. Open pasture species such as *Hypharpax* sp., *Macylothorax* sp., *Saprosites* sp., *Costelytra zealandica, Hyperodes* sp., *Listroderes* sp., *Graphognathus leucoloma,* staphylinids, *Nysius huttoni,* and earthworms were recorded more in Starlings than Mynas. On the other hand *Rhodopsalta* sp., *Crambus* sp., *Xanthocnemis* sp., and flies of the families Calliphoridae and Muscidae were usually, but not exclusively, associated with taller grass, and were recorded more in Mynas than Starlings.

It is theoretically possible for the resources of the habitat to be divided between different species by each having a different breeding season, but the breeding season of Starlings and Mynas overlaps. Mynas are territorial and establish spatial separation from Starlings as well as from each other. Nest boxes with narrow entrances excluded Mynas and allowed Starlings to breed in Mynas' territories. The two species were thus separated in the use of nest sites, but this did not divide the food resources. The data presented here suggest that, although there is overlap in the diet, Starlings and Mynas use different components and proportions of food, thereby reducing competition for food during the breeding season.

TABLE 2 - Frequency and number of food items in Starling and Myna nestlings

Food item	Starling n = 19		Myna n = 16	
	Freq.	No.	Freq.	No.
Coleoptera				
Lacon variabilis Adult	5	6	3	8
Aemona hirta Adult	0	0	3	4
Cilibe sp. Adult	2	4	0	0
Hypharpax sp. Adult	7	16	4	7
Macylothorax sp. Adult	11	16	1	2
Saprosites sp. Adult	7	9	4	9
Costelytra zealandica Adult	11	34	8	15
Coccinella undecimpunctata Adult	2	8	0	0
Paropsis sp. Adult	4	6	0	0
Hyperodes sp. Adult	8	27	2	8
Listroderes sp. Adult	10	41	1	4
Graphognathus leucoloma Adult	18	147	4	11
Creophilus oculatus Adult	1	2	0	0
Leptacinus sp. Adult	1	2	0	0
Staphylinidae Adult	8	23	2	3
Hemiptera				
Rhodopsalta sp. Adult	12	28	15	40
Dictyotus sp. Adult	7	12	5	14
Nysius huttoni Adult	4	23	0	0
Diptera				
Sarcophaga milleri Larva	4	23	0	0
Calliphoridae Adult indet.	0	0	2	5
Muscidae Adult indet.	4	14	8	26
Lepidoptera				
Crambus spp.Adult	0	0	2	9
Crambus spp. Larva	4	9	1	2
Coleophora sp. Larva	1	2	0	0
Noctuidae Adult indet.	6	15	1	3
Noctuidae Larva indet.	15	35	3	7
Noctuidae Pupa	2	2	0	0
Odonata				
Xanthocnemis sp. Adult	1	3	4	8
Hymenoptera				
Ichneumonidae Adult indet.	4	7	3	11
Dermaptera				
Forficula auricularia Adult	4	8	1	1
Orthoptera				
Phaulacridium marginale Adult	2	2	0	0
Spiders				
Lycosidae indet.	3	8	4	8
Isopoda indet.	7	12	2	4
Millipedes indet.	0	0	1	2
Snails indet.	9	12	6	7
Earthworms indet.	19	-	7	-
Egg shell indet.	0	0	3	-
Fruits				
Malus sylvestris	0	0	4	-
Prunus persica	0	0	4	-
Prunus cerasus	2	-	0	0
Solanum nigrum	0	0	3	-
Seeds				
Zea mays	1	-	0	0
Gramineae indet.	1	-	0	0
Rubber band	0	0	2	-

ACKNOWLEDGEMENTS

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REFERENCE

WILSON, P. R. 1973. The ecology of the Common Myna (**Acridotheres tristis** L.) in Hawke's Bay. Ph. D. Thesis. Victoria University of Wellington, Wellington.

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SHORT NOTES

DISPLAY OF THE EYELINE BY THE CHATHAM ISLAND WARBLER, *Gerygone albofrontata*

On 3 February 1973 I observed a brief chase between two Chatham Island Warblers *(Gerygone albofrontata)* in open, low forest on Little Mangere Island. The two birds landed on the side of a vertical trunk about 2.5 m off the ground. The attacking bird landed above and almost touching the pursued warbler. The former was hanging facing the lower bird and displaying its prominently expanded white line above the eye. The degree to which this normally thin white area was expanded was impressive. The lower bird was facing down and away from the upper bird, and held its wings approximately half opened, in the plane of its body. Its eyeline was not displayed. These positions were held for less than a minute before the birds flew away.

I have made numerous visits to this and other islands where this species is common, but I have not observed another instance of eyeline display. However, this species is often obscured in canopy foliage where it feeds and nests. On Little Mangere Island warblers are abundant in the scrub and low forest, and appear to rear two broods with good success, and in the absence of the Shining Cuckoo *(Chalcites lucidus)*. By January and February large numbers of independent juveniles are seen amongst moulting adults. The age of the birds involved in the display was not known, but moulting was not noticeable on either bird.

This observation is recorded for interest in comparing it with displays of the white eyebrow line of *Rhipidura* (Hough, *Emu* 68: 282; Ives, *Emu* 75: 40-42) and the white frontal spot of *Petroica* species (Flack, *Notornis* 23 (2) in press). In addition, it is of interest that the eyeline and associated display are absent in the reputedly closely related Grey Warbler *(G. igata)*.

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THE BREEDING OF THE FERAL PIGEON (Columba livia) IN HAWKE'S BAY NEW ZEALAND

By P. J. DILKS

ABSTRACT

Feral pigeons bred in all months of the year but did less well in March when food was short. The most common clutch size, two, was also the most productive, 50% of eggs producing flying young. Clutches of one and four had significantly lower productivity. Clutches of one accounted for 15% of total clutches, three for 1% and four for 3%. Man seemed to be the only important predator of adult birds.

INTRODUCTION

The feral pigeon *(Columba livia)* has become widely established in New Zealand, breeding and roosting on bridges, cliffs and buildings. This study of the breeding of pigeons was carried out when investigating their diet in Hawke's Bay (Dilks 1975).

METHODS

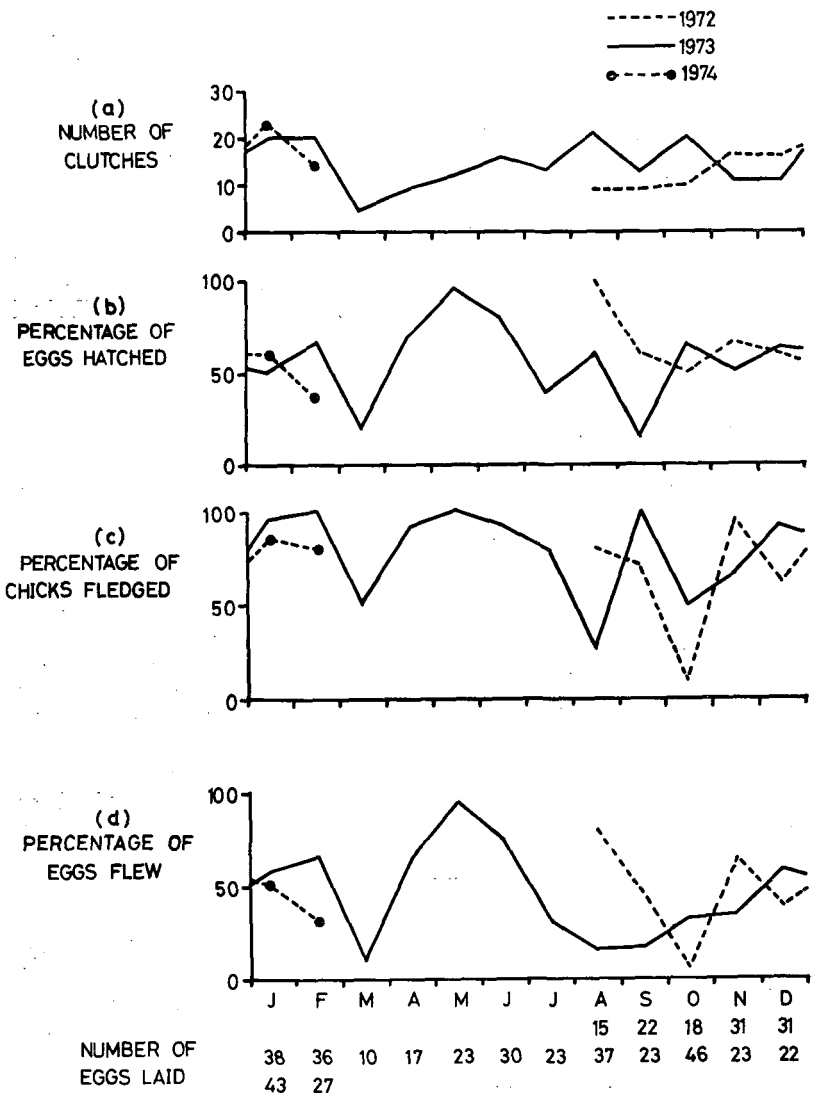
"Feral" pigeons were kept in a loft at the DSIR Research Orchard in Havelock North. Initially the birds were confined and fed on maize *(Zea mays)* and poultry pellets but as soon as they had dependent chicks they were freed. One month later supplementary feeding was discontinued and the birds foraged over surrounding farmland. These pigeons returned to the loft to roost and breed, but they were not fed, and could be regarded as a feral population. The loft was raised three feet above the ground which prevented predation by cats, rats or mustelids on birds inside. Thirty-eight nesting platforms were provided and the state of nest construction and contents were recorded at least once a week, often daily. Adult birds were banded and captured on the nest to ascertain nest ownership. Some chicks were killed to provide information on the birds' food but usually one chick was left alive in each nest. In calculating breeding success, birds sacrificed for food analysis were assumed to have fledged as almost all were healthy birds killed during the week before fledging.

RESULTS

Population

In August 1972, 41 marked pigeons (descendants of six feral birds) were transferred from an aviary to the loft. They commenced breeding immediately. Nineteen birds reared in the loft were banded on 16 October 1972 and 14 more on 11 July 1973. Three strayed

racing pigeons had permanently joined the flock by 11 July 1973 but other strays left after staying a few days. By 11 July 1973, 73 nestlings had been killed for food studies (10 birds per month) and 68 marked birds plus 14 newly fledged juveniles remained. Of the 77 marked birds, only 35 (46%) remained in the loft at the final census on 30 January 1974. The 41 birds originally introduced to



the loft increased to a peak of 68 in July 1973 but numbers then declined to 38 in January 1974. During the 19 months of the study 240 chicks were reared; six banded adults and 114 unmarked chicks were killed for a study of their diet between December 1972 and November 1973.

Breeding

Eggs were laid throughout the year with a peak in spring and summer and a low in March followed by a recovery during winter (Fig. 1a). Young were successfully reared in all months of the year but success was significantly lower in March and between July and October ($p<0.005$*) when a lower percentage of eggs gave rise to

* All probability values derived from chi-squared tests

flying young (Fig. 1d). The high breeding success in August and September 1972 was probably a result of the birds being fed.

The most common clutch size was two (213 of 261 clutches) with 38 clutches of one, 3 of three and 7 of four (most of the latter clutches were probably laid by two females). Clutches of one egg had a significantly lower hatching success than larger clutches ($p<0.005$) (Table 1). Some one-egg clutches were probably two-egg clutches from which one egg was lost without being noted. The owners of such clutches were perhaps inexperienced birds and, if so, the remaining egg would probably have a lower chance of survival. The high failure rate of four-egg clutches may have been caused by the incubating bird having difficulty covering all the eggs and resultant chilling. This happened with poorly constructed nests where the eggs could roll out; and in two of the four-egg clutches eggs rolled out from under the incubating bird. The percentage of eggs resulting in flying young was significantly lower for clutches of one and four than for those of two or three ($p<0.01$). Broods of one or two were reared equally well. Three broods of three were hatched (two from four-egg clutches) but in all cases no more than two chicks were reared.

The incubation period was about 18 days (from last egg laid to the last chick hatched) and the chicks spent approximately four weeks in the nest before fledging. Fledglings spent another week in and around the loft before foraging with the adults. Adult birds sometimes fed chicks that were not their own, especially newly fledged young or nestlings on the floor. Returning adults, mobbed by begging chicks, would feed the most persistent individual — not necessarily their own. Many females relaid, usually in another nest, while still feeding well-grown young. Figure 2 records breeding observations of seven marked pairs (A-G) showing that the birds can breed almost continuously. Clutches are shown as overlapping when a

TABLE 1 - The success of different clutch and brood sizes of *Columba livia*

HATCHING SUCCESS

Clutch size	Number of clutches	% Eggs hatched	Average brood size	Standard* error of brood size
1	38	26.3	0.26	0.07
2	213	64.8	1.30	0.05
3	3	55.5	1.67	0.50
4	7	28.6	1.14	0.34

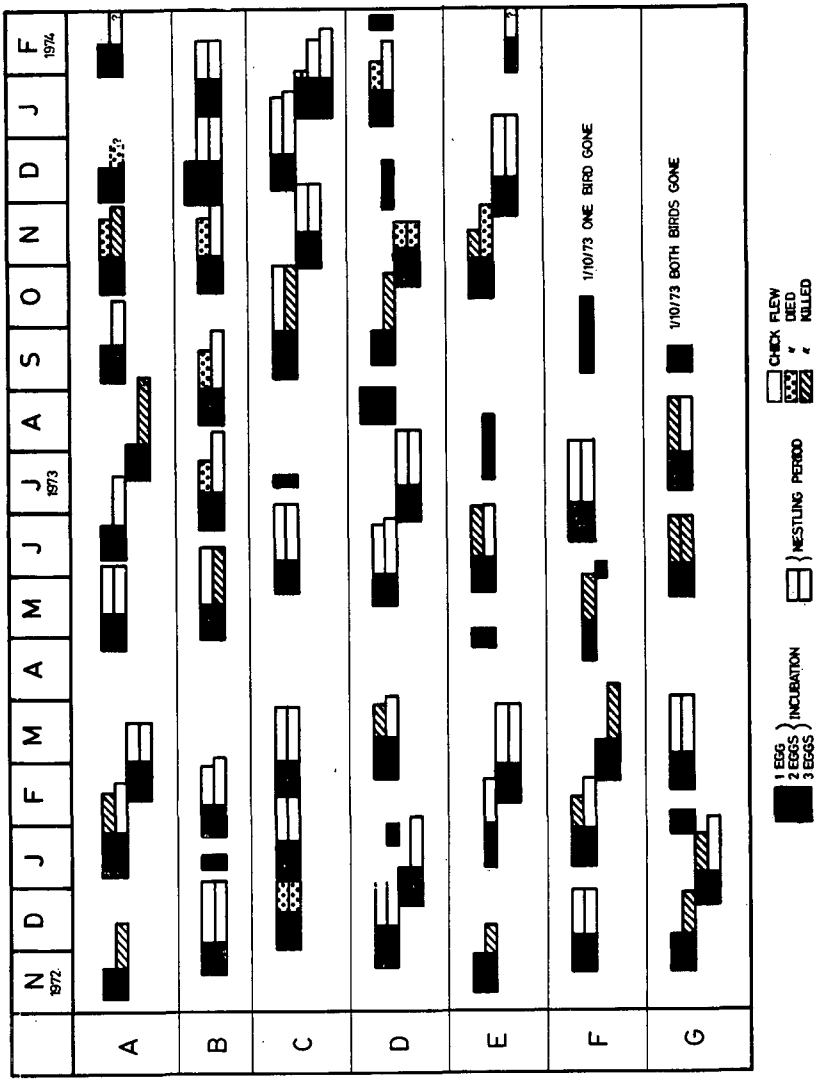
FLEDGING SUCCESS

Brood size	Number of broods	% of nestlings fledged	Average no. fledged	Standard* error of number fledged
1	50	74.0	0.74	0.06
2	121	78.1	1.56	0.05
3	3	44.5	1.33	0.49

BREEDING SUCCESS

Clutch size	Number of clutches	% of eggs fledged	Average no. fledged	Standard* error of number fledged
1	38	23.7	0.24	0.07
2	213	50.2	1.00	0.05
3	3	44.4	1.33	0.49
4	7	7.1	0.29	0.19

* These standard errors are from the formula for a binomial proportion



pair had two active nests simultaneously. This may have occurred quite commonly but was unrecorded as many breeding adults were so wary they could not be identified regularly.

Mortality

Losses of part of a brood were caused by competition between nestlings for food or by interference by other adults. Failure of whole broods was uncommon and probably resulted from the death of one

or both adults. Only 10 fledged juveniles and 7 adults died in the loft; one of these (a fledged juvenile with a wound on its back) may have been attacked by a N.Z. Falcon *(Falco novaeseelandiae)* which was seen nearby several times. In observed chases the pigeons escaped into trees or outpaced their pursuer in level flight. Pigeons often fed on fields bordered with long grass and among weeds where they were vulnerable to predation by cats.

Of the 17 pigeons that died in the loft, 10 died during September. The disappearance rate of marked adults was also high then (Table 2). This period coincides with the sowing of peas *(Pisum sativum)* for canning, which were an important part of the pigeons' diet (Dilks 1975). During September four birds injured by shot were handled, so this heavy mortality was probably largely caused by shooting to protect newly sown crops.

TABLE 2 — Disappearance rate of marked birds from the loft

	11/9/73	1/10/73	30/1/74
Number remaining of 68 alive on 11 July 1973	60	45	35
% loss in the interval	12	25	22
% loss per day	0.19	1.25	0.18

DISCUSSION

Killing of some chicks for the study of their food may have influenced the breeding rate but some birds demonstrated an ability to breed continuously. Two breeding populations of *Columba livia* were recently studied in Britain; a rural population at Flamborough Head (Murton & Clarke 1968) and an urban population at Salford Docks (Murton, Thearle & Thompson 1972). As in Hawke's Bay, breeding at Salford Docks continued throughout the year with only slight seasonal peaks. At Flamborough Head breeding was markedly seasonal, although some eggs were laid in each month. The similarity of the Hawke's Bay breeding pattern to that of an urban population in England was probably caused by the lack of seasonal variation in food supply. At Salford Docks ample food was always available and in Hawke's Bay newly sown peas and pea and maize stubbles were important in most months (Dilks 1975). The period between the exhausting of pea stubbles (March) and harvesting of maize (April) was the only time when the birds were obviously so short of food that their breeding was seriously affected. At this time breeding adults may also have been moulting, and these two factors combined could reduce the breeding success. High breeding success in April, May and June may be a result of abundantly available maize stubble less than 400 metres from the loft.

In general, the results supported Lack's (1968) hypothesis that "clutch-size corresponds to the brood size from which the parents can, on average, raise most young, the limit being set by the amount of food which they can collect for them." An exception was provided

by three-egg clutches which were only slightly (and statistically insignificantly) less successful than broods of two. However, their scarcity suggested strong selection against them.

Man seemed to be the major predator on feral pigeons. This agrees with Riddle's (1971) findings where 76% of adult pigeons found dead during his study in Britain had been shot. Overcrowding in the loft may have caused some birds to leave the flock as many birds were forced to breed and roost on the loft floor as a result of lack of space.

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REFERENCES

DILKS, P. J. 1975. Diet of feral pigeons (**Columba livia**) in Hawke's Bay, New Zealand. **N.Z. Journal of Agricultural Research 18**: 87-90.

LACK, D. 1968. Ecological adaptations for breeding in birds. Pp. 1-409. London: Methuen.

MURTON, R. K.; CLARKE, S. P. 1968. Breeding biology of Rock Doves. **British Birds 61**: 429-48.

MURTON, R. K.; THEARLE, R. J. P.; THOMPSON, J. 1972. Ecological studies of the feral pigeon **Columba livia** var. I Population, breeding biology and methods of control. **Journal of Applied Ecology 9**: 835-74.

RIDDLE, G. 1971. The breeding season in a rural colony of Feral Pigeons. **Scottish Birds 6 (6)**: 321-29.

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BEHAVIOUR OF PETRELS IN RELATION TO THE MOON AND ARTIFICIAL LIGHTS

By M. J. IMBER

ABSTRACT

Petrels, especially Procellariidae and Hydrobatidae, visit their breeding places in lesser numbers on moonlit nights than on darker nights. This is probably caused by poor feeding conditions because prey do not come so near the surface on moonlit nights.

Fledgling petrels, mainly Procellariidae, are particularly liable to be attracted to artificial lights situated near the breeding colony. It is suggested that nocturnal-feeding petrels are instinctively attracted to light sources because they exploit bioluminescent prey. A small proportion of fledglings seem to be initially misled by this instinct.

There are innumerable references in the literature (e.g. Lack 1966: 264) to the marked tendency of those petrels that visit their breeding places mainly at night, to be less active and presumably less numerous over the colonies on moonlit nights. This applies particularly to the Procellariidae and Hydrobatidae, and I have observed this many times in studies of Grey-faced Petrels *(Pterodroma macroptera gouldi)* and Cook's Petrels *(Pterodroma cooki cooki)*. Similar behaviour has been observed in Cassin's Auklet *(Ptychoramphus aleuticus)*, one of the North Pacific Auks (family Alcidae), which is also nocturnal on land (Manuwal 1974).

Virtually all obvious activity over a petrel colony at night is produced by the aerial displays and chases, and the calling of non-breeding birds. Those actively engaged in nesting come and go quietly and without becoming involved in the aerobatics. However, on bright moonlit nights, after initial activity at dusk and in the early hour or two of darkness, the birds disperse, most going back to sea.

Since one of the reasons why most petrels visit their breeding places at night is considered to be evasion of diurnal predators, Lack (1966) suggested a similar reason for less visiting on moonlit nights. However, this explanation seems unsatisfactory since few petrel colonies, at least around northern New Zealand, have nocturnal predators that are liable to attack adult petrels. A more plausible explanation is provided by a consideration of feeding habits and the behaviour of prey.

Many species of petrels, especially Procellariidae but probably also Hydrobatidae, obtain most of their food at night. This is particularly so for the genera *Pterodroma, Procellaria* and *Pachyptila* (Imber 1973, 1976a, and unpublished, Harper 1972). Though nocturnal

feeding may be less important to some species of *Puffinus,* it nevertheless seems likely to be sufficiently important to affect their behaviour at the breeding colonies. Prey obtained at night migrates from deep water into surface waters, thereby greatly increasing the biomass of animal life at the surface at night compared with daytime in most seas, except perhaps those at very high latitudes (Marshall 1954). A significant factor concerning vertical migration of this fauna, however, is that on moonlit nights, because the migrations are controlled by light intensity (Boden & Kampa 1967), the animals do not come so near the surface. They tend to stay at depths that are out of reach of seabirds. This has been found to be so in the behaviour of the three main groups of prey of oceanic birds: squids (Clark 1966: 108, 265), fishes (Clarke 1973: 425) and crustaceans (Mauchline & Fisher 1969: 167). Thus petrels will find feeding conditions much more difficult on moonlit nights. One of the few observations of seabirds feeding at night was made on a moonlit night, of course (Gould 1967), but this is more a judgement upon the quality of human nocturnal vision than upon the normal feeding behaviour of petrels.

What do birds do when feeding conditions are poor? Do they continue to try to find food or do they wait for better conditions? The anthropomorphic attitude would probably be to save energy and wait for better conditions. But we in the developed countries at least, know that our society will not willingly allow us to starve to death. There are no such safeguards for birds. Thus their attitude is likely to be to continue to search for food if feeding conditions are poor. Only when they are reasonably well fed are non-breeding petrels likely to visit the breeding colonies and engage in courtship activities. When feeding conditions are good (dark nights) many petrels are likely to obtain food and those within range of the colony are likely to visit it after feeding. Thus there is likely to be a continual stream of birds arriving over the colony through the night. I believe there is also likely to be a strong social element in this courtship behaviour: if few birds continue arriving at the colony during the night, those that arrived at dusk (having fed well the previous night or nights, or having fortuitously obtained food by day) probably go back to sea early in the night, whereas they might have stayed at the colony all night if more birds had continued arriving through the night.

It may be possible to test the effect of the moon on feeding success of petrels by observations of feeding of chicks. The matter is not a simple one, however, because oceanic petrels feed over rather extensive areas where cloud conditions may differ from those over the colony, and they have long feeding forays (up to 1 week when feeding chicks) so that their return to the colony with food may not reflect feeding conditions that night or even the previous night. Nevertheless we should expect more chicks to be fed in later stages of the night (because of parents obtaining more food that night)

on dark nights than on moonlit nights. The proportions of chicks being fed in the early part of the night are unlikely to be affected by moonlight on that night.

Another interesting behaviour pattern of petrels in relation to light is the tendency for fledglings just leaving the breeding colony to be attracted to nearby artificial lights. This has been observed for at least the following species: Newell's Shearwater *(Puffinus puffinus newelli)* by Sincock & Swedberg (1969: 69), Hutton's Shearwater *(Puffinus huttoni)* by J. A. D. Flack (pers. comm.), Grey-faced Petrel *(Pterodroma macroptera gouldi)* by N. R. Hellyer & D. J. Stack (pers. comm.), Kerguelen Petrel *(Pterodroma brevirostris)* by Swales (1965: 217), Black-capped Petrel *(Pterodroma hasitata)* by Wingate (1964: 158), Barau's Petrel *(Pterodroma baraui)* by Jouanin & Gill (1967: 17) and Black Petrel *(Procellaria parkinsoni)* by Imber (1975).

N. R. Hellyer and D. J. Stack, while stationed in Whakatane as officers of the Wildlife Service, have studied this behaviour over several years in Grey-faced Petrels reared on Whale Island, Bay of Plenty. Whakatane is situated just 10 km from Whale Island, and every December - January a number of fledgling Grey-faced Petrels are picked up around that town. A particularly common place where they have been found is the Board Mills which have floodlights illuminating the yards. Fledglings are found throughout the period of departure from the island, and the numbers show a slightly skewed distribution reflecting the kind of distribution of numbers leaving the colony. Their occurrence in Whakatane cannot be explained by wind drift, or by poor weather conditions. Furthermore, adults have not been reported as being found there, apart from occasional dead ones on beaches. In December - January of 1971-2, after a very successful breeding season on Whale Island, 50 were handled in Whakatane by N .R. Hellyer. Half of these had been banded shortly beforehand on the island. On the basis of this I estimated that less than 1% of fledglings had been distracted to the lights of Whakatane.

The other references given above indicate similar circumstances with the other species mentioned. A critical examination of the data seems to confirm that adults are rarely actually attracted to lights from a distance. They may be temporarily dazzled and thereby apparently attracted by bright lights shining at them when they are flying past a light source, but there is no conclusive evidence that they have been drawn to a light from a distance such that they could not have been dazzled by it.

Why then are only fledglings affected? Chicks of Procellariiforms are fed on regurgitations of their parents and they obtain no visual cue to the prey they must later catch for themselves. It may not even taste the same since it is usually in such an advanced stage of digestion. Furthermore, there is no evidence that parents ever

accompany their young from the nest or teach them to hunt. Indeed the opposite has been shown many times for in several species the parents depart on a migration some time before the chicks leave the colony (e.g. Lack 1966, personal observations). Fledglings of some species may have body reserves to give them a better chance of survival at departure, but this is not so with Grey-faced Petrels (Imber 1976b) or Cook's Petrels (Imber unpublished). Thus they must learn to find food soon after departure.

In studies of the food of several species of oceanic birds (Grey-faced Petrel (Imber 1973), Wandering Albatross (Imber & Russ 1975), Black Petrel (Imber 1976a), Cook's Petrel (Imber unpublished)) I have found that between 80-100% of their prey are bioluminescent and I have suggested that they detect many of such prey by the light emissions. There is evidence in these studies that oceanic birds take bioluminescent animals in preference to non-bioluminescent ones that have been considered the more abundant. If so, this indicates the possibility that many oceanic petrels are instinctively attracted to light sources because they detect prey by them. This instinct would serve a major purpose in directing fledgling petrels to their food, in the absence of supervision by parents and other cues. Once they had begun taking such prey individual petrels would no longer be fooled by artificial sources of light. Initially, however, a very small proportion of fledglings are distracted towards artificial lights perhaps because of stronger instincts that have not yet been given direction. Since most of these artificial lights have been present only in this century, natural selection is still operating against excessive attraction to them.

LITERATURE CITED

BODEN, B. P.; KAMPA, E. M. 1967. The influence of natural light on the vertical migrations of an animal community in the sea. Symposia of the Zoological Society of London 19: 15-26.

CLARKE, M. R. 1966. A review of the systematics and ecology of oceanic squids. Advances in Marine Biology 4: 91-300, figs 1-59, tables I-VII.

CLARKE, T. A. 1973. Some aspects of the ecology of lanternfishes (Myctophidae) in the Pacific Ocean near Hawaii. Fishery Bulletin (National Marine Fisheries Service, NOAA) 71 (2): 401-434, figs 1-12, tables 1-6, appendix tables 1-2.

GOULD, P. J. 1967. Nocturnal feeding of **Sterna fuscata** and **Puffinus pacificus**. Condor 69 (5): 529.

HARPER, P. 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, figs 1-11, tables 1-11.

IMBER, M. J. 1973. The food of grey-faced petrels **(Pterodroma macroptera gouldi** (Hutton)), with special reference to diurnal vertical migration of their prey. Journal of Animal Ecology 42 (3): 645-662, tables 1-8.

IMBER, M. J. 1975. The Black Petrel. Wildlife — A Review 6: 37-39. (Wildlife Service, Department of Internal Affairs, Wellington).

IMBER, M. J. 1976a. Comparison of prey of the black **Procellaria** petrels of New Zealand. N.Z. Journal of Marine and Freshwater Research 10 (1): in press.

IMBER, M. J. 1976b. Breeding biology of the Grey-faced Petrel **Pterodroma macroptera gouldi**. Ibis 118 (1): 1-14, tables 1-8.

IMBER, M. J.; RUSS, R. 1975. Some foods of the Wandering Albatross **Diomedea exulans**. Notornis 22 (1): 27-36, tables 1-3.

JOUANIN, C.; GILL, F. B. 1967. Recherche du Petrel de Barau, **Pterodroma baraui**. Oiseau et Revue francaise d'Ornithologie 37 (1-2): 1-19, 1 table, 2 maps, 1 plate.

LACK, D. 1966. Population Studies of Birds. Pp. 1-341, figs 1-31, tables 1-50. Oxford: Clarendon Press.

MANUWAL, D. A. 1974. The natural history of Cassin's Auklet **(Ptychoramphus aleuticus)**. Condor 76 (4): 421-431, figs 1-6, tables 1-6.

MAUCHLINE, J.; FISHER, L. R. 1969. The biology of euphausiids. Advances in Marine Biology 7: 1-454, figs 1-137, tables I-XL.

MMARSHALL, N. B. 1954. Aspects of Deep Sea Biology. Pp. 1-380, figs I-XIII, col pls I-IV. London: Hutchinson.
SINCOCK, J. L.; SWEDBERG, G. E. 1969. Rediscovery of the nesting grounds of Newell's Manx Shearwater (**Puffinus puffinus newelli**), with initial observations. Condor 71 (1): 69-71.
SWALES, M. K. 1965. The sea-birds of Gough Island. Ibis 107 (1 & 2): 17-42, 215-229, figs 1-3, maps 1-2, tables 1-12.
WINGATE, D. B. 1964. Discovery of breeding Black-capped Petrels on Hispaniola. Auk 81 (2): 147-159, figs 1-2.

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SHORT NOTE

BIRD NOTES FROM HUNUA

While making regular surveys of the Kokako *(Callaeas cinerea wilsoni)*, in the Hunua Ranges, other species of birds, some of which are locally rare, have been noted.

On 12/12/74, accompanied by G. Arnold and Mrs B. Brown, 3 Kakariki (*Cyanoramphus* sp.) were seen. Unfortunately, we were only to glimpse the parakeets so it was difficult to discern whether they were Red or Yellow-crowned.

On 12/11/74 we heard unfamiliar calls coming from the *Quintinia* scrub just below the summit of Mt Kohukohunui (Mt London), and before long we located a pair of Bellbirds. We have not seen Parakeets or Bellbirds on subsequent trips this year on 16/3/75 and 19/4/75.

Tomtit and Kaka are two species which are logged consistently during forays into the Kohukohunui bush. Along four km of track between Plow's Road and Mt Kohukohunui, Tomtit counts taken on a number of trips give an average of 19, while Kaka numbers average 3. According to H. R. McKenzie (pers. comm.), these figures indicate a substantial increase on past records when the bush suffered from heavy goat browsing. Since the area has been included in the Auckland Regional Authority water catchment reserve, shooting has reduced the goat population, resulting in steady regeneration which seems to be encouraging the local birdlife.

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OBSERVATIONS ON A CATTLE EGRET (Bubulcus ibis) NEAR CHRISTCHURCH AIRPORT, JULY TO OCTOBER 1974

By K. HARRISON and P. HOWELL

ABSTRACT

An immature Cattle Egret was observed over a period of three months. The ecosystem in which the bird was placed is discussed with particular reference to the associated cattle, territory occupied and interaction with other herons and with humans. Notes are given on aspects of behaviour including feeding, resting, preening and flight characterists.

INTRODUCTION

On the morning of 11 July 1974, one of us observed a NZBC cameraman taking photographs of what appeared to be a smallish white heron which was walking about in a field a few metres from the road on the east side of Harewood Road, several hundred metres north of the junction of Pound Road near the Christchurch airport. The bird appeared little concerned with the attention it was getting and stalked about casually amongst members of a herd of red and white and black and white cattle grazing there. It appeared completely oblivious of the passage of noisy, heavily laden shingle trucks, which were passing every few minutes. Later, the bird was to become quite wary of any direct human attention. Since no telephoto lens was available it was deemed necessary to approach as closely as possible, so a slow stalk was commenced. At a distance of about 5 metres, the bird suddenly showed alarm and flew off parallel to the fence, alighting near the western boundary of the field. Several rather unsatisfactory 35 mm Ektachrome colour slides were obtained.

Initially, some difficulty was encountered in positively identifying the species to which the bird belonged. There were a number of reasons for this, apart from general ignorance which we freely concede. Firstly, the bird appeared virtually identical in every respect other than size to a White Heron *(Egretta alba modesta)*. This included its relative proportions which were checked against an excellent colour slide of the latter made by M. Landreth in the stream bed behind Staveley the previous autumn. Its size agreed most closely with that of the Little Egret *(E. garzetta)*; however, the single yellow colour of the beak and the absence of bare skin on the face did not tally. To add to the confusion, one of us had made at least two, if not three sightings of Cattle Egrets during the preceding one-and-a-half decades in Canterbury, the birds being on each occasion in the " buff " phase and regrettably without realising the ornithological significance or that there was an eclipse plumage which differed. The identification was established to our satisfaction by joint reference to standard works

(e.g. Falla, Sibson & Turbott 1970), to previously published material (Westerskov 1974) and by private communication by one of us with Messrs G. Harrow and G. Tunnicliffe.

It was determined to establish a watch and to keep the egret under observation for as long as possible. To this end one or the other of us managed to visit the site several times each week for the succeeding three months.

THE SITE

The field in which the bird spent most of its time while under observation is substantially rectangular, both boundaries being some hundreds of metres long, with a cut-out in the north-east corner, being bounded on its north side by a hedge in front of an irrigation ditch, its east side by a line of conifers *(Pinus radiatu)*, its south side by a wire fence and Harewood Road and on its west side by conifers and a patchy hedge. Although flat in the overall sense that it is not pitched in any direction, it is traversed diagonally by ridges between hollows of several metres depth made by an old watercourse system associated with the Waimakariri river. It was sown with pasture grasses for cattle feed and this was being supplemented with hay and silage from time to time. Near the south-east corner of the field there is a large barn painted a dark green, behind which the egret would take refuge at times when it became aware of undue attention. Near the south-west boundary there are several pine trees and posts adjacent to a farm house and on one of these in very wet weather, the bird would sometimes perch between feeding sessions.

THE CATTLE

This pasture contained a herd of perhaps twenty red and white and black and white cattle beasts, together with several riding hacks which came and went. During one phase of its two distinct modes of feeding behaviour, the egret associated closely with the cattle; yet it was never observed to ride about on any of the beasts' backs as has been noted elsewhere. It was also most noticeable that at all times the cattle appeared to accept the presence of the bird without resentment, even to the extent of being prepared to move out of its way. Reciprocally, the egret showed little fear of them and was apparently undisturbed when actually struck by the whisking of the beasts' tails.

TERRITORIAL BEHAVIOUR — THE SYSTEMS CONCEPT

To a human observer, this field with its herd of cattle, occasional ponies, several Australian magpies and a flock of Chaffinches, appeared to differ in no signigcant or ascertainable way form any number of nearby fields containing herds and yet there was a definite attachment by the bird, either to a particular piece of territory, or a particular herd or perhaps more likely, to the unique combination or "system" which they, together with unnoticed factors, comprised. This was

made evident whenever the bird was sufficiently disturbed to fly an appreciable distance, when it could have quite readily joined a similar herd in an adjacent field near a hedge, or to continue circling until it deemed itself safe to rejoin the selected cattle.

There were only two occasions when it was observed to have crossed over the western boundary into a field shared at times by the same herd of cattle; once when disturbed od the afternoon of discovery and on the occasion of its last sighting on 9 October when the cattle had been cleared from the original field for over a week. During the period of observation on those occasions when the bird was not immediately visible, the adjacent fields and herds, at distances of up to two kilometres from the site, were searched unsuccessfully to find out whether the bird had an alternative range. Often the egret appeared after some time, having been hidden in one of the hollows and/or by the flanks or legs of the cattle with which it associated.

FEEDING BEHAVIOUR

There were two distinct phases of feeding; the commensal relationship when the bird attended the various beasts in the herd, moving between their feet, having to dodge aside to avoid being repeatedly struck by swishing tails, etc., quite evidently without fear and with total acceptance by the cows. At such times observation through binoculars showed that it was picking up worms, grubs and insects from the ground, presumably disturbed by the beasts' feet. Since our bird, "Ardeola," was never noticed perching or attempting to perch on any of the cows, it was presumed that an absence of ticks may have resulted in a diminished incentive. It would be presumptious to enlarge on the relationship observed between the bird and the cattle on the basis of these limited observations. However, it was apparent, subtle and extant to a sufficient degree at times to be able to say that there appeared to be some mutual communication whereby the bird established itself, knew and was known to, accepted and was accepted by, the cattle. It is our conclusion that observation and analyses by persons versed in communications techniques should be rewarding.

In the second phase, the bird stalked along by itself often parallel to the western or northern boundaries of the field, or in one of the hollows, occasionally stabbing or thrusting with its beak when it was seen once more to have worms or insect larvae in its bill. The movements of the bird were less desultory and distinctly more purposive at such times, although on wet and cold days it frequently had a most dejected appearance, interspersing its feeding with protracted periods of sitting one-legged upon a pole.

From the lack of interest of the many passers-by, it must be assumed that many persons mistook the bird for an escaped White Leghorn hen from the nearby farm. Its behaviour certainly subscribed

to such a conclusion on one accasion when it was seen to be alternately walking and scratching its way through a pile of recently dropped silage, picking out grubs in a manner reminescent of a domestic fowl.

RESTING AND PREENING BEHAVIOUR AND APPEARANCE

Another occasional gesture which was also reminiscent of the behaviour of Pea Fowls was the stretching of one wing towards the ground with all the flight feathers distended. Since the wing is relatively of enormous size, the subsequent retraction and folding into the normal resting position is a study in elegance of design and performance. When not feeding, the bird had a habit of resting for longish periods of time — several tens of minutes — one one leg, showing a ditinct perference for the left, the other being fully retracted out of sight. On a number of occasions when it recommended walking, the bird appeared to be distinctly lame for a minute or two, after which time the stiff limb evidently regained full mobility. This one-legged stance might occur on the ground or when perched on the post described previously. Preening was irregular and never protracted in our experience and was sometimes carried out between picking up insects and sometimes while resting. Some birds, e.g. Spurwing Plovers *(Lobibyx novaehollandiae)*, appear remarkably spruce at all times; the Cattle Egret had a wide range of appearances from the picture of elegance with every feather in place, to a somewhat untidy and distinctly dejected state, with some feathers wind ruffled.

INTERACTION WITH ALLIED SPECIES

Several hundred metres west along Harewood Road from the field occupied by the Cattle Egret, there are several tall pines which are used as a roosting place by a pair of White-faced Herons *(Ardea novaehollandiae)*. On one occasion these birds overflew the egret at about 30 m altitude, with the lighting conditions such as to present silhouettes. This produced clear evidence of some degree of recognition, evidenced by disturbed behaviour. The bird ceased feeding and moved agitatedly for several seconds and appeared to be preparing to fly after them, then it settled down to feed once more.

On another occasion, the pair of White-faced Herons flew in, landing in the field near the north-west boundary and commenced to work their way diagonally towards the south-east corner. The Cattle Egret vacated the field immediately and flew up into the lower branches of an old willow tree near one of its resting places beside an irrigation ditch on hot afternoons. It hopped and flew from branch to branch in a most agitated fashion watching the other herons feeding, while they took no evident notice of it. Eventually it flew off in a northerly direction.

Contrary to Westerskov's remarks (1974) to the effect that the Cattle Egret is a socially inclined species, this bird appeared resentful of intrusion.

FLIGHT CHARACTERISTICS

Consequent upon various disturbances such as attempts to get close enough to photograph the egret and occasionally from movements of its own volition, there were opportunities to observe take-off, climbing flight, gliding and landing behaviour. The apparent speed and ease with which the bird became airborne, stood out in sharp contrast to its evident reluctance to fly when disturbed.

It preferred to stalk away if there were sufficient time and room; although on a few occasions it flew short distances with no apparent stimulus. At take-off it appeared to jump into the air, presumably to allow freedom for the down-beat of the large wings. The rapidity of climb evidenced a considerable power to weight ratio; while sustained flight showed the slow wing beat of the herons generally. On several occasions, after circling the field several times at altitudes between 50 and 30 metres the bird would glide down at a shallow angle and at considerable speed to make a " wheeler " style landing terminating in a short run. It appeared to prefer this to stalling in and using its wings and tail as air-brakes. However, it was quite capable of making " parachute " type landings, as was evidenced when it was flying about from branch to branch of the willow tree, landing atop the post, etc.

One quite remarkable feature was the fashion in which the bird locked its legs, placing one foot over the other and interlacing the toes in preparation for sustained flight. It was immediately clear that this would increase rigidity and reduce parasite drag from its undercart to a minimum.

INTERACTION WITH HUMANS

It was apparent throughout the period of observation that this bird took no notice whatsoever of moving motor transport, regardless of noise, size, colour, etc., and, initially, of stationary vehicles or their occupants. Regretably, however, it appeared as a direct result of deliberate approach to become increasingly aware and restive in the presence of vehicles stopping nearby and would walk away or fly off if it saw persons leaving them, usually to alight two or three hundred metres away in the north-west corner of the field where it sometimes took refuge in a ditch.

GENERAL APPEARANCE

Size:

At best this could only be estimated by comparison with fence wire spacing, the size of other birds — the White-faced Herons for example — and the size of the cattle. It is believed to have been about 55-60 cm with the head lifted and the neck straight. It was slightly smaller though not by much then either of the white-faces.

Shape and Proportions:

The body appeared very slightly less slender than those of the two White-faced Herons; similarly, the neck was not so long in proportion when extended. The bill, however, appeared to be of identical shape. The legs were long, and strongly developed.

Colour:

The egret's plumage was a brilliant snowy white when first seen and remained so throughout the whole period of observation. Considerable care was taken to note whether there was any sign of the development of the characteristic buff colour associated with the breeding period. The fact that no change took place tended to confirm our opinion that this was a young bird. The bill was lemon yellow and the legs a dark slate grey, these members also remained unchanged throughout the three-month period of observation.

Gait:

The slow, deliberate, long stepped gait deserved special mention; the comparable movements of the White-faced Herons appear quite random by comparison.

CONCLUSION

To our considerable regret, the bird's stay was prematurely terminated when the farmer broke up the immediate eco-system by transferring the cattle elsewhere at the beginning of October, so that the grass would grow for subsequent conversion to hay. The egret stayed for a few days, being seen several times in the adjacent field to which some of the beasts had been moved. When they were moved again, the bird disappeared and could not be traced despite an extensive search carried out for the next two months of all the nearby properties which appeared to offer similar conditions.

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LITERATURE CITED

FALLA, R. A.; SIBSON, R. B.; TURBOTT, E. G. 1970. Field Guide to the Bird of New Zealand. 2nd ed. London: Collins.

WESTERSKOV, K. 1974. Probable first breeding of the Cattle Egret (**Bubulcus ibis**) in New Zealand. Notornis 21 (3): 239-246, 1 fig.

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CLASSIFIED SUMMARISED NOTES

Compiled by A. T. EDGAR

Selected extracts from notes supplied to the Recording Scheme during 1974-75. Information received on Reef and White Herons, Egrets, Ibis, Spoonbill and Kestrel have been sent to the organisers of Special Enquiries and, as they will be published elsewhere, are not included in this series.

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E. & O. E.

KIWI *(Apteryx australis)*

Kaikohe, Feb 75, one photographed at 1100 hours feeding in a clean paddock near a house, just off Te Pua road on the outskirts of the town (press report).

Apteryx sp.

Heaphy track, Jan 75, pairs heard calling and answering, Brown and McKay Huts (BB). Barrytown, May 75, heard within ten yards at Rowe sub-colony of Westland Petrels (JRJ).

YELLOW-EYED PENGUIN *(Megadyptes antipodes)*
Early August 73, Penguin Beach, 74; Sandfly Bay, 14; Sandymount, 44 (AW). Hinahina Cove, 21/1/75, c. 40 ashore, numerous chicks in tree nettle and blackberry scrub (DC).

BLUE PENGUIN *(Eudyptula minor)*
Hooper's Inlet, 25/2/74, six birds in a clearing among tree nettles, not moulting (JH). Chatham Island, Point Gap, Jan 75, five in one hole, all in moult (PJM).

CRESTED PENGUIN *(Eudyptes pachyrhynchus)*
Jackson Bay, 29/8/74, a large number of dead birds in the nesting colony (RG). Hooper's Inlet, 25/2/74, a bird under a mound of muehlenbeckia, moulting, plumage fairly intact (JH).

SOUTHERN CRESTED GREBE *(Podiceps cristatus)*
Lake Mapourika 18/2/74, 3 birds (DAL). Lake Monowai 3/3/75, three adults each with one juvenile, a fourth juvenile on its own (WMJ).

N.Z. DABCHICK *(P. rufopectus)*
Muriwai Lakes 9/2/75, 71 (SMR). Farm pond at Laing's road, Karaka, 26/2/75, two adults one juvenile; Te Kauwhata, Lake Waikare, 13/4/75, 3 (BB). Rotorua, Ohau Channel, 12/12/74, nest attached to overhanging vegetation, one egg (AP); 29/1/75, two adults with one chick which swam close behind the female, the male following several feet behind (CFJO'D); Motuatara Point 6/3/75, 10; Lake Rotoiti, one with a chick on its back, 3/2/75 (AP). Lake Tarawera landing 1/6/74, 4 (DAL). Waipaoa River (SW of Gisborne) 25/3/75, two in a small stream; Lake Tutira 26/11/74, 7 (JCH). Tamumu, Hawkes Bay, 4/1/75, four on a dam (GE). Manawatu, Lake Koputara, 1/2/75, c. 30 (JLMM). Lake Horowhenua 12/8/75, 13, one pair displaying (EBJ). Paraparaumu 23/11/74, pair with three juveniles (JLMM).

AUSTRALIAN LITTLE GREBE *(P. novaehollandiae)*
Paraparaumu, Nov 74, one in a swampy area near Otahainga road (MLF, JLMM). West Coast, Lake Ryan, 7/7/74, one with Grey, Mallard and Shoveler ducks, seen by R. W. H. Simpson (JD). Lake Pratt, Waiho Valley, Oct 74, one (MLF).

HOARY-HEADED GREBE *(P. poliocephalus)*
Snares Island, early 1975 (BDB).

WANDERING ALBATROSS *(Diomedea exulans)*
Cook Strait 25/1/75, 50 (JRJ).

BULLER'S MOLLYMAWK *(D. bulleri)*
Aramoana 18/5/75, two on water close to mole (JH). Half Moon Bay 30/5/74, 290 Mollymawks, *D. bulleri* and *D. cauta cauta*, around fishing vessels (RJP).

LIGHT-MANTLED SOOTY ALBATROSS *(Phoebetria palpebrata)*
One, banded a chick at Macquarie Island on 4/3/73, recovered at Dargaville beach 19/8/73 (WJC). One, still alive but very weak, found 13 km inland and 8 km south of Ruatoria, after strong S-SE gales (JCH).

NELLY *(Macronectes giganteus)*

Following ships in Auckland harbour, 4 in August 74, up to 5 in October and November 74, 6 on 23/6/75 (TGL). Off Barrett's Reef, Taranaki, Aug 75, 7 (CDP). Ngauranga, Wellington harbour, maximum seen 16 on 2/7/74 (JLMM). Often seen in winter feeding at the city sewer outlet 1500 yards offshore from Boulder Bank, Nelson, singles or up to 3-5 birds (FHB, CFJO'D). Kaikoura 29/9/74, 41 near wharf (JAC). Birds counted at sea during voyages between Lyttleton and Wellington, 5/12/74, 50; 1975 Feb, 53; March, 41; April, 31; May, 14; 14/6/75, 74 (JRJ). White phase birds, Dargaville beach 22/6/75 (DEC); one with a few flecks seen off Waiheke 8/10/74 by E. D. Willis and south of Tiritiri 12/10/74 by several observers (SMR); 23/8/74, one at Double Bay, Whitianga, tangled in a fisherman's long line (ABJ).

CAPE PIGEON *(Daption capensis)*

Huia Bay, Manukau, 7/7/75, one; flew off after being harassed by Black-backed Gulls (JFS). Aug-Sep 74, large numbers in Wellington harbour and Cook Strait; more than 200 in the wake of Picton ferry Sep 74 (MLF). Nelson sewer outlet, winter, small scattered groups and sometimes rafts of several hundred birds (FHB, CFJO'D). 25/5/75, over 1000 offshore at a point between Clarence mouth and Ward Beach (JRJ). Kaikoura 29/9/74, 250 near wharf (JAC).

GREY-FACED PETREL *(Pterodroma macroptera)*

Taranaki, young birds had left Pukeruhe colony prior to 7/1/75; cleaning burrows had started by 29/6/75 (DGM).

KERGUELEN PETREL *(P. brevirostris)*

Gorge Road, Gisborne, one in a paddock 5/9/75; died overnight (AB).

FAIRY PRION *(Pachyptila turtur)*

2329 storm-cast on Muriwai, Dargaville and 90 Mile beaches 25/7/75 - 10/8/75. A bird banded as adult on Stephens Island 22/7/63 was recovered on Muriwai beach 6/7/75 (DEC, SMR).

WESTLAND BLACK PETREL *(Procellaria westlandica)*

A Black Petrel, probably this sp., seen following a fishing vessel right in to Wellington wharves, with a flock of Black-backed Gulls, 1445 hours 5/10/74; weather fine with light breeze and small chop (CJRR). Punakaiki 30/3/75, many wheeling over coast and heading inland at dusk on a wet misty evening (JAC). 3/5/75, 1400-1500 hours, 5 miles off Kaikoura, 3; 8 miles off Clarence mouth, 30 (JRJ).

FLESH-FOOTED SHEARWATER *(Puffinus carneipes)*

Firth of Thames 15/2/75, calm sea; hundreds, in rafts (BB).

BULLER'S SHEARWATER *(P. bulleri)*

Firth of Thames 15/2/75, hundreds present, on calm sea (BB). Seen at sea during voyages Lyttleton-Wellington, 25/1/75, 50, mid-Cook Strait; 8/2/75, 100, 7 miles south Pencarrow Head; 22/3/75 200, 4 miles off Waima mouth, 100 eight miles off Cape Campbell; 3/5/75, 500 eight miles off Clarence mouth (JRJ).

SOOTY SHEARWATER *(P. griseus)*

Te Wae Wae Bay, Southland, 6/4/75, the whole sea a teeming mass of birds as far as could be seen in all directions (RRS).

FLUTTERING SHEARWATER *(P. gavia)*

Ahipara 31/1/75, 2-3000 feeding 500 yards offshore (DWW). Mercury Bay 15-25/7/74, thousands (ABJ). Off Foxton Beach 27-31/12/74, several thousand passing south (JLMM).

KERMADEC STORM PETREL *(Pelagodroma marina abliclunis)*

Raoul Island Sep-Dec 74, close view of six birds feeding just off Hutchinson's Bluff with Sooty Terns, Grey Ternlets and White-capped Noddies; white rump well seen. A beach wreck picked up on the NE coast of the island on 25/11/74 was identified at National Museum (CSK).

WHITE-BELLIED STORM PETREL *(Fregetta grallaria)*

One recovered Waikawa beach (Wellington West Coast) July 75 (BH).

RED-TAILED TROPIC BIRD *(Phaethon rubricauda)*

Kermadecs, North Meyer 15/4/73, several sitting around the cliffs and one disturbed had one egg. Raoul 7/4/73, north cliffs towards Hutchinson Bluff, one nearly fledged chick with 8 adults flying around it; near Boat Cove 6/5/73, a newly fledged chick, which on 9/5/73 was found dead and torn apart, many rat tracks in the surrounding dust. 16/6/73, a dead fledgling washed down a gully towards Hutchinson Bluff, probably not the one recorded on 7/4/73. North Meyer 4/10/74, adult feeding nearly fledged young (CSK, JI).

AUSTRALIAN GANNET *(Sula bassana)*

Port Waikato 11/5/75, 4 fishing up the river, strong westerly wind (BB). Considerable northward passage observed from Foxton Beach 22-30/3/75; counts made 0700-0800 hours gave about 30 per hour, with 20 in a 15-minute count on 30/3/75 (JLMM). Aramoana 18/5/75, a juvenile, not spotted evenly all over, had large areas of grey-white on crown (JH, PDG). Little Solander Nov 74, 11 nests (R. Milford per MLB).

BLACK SHAG *(Phalacrocorax carbo)*

Minginui, Urewera 30/3/75, 28 flying over heavy bush (AP). Westshore, HB, 16/3/75, 144 (NBM). Lake Horowhenua, usually small numbers but up to 50 in mid-Aug 75 (EBJ). Lake Kohangatera colony July 75, 13 nests with eggs, one clutch of 5 (PR). July 75, groups, each of 8 birds, near the mouths of Ohau and Ahuriri rivers; there seem to be more shags on these rivers in winter than in summer (CL); 10 at Lake Benmore 25/2/74 (DAL). Ryton River, Lake Coleridge, 1974-75 summer, small colony, 12 adults; 4 young birds at cliff nest sites (RJP). 11 on a gravel beach at the curve of Taieri River, Outram on 1/5/74 was an unusually large number for the area (GG).

PIED SHAG *(P. varius)*

Auckland, Panmure Bridge colony has shrunk considerably as some of the trees have died. In Orakei Basin a pine tree which harboured many nests was felled as it was considered dangerous.

Many of the birds moved to a tree at the entrance to Lucerne Road Creek where in March 75 there were 21 nests with eggs or young, average 2 per nest; 81 birds roost there (SMR). Kaituna estuary 10/1/75, a bird took about 5 minutes to devour a large eel (AP).

LITTLE BLACK SHAG *(P. sulcirostris)*

Mangonui harbour 3/9/74, 15; Oruaiti River 29/12/74, 16 (ATE). Muriwai Lakes 9/2/75, 8 (SMR). Ryburn's Lagoon, Pokeno Valley 30/11/74, 50 pairs nesting in weeping willows with 6 pairs of Black Shags and 4 pairs of Little Shags. All eggs hatched, most of young well grown (DAL). Tanner's Point, Tauranga 13/7/75, 23 (JFC). Westshore, HB, 16/3/75, 231 (NBM). Lake Pukepuke 11-24/11/74, 4-7 birds; 7 on 7/1/75 remained for about 40 minutes, caught a few small eels and flew off to the south (WJP). Wellington harbour 1974, 14 in July, 7 in August; June 1975, 6 (JLMM).

LITTLE SHAG *(P. melanoleucos)*

Three Sisters, off Waiheke 13/4/75, c. 20 nests (BB). Lake Rotoehu colony of c. 200 pairs apparently not in use in 1974 (AP). South side of Otago harbour 28/10/72, pied phase 10; white-throated 68; either white-throated or black immatures 22; black 20 (JH).

CHATHAM ISLAND SHAG *(Leucocarbo carunculatus onslowi)*

Jan 75, Matarakau, 20 plus, breeding (PJM).

SPOTTED SHAG *(Stictocarbo punctatus punctatus)*

Scully's Reef, Ponui Island 15/2/75, 2500. Among these one albino, all white but for a sprinkling of black on head and back and some black on tail and primaries; bill pale horn, feet pale yellowish, facial skin green, a crest present. Elephant Cove, off Coromandel 15/2/74, 1200 (BB). Port Taranaki wharves Feb 75, one (REL); Apr 75, four, apparently juveniles (RWW). No breeding reported on Palliser Bay coast but in 1974 and 1975 some have spent the non-breeding season about a conical rock past Whatarangi (HC). Nelson coast, high tide roosts on Fifeshire Rock and other offshore stacks; lone juveniles sometimes come to tidal flats in autumn and in winter flocks sometimes appear in Nelson harbour and stay for varying periods of time (CFJO'D). Ashburton, up to 1000 regular at river mouth in the off season; in December 74 about half that number, many in breeding plumage; formerly they nested (Nov-Jan) on the shingle cliffs but as the number of fishing huts increased the presence of the shags became unpopular and nests were systematically destroyed. A few still rear young further along the cliffs; after January numbers build up again (ML). Taiaroa Head 18/5/75, 2000 plus flew from below the albatross colony to form a large raft offshore (BB). Waihopai river 15/6/75, at 1000 hrs, half tide, a single bird made its way upstream, swimming underwater in a weaving manner, surfacing at intervals; timed over a distance of 140 yards in 157 seconds it spent periods of 22, 52, 25 and 19 seconds underwater and surfaced for 26, 7 and 6 seconds. At 1105 hours presumably the same bird " motored " downstream, swimming on the surface with head well up; it dived three times (14, 10 and 16 seconds) and swam on the surface for 53 and 35 seconds, covering 212 yards in 128 seconds (MLB).

BLUE SHAG *(S. p. steadi)*

Stewart Island 1974, only 3-4 nests at Jansen's Point; no nesting at main colony site or other areas on this coast (PW).

PITT ISLAND SHAG *(S. p. featherstoni)*

Chatham Island, Jan 75, 12, including one chick, counted on a small rocky islet south of Point Gap (PGM); 17 at Matarakau (LH).

WHITE-FACED HERON *(Ardea novaehollandiae)*

Paua 12/4/75, 88 (DEC); 27/5/75, 80 (ATE). Whangarei harbour 15/3/75, 43 (DEC). Manukau, 17/11/74, 301; 13/7/75, 365 (BB). Firth of Thames 20/10/74, 55; 29/6/75, 61 (BB); chicks on 12/7/74 (MPD). One by a stream in farmland on the edge of the bush immediately west of Mt Pirongia, 6/10/74 (JFC). Whitianga 4/9/74, 2; 8/10/74, 3; 10/3/75, one (ABJ). Lake Rotoehu 10/1/75, one with its neck held straight as if it had swallowed a piece of wood had much difficulty in feeding (AP). Whakaki lagoon 8/3/75, 106; 10/5/75, lagoon and flooded paddocks, c. 300 (GF). Westshore, HB, 16/3/75, 97 (NBM). St Annes Lagoon, Cheviot 18/1/75, 30 plus (MLB). Lake Wainono 28/12/74, 23 (RJP). Sandhill Point, W Southland, 10/3/75, 4 on rocks (WAW). Paterson Inlet 28/5/74, 14 (RJP). Chatham Islands, one at Point Gap 18/1/75 (PJM).

AUSTRALIAN BITTERN *(Botaurus stellaris)*

Pokeno 30/3/74, with F. Thomson, saw 12 in one paddock and 20 during the day (AH). Waikato river below Taupo floodgates 27/4/75, one (PDG). Lake Rotongata (near Lake Okataina) 3/11/74, nest with three chicks 1-2 weeks old; 1975 sightings at several localities around Rotorua Lakes district and at Matata and Kaituna (AP). Wairarapa, Tauherinikau delta, June 75, one feeding in a paddock 20 yards from me (HC).

MUTE SWAN *(Cygnus olor)*

Lake Tutira 12/10/74, one (AP). Ashley River mouth 26/12/74, 2 adults with 4 cygnets (RJP).

BLACK SWAN *(C. atratus)*

Paua, 200-250 Feb-Apr 75; only 20-28 June-Oct 75 (ATE). Tapora, 1200 on 1/3/75; Muriwai Lakes 9/2/75, 54 (SMR). Count from aircraft, with F. Thomson, 15/4/75, Lake Waikare, 11075; Lake Whangape, 4400; Lake Wahi, 2125; Manukau harbour, 310 (AH). Tanner's Point-Athenree 13/7/75, c. 500 (JFC). Westshore, HB, 16/3/75, 280 (NBM). Lake Elterwater 17/5/75, 150, more arriving from north at dusk (TJT). Lake Wainono 28/12/74, 1200 (RJP). Woodend, Invercargill 8/2/75, 1600 plus (MLB).

CANADA GOOSE *(Branta canadensis)*

Lake Waikare 22/7/75, 8 (FT). Bay of Plenty, Tanner's Point, 7/7/74, one on mudflats, metal band on left leg (JFC). Wairoa, Ngamoko lagoon, Nov 74, 4 pairs nesting; two hatched clutches, one nest deserted, one nest not completed (GF). Westshore, HB, 16/3/75, one (NBM). Pauatahanui Inlet 13/6/75, one (JLMM). Maitai Valley, Nelson, one to three occasional on farmland, short visits only (CFJO'D). Lake Elterwater 14/5/75, 6 seen by O. Hickman (TJT). Kaikoura, Lyall Creek, two appeared after hurricane on 1/8/75, seen frequently during that month (JAC).

PARADISE DUCK *(Tadorna variegata)*

Paua, pair with 8 striped young 31/10/74 (JHS); 40 on paddocks 9/9/75, but had dispersed by October (ATE). Scattered pairs near Kerikeri (TGL), Ngunguru (MDW) and seven at Waiotira (TGL). Muriwai Lakes 9/2/75, 4; Waimauku, pair with 4 young 12/10/74 (SMR). Waikato, Marakopa, flock of 40 by river, 2 km from coast, 12/10/74 (TC, JFC). Kaawa Creek, south of Port Waikato, 74-75 season, family of six hatched, three survived (DMW). 15/4/75, Lake Whangape, 2; Lake Wahi, 45; Lake Waikare 13 (AH). Opoutere, 3/1/75, a female; new record for here (BB). Westshore, HB, 16/3/75, 290 (NBM). Lake Rotomahana 26/1/75, 50 in an isolated bay; Barrett Lagoon, New Plymouth 23/1/75, 4 (CFJO'D). Lake Horowhenua July 74, 40 (EBJ). Lake Pauatahanui, pair on 26/12/74 (JLMM). Nelson Haven, flock built up to 28 at northern end prior to May 75 (FHB). Lake Rotoiti (Nelson), 21/4/74, 50 (PJ). Christchurch, Avon River, Apr 75, 4; Heathcote River, 5 (BR). Sandhill Point, Southland, 10/3/75, pair on shore (WAW).

MALLARD *(Anas platyrhynchus)*

GREY DUCK *(A. superciliosa)*

Muriwai Lakes 9/2/75, Mallard 53, Mallard/Grey 421, Grey 53 (SMR). Hamilton 7/9/74, Grey with 6 recently hatched young (JFC). Westshore, HB, 16/3/75, Mallard 2571, Grey 8 (NBM). Waipawa, 18/8/74, Mallard pair with young 1-2 weeks old; Aokautere, Mallard adult with 24 ducklings all about one week old, perhaps two families or a communal nest (HAR). Nelson 12/12/74, adult Mallard with 19 new-hatched ducklings (CFJO'D).

GREY TEAL *(A. gibberifrons)*

Waiotira 15/12/74, 3 (TGL). Pokeno Valley, Ryburn's Lagoon, 30/11/74, 50; 26/12/74, 30 on a nearby pond (DAL). Kaituna, 28/1/75, 4 (JHS); 22/3/75, 22 (AP). Raukumara Range 28/10/74, adults with 8 young at Moutohora, 7 young at Motu (JCH). Westshore HB, 16/3/75, 779 (NBM). Manawatu, Lake Pukepuke, small numbers recorded each summer in recent years, especially in drought years when sandy shore lines have become exposed by falling water level. First breeding record for this lagoon Dec 74, when two broods were regularly seen (WJP). Lake Koputara 1/2/75, 3 (JLMM). Lake Elterwater 17/6/74 100-150; Ward, 21/12/74, 3 pairs breeding on farm ponds (TJT). St Annes Lagoon, Cheviot 18/1/75, 8 Class 4 young. Waikouaiti lagoon 28/1/75, 4-500 (MLB).

BROWN TEAL *(A. aucklandica)*

Ngunguru River 10/4/75, one (MDW). Matata, Jan 75, one female (AP). Manawatu, Lake Koputara, 29/3/75, one male, four females or immature (JLMM).

NORTHERN SHOVELER *(A. clypeata)*

Lake Horowhenua 27-31 May 75, a drake and probable duck (EBJ).

N.Z. SHOVELER *(A. rhynchotis)*

Muriwai Lakes 9/2/75), 53 (SMR). Pond in Whakarewarewa forest 26/11/74, pair with 9-10 young (AP). Westshore HB 16/3/75, 234 (NBM). Lake Horowhenua, numbers built up from 100 in Apr 75

to 150 in May and 3-500 in June (EBJ). Paraparaumu 19/11/74, two pairs, one with 3 juveniles, the other with three downy young (JLMM). Gore, early brood reported 7/10/74 (AJR).

BLUE DUCK *(Hymenolaimus malacorhynchus)*

Te Whaiti, Okui hut footbridge, 31/3/75, 3 (AP). Aniwaniwa stream, Waikaremoana 15/12/74, pair with two young (GF). Marlborough, Waikakaho Valley, 3/6/74, seen by P. Adams (JAC). Nelson Lakes, Sabine River, one, 1/11/74 (PJ). West Coast, two at Windbag Creek near Lake Moeraki, seen by M. Hall Feb 75; one in 1975 at Porarari River, Paparoa Range, seen by D. Onley (JD).

N.Z. SCAUP *(Aythya novaeseelandiae)*

Ruakaka, Gisborne, 16/7/74, 13, including one immature, on a small dam (AB). Lake Waikareiti 15/12/74, 18 (GF). Lake Tutira 26/11/74, 22 (JCH). Westshore, HB, 16/3/75, one (NBM). Berwick, Ram Island lagoon 27/4/74, 2 (HS). Te Anau 5/4/75, brood of three half grown young on pond (RRS).

AUSTRALASIAN HARRIER *(Circus approximans)*

Hamilton 19/6/74, two in chase; repeatedly circled low over sides of a gully, one immediately behind the other; wheeled, turned sharply, stalled and dived together along 150 m. of the gully (JFC). Eating Pheasant eggs Nov 73, Scaup eggs Dec 73 at Lake Rotoiti (AP). Four seen together at a point between Karamea and Millerton, Jan 75 (BB). Benmore 17/6/75, attacked by Spur-winged Plovers (CL).

N.Z. FALCON *(Falco novaeseelandiae)*

Sightings of single birds at Mt Karioi 19/4/74, flying over bush 10 km south of Thames 18/8/74, and in State Forest 14, North Kaimai Range, 10/5/75 (JFC). Matea area of Kaingaroa Forest, 21/8/75, one flew after a skylark; the lark dodged each rush of the falcon but the falcon had the advantage of speed. The lark started to sing; the birds entered a thermal and the lark then started to fly faster than the falcon, which broke off the chase. On 27/8/75 G. Brunsden and P. Bowles were in a compartment close to the above area, with dogs. The dogs seemed to attract a falcon, which flew around them. A fantail flew towards the group and the falcon at once attacked; the fantail kept close to the ground, dodging each swoop, the falcon repeatedly rose about 6 m. to dive on the fantail. The chase continued over a hill and the outcome is in doubt but the falcon shortly returned and landed in a monoa bush, where it permitted P. Bowles to approach to within 4m. before it flew (RWJ).

Falcons appear to be fairly well spread throughout the Gisborne-East Cape region, appearing in both populated and " empty " places. The following are some of my own sightings, in each case a single bird:— 2/6/74, with finch in talons, flying about 1 m. above maize near Gisborne Airport; 12/7/74, hunting over maize stubble near Hikuwai bridge, State Highway 35, south of Tokomaru Bay; 19/8/74, from S.H. 35 at Waipiro Bay turnoff; 20/9/74, over farmland at Te Karaka, 28 km. NW of Gisborne; 4/10/74, over Tuamatu Island 4 km SE of Gisborne city; 8/10/74, from Mason St, Gisborne suburb, flying E towards city; 28/10/74, at Motu, Raukumara Range; 30/10/74, in coastal area S of Tolaga Bay; 17/11/74, over Waikura River, W of Gisborne; 12/8/75, from Mason St, again flying E towards city (JCH).

Waioeka River, March 75, one (AB). Lower Hutt 15/11/74, one sitting on a power pole eating a small bird (JLMM). Sightings at Dog Hill, Ward, several times in 1974-75; Seddon district, Apr 75, one seen from Grassmere Road, 1½ m. from main highway (TJT). Fox Glacier, Aug 73, aerial chase of a Spur-winged Plover lasted nearly 15 minutes. The falcon followed every aerial acrobatic turn of the plover, always 6-12 ft behind it, in the open, to and fro over roof tops and through a carport, till finally the plover, outmanoeuvred and worn down, was caught in the yard; Nov 74, courting flight high above the township, the male diving at the female at great speed and just missing her, then the pair wheeling away together to repeat the performance, with shrill cries. Aug 75, Lake Matheson, falcon and harrier in aerial combat; the harrier broke off and slipped away (Margaret Hall per JD). Southland, several 1974 sightings, Jock's Bay and Akers Point (PW); March 75, one over sandhills near bush edge at Sandhill Point, one at Port Craig (WAW).

CHUKOR *(Alectoris chukar)*

Mt Fyffe, Kaikoura, 7/3/75, groups of up to 17 (RG).

BROWN QUAIL *(Synoicus ypsiliphorus)*

Tiritiri Matangi Island 12/10/74, 2 (SMR). Ohiwa Spit, Oct 74, at dawn and dusk; a pair with 6 young close to Whakatane River estuary: Minginui, Mar 75, 3 (AP).

CALIFORNIAN QUAIL *(Lophortyx californica)*

Kerikeri, 1974-75, hatching dates late Nov to third week in March (ATE). Waipu, behind Uretiti beach, 40 in scrub on dunes, Mar 75 (TGL). Tiritiri Matangi Island 12/10/74, one (SMR). Murchison river flats 29/12/74, 10 (JFC). Silverstream, Otago, two adults; habitat margin of pine forest and paddocks with willows and gorse (JH).

BANDED RAIL *(Rallus philippensis)*

Often forages around rubbish dumps where these are adjacent to mangroves, e.g., Taipa, Kerikeri (ATE), Whangae (DWW). Road Waipu Cove-Mangawhai, south of Laing's Beach, one; on edge of saltmarsh north of Waipu Cove, Apr 75, 3 (MDW). Dec 74, mangrove fringed road near Leigh (HAR). Massey side of Henderson Creek, Jan 74, 2 (AM). One dead on Shore Road, Remuera, Dec 74 (TGL). Karaka, Urquhart's property, Jan 75 (DAU). Kaituna lagoon, sightings of single birds Jan-Mar 75, feeding just before high tide in windy cloudy weather (AP).

N.I. WEKA *(Gallirallus australis greyi)*

Waipu birds liberated Dec 71 doing well; family party in a garden for some months, take food put out for cats even when cats nearby; 19/2/75, brood of five chicks (TGL). Portland Road, Auckland, 18/7/75, one (SMR). Mokoia Island, Rotorua, 15 plus attracted to tape recorded calls (AP). Ruataniwha, HB, 22/10/74 (GE).

WESTERN WEKA *(G. a. australis)*

Heaphy Track, Jan 75, near Katipo shelter, one feeding on the track tossed aside large dried nikau debris to search underneath (BB). Mar-Apr 75, seen at Middle, Robinson and Top Huts, Grey headwaters (JRJ). Edwards Valley, Arthur's Pass, numbers calling at night, 5/10/74 (RG).

BUFF WEKA *(G. a. hectori)*

Chatham Island, Jan 75 (PJM).

MARSH CRAKE *(Porzana pusilla)*

Matata lagoon, 6/4/75, atrracted by disturbance made by Spotless Crakes responding to taped calls; both species seen in the open, feeding together on small insects, probably fruit flies (AP). Present on several Manawatu lakes 1975, less numerous than Spotless Crake (HAR).

SPOTLESS CRAKE *(P. tabuensis)*

Puketona 13/5/75, two seen and others heard in raupo swamp (TGL). Kaipara, McLean's farm dam, 30/3/75, one; Tiritiri Matangi Island 12/10/74, one (SMR). 1975, located in seven separate swamps near Waiuku (IWJ); two swamps at Hunua (BB) and at Mangatawhiri (DAU). Nolan's road, Kaawa Creek valley, S of Port Waikato, 26/4/75 (DMW). 4 m. south of Te Kuiti, 5 seen, others heard, using taped calls, Apr 75 (TC). Matata lagoon several, Little Waihi one, 28/9/75 (AP). Rotorua district 1974-75, located at Soda Springs, Earthquake Flat, Lake Rotongata, a pair in Whakarewarewa forest, and at Rotorua airport (AP, RWJ). Makarika, near Ruatoria, 7/5/74; Tokomaru Bay to Te Puia Springs, Dec 74, 4 seen and 3 heard, responding to taped calls (JCH); in a swamp south of Tolaga Bay (AB); Mill Road, Wairoa, in a small raupo-cutty grass swamp, 24/2/75 (GF). Himatangi area, 1974-75 (DAL, JLMM). Lake Kohangatera, E of Pencarrow, 23/2/75 (MLF).

PUKEKO *(Porphyrio porphyrio)*

Whangarei dump, over 100 on 1/2/75 (DWW). Muriwai Lakes 9/2/75, 40; Tiritiri Matangi Island 12/10/74, 29 (SMR): Great Barrier, Whangaparapara, 3/2/75, calling at night (AJG). Rotorua, one slowly eating a fresh dead duckling weighing at least 1 lb (AP). Often reply to taped calls of Spotless Crake, but do not seem attracted by them (JCH). Manawatu estuary 19/4/75, 25 (JLMM). Silverstream, Hutt Valley, several still present (HLS). Spider Lagoon, Sumner, summer 74-75, one sighting in eight visits (RJP). Chatham Island, Waitangi, Jan 75, 4 (PJM).

AUSTRALIAN COOT *(Fulica atra)*

Volcanic Plateau, reports from Lakes Okareka, Rotoiti, Rotoma, a juvenile at Lake Tarawera and 13 at Okere Falls on 22/6/75 (AP, MDW, JW). Lake Rotokaha, Tiniroto, 17/9/75, 2; near Waikura River, W of Gisborne, 5 in a swampy natural ponded area, 17/11/74 (JCH). Barrett Lagoon, New Plymouth, 23/1/75, one, on that part of the lagoon edged with sedge (CFJO'D). Wairarapa, coots have apparently been present for about three years on a 6-7 acre private lake at Te Parae, E of Masterton, and have bred, but the young are said to have been predated by harrier and perhaps by eels; on 2/9/74 two pairs were seen, and the suspected beginnings of a nest under a drooping rhododendron (MDD). St Annes Lagoon, Cheviot, full again on 4/5/75 after being dry for two years; 14 coots seen (JAC); young birds seen 18/1/75 (MLB).

S.I. PIED OYSTERCATCHER *(Haematopus ostralegus finschi)*

Paua, less than usual 1975 winter, count 10-15 only (ATE). Whangarei, 1975, 370 in March, 419 in July (DEC). Tapora 30/3/75, 2705; 50 at Port Albert 31/3/75 (SMR). Manukau, 17/11/74, 2329; 13/7/75, 17261, 8000 more than last year (BB). Huia Bay 23/8/75, 120, the largest number seen here (JFS). Waitemata, Te Atatu beaches, only four sightings of 2-3 birds 1968-73; 1974 May, 18; June-August 29-140, Oct-Nov 150-194; 1975, maximum seen 280 (AM). Firth of Thames 26/10/74, 758; 29/6/75, 6731, including a very large flock of c 4000 (BB). Manawatu, Mar-Apr 75, maximum 80 (JLMM). Motueka sewer outlet 16/3/75, 1500; Rabbit Island 31/3/75, 1000 plus (FHB). Aug 75, nine, calling while flying up Flaxbourne river, Marlborough (TJT). A pair chasing and calling at Ohau mouth 28/7/75 (CL). Three still in Eglinton Valley, Cascade Creek area, 18/12/74 (WMJ). Southland, 1500 at Woodend 8/2/75 (MLB); mated pairs on inland territories by first week in July 74; nest building on 13/8/74 near Mossburn considered early; 31/8/74, incubating eggs at Hamilton Burn (RRS). Stewart Island 22-31/5/74, 6 at Mason Bay, several hundred Paterson Inlet (RJP).

VARIABLE OYSTERCATCHER *(H. unicolor)*

Paua 16/3/75, 170 (ATE). Tanner's Point, Tauranga, 30/3/75, 19, two of which were black (JFC). Little Waihi 5/1/75, nest with one chick found by following footprints (AP). Whitianga estuary 20/11/74, 18; Buffalo Beach 1974-5, two pairs regular, up to three additional birds at times (ABJ). Nesting north of river, Waikanae estuary, 21/11/74 (AKB). Nelson, Rabbit Island, 3/11/74, nests among driftwood on beach; Boulder Bank 6/1/75, 3 fledglings (CFJO'D).

CHATHAM ISLAND OYSTERCATCHER *(H. chathamensis)*

Point Gap 16/1/75, a pair, one bird very noisy near an empty nest (PJM).

SPUR-WINGED PLOVER *(Lobibyx novaehollandiae)*

Okitu, Gisborne, 27/7/74, 2 (AB). Dannevirke area, two chicks Oct 73, one chick Oct 74 (MRM). Rangitikei estuary 25/10/74, pair in a marshy paddock (AP). Foxton 8/3/75, 10 (JLMM). Paekakariki, the pair deserted a 5-egg nest, trampled by stock, and on 31/10/74 had three eggs in another nest. In 1975 4 chicks hatched 6 or 7 July and three of them were banded by BDH on 2/8/75. A later nest of 2 eggs was abandoned and 4 eggs laid in another nest 10 feet away; these were being incubated in early Oct 75. One of the birds colour banded at Paekakariki as a chick on 20/7/74 was seen in August 75 near Ruamahanga river, Wairarapa, by D. Sims (MLF). Nelson Lake Rotoiti, up to 50 reported 1974, some nesting (PJ). Mapua school, two on pasture land 14/9/75 (FHB). Blenheim, 25 Jan-1 Feb 75, seven apparently adult, at Hardings Road (RNH); Wairau Bar 9/4/75, 2 (BDB). Three near Ward township 18/5/75 (TJT). Kaikoura, Cribb Creek bridge, 6-8, Oct 74-Feb 75; Conway mouth 27/9/74, pair with two chicks (JAC). Breeding at Westport and Punakaiki, reports from Atarau, Kowhiterangi, Ross; Fox Glacier, best count July 74, 47 in paddocks (JD). Paringa to Fox Glacier, well established 1974, commonly observed in large grass paddocks especially where

there is rush growth (SCS). Hanmer Springs 19/2/75, 18 in a paddock (GMcM). Hurunui, 3/5/75, 13 (RG). Lake Pearson 26/1/75, 2 (MLB). Ashburton 18/12/74, one flying over town centre pursuing a Black-backed Gull (ML). Attacking a harrier at Ohau 17/6/75 (CL). 50 at Puerua wetlands south of Finegand, 19/7/74 (JH). Eglinton Valley, Cascade Creek area, 2 on 18/12/74 (WMJ).

GREY PLOVER *(Pluvialis squatarola)*

Paua 31/10/74, one remained on paddock when Golden Plover flew; white rump and black axillaries seen (JHS).

GOLDEN PLOVER *(P. dominica)*

Raoul Island 29/9/74, 14 on farm (CSK). Paua 1974, October influx of 300 reduced to 250 in Nov, none Dec; 1975, Jan, 17; March, 20; only 2 on 25/3/75 (ATE). Whangarei, 15/3/75, 25 (DEC). Tapora March 75, 28 (SMR). Manukau 17/11/74, 30; 16 at Kidd's 26/2/75. Firth of Thames 20/10/74, one (BB). Kaituna, sightings of a single bird Dec 74-March 75 (AP, RWJ); 45 on a ploughed peat field 28/1/75 (JHS). Ohope 29/10/74, 14 (AP). 29/12/74, 18 (RMW). Westshore HB, 16/3/75, 7 (NBM). Rangitikei estuary 22/10/74, 6 (AP). West coast, Gillespie's beach, one present for 2-3 weeks Oct 74 (MH). Lake Wainono 12/11/74, one (RJP). Southland Lake Waituna 30/12/74, 23; Awarua 22/2/75, 22 (MLB). Chatham Island Jan 75 (DEC).

N.Z. DOTTEREL *(Charadrius obscurus)*

Karaka, Dec 74, a breeding pair ousted from their chosen nest site by a pair of White-fronted Terns which are nesting away from their colony on a separate sandbank and within a foot of the dotterels' first site. The dotterels now have a nest 3-4 yards away from the terns; the nest started as a built up cup, almost a goblet, but is now somewhat flattened; one egg has been laid. Squabbling continues (BB). Buffalo Beach, Coromandel, one raking soft sand with its foot to flush sand hoppers (ABJ). Christchurch estuary, one on 27/7/74 and 18/8/74 (RG).

BANDED DOTTEREL *(C. bicinctus)*

Paua, only about 300 in February 75 and none found after March (ATE). Whangarei, 65 in March and 139 in July 75 (DEC). Tapora, 30/3/75, 202 (SMR). Manawatu estuary, maximum 80 on 28/3/75 (JLMM). The species is an inland breeder in Otago but does not generally breed on the coast. There are always a few pairs on a stony paddock at the mouth of Waianakaurua river but south, as far as Awarua Bay, breeding has not previously been recorded. On 20/12/74 there were six adult dotterels on the salt marsh at the SW corner of Aramoana eastern flats; two of these did not move off with the others and persisted in flying around. A brief search produced a very small downy chick at the vulnerable stage when it could run a short distance and then crouch (JH).

MONGOLIAN DOTTEREL *(C. mongolus)*

Karaka, sightings 13 and 26 Feb 75 (BB). Invercargill estuary, 21/9/74, one, with Turnstone; Banded Dotterel also present (MLB).

LARGE SAND DOTTEREL *(C. leschenaulti)*

Karaka, one on 13/2/75 (BB).

ORIENTAL DOTTEREL *(C. veredus)*

Unconfirmed sighting at Tapora 1/3/75 (SMR). Karaka, brief sightings of one bird, apparently young and with very grey plumage, by several members during Feb 75 (BB).

BLACK-FRONTED DOTTEREL *(C. melanops)*

Pukepuke lagoon, 2 on 24/2/75 was the first sighting since 4/6/74; five sightings in March, best count 17 on 27th; 21 on 1/4/75, 25 plus 18/4/75; two flying over the new pond on 7/5/75 (WJP). Waikanae June 75, 3 (BDH). Tauherinikau, regular breeding since 1972 (MLF, 1974). Lower 12 miles of Orari river, 21/12/74, one; Opihi, downstream of main road bridge 26/10/74, 12; between main road bridge and Pleasant Point 22/12/74, one (RJP). Washdyke lagoon 10/5/75 (PS). Taieri plain, 1½ miles from Outram and ¼ mile from Taieri river, two birds feeding on a clear area of soft mud at one end of a farm pond, most of which is fringed with willows and covered with duckweed; seen noon-1300 hours on 26/3/75; not seen on subsequent visits but reported present 12/4/75. Two on a gravel beach at Silverstream 19-26/6/75 (GG).

WRYBILL *(Anarhynchus frontalis)*

Paua 12/4/75, 90, a high count for this area (DEC); May-June 75, 12-16 only (ATE). Whangarei 15/3/75, 27 (DEC). Ngunguru, one on 12/2/75 (DWW). Tapora 30/3/75, 215 (SMR). Manukau, 25 at Karaka 18/9/74; harbour counts 17/11/74, 19; 13/1/75, 769. Firth of Thames 20/10/74, 85; 3000 at Taramaire 1/3/75, 4000 at Limeworks 2/3/75; winter count 29/6/75, 1940 (BB). White Island, March 75, two on old crater flat (JHS). Bay of Plenty, 1-3 birds sighted at Tanner's Point (JHS), Kaituna and Tarawera estuary (AP) during Jan-March 75; Sulphur Point, 23/1/75, 25 (JFMF). Porangahau, HB, 10 on 27/4/75 (KVT). Manawatu estuary Feb-May 75, maximum 20 (JLMM). Rangitikei estuary 26/10/74, two in breeding plumage (AP). One at Saltwater lagoon, Waikuku, Christchurch during July 75 (PH). One at Lake Ellesmere 18/11/74 (RJP). Upper Rakaia, a number of juveniles still present 3/1/74 (SCS). One at Waimatuku mouth 31/8/74 (MLB).

LONG-BILLED CURLEW *(Numenius madagascariensis)*

Kermadecs, North Meyer, one 4/10/74 (CSK). Paua, 5 on 4/9/74, 6 on 19/9/74 and present till 28/2/75; 3 in March, one on 12/4/75; 9/9/75, 3 (ATE). Manukau 13/7/75, 4. Firth of Thames 20/10/74, 10; 2/3/75, 13; 29/6/75, one (BB). Maketu 28/9/75, one; 25/1/75 - 8/2/75, 4 (RWJ, AP). New Plymouth, Waiwakaiho mouth 26/9/75, one (CDP, DGM). Manawatu estuary one, 28/3/75 - 11/5/75 (JLMM). Farewell Spit, early August 75, one (EMG). Petone beach, one storm wrecked 14/9/74 (MLF). Waituna 30/12/74, 5 (MLB).

ASIATIC WHIMBREL *(N. phaeopus variegatus)*

Paua 8/10/74, one (ATE); 19/10/74, 4 (RBS); 16/3/75, one (ATE). Kerikeri, one on shellbank 17/12/74 - 27/2/75 (ATE). Manukau 18/11/74, 2 (BB); Whimbrel sp. at Auckland airport 15/12/74 (RVJC). Firth of Thames 29/6/75, one (BB). Ohope Spit 29/12/74, 5 (RMW). Manawatu estuary 3/10/74, one (EBJ). Ashley river mouth 26/12/74 and 15/2/75, one (RJP). Southland, Woodend, 8/2/75, one (MLB).

AMERICAN WHIMBREL *(N. p. hudsonicus)*

Henderson Bay, Northland, one on rocks 1/11/74; flew and called, returned to rocks and repeated the performance; similar behaviour observed in America (JHS). Karaka, 2/11/74, 17/11/74, 1/12/74, two; Miranda, two on 23/3/75 and 29/6/75 (BB).

HUDSONIAN GODWIT *(Limosa haemasticta)*

Huia Bay, 30/9/75, one with a flock of 20 S.I. Pied Oystercatchers (JFS). A Black-tailed Godwit (? sp) seen on 13/12/74 and 4/2/75 at Buffalo Beach and on 15/3/75 at Whitianga estuary (ABJ).

BAR-TAILED GODWIT *(L. lapponica)*

Paua, 19/9/74, 1350, some with traces of red (ATE); 19/10/74, c. 1000, very flighty (RBS); only 60-80 seen Nov-Jan; paddocks on which they normally roost were overgrown; 700 on 13/2/75; 350-400 Apr-June 75 (ATE). Rangiputa 1/11/74, large flock, not counted. One bird had a small cockle clamped on the end of its bill; seemed distressed and frequently dunked the shell in the edge of the tide (JHS). Whangarei 15/3/75, 2250; 13/7/75, 295 (DEC). Tapora 1/3/75, 2000; 30/3/75, 635 (SMR). Manukau 17/11/74, 23358; 13/7/75, 2189. 3500 at Auckland airport on 15/12/74 (BB). Upper Waitemata harbour, counts of birds on beaches in Te Atatu area at approximately weekly intervals over the period 1968-74 indicate a change in the pattern of godwit usage. No godwits seen in 1968; 1969, 5 sightings, a flock of 1000 in Feb, strays in May, Sep, Oct. 1970, 3 sightings, 1000 in Feb and in March. 1971, 3 sightings, no large flock; 44 in Jan, 4 in June, one in Oct. 1972, 7 sightings; 1000 in Jan, 2000 in Feb, 1500 in March and 112 in Dec. Up till this date the pattern is of casual use by "overflow" flocks in the Jan-March period and occasional strays at other times of the year. 1973, 18 sightings, flocks of 200 Jan and Feb, a flock of 3500 one day in March; in the May-August period 10 sightings, maximum number 173, average 41 birds. 1974, 27 sightings; smaller flocks (600, 600, 550) in Feb-March; none in May but 11 sightings June-Aug, maximum 125, average 43 birds. Manukau winter count in July 73 was relatively high at 3563 and this might have been a reason for some birds wintering in Waitemata, but in 1974 Manukau winter count was down to 2130 while the Te Atatu count was slightly up. 1974 spring flocks (Oct-Nov) of 320, 200 and 300 were observed at Te Atatu (AM). Firth of Thames, 20/10/74, 14620; 29/6/75, 660 (BB). Pokeno Valley, Ryburn's lagoon, 30/11/74, one feeding on exposed mud (DAL). Buffalo Beach 27/7/74, 80 (ABJ). Opoutere, 28/10/74, 75; 11/1/75, 650 (BB). Tauranga harbour 14/1/75, several thousand on mud, apart from those at Tanner's Point where there were 2000 on 2/1/75 (JHS). Westshore, HB, 16/3/75, 397 (NBM). Manawatu estuary 1974, build up from 20 in Sep to 300 in Oct (JLMM) and 400 in Nov (EBJ). Nelson Haven, 500 in summer, 1000 on 1/3/75; most left by mid-April, c. 80 apparently over-wintering (CFJO'D). Aramoana 23/3/74, 220; 20/7/74, 83; Ashley mouth 26/12/74, 200 (RJP). Southland, main flock arrived night of 26/9/74; 19/10/74, 2000 plus; winter census 17/8/74, 196 (MLB).

GREENSHANK *(Tringa nebularia)*

Paua 17/11/74, one (ATE).

WANDERING TATTLER *(T. incana)*

Raoul Island 18/10/74, 7, some showing partial breeding plumage; a single bird, possibly this sp., on North Meyer 12 and 29/10/74 (CSK).

SIBERIAN TATTLER *(T. brevipes)*

Seal Point, Kaikoura 18/1/75, 2 (MLB). Two tattlers, sp. unid., recorded at Kaikoura 27/7/74 (JAC). Ashley River mouth 15/2/75, one; two tattlers, probably this sp., had been seen on 26/12/74 (RJP).

TATTLER sp.

Aramoana, two tattlers seen regularly between Xmas 1972 and May 73 (GH); one on 23/3/74 (RJP). Awarua Bay, 3, 22/2/75 - 1/3/75 (MLB).

TEREK SANDPIPER *(Xenus cinereus)*

Firth of Thames, seven reports of a single bird Oct 74 - Mar 75 (RBS, BB, THH). Westshore, HB, one on 16/3/75 (NBM). Southland, Awarua Bay, one on 22/2/75, 1/3/75 (MLB).

TURNSTONE *(Arenaria interpres)*

Paua, Sep 74, 300; built up to 600 in Nov; none seen Dec 74, 37 in mid-Jan 75, 300 by late Jan, decreased to 160 by late March, but 600 in mid-April; 3 present May-June 75 (ATE). Rangiputa 1/11/74, 800 (JHS). Karikari Bay 29/8/75, 20 (LH). Waipu estuary, 10 on 18/12/74 (TGL) and on 8/4/75 (MDW). Tapora, Mar 75, 285 (SMR). Manukau 17/11/74, 465; 13/7/75, 8. Firth of Thames 20/10/74, 145; 29/6/75, 17 (BB). Bay of Plenty, Jan 75, Tanner's Point 50, Kaituna 3 (JHS). Rangitikei estuary 22/10/75, one (AP). Kaikoura 15/4/74, 12; 7/5/75, 4 (RG). Motueka, several sightings of small numbers; 100 on 16/3/75 (FHB). Kaitorete Spit 30/11/74, one; Wainono 12/11/74, 2; 18/1/75, one (RJP). Southland winter count 17/8/74, Awarua Bay 19, estuary 51, shellbanks 64, total 134 (RRS); Thornbury, 80 on pasture 13/9/75 (IAM); Invercargill estuary 21/9/74, 200 plus; 19/10/74, 250 plus; Feb 75, 165 at Woodend, 200 plus at Awarua (MLB).

KNOT *(Calidris canutus)*

Paua, 700 on 19/9/74, otherwise small numbers in 1974-5 season (ATE). Rangiputa, Oct-Nov 74, over 1000 (ATE, JHS). Whangarei 15/3/75, 800 (DEC). Waipu estuary 18/12/74, 138 (TGL); 8/4/75, 8 (MDW). Tapora 1/3/75, 3000; 30/3/75, 1100 (SMR). Manukau 17/11/74, 4750, of which 2400 were at Karaka, where numbers built up to 4000 in Feb and 5000 in early March. 13/7/75, 670 (BB). Firth of Thames 20/10/74, 11400; 29/6/75, 350 (BB). Bay of Plenty, none at Tanner's Point in Jan 75, as usual in this harbour (JHS); Maketu 28/9/75, 5 (AP). Wairoa estuary 7/12/74, 18 (GF). Manawatu estuary Feb 75, 42 (JLMM). Christchurch estuary 17/11/74, 13; 9/3/75, 4 (RG). Southland 17/8/74, 25 at Awarua Bay (RRS), small numbers recorded elsewhere, e.g. Invercargill estuary, 25; Woodend, 14; Waituna, 3; at Awarua, 20 in Feb and 53 on 1/3/75 (MLB).

SHARP-TAILED SANDPIPER *(C. acuminata)*

Paua 29/1/75, 17 (ATE). Whangarei 15/3/75, 2 (DEC). Manukau, 2 at Karaka, 2/11/74 and still there 15/3/75 (RBS, BB). Firth of Thames, 2/1/75, 22; 2/3/75, 17 (BB). Kaituna, one, 10/1/75, 6/4/75 (AP). Westshore, HB, 16/3/75, 7 (NBM). Manawatu estuary 4/2/75, 14; 8/3/75, 6; 28/3/75, one (JLMM). Greenpark 18/11/74, 2; Wainono, 12/11/74, 5 and 28/12/74, 10; 18/1/75, 14 (RJP). Waituna 30/12/74, one; Invercargill estuary 19/10/74, 3; 8/2/75, 7 (MLB).

PECTORAL SANDPIPER *(C. melanotos)*

Manawatu estuary 6/2/75, one; 22/2/75, 3; 8/3/75, one (JLMM). Wainono 19/3/74, 2 (RJP). Waituna 30/12/74, 5 (MLB).

CURLEW SANDPIPER *(C. ferruginea)*

Paua 19/9/74, 3; one, or two, till 31/3/75 (ATE). Tapora 30/3/75, one (SMR). Miranda, 1975, up to 8 in Jan, 12 on 22/2/75, up to 5 in March (BB, THH). Kaitorete Spit 6/1/75, c. 30 (RJP). Waituna 30/12/74, 2; Awarua 22/2/75, 2 (MLB).

RED-NECKED STINT *(C. ruficollis)*

Paua, June-Aug 74, 2; no others seen till one on 14/1/75; 29/1/75, 4; 13/2/75, 6 (ATE). Rangiputa 1/11/74, 4 (JHS). Whangarei 15/3/75, 12 (DEC). Manukau 17/11/74, 15; 17 at Karaka 7/12/74 and until 12/4/75 (BB, TGL). Firth of Thames 20/10/74, 7; 2/1/75, 6; 26/3/75, 3 (BB). Rangitikei estuary Oct 74, 6 (AP). Tangimoana 28/3/75, one (RNC). Greenpark 18/11/74, 4; 15/12/74, 20; Kaitorete Spit 30/11/74, 8 (RJP). Invercargill estuary 19/10/74, 8; Awarua, one on 17/8/74 and on 22/2/75 (MLB, RRS).

SANDERLING *(C. alba)*

Single bird at Waituna 30/12/74 and one at Awarua 1/3/75 (MLB).

PIED STILT *(Himantopus himantopus)*

Paua, less than last year; maximum 800 in May 75, 500 June, 160 August; only 50 in September 1975, 10 of which were in juvenile plumage (ATE). Whangarei 15/3/75, 809 (DEC); Tapora 30/3/75, 320 (SMR). Westshore, HB, 16/3/75, 1892 (NBM). Waiuku, 1975, a female which reared two chicks this season had on each wing two white lines, extending the length of the open wing but not visible on the closed wing (IWJ).

BLACK STILT *(H. novaezelandiae)*

Karaka, 7/6/75, one, still present on 13/7/75, had some white on lower breast and belly. A second bird, present on 13/7/75, had a white facial ring around the base of the bill and white from below the neck on to breast and belly (BB, BJB).

SOUTHERN SKUA *(Stercorarius skua lonnbergi)*

5/5/74, two off Cape Brett, at a time when many prions were in the area (GC). Arahura mouth, after a storm, a sick bird with off-balance flight sitting beside a dead juvenile Black-backed Gull which had been struck on the nape but not eaten. The skua was heavily infested with Black-backed Gull lice and no Skua lice were noticed (JH, JRJ). Waituna, 3/12/74, two harrying a White-fronted

Tern till it dropped the fish it was carrying, fish caught in air by skua. At the tern colony (about 150 birds) there were signs of predation — some pipped rolled eggs and patches of feathers; remains of two birds (bodies and feathers) together in one place on the edge of the colony. Stoat and rabbit signs in the colony area, but well away from the colony on a low projecting headland was an eggshell in two parts, contents gone, and at least two patches of feathers some distance from the colony, may have been the work of a skua (MLB).

POMARINE SKUA *(S. pomarinus)*

Hauraki Gulf 15/2/75, one; excellent view on water and later in flight (BB). Cape Runaway 6/1/75, two skuas working ½ mile offshore; one later flew along the beach allowing close inspection (GF).

ARCTIC SKUA *(S. parasiticus)*

Mercury Bay Oct 74 - Feb 75, two in the bay whenever White-fronted Terns were working; 28/10/74, after chasing a tern, one skua was observed to land on the water, dip its breast about a dozen times then partly stand up in the water and flap its wings; this process was repeated two or three times (ABJ). Several records Jan-Feb 75 from Coromandel and Bay of Plenty; one flying over the land at Maketu (RWJ). Foxton, noted from 27/12/74 - 19/4/75, maximum 10 on 22/2/75 (JLMM); 2 on 20/4/75 (HAR). Ngauranga 26/4/75, 4, working on terns and gulls (RNC). Christchurch estuary, one on 16/3/74, 21/4/74, protruding tail feathers of April bird well seen (RG).

BLACK-BACKED GULL *(Larus dominicanus)*

A pale cream coloured bird observed at Waikanae estuary from 27/2/75 is apparently this season's bird as it was watched on 13/3/75 begging food from a normally coloured adult (MLF). Matakitaki Valley, Nelson, June 74, 50 at the foot of the mountain chain (CFJO'D). Colony on tussock edge on Lammerlaws about ½ hour drive from Lake Mahinerangi, late Dec 73, 20 adults, six live and two dead chicks; chicks mobile enough to run into tussock or out on to boggy area (DRD).

BLACK-BILLED GULL *(L. bulleri)*

Firth of Thames, 1974-75 season, three nesting colonies at Taramaire, Limeworks and Kairito (BB). Wairoa river and estuary, 300 wintering 1975; Whakaki lagoon 8/3/75, 350; 28/6/75, 1000 (GF). Rotorua , Travel Lodge silica flats, 35 nests with eggs, 10/11/74; dogs seen molesting the gulls; nests destroyed, probably by vandals (AP). Two colonies in rolling tussock country on the schist plateau 1½ miles SW of Sutton, about 600 yards apart; one of four nests with eggs, the other 129 nests with eggs. The small colony about 15 ft from the edge of boggy ground, the larger one in short vegetation on a shelf about 150 yards from a swampy hollow. Both colonies completely open to predation and disturbance by stock. The Taieri river where gulls normally nest is 2 miles to the east (JC). Southland, small colony just started 28/8/74, Dawson city dam near Whitestone river. First chicks just hatching at Oporo, Oreti river, 6/10/74. Total breeding population on Oreti river Oct-Nov 74 estimated 48000 pairs; no floods; very successful breeding (RRS). Road Hedgehope-Winton 27/1/74, 326 dead gulls in 10 miles (MLB).

BLACK-FRONTED TERN *(Chlidonias hybrida)*

Firth of Thames Feb-Mar 75, single birds (BB, AP, THH). Rangitaiki estuary 6/4/75, 2 (AP). Waikanae 17/4/75, three harassing a Rook (MLF). 26/4/75, 3 at Evans Bay, with White-fronted Terns over schooling kahawai (BDB); 2 at Kaiwharawhara (RNC). Kaikoura, observed 2-3 miles offshore from fishing boat, May-July, one-two birds at a time, surface feeding (SCS). May 74, 10 in Foveaux Strait, 50 at Paterson Inlet (RJP).

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

Kaituna 12/10/74, one in breeding plumage, flying over lupins and upsetting stilts (RWJ). Westshore, HB, 16/3/75, one (NBM). Manawatu estuary 5/10/74, one (JLMM). Cass River 29/12/74, one in breeding plumage, with 40 Black-fronted Terns. Spider lagoon, Sumner, 26/10/74, one, breeding plumage; 13/11/74, two in breeding and one in non-breeding plumage; 21/11/74, two non-breeding, one intermediate plumage; 9/12/74, 3 non-breeding, one intermediate plumage (RJP).

GULL-BILLED TERN *(Gelichelidon nilotica)*

25/5/75, between Plimmerton and Pukerua Bay, two birds thought to be this sp. (BDH).

CASPIAN TERN *(Hydroprogne caspia)*

A bird banded as a chick at Palliser Spit on 18/11/67 was recovered at Mahuta Gap, Dargaville, on 21/6/75 (DEC).

ARCTIC TERN *(Sterna paradisea)*

Aramoana 31/12/72, one feeding over water half way along the mole (MJH).

FAIRY TERN *(S. nereis)*

Mangawhai, one nest, two eggs, 15/12/74; breeding unsuccessful (SMR). Waipu estuary 18/12/74, 4; three on 23/12/74 and 10/1/75 (TGL).

LITTLE TERN *(S. albifrons)*

Kermadecs, 13/10/74, a bird feeding in broken water off the south end of South Meyer thought to be this sp.; bill dark (CSK). Rangiputa 20/10/74, 36 (RBS); 1/11/74, 45 (JHS); 15/12/74, 57 (ATE). Waipu estuary 29/3/75, 12 (TGL). Tapora 1/3/75, 58; 30/3/75, 48 (SMR). Karaka, 2/11/74, 8 (RBS); 16/12/74, 10; 15/3/75, 8 (BB). Firth of Thames ,22/11/74, 16 (RBS); 2/1/75, 20 (BB); 30/3/75, 15 at Limeworks, 10 at Taramaire (THH). Sulphur Point, Tauranga, 5/1/75, one (JFMF); Ohope Spit 29/12/74, 8 (RMW). Westshore, HB, 16/3/75, one (NBM). Manawatu, 1975, small terns thought to be this sp., 2 in June, one in July, 4 in August and Sep (EBJ).

WHITE-FRONTED TERN *(S. striata)*

Bay of Plenty, Tanner's Point, 2/1/75, 70 birds, 20 nesting, one egg just hatched; there was a 3.5 m. tide; as little waves splashed up to the edges of two nests on which birds were sitting, a third bird, standing between them, systematically tossed shells and twigs back to form a sort of rough tip to the nests, to stem the flood (JHS).

SOOTY TERN *(S. fuscata)*

Wellington Harbour, Ngauranga, 12/3/75, one; strong southerly and rough sea. Last observation prior to above, 4 birds at the junction of Tory Channel and Queen Charlotte Sound, 27/2/68 (HLS).

WHITE-CAPPED NODDY *(Aous minutus)*

March 1975, a bird blown into Houhora harbour during Hurricane Alison was picked up dead by Mr M. Richards, Pukenui, and sent to Auckland Museum (ATE). 3/5/75, two seen from TEV Rangitata, 5 miles NE of Waipara mouth, with White-fronted Terns; weather very bleak, with light rain (JRJ).

N.Z. PIGEON *(Hemiphaga novaeseelandiae)*

Waitakaruru 14/7/74, eating flower buds and flowers of early flowering wattle (MPD). Hatepe, Lake Taupo, one on 18/1/75, the first seen here in 15 years (WAW). Heaphy Track, Jan 75, seen, especially near Brown and McKay huts and in a nikau grove near Heaphy river mouth (BB). Banks Peninsula, Okuti bush reserve (about 15 acres), 21 in three willow trees, Sep 73 (SCS). Several reports of pigeon becoming accustomed to urban surroundings, e.g., Parnell, Auckland, Apr (GE) and June 75, when one in Rose Gardens was mobbed by sparrows (TGL); one on a power pole, Weraroa Road, Levin, Aug 75 (EBJ); a conspicuous bird in Akaroa township, May 74; frequently seen flying in central Christchurch and especially observed in Botanic Gardens, Hagley Park, Bealey Avenue (where six were seen in one tree, above traffic lights during the evening rush hour) and in well treed parts of Fendalton, Merivale and St Albans; strong preference for holly berries (SCS).

The Chatham Island Pigeon *(H. n. chathamensis)* was observed in Jan 75 in the southern part of the main island (PJM, DEC).

ROCK PIGEON *(Columba livia)*

At least 50 nests in holes in cliffs and boulders on an island just off Mt Maunganui, 17/11/74; of 8 nests inspected six had eggs and two had chicks (AP).

MALAY SPOTTED DOVE *(Strephtopelia chinensis)*

1975, at Kidd's farm, Karaka (BB, AH) and at Kingseat Hospital, Patumahoe (RP).

BARBARY DOVE *(S. risoria)*

Port Ohope, 3/1/75, one caught and closely examined; identification checked with R. H. D. Stidolph. Similar doves have been seen at intervals in Whakatane district for a number of years but this is my first definite identification (RMW).

WHITE COCKATOO *(Cacatua galerita)*

Two at Birkenhead Oct 74 (SMR). Riverhead, two seen regularly 21/12/74 - 6/1/75; they removed the terminal growing points of pine trees and fed on the base of the young needles (DWW).

GALAH *(Eolophus roseicapillus)*

Woodhill 8/6/75, one (presumably an escape) seen by 14 Auckland members in a hillside paddock (SMR).

COCKATIEL *(Nymphicus hollandicus)*
Atawhai Drive, Nelson, 12/5/75, two on telegraph wires; one seemed slightly larger than the other and had the outer tail feathers darker but otherwise both had the appearance of females, according to Slater's plate 54. The birds are said to have been in the area since before Xmas 74. Presumably escapes, but no local residents are known to have lost any Cockatiels (FHB, CRB).

N.I. KAKA *(Nestor meridionalis septentrionalis)*
Mareretu Forest, Waipu, 28/12/74 (TGL). One at St Helier's Bay 17-21/1/75 (SMR). Regular on Kohukohunui Track, Hunua, 1974-75 (TGL). One reported by P. Howard at Pollok, Awhitu peninsula, 22/4/75 (BB). Gisborne area, Ngatapa, one in a 3-acre patch of bush, 21/8/74 (AB); Matawhero, one present May-Sep 75, favouring a small clump of gum trees; no native bush in the area. Responds to taped calls, takes nectar from gum flowers and accepts cut orange put out by a local resident (JCH). Tihoi forest, W. Taupo, seen Feb 75 and reported numerous there (RWJ).

S.I. KAKA *(N. m. meridionalis)*
St Arnaud township 4/11/75, 4 in a beech tree (PJ). Small numbers in high country, Matakitaki Valley (CFJO'D). Heaphy Track, Mt Perry, Jan 75 (BB). Christchurch, one about Red Cliffs and Sumner until captured on 8/6/75; thought to be a wild bird (RG). Seacliff, Otago, 9-11/8/75, one feeding in a large broadleaf tree; very tame, possibly an escape (JH). Cascade Creek 18/12/74, 17 (WMJ). Stewart Island, May 74, Oban area and forested slopes on both sides of Freshwater Valley (RWJ).

KEA *(N. notabilis)*
Heaphy Track, Jan 75, calls heard in early evening, Brown Hut; seen at Perry, Saddle and Downs huts (BB). Matakitaki Valley, birds seen by spotlight in full darkness, come down from high country to scavenge at known feeding sites, June 74 (CFJO'D). Saddle Creek, 14-20/12/74, visited each night by a Kea (WMJ).

EASTERN ROSELLA *(Platycercus eximius)*
Regular evening flight to roost in totaras at Pakotai; also noted at Broadwood and Maungatapere (RSC). Bred on Waiheke Island 1974 (CS). Pollok, Awhitu peninsula, 22/4/75, P. Howard reports 30 on a farm; Kauerenga Valley 28/9/74, three parties, each of 3-4 birds (BB). Opoteri Forest nursery, Tairua, 5 on 9/7/75 (RWJ). Increasing round northern slopes of Mt Cargill, party of 5 regular 1973 (GH). Silverstream, flying from rough grass to pines, 18/1/75 (JH).

KERMADEC PARAKEET *(Cyanoramphus novaezelandiae cyanurus)*
Plentiful on Meyer Islet; not seen on Raoul Sep-Dec 74 but JI reported one seen June-Aug 73 at Rayner Point, Low Flat and near the Met. Station (CSK).

RED-CROWNED PARAKEET *(C. n. novaezelandiae)*
Tiritiri Matangi Island 12/10/74, 3 (SMR). Kohukohunui Track, Hunua, 12/12/74, 3 (BB, TGL). Ben Bell reports answer to

taped call at Gurney Road, Belmont, 22/6/75; reported at McKay's Crossing by P. Harper (MLF). Small numbers on bush fringed farmland, Matakitaki Valley, June 74 (CFJO'D).

CHATHAM ISLAND RED-CROWNED PARAKEET *(C. n. chathamensis)*

Seen in the SW of the main island, Jan 75 (PJM).

YELLOW-CROWNED PARAKEET *(C. auriceps)*

Monmouth Redoubt Gardens, Tauranga, Jan 75, one which seemed attracted by calls of caged kakas (JHS). Tihoi forest, W. Taupo, 22/2/75, two came to taped calls (RWJ, AP). Leith Valley, 1974, one mile below Leith Saddle on the Waitati side, climbing round in low shrub (JH). Paringa, 1960-73, often observed in silver beech and totara second growth (SCS).

SHINING CUCKOO *(Chalcites lucidus)*

A very late call at Milford, 21/5/75 (SMR). Young cuckoo being fed by fantail, Rotorua 8/12/73 (AP). Motueka Valley, flocking noted on four occasions, Jan 75; on 5/1/75, 12 in a small black beech at 0655 hours summer time, much calling, with" tsiu "notes, for about 3 minutes, then all left, flying north. Similar flock on 7/1/75 in garden shrub, 12 birds; flocks, not countable, on a walnut tree on two occasions. Christchurch March 74, a bird catching moths (SCS). Immature stunned by flying into window, Dunedin 7/3/75 (RFS).

LONG-TAILED CUCKOO *(Eudynamis taitensis)*

Bay of Islands, Urupukapuka, one on 6/12/74 (DW). Takanini 1/5/75, one in flight, harried by starlings (AJG). Responding to taped calls, Little Barrier, 3/11/74 (DAL). Rotorua, first call heard 29/9/74; calling at 2120 hours 6/11/74; 3/12/74, 2300 hours, one flying down an unlit street, perching and calling at intervals (AP); 11/2/75, one flew into a window at F.R.I., then lay spread-eagled on the grass below while a Tui repeatedly dived at it, approached by Mrs Moore, it flew towards the buildings, again hit a window, hid for a time and when found flew, with tail spread (RWJ). Upper Hutt 2/12/74, several calls heard 0300 hours (HLS). Port Ligar, observed from boat, two calling and flying from tree to tree close to shoreline (SCS). Nelson Feb 75, one landed briefly in a buddleia in garden (FHB). Christchurch, one spent 14-17 Apr 75 in Four Square bulk foodstuffs store at Northcote; defied all efforts of Fire Brigade, Museum staff and store staff to capture it and did not take advantage of loading bay doors left open earlier and later than the normal working day on its account. Finally the management had glass removed from a skylight about 40 ft above ground level and within ten minutes the cuckoo had taken this route to freedom (SCS).

MOREPORK *(Ninox novaeseelandiae)*

Mangonui, Sep 75, one calling throughout the morning up to 1100 hours, possibly activated by morepork call on radio (ECMC). Several instances of daylight calling, e.g., Tanner's Point, Tauranga, 1500 hours 11/8/74 (JFC); Rotorua district 0900 and 1000 hours 24/12/74, and the " cree " note at 1140 hours 3/1/75, Minginui (AP); Nelson, 1000-1100 hours (CFJO'D). Tutakaka 18/3/73, one which

had perched at night near a road lamp attempted to catch in flight clods of earth tossed into the air near its perch (SCS). Dome Valley, north of Warkworth, 1630 hours 6/4/75, one which was roosting about 5 m. above ground was mobbed and put to flight by three tuis. The first tui swooped to within 1 m. of the owl and then perched 3 m. from it, uttering a prolonged series of scolding calls. After about 5 minutes, with three tuis in attendance, the owl flew a short distance to a more sheltered situation; as it flew the tuis, which immediately before had been silent, joined in a loud chorus of mewing calls but did not pursue it (MJT). Rotoma hill at dawn, one swooped low over my head and returned to a tree, several times; no sign of a nest (AP).

SPINE-TAILED SWIFT *(Chaetura caudacuta)*

Surville Cliffs, near North Cape, 5/12/74, 6 circling over and below the cliff top; all dark except for white under tail and on throat (GC).

FORK-TAILED SWIFT *(Apus pacificus)*

Foxton Beach 14/6/75, one seen on three occasions as it hunted over the dunes. Tail long and deeply forked, plumage black but for a white rump, greyish white throat and greyish edging to feathers of breast and belly giving a scalloped appearance, only observable at close range. Flight strong and vigorous with frequent changes of direction, alternate glides and short bursts of flapping or the typical swift see-sawing action, as we have observed overseas (JLMM).

KINGFISHER *(Halcyon sancta)*

Oakleigh 6/7/74, 25 along one mile of power lines (TGL). Opoutere, abundant; three working in dead calm water 1½-3 ft deep, from perches 5-6 ft above water level; after each splash dive they returned to the perch, beat fish on branch and swallowed it; when a ripple developed they fed on crabs at the water edge (BB). Featherston, one arrived in the eastern quarter of the town on 21/9/75, the first seen here for 15 years; the nearest known Kingfishers are about 2 miles away. Since it arrived it has called frequently and flies around what would appear to be the perimeter of a territory, but so far no sign of a nest or a mate (HC). Balmacewen, one eating a Waxeye which it had killed by hammering it on the clothes line (JH). Fortrose 15/8/74, the only two birds in the area use a high bare driftwood tree in the intertidal zone as an anvil; over 280 crabs' legs counted on sand below the tree (MLB).

KOOKABURRA *(Dacelo gigas)*

Puhoi, Feb-Mar 75, several present; three seen together on 30/3/75 (MJT).

RIFLEMAN *(Acanthisitta chloris)*

Opepe Reserve, Taupo, 17/8/74, 2; Mt Ngongotaha 18/8/74, 6 (AP). Nelson Lake Rotoroa June 74, common in bush up to 3500 ft a.s.l. (CFJO'D). Heaphy Track Jan 75, small parties in beech forest, Brown to Lewis Huts (BB). Hanmer 21/4/74, pair in blackberry tangle at the edge of a stand of larch. At Lake Ohau, Easter 1962, a family party of 5 Riflemen adopted our fishing campsite; they were very tame and after our meals would feed on clean fat and

grease from frypans and plates (SCS). Cave (S. Canterbury) 9/11/72, two in a plantation of pine, oregon and larch (RJP). Arrowtown 24/2/74, two in willow trees (DAL).

ROCK WREN *(Xenicus gilviventris)*
Gertrude Valley, Fiordland 19/12/74, two (WMJ).

SKYLARK *(Alauda arvensis)*
Buffalo Beach, Coromandel 15/9/74, 8 pairs on foreshore, where only one pair of pipits was noted on 18/9/74 (ABJ). Nelson Road, Gisborne 10/5/75, flock of 100 (AB). Waimatuku 1/5/73, still singing, but subdued (MLB).

TREE MARTIN *(Hylochelidon migricans)*
1975, reported at Waipori near Lake Waihola (MLF).

WELCOME SWALLOW *(Hirundo neoxena)*
Muriwai Lakes 9/2/75, 87 (SMR). Great Barrier 5/2/75, 2 at Kaitoke swamp (AJG). Kawau I., 7/4/75, flying in and out of a cave at Lady's Bay, near Mansion House (MDW). Tiritiri Matangi I., 12/10/74, breeding in old woolshed (SMR). Waiheke I., Orapiu Bay, Aug 75 (CS). Te Atatu beaches 10/11/74, 15 (AM). A pair flying round Jellicoe Wharf, Auckland 26/11/74 (SMR). Waiuku, nest in a cowshed wrecked by mynas 21/10/74; population round farm pond up from 2 to 14 in 1974; two swallows dived on a kingfisher three times and later chased it; the kingfisher had been sitting on a power line normally used as a perch by the swallows (IWJ). Papakura, 30 on a clothes line on two successive days in Jan 75 (BB). Waikato University area, up to 38 seen prior to 1974 nesting season (TC). Very plentiful around Lake Waikare shore 1974 (MPD). Whitianga 30/1/75, 15 (RWJ); three miles further north at Simpson's Beach, 26/1/75, 50; increasing between Hikuai and Whitianga (ABJ). Te Aroha 28/9/74, ten nests under wooden bridges (AP). Bay of Plenty, Tanner's Point, nest attached to a clay bank near the top of a small dome formed underneath an overhanging pohutukawa, between branch and bank, 3 m. above tide level; 4 feathered young on 28/10/74, 5 eggs on 20/11/74 (JFC). Matata 29/10/74, nest with 5 eggs under a small concrete bridge (AP). Te Teko, pair with three young 29/1/75 (CFJO'D). Wairoa, Korito (Te Paeroa) lagoon, 11/5/75, c. 200 perching in long lines on fence wires; 17/5/75, 4-500 birds (GF). Rotorua 1/9/74, a pair collecting feathers from the gull colony and flying towards sewage works (AP). Hardcastle lagoon, Broadlands, Taupo, breeding suspected 13/9/75 (RWJ). Manawatu estuary 26/12/74, 20 (JLMM); Hokio 27/2/75, 50 (EBJ). Paekakariki, nested, 4 young 23/11/74; Pauatahanui, two seen by BDH, 1975 (MLF). Upper Hutt, Apr-May 75, several present near confluence Hutt and Wakatikei rivers (HLS). Blenheim 26/6/75, 4 at Hutcheson Street bridge; Kaikoura 9/12/75, two at Middle Creek bridge (JAC). Nelson tidal flats 1974-75, pair bred under a culvert, probably two broods; pair round a bridge in Maitai Valley from late May 75; pair at Tahunanui beach Dec 74 (CFJO'D). Gouland Downs Jan 75, 2 (BB). 26/1/75, Westport, 7; Charleston, 12 (MLB). Mawheriti, near Reefton, 27/2/74, 2 (DAL). Paringa, Easter 73, two at river mouth (SCS). Ashley river mouth, 15/2/75; 1974-75, usual nest under wooden bridge at Methven; Opihi river mouth 30/6/74, 10; 29/11/74 and 19/1/75, 2

(RJP). Washdyke lagoon 10/5/575, 12 (PS). Lake Wainono 19/3/74, 35; 27/6/74, 20; not seen Nov 74 - Jan 75 (RJP). Waikouaiti lagoons 4/8/74, 3 (JH); four over a pond on a farm near Black Head 20/6/74 (GG); Berwick, near Ram Island, flocks of up to 200 March - April; birds roost on two rowing boats by jetty; some birds about at Xmas 72 (HS). Lake Waipori 1973, seen frequently at the pumping station during Sep - Oct, maximum 26 in Oct, 16 on 1-3/11/73; had departed when searched for over the following 2-3 weeks (PS). On the Clutha river near Stirling, late March - early April 74, 19 (LO). Southland 1974, widespread and abundant throughout the district in winter and early spring, flocks of over 100 recorded. Last spring sightings, 6 at Lake Murihuku 25/10/74, two at Lochiel 28/10/74. No summer sightings or evidence of breeding. First autumn sightings 25/2/75, three at West Plains, one at Waituna lagoon; steady build-up as winter approaches; particularly abundant on Mataura river from Gore to Gorge Road (RRS). Sandhill Point 14/3/75, 5 over lagoon in dunes (WAW). Waimatuku, 16/3/75, 9 (MLB).

PIPIT *(Anthus novaeseelandiae)*

In farmland around Kerikeri and in sand dune country at Waipu (TGL). Hatepe, Lake Taupo, two frequently seen on pebbly foreshore of lake at periods of low water level (WAW). Summit of Mt Tarawera 1/6/74 (DAL). Nelson Lakes National Park, in tussock country 4500-5000 ft a.s.l., June 74 (CFJO'D). Mt Robert, 31/8/74, numerous on side of mountain, some in snow on top of the ridge (PJ). Heaphy Track, Jan 75, plentiful and confiding (BB). Dunback lime quarries, 20/7/75, one in open tussock, 1000 ft (JH). Outram, first for the winter, two on 25/4/74; occasional subsequent sightings on farm paddocks, particularly close to the river (GG).

HEDGE SPARROW *(Prunella modularis)*

Rotorua, singing 22/6/75; 21/9/75, a pair on a flower bed, pecking at fresh compost. The female moved her tail and vibrated her wings; the male pecked her under the tail. She repeated her performance; the male flew to a tree and sang. She continued to feed on *Poa annua* seed and grass tips, ignoring bitter cress (*Cardamine* sp., so loved by Greenfinches) (RWJ).

FERNBIRD *(Bowdleria punctata)*

Northland 1975, in manuka scrub at Puketotara and Kapiro; in manuka scrub and raupo at Puketona (TGL). Tapora, one on 1/3/75 (SMR). Bay of Plenty, Matata, Little Waihi and Ohiwa (AP). Volcanic Plateau, near Lake Okataina, near Rotorua airport, round a pond in Whaka forest, in a boggy valley on Ruapehu; at Waimarino (National Park) one came right up when a tape recording of Spotless Crake call was played (RWJ, AP). Pukepuke lagoon, in raupo, 23/2/75, the first sighting for about 2 years (WJP). Heaphy Track, seen or heard at each stop across Gouland Downs from Perry's Hut, Jan 75 (BB). Greymouth, Paroa swamp, 7/1/75, several (JAC). Mt Cargill, Dunedin, two in open cassinia scrub on north side of summit, 17/5/75 (PCB) and also a few days later (CB).

BROWN CREEPER *(Finchia novaeseelandiae)*

Heaphy Track Jan 75, Downs to McKay Hut section, six in beech forest with Tits and Bellbirds (BB). Hanmer, good numbers

in radiata and larch stands on the way to the forest fire lookout, 21/4/74. Paringa, near M.O.W. camp, observed frequently in silver beech and totara second growth, 1960-1973 (SCS). Banks Peninsula, small flocks seen in a number of patches of bush (RG). Cascade Creek 18/12/74, 10 (WMJ). Stewart Island May 74, two parties each of 7-8 birds, in manuka near Freshwater River (RJP).

YELLOWHEAD *(Mohoua ochrocephala)*

Near Lake Chalice, Wairau Valley, 24/1/73, 2600 ft a.s.l., one, in 60% open canopy forest with dense understorey and moderate basal area; forest composed of red and silver beech with some rata and kamahi (RG). Not found in the head of Boyle Valley Apr 75, though its presence there had been reported (JRJ).

GREY WARBLER *(Gerygone igata)*

Remuera, song 7/4, 28/5, 17/6/74 (TGL). Hawking insects over the river in Tarawera forest, 21/8/74 (RWJ).

FANTAIL *(Rhipidura fuliginosa)*

Black Fantails at Titirangi 6/6/75 (SMR), at Turangi, May 75 (MB) and at Gisborne 23/5/74; a pure albino at Muriwai, Gisborne, 10/6/75 (AB). Volcanic Plateau 1974, nest sites noted include conifers, coprosma, 15 ft in a rose bush, a hedgerow, manuka, a 3 ft high fern on a bank, and hanging roots under a roadside bank. In Rotorua a bird entered a broken street lamp in pursuit of insects, 2/4/75 (AP). Winter 75, notable increase of Fantail numbers in Kaikoura district (JAC) and in Ward district after a very wet summer (TJT).

PIED TIT *(Petroica macrocephala toitoi)*

Waitakere Ranges, Auckland, not uncommon (JFS). Hunua, Kohukohunui track Dec 74, 24 (BB, TGL).

YELLOW-BREASTED TIT *(P. m. macrocephala)*

Matakitaki Valley, mountain beech and scrub up to 4000 ft, June 74 (CFJO'D). W. Southland, Port Craig to Sandhill Point, Apr 75, constantly seen and heard in bush (WAW).

N.I. ROBIN *(P. australis longipes)*

North Kaimai Range, S.F. 14, seen and song heard 10/5/75 (JFC). Mangaorewa S.F., 27/4/75, numerous in silver beech-tawa-kamahi forest (MDW). Otanewainuku S.F., near Te Puke, two singing 16/8/75; Horohoro S.F., Mamaku, 31/5/75 (RWJ).

S.I. ROBIN *(P. a. australis)*

Pelorus bridge, common; came out of bush to camping ground and entered tents in search of insects and crumbs. Matakitaki Valley up to 4000 ft, in mountain beech, June 74 (CFJO'D). Heaphy Track, Jan 75, one singing continuous sub-song was watched closely for 5-10 minutes; bill was closed, but several times the bird assumed a " raised eyebrow " look, apparently as breath was inhaled (BB). Common in Hope and Hurunui valleys (RG).

BLACKBIRD *(Turdus merula)*

Whitianga 1/2/75, a bird picking in a fish pond, suspect taking water snails (RWJ). Heard in deep bush at Mangaorewa S.F., 27/4/75 (MDW). Rotorua, a nearly pure white Blackbird seen carrying food to its young (AP).

SILVEREYE *(Zosterops lateralis)*

Te Kuiti, still flocked throughout Sep 74, 50 feeding on a crop of young rye corn (TC). Rotorua 16/8/74, feeding on *Prunus campanulata,* putting head right into the flowers to feed. 21/8/74, hawking insects over Tarawera river, chased by a Chaffinch (RWJ). Mahitahi, S. Westland, small flocks observed in paddocks in heavy rain and surface water, inspecting and penetrating rush clumps above water level and obtaining caterpillars and insects probably forced out by surface water (SCS).

BELLBIRD *(Anthornis melanura)*

Tiritiri Matangi I., 12/10/74, 43 (SMR). Hunua, Mt Kohukohunui, a pair, 24/11/74 (TGL). Kauerenga Valley, Thames, moderate numbers on 29/9/74 (BB). Noticeable increase in Bellbird population on East Coast in recent years (JCH); Aug 74, numerous reports from Gisborne suburbs (AB). Rotorua, feeding on nectar of willow catkins 29/8/74 (RWJ). Hanmer, Apr 74, probably the most conspicuous bird, constant song from all types of exotic forest stands, both deciduous and evergreen. In Canterbury foothills any gully with a patch of tall matagouri and/or manuka will support at least one pair. Where scattered mountain or black beech clumps occur together with water and flax the habitat is even more suitable and numbers of resident Bellbirds increase accordingly. In the plains the Bellbird is a common winter (May-Sep) visitor, birds moving from foothill scrub and bush to farm plantations where the winter flowering *Eucalyptus leucoxylon rosea* grows in association with pines and willows; a few pairs remain through summer and nest. In Banks Peninsula, round Lyttleton harbour and in Port Hills, Bellbirds are present and often common in every remnant of scrub or low second growth bush and in exotic stands. In May 74 constant song was heard in all parts of Akaroa township. Motueka Valley, Bellbirds noted feeding in lombardy poplar tops, on totara berries and on black beech honey dew. A juvenile was observed daily from 1-9 Jan 75; when first seen it had a very short tail, traces of down, crinkled yellow at gape; was estimated to be about 5 days out of the nest and could easily have been caught by hand, but was already independent. For the first six days it was not observed outside a 16 m. radius, frequenting two large black beech trees and never more than 5 m. from the ground; catching insects in ground litter, taking insects and honeydew from trunks and branches, and making short, clumsy but successful hawking flights to catch flying insects. It constantly uttered a high-pitched cheep, but I did not at any time see it visited by an adult. By the end of the observation period it had extended its range by about 45 m. to include a neighbouring clump of black beech, was ascending up to 10 m. from ground, flying and moving much more efficiently; the traces of down had disappeared, the yellow at gape had almost gone and its tail had grown to nearly normal length (SCS).

TUI *(Prosthemadera novaeseelandiae)*

Rotorua 27/9/74, 0800 hours, seven flying from the town to the bush on Mt Ngongotaha, perhaps returning from a dawn visit to suburban gardens (AP). A party of 8 flew over Lewis Hut, Heaphy Track, at dusk on 28/1/75 (BB). From the summit of Lewis Pass to Murchison, 9/11/73, both visibly and audibly the most conspicuous bush bird. Much of the area is under beech forest (mostly red, some

silver and mountain beech); Tuis near the road were taking nectar from native fuchsia; they were abundant in the red beech of Shenadoah saddle. Large kowhai stands on Maruia river flats and flax, plentiful on the flats and above the bush line, probably help to sustain a high population at other times of the year. Woodstock, Motueka Valley, Dec 74 - Jan 75, Tuis widespread and conspicuous but not abundant. The first bird to call in the morning, about 0430 hours (summer time) while it was still dark. Observed searching and feeding in the tops of lombardy poplars, outer branches and canopy of black beech and at low level in manuka; always present in willows lining the river bank; occasionally taking nectar from tobacco flowers and taking honeydew from trunk and branches of black beech; eating ripe muehlenbeckia berries; chasing other birds away but allowing itself to be hustled out of the vicinity of a Bellbird's nest by the male parent. Tuis and Bellbirds feeding on honeydew move rapidly, clinging to vertical trunks, hanging upside down on boughs, hopping on branches, moving from one droplet of honeydew to the next, holding successive droplets on the tip of the tongue till sufficient has accumulated to form a large drop, which is then swallowed (SCS).

CIRL BUNTING *(Emberiza cirlus)*

Manawatu, Aokautere, 18/4/75, 2 (HAR). A possible sighting in Wellington, above Clifton Terrace (MB). Stoke, 19/5/75, 5 in garden (HFH); Rough Island, Nelson, 16/6/75, 4-5 (FHB). Marlborough Nov 74, one on farmland near Wairau river (BDB), one near Wairau mouth (BDH).

CHAFFINCH *(Fringilla coelebs)*

Rotorua, a female taking pale blue aphids from a cabbage (RWJ). Lower Hutt 3/5/75, one with a " bachelor " flock at Gracefield had the whole plumage yellowish cream except for an almost white wing bar (JLMM).

GREENFINCH *(Carduelis chloris)*

Ward, Oct-Nov 74, 3-500 on Flaxbourne River terrace flats (TJT). Spencerville 20/4/75, flock of c. 200 (RG). Waimatuku 16/3/75, flock of 14 hawking insects in air, churring call in flight (MLB).

GOLDFINCH *(C. carduelis)*

Rotorua, eating dandelion seeds 25/4/75; seeds of *Cryptomeria japonica* 1/7/75, birds hanging like a European tit as they pulled out the seeds (RWJ).

REDPOLL *(Acanthis flammea)*

Waerenga, birds usually arrive here in June but none seen in 1975 (MPD). Heaphy Track, Jan 75, flocks on Gouland Downs and south of Heaphy river; also common Stockton to Westport (BB). Hangaroa, Gisborne, flock of 80, 26/8/74 (AB).

HOUSE SPARROW *(Passer domesticus)*

Pecking at flax flowers 1/2/75, Rotorua (RWJ); attacking its reflection in a car bumper, Jan 75 (AP).

STARLING *(Sturnus vulgaris)*

Rotorua 6/9/74, two fighting; one stood on the other's breast, pecking vigorously at its head (AP); 14/5/75, four birds feeding on black aphid nymphs on *Acer palmatum* (RWJ). Manawatu, 20

catching insects on the wing, flying like swallows but with long periods of gliding with spread tail; often launched themselves from the tops of 30-60 ft macrocarpas; it was a warm calm day (HAR). Christchurch ,one carrying food, probably worms, 31/1/75 (JRJ).

INDIAN MYNA *(Acridotheres tristis)*

Tiritiri Matangi Island, 5/10/69, 11; 12/10/74, 23 (SMR). Rotorua area, a nest in a sandbank and three nests in roadside banks, Nov 74. Dec 74, three birds fiercely attacking a cat; Jan 75, one attacking its own reflection in a car bumper (AP). Seen just outside Wanganui Jan 75 (CFJO'D). 1975, rarely seen in Dannevirke and Hunterville, where it was fairly common some years ago (HAR). Trentham, an adult on 14/10/74 and a juvenile 13/1/75 (HLS). Riverlands, Blenheim, one in Dec 74; the small group which formerly lived here was thought to have disappeared (TJT).

KOKAKO *(Callaeas cinerea)*

Tutamoe mountain (north of Dargaville), in rimu-kahikatea forest, Kokako heard 29/6/75, heard and seen 13/7/75, 300 m. in from bush line. A local farmer reports seeing a Kokako at the other end of the forest (MEMcK). Hunua, Kohukohunui, 24/11/74, 3 seen; a pair on 19/4/75 (TGL). Rotoma hill 24/12/74, two pairs in heavy forest (AP). Otanewainuku S.F., near Te Puke, tawa-kamahi-kohekohe-mahoe-coprosma, heard more than one Kokako on 16/8/75 (RWJ). Tahora, Nov 74, three pairs on spurs off trig, calling 0540-0900 hours; 1975, Aotuhia Valley, Round Hill, reported by J. Weston; heard by J. Clark above Boys' Brigade hut at Rerekapa stream, North Taranaki; a further report indicates presence of two pairs in this area (RWW).

BLACK-BACKED MAGPIE *(Gymnorhina tibicen tibicen)*

Waiotira, one on 6/9/74 (TGL). One on Napier-Taupo highway 1/10/74; 3/1/75, Minginui, two, with one white-backed, in freshly cleared and burnt coniferous forest (AP). Single birds at Tangimoana 5/2/75 and at Foxton Beach 24/3/75 (JLMM).

WHITE-BACKED MAGPIE *(G. t. hypoleuca)*

Tutaki Valley near Murchison, a pair on 18/6/74 (CFJO'D). Miss Mary A. McLachlan, Christchurch, writes — " in December 1974 a magpie died at the age of 32 years. There is no doubt about its age because I gave it to my niece in 1942 and she has the record in her diary. Its food was beef and a little cooked egg yolk, supplemented with anything it fancied in the garden."

ROOK *(Corvus frugilegus)*

Miranda 25/11/74, 46 (RBS); 23/3/75, 30 (BB). Akaaka, one reported May 75 (IWJ). North of Tolaga Bay on west bank of Uawa river, 4/5/75, 8, apparently survivors of recent extermination efforts in the area. Matawhero, 2/8/75, one, reported present for the past two months; NE of Lake Tutira 11/4/74, 48, paddock feeding (JCH). Uruti, Taranaki, 4 on 25/1/75 (CFJO'D). Manawatu, 5 on the river NE of Palmerston North 28/9/74 (HAR); 3 flying over Pukepuke lagoon 15/10/74 (WJP); a big influx in Jan 75, flocks of 250 seen at Cheltenham and H. Wenham reported c. 500 feeding on barley stubble, NE of Palmerston North. These large flocks later disappeared from the district (HAR). Waikanae estuary 17/4/75, one (MLF).

SHORT NOTES

FURTHER SIGHTINGS OF NANKEEN KESTRELS IN HAWKE'S BAY

I recently wrote some short notes (*Notornis* 22: 175-176, June 1975) about my sighting of a Nankeen Kestrel *(Falco cenchroides)* at Bridge Pa Golfcourse on 25 April and subsequent sightings of a kestrel by other reliable observers near Napier Airport over a period of weeks. I suggested, that due to evidence available at the time, that one bird was responsible for these sightings. However, it seems that more than one bird is present in the Napier-Hastings area — at least two and very probably three.

On 12 June, I was informed by some friends that they had sighted a bird they felt to be a kestrel, flying around the quarry where they worked. They had first seen it two days before, and on the following day I saw this bird myself and confirmed that it was a Nankeen Kestrel. I have had many sightings of this same bird since as it has established a territory with the quarry cliff as its roost. It may be observed any morning sunning itself at its perch which is usually about ½ to ¾ up the quarry face. This face would be about 20-30 m high and has numerous small ledges and holes on it. It stays for about ½ hour to 1 hour then flies away. Sometimes it is seen during the middle of the day as it flies about (it frequently attacks passing harriers) but always returns to roost between 4.30 p.m. and 5 p.m. Often there is heavy quarry machinery in operation when it returns to roost, but does not seem to be at all disturbed by the noise and movement. I have spent some hours observing this kestrel through 10 x 50 field glasses and am fairly certain it is an adult female because of its head and tail markings and colour. It seems quite probable that this kestrel is the one I first sighted at Bridge Pa because the quarry is quite close and would be visible to any kestrel flying nearby. It would no doubt present a strong attraction as a secure, sheltered place to roost.

On 19 June about 12.15 p.m. I was observing the " resident " kestrel whilst having my lunch. It had been sitting on a fence post at the very top of the quarry face for about 20 minutes occesionally preening. It then flew off and disappeared behind the cliff. A couple of minutes later, it reappeared briefly, chasing what seemed to be another kestrel. Hoping they would appear again, I was ready with my glasses when they did. I was able to confirm from this second longer sighting that the other bird was another kestrel, and, because it had lighter head and tail markings and was slightly smaller, I feel it could possibly be a male. Unfortunately, this second bird has not

been seen since and was probably driven off its territory by the female, However, presuming they are opposite sexes, there might be a possibility of them nesting on the quarry face.

The kestrel that was sighted at Napier is still being seen fairly regularly by reliable observers. It is rather unlikely that it is the second bird seen by me at the quarry since the distance between the two areas is about 29 km. One rather interesting fact remains to intrigue me: one of the men who first sighted the " quarry " kestrel maintains he saw three of them one day flying near a small flock of Rooks. Having seen two myself in this area, I have no reason to disbelieve this perhaps rather extravagant statement.

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YELLOW-NOSED MOLLYMAWK *(Diomedea chlororhynchus)* RECORDED IN THE CHATHAM ISLANDS

The Sisters Islands (43° 35'S, 176° 50'W) represent the northern outliers of the Chatham Island group, some 800 kilometres east of New Zealand. Between October 1973 and January 1975 about 14 weeks were spent on the Middle Sister as part of an intensive study of the status and breeding biology of the *Diomedea* species at their most northerly breeding locality in the New Zealand region.

Soon after our arrival on 21 January 1975 a strange Mollymawk was observed and photographed at 1030 hrs moving among nesting Northern Royal Albatross *(Diomedea epomophora sanfordi)* on the western side of the island. When compared with Bullers Mollymawk *(Diomedea bulleri)* which also breeds on the island a number of differences were immediately evident. These were its small size, single yellow bill stripe, cherry-pink tip to the bill, dark triangular eye patch, and light grey nape and back of head. The underwing was largely white with the narrow black margin wider on the anterior edge (Fig. 1).

Though remaining on land for only a few minutes it was easily identified as a Yellow-nosed Mollymawk *(Diomedea chlororhynchus)* in adult plumage. Apart from its plumage characteristics, the mode of walking with a forward horizontal movement of the head was unlike any other mollymawk in the New Zealand area (Fig. 2).

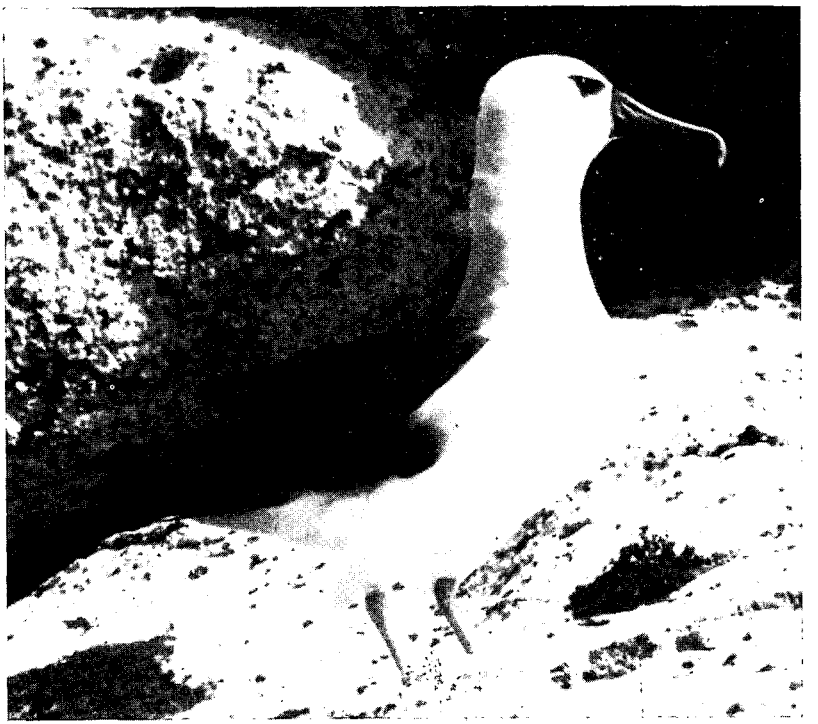

FIGURE 1 — Yellow-nosed Mollymawk ashore on Middle Sister Island, Chatham Is., 21 January 1975.
Photo: C. J. R. Robertson

Previous records of this species in the New Zealand area have been limited since the first beach wrecked specimen in 1921. The following are these records, the basis for which can be found in the appended " References."

1. Muriwai Beach, 1 Ad., 21 Aug., R. A. Falla.
2. Off North Cape, 2 Ad., 16/8/32, R. A. Falla.
3. Off Three Kings Is., 5 Ad., 1 + Imm., 17/8/32, R. A. Falla.
4. Between Hen I. and Poor Knights Is., 1 Ad.?, 4/8/58, B. D. Bell.
5. Off Tutukaka, 1 Ad.?, 22/4/60, B. D. Bell.
6. West of Three Kings Is., 1 Ad., 1 Imm., 4/10/62, A. Y. Norris.
7. Little Barrier I. (skull), 1?, 1962, R. B. Sibson.
8. Off Bay of Islands, 1 Imm., 5/10/62, A. Y. Norris.
9. Outer Bay of Plenty, 1 Ad., 12/10/62, A. Y. Norris.
10. Hauraki Gulf, 1 Imm., 4/6/63, F. C. Kinsky.
11. Waiau River mouth and off Kaikoura, 1+ Ad.?, 5/6/71, J. R. Jackson.

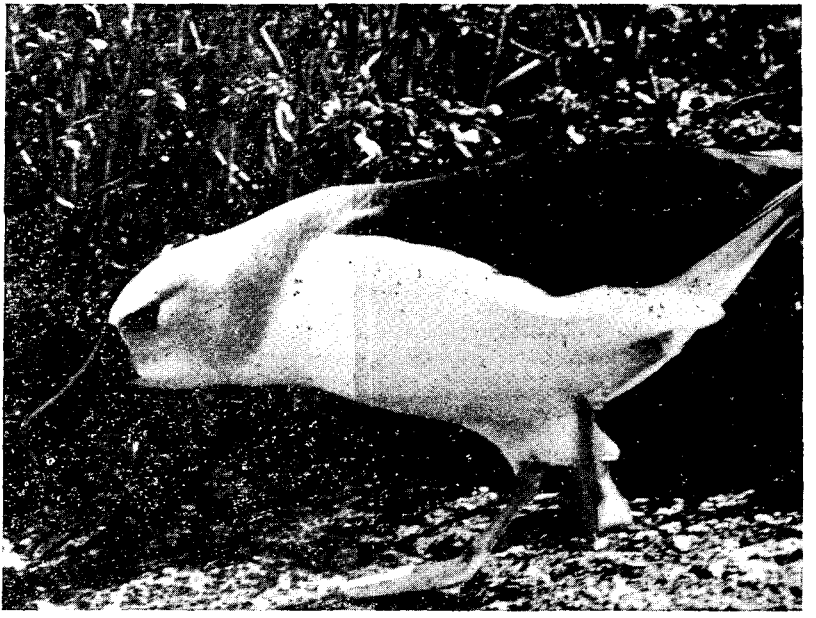

FIGURE 2 — Yellow-nosed Mollymawk, walking posture. Middle Sister Island, Chatham Is., 21 January, 1975.
Photo: C. J. R. Robertson

The closest breeding grounds for this species are at Amsterdam and St Paul Is in the South Indian Ocean where the breeding season extends from September to April. From May to October birds are found at sea in decreasing numbers eastwards across southern and eastern Australia. It is evident from the above records that New Zealand probably marks the limit of their winter range. This Chatham Island record for January would seem to be a vagrant caught well out of its normal breeding range and in search of company.

REFERENCES

AMIET, L. 1958. The Distribution of **Diomedea** in Eastern Australian Waters: North of Sydney. Notornis 7 (8): 219-230.
BELL, B. D. 1960. Yellow-nosed Mollymawk in Northern New Zealand Waters. Notornis 9 (3): 109.
FALLA, R. A. 1933. Notes on New Zealand Petrels. Records of the Auckland Institute & Museum 1 (4): 173-180.
NORRIS, A. Y. 1965. Observations of Seabirds in the Tasman Sea and in New Zealand Waters in October and November 1962. Notornis 12 (2): 80-105.
ROWAN, M. K. 1951. The Yellow-nosed Albatross at its Breeding Grounds in the Tristan da Cunha Group. Ostrich 22: 139-155.

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FURTHER NOTES ON PROCELLARIIFORMES OCCURRING IN COOK STRAIT

WHITE-CAPPED and SALVIN'S MOLLYMAWKS

The reliability of the dark tip of the lower mandible (mandibular unguis) for separating Salvin's Mollymawks *(Diomedea cauta salvini)* from White-capped Mollymawks *(D. c. cauta)* has been questioned by Vooren (1973) and others. Although all adult Salvin's Mollymawks show this feature, a dark mandibular unguis may persist in adult White-capped Mollymawks even after the rest of the dark grey on the bills of first and second year birds has disappeared. Recently Johnstone *et al.* (1975) found White-capped Mollymawks on their breeding grounds at Albatross Island, Bass Strait, with dark grey at the tip of the bill, especially on the mandibular unguis. Although most of these birds did not appear to be attached to a nest (so were probably subadult), some were seen feeding chicks. My statement (Bartle 1974) that the dark mandibular unguis in *salvini* is the most reliable feature for separating adults of these subspecies in the field is therefore wrong. There is, however, no doubt about the identity of the numerous *salvini* in Cook Strait during autumn because they have been identified by a combination of characters including size and bill, head and mantle colouration.

To complicate matters, Johnstone *et al.* found some White-capped Mollymawks on Albatross Island with pale grey on the neck and cheeks. They pointed out that the dark mark at the base of the leading edge of the underwing is also common to both subspecies. The only diagnostic features of *salvini* always visible at sea may be the larger area of black on the tip of the underwing and the paler grey mantle (Harper & Kinsky 1974, plate 3).

Johnstone *et al.* concluded that nearly all adult White-capped Mollymawks spend the night on the colony, and not at sea. This agrees with the scant nocturnal activity of this mollymawk observed in Cook Strait (Bartle 1974).

BLACK, WESTLAND BLACK and WHITE-CHINNED PETRELS

The side plates (latericorn and ramicorn) of the bills of adult Black Petrels *(Procellaria parkinsoni)* are not an even bluish shade as I described them (Bartle 1974). In fact, the yellowish side plates contrast strongly with the blackish nails of the upper and lower mandibles when seen at sea in good light (J. M. Moreland, pers. comm.). The colour of the latericorn and ramicorn in adult *parkinsoni* is intermediate in hue between the " buff-yellow " and " spectrum yellow " of Smithe (1975), whereas in the Westland Black Petrel *(P. westlandica)* these bill plates are even more whitish in hue than the " cream colour " illustrated by Palmer (1962) and Smithe (1975). Oliver (1955), Falla *et al.* (1966), and Serventy *et al.* (1971) are mistaken in describing

the latericorn and ramicorn of adult *parkinsoni* as " bluish white," " bluish horn," and " bluish white " (respectively). The yellowish colour may fade after death. However, several specimens in the National Museum which had " blue-grey " side plates when freshly dead were found to be immature birds (F. C. Kinsky, pers. comm.), suggesting that bill colour changes with age.

The large size of the Westland Black Petrel and its relatively larger bill enable separation from *P. parkinsoni* at sea under good conditions. An excellent photograph (taken off Guatemala) showing the much less prominent bill of *parkinsoni* is given in Jehl (1974, Fig. 2), although he erroneously states that the bill of *P. parkinsoni* is " relatively much stouter " than *P. westlandica* and *P. aequinoctialis*, for the converse is true. The photograph of the White-chinned Petrel *(P. aequinoctialis)* in Vooren (1973, Fig. 5) clearly shows the heavy pale bill. Recent observations of White-chinned Petrels at close quarters in Cook Strait (December 1974) confirmed my view that the " cream coloured " nails of the mandibles are the most useful character for distinguishing White-chinned Petrels from other large black petrels at sea (Bartle 1974).

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LITERATURE CITED

BARTLE, J. A. 1974. Seabirds of eastern Cook Strait, New Zealand, in autumn. Notornis 21 (2): 135-166, figs 1-3.

FALLA, R. A.; SIBSON, R. B.; TURBOTT, E. G. 1966. A field guide to the birds of Nef Zealand and outlying islands [1st ed.]. London and Auckland: Collins.

HARPER, P. C.; KINSKY, F. C. 1974. New Zealand albatrosses and petrels an identification guide. Tuatara 21 (1 & 2): 1-80, figs 1-17, pls 1-21, appendices 1-2.

JEHL, J. R. 1974. The near-shore avifauna of the Middle American west coast. Auk 91 (4): 681-699, figs 1-3, 1 table.

JOHNSTONE, G. W.; MILLEDGE, D.; DORWARD, D. F. 1975. The White-capped Albatross of Albatross Island: numbers and breeding behaviour. Emu 75 (1): 1-11, figs 1-6; tables 1-4, plate 1.

OLIVER, W. R. B. 1955. New Zealand birds 2nd ed. Wellington: A. H. & A. W. Reed.

PALMER, R. S. 1962. Handbook of North American birds. Vol. 1. New Haven and London: Yale University Press.

ROBERTSON, C. J. R.; KINSKY, F. C. 1972. The dispersal movements of the Royal Albatross **(Diomedea epomophora)**. Notornis 19 (4): 289-301, figs 1-5, tables 1-2.

SERVENTY, D. L.; SERVENTY, V. N.; Warham, J. 1971. The handbook of Australian sea-birds. Sydney, **&c.**: A. H. & A. W. Reed.

SMITHE, F. B. 1975. Naturalist's color guide. New York: the American Museum of Natural History.

VOOREN, C. M. 1973. Notes on sea birds between New Zealand and the Bounty Islands. Notornis 20 (4): 301-310, figs 1-5, tables 1-3.

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WHITE FORM OF THE SOUTHERN GIANT PETREL: FURTHER N.Z. RECORDS

New Zealand coastal voyages during the past 18 months have produced the following records:—

1. 12th September 1974, position 40°57'S 176°25'E, vessel 9 miles ESE from Castle Point. One white Southern Giant Petrel *(Macronectes giganteus)* with scattered black spots on body and upper wing and a pale yellow-brown bill. The bird was closely observed following the vessel for 24 minutes, it then settled on the water with dark plumaged Giant Petrels (*Macronectes* sp.) which were feeding on galley refuse. It was then seen intermittently during the next 45 minutes following the vessel and occasionally flying out on the vessel's beam. Other ship-following birds were 14 dark Giant Petrels (*Macronectes* sp.), 80+ Cape Pigeons *(Daption capensis)* and 3 Wandering Albatrosses *(Diomedea exulans)*.

2. 18th August 1975, position 35°52'S 174°32'E, vessel entering Whangarei Harbour during gale conditions with wind North Easterly 40 knots. A white Southern Giant Petrel followed the ship from the Fairway Buoy in as far as Busby Head (2 miles). Plumage was entirely white apart from a few black spots, bill light brown and the feet appeared black. Strangely, the bird had a piece of rope about 3 feet long attached to one leg. This did not appear to affect the bird's flight power and in the very strong wind the rope streamed out behind like an extended tail. Indeed at first glance the observer thought he had sighted an immense Tropic Bird, *"Phaethon giganteus"* ?.

Other birds included 10 dark Giant Petrels (*Macronectes* sp.) and 15 Cape Pigeons which followed the ship into Whangarei Harbour as far as the Refinery jetties.

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SOME THOUGHTS ON A DIFFICULT DOTTEREL, *CHARADRIUS MONGOLUS*

When collating more than 30 years' jottings on Banded Dotterels *(Charadrius bicinctus)* in the Firth of Thames, I came upon a forgotten note describing what I called at the time a 'Mystery' Dotterel. In the light of wider experience there can be little doubt that the bird was a Mongolian Dotterel *(Charadrius mongolus)*, a migratory species

which had been causing confusion among Australian ornithologists (McGill & Keast 1945) and at that time had not been detected in New Zealand (Hogg 1961).

On 25 November 1945 C. A. Fleming, H. R. McKenzie and I spent some hours on the west coast of the Firth of Thames south to Miranda. We were especially interested in the Banded Dotterels. Some pairs were still occupying territories and nests with eggs were found. Some young of the season were already on the wing and flocking had begun, one flock numbering about twenty birds. On the bottom of a drying pool was a mixed gathering of adult and youngsters . One of the adults was already losing its bands. Sandy, speckled first-flying plumage easily separated the two or three young birds. Nearby was a dotterel which puzzled us greatly and " which we felt ought to be *bicinctus,* but if it was, was certainly something of a freak."

The description in my notebook reads: " White forehead and superciliary stripe, with black running back from bill through eye. Single blackish band across chest; high about one third of an inch wide perhaps fainter in middle. Legs muddy green or greenish grey. Otherwise like a Banded Dotterel. No note heard. Size of Banded Dotterel. Markings clear cut; no smudginess. Certainly not a juv. *bicinctus.* The single band and the distinct white superciliary stripe made it unlike *bicinctus* going into eclipse, for there was no sign of the bigger chestnut band on the lower chest. Even C.A.F. thoroughly foxed. If not a Banded Dotterel, what can it be ? Certainly not *hiaticula, alexendrinus, dubius, leschenaulti."* It had an air of paleness, missing in *bicinctus* at this season.

The migratory plover, now commonly called the Large Sand Dotterel *Charadrius leschenaulti* was noticed for the first time (Sibson & Bull 1946 *a*) in New Zealand in 1943. One was again found in 1945 (Sibson & Bull 1946 *b*). Subsequently, many local observers became familiar with the species (Sibson 1953) and it is now accepted as a rare but regular visitor. With its large bill and conspicuous eye-patch, it is not a hard bird to identify especially if other species of dotterel are at hand, as they often are, for purposes of comparison.

However, the smaller migratory dotterels in first winter or eclipse plumage are acknowledged to be a very difficult group. Perhaps the most difficult is *mongolus.* Later in the same summer, 1945-1946, as that in which I took notes on the unusual dotterel at Miranda, McKenzie (1946) reported on two puzzling dotterels which he watched at Ruakaka and considered might be *mongolus* beginning to assume breeding plumage. As *mongolus* was then unknown in New Zealand, it was wise to be cautious.

For most of its stay in the southern hemisphere, *mongolus* is a rather plain dotterel without a single salient feature. But before it

leaves for its Asiatic breeding grounds, it becomes highly ornamental in both sexes. On 6 May 1957 K. A. Hindwood, in his typically kind and thoughtful way, took me to Botany Bay, Sydney, where we were able to watch at close range with other waders a flock of c. 20 Mongolian Dotterels, most of which were very richly coloured in readiness for migration. Serventy & Whittell (1948: 147) mention "rufous red breast-band lined with black above," Vaurie (1965: 378-80) states that "the white throat is separated from the russet breast by a narrow blackish or dark brown line." What is especially significant is that, as nuptial plumage is assumed, the black edging above the rich rufous emerges last and during the post-nutial moult is the last to fade, becoming what Macdonald (1973: 154-155) describes as "a narrow dusky band on upper breast."

If the enigmatic Miranda dotterel of late November was an adult *mongolus* in the last stages of moulting into eclipse and if the two dotterels described from Ruakaka in February were adults just starting to assume breeding dress, as happens in south-eastern Australia (Hindwood & Hoskin 1954), the riddle of their identity is solved and the solution is in accord with our present greatly increased knowledge of the species (Urquhart 1963).

With these thoughts in mind, it appears that the first sightings in New Zealand, not only of *leschenaulti* but also of *mongolus,* can be dated back to the mid-1940s.

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LITERATURE CITED

HINDWOOD, K. A.; HOSKIN, E. S. 1954. The waders of Sydney. Emu 54: 217-255.

HOGG, M. J. 1961. Reports on two rare waders (a) Mongolian Dotterel. Pp. 154-156, 1 fig. **in:** BELL, B. D., McKENZIE, H. R. & SIBSON, R. B. Field study course at Farewell Spit, 22-29/1/1961. Notornis 9 (5): 145-

MACDONALD, J. D. 1973. Birds of Australia. Sydney, **&c.**: A. H. & A. W. Reed.

McGILL, A. R.; KEAST, A. J. 1945. The Mongolian Sand Dotterel in Australia. Emu 44: 202-216.

McKENZIE, H. R. 1946. Puzzling Dotterels at Ruakaka. N.Z. Bird Notes 2: 75.

SERVENTY, D. L.; WHITTELL, H. M. 1948. A handbook of the birds of Western Australia. Perth: Patterson brokensha.

SIBSON, R. B. 1953. Further Notes on **Charadrius leschenaulti.** Notornis 5: 179-181.

SIBSON, R. B.; BULL, P. C. 1946 **a.** On the Occurrence of Geoffroy's Sand Plover in N.Z. Emu 45: 223-224.

SIBSON, R. B.; BULL, P. C. 1946**b. Charadrius leschenaulti** again in N.Z. Emu 46: 7-77.

URQUHART, JULIETTE. 1963. Mongolian Dotterel at Karaka. Notornis 10 (5): 234-235.

VAURIE, C. 1965. The Birds of the Palearctic Fauna. Non-Passeriformes. London:

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A DAWN CHORUS

During the Rotorua-based OSNZ field study course of Labour Weekend 1975, I took the opportunity to listen to a dawn chorus and made the following notes.

Dawn chorus. 4 km S of Te Teko. 27 October 1975; 0515-0630. Open farmland adjacent to swamp and scrub. Weather fine with hazy cloud. Sunrise: 0622 NZ Daylight Time.

0515-0530	All quiet
0530	Skylark flight song; Pheasant call
0532	Blackbird song
0534	Song Thrush song; Pukeko call
0537	Blackbirds and thrushes singing on all sides
0542	Magpie brief snatch of song
0545	Fantail song
0555	Grey Warbler song
0557	Californian Quail call
0558	Spotless Crake call
0559	Chaffinch song
0605	Shining Cuckoo call
0607	Starling song
0608	Cockerel
0609	Mallard quacks
0614	Greenfinch call
0618	Silvereye song and call; Greenfinch song
0622	Sunrise — obscured by cloud
0623	Mynah calls
0626	Goldfinch flight calls
0630	Note taking discontinued

Comment: Although it is open to question whether dawn chorus reports have more than general interest in New Zealand conditions, Labour Weekend being the first in Daylight Time appears a good date to make such observations.

MICHAEL J. TAYLOR

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Auckland 5

LETTER

The Editor,
Sir,

PARAKEET HYBRIDS

The natural hybrids between subspecies of the Red-fronted *(Cyanoramphus novaezelandiae)* and the Yellow-fronted Parakeet *(C. auriceps)* on the Chatham Islands reported by Taylor (*Notornis* 22: 110-121) caused him to pose possible causes for the hybridization and to wonder whether such hybrids would swamp-out one of the parent species ? May I comment from my own observations of captive individuals of the nominate species and from my examination of museum material ?

The reduction in the proportion of hybrids and the maintainance of the number of Yellow-fronted Parakeets in the three years from 1970 to 1973 is interesting. This may not be immediately evident from the way that the figures were presented; but if we disentangle the percentages then in 1970, from a population of sixty, 5 were Yellow-fronted, 19 were Red-fronted and 36 were intermediates. In 1973 (reducing the then estimated population of one hundred down to sixty) 4 were Yellow-fronted, 28 were Red-fronted and 28 were intermediates.

In England New Zealand parakeets will breed at any time of the year. Except for the tropics, where the food source is maintained at approximately the same level throughout the year, such reproductive licence is generally given to opportunist breeders such as the Budgerigar *(Melopsittacus undulatus)* and the Zebra Finch *(Poephila guttata)*, species whose gonad development is correlated with nourishment and not day-length. Perhaps the reproductive physiology of New Zealand parakeets is also linked with the availability of food ? Competition for food might be important. The different widths to the bill between sexes, and between the species, perhaps is best explained as being adaptations to reduce intra- and interspecific competition: enabling them to take a wider range of foods than would otherwise be available (Lack, D. 1971. Ecological Isolation in Birds). In all the species males are the larger sex and the Red-fronted is larger than the Yellow-fronted Parakeet. If we ignore species and plot, using all species, the width of the upper mandible against wing length this produces a straight line curve: showing that the width of the bill is directly proportionate to body size (pers. obs.). The greatest difference in size between individuals is, therefore, when a male Red-fronted is compared with a female Yellow-fronted. The least difference is between a female Red-fronted and a male Yellow-fronted Parakeet.

These differences in size are obstacles to successful hybridization (pers. obs.). In the first case, when the male is very much bigger than the female, fertility is low because one, or both, tend to topple over when treading. In the other case large females are unnaturally dominant over the males. Dominance is correlated with size. This is demonstrated, in the second case, by the female reversing the usual sexual pattern and she regurgitatory-feeds the male. The male further shows subservience by being excessively hesitant in responding to the sexually soliciting female. Fertility, not surprisingly, is again low. The pair-bond, which is partly maintained by regurgitatory-feeding and copulation (pers. obs.), is, therefore, not particularly strong in both cases and is easily disrupted by a more suitably-sized rival.

Taylor suggests that on the Chatham Islands the Yellow-fronted subspecies is about the same size as the Red-fronted; but is it ? The measurements of museum skins, given for Forshaw (1973, Parrots of the World) do not bear this out. If Taylor is correct, and they are now the same approximate size, perhaps because the altered habitat causes many Red-fronted to be stunted by an insufficiency of food during the rearing period, then being equal-sized, they would be more likely to form hybrids.

In the wild hybrids sometimes result from scarcity of one species relative to the other (e.g. Brown, R. G. B. 1967. *Ibis* 109: 310-318): this might also apply to the Chathams. But the argument that differences in feeding ecology in what are, after all, very similar species of parakeet would be a natural barrier to hybridization is debatable: if bill size is correlated to food source and to the manner of feeding (Lack, D. *loc. cit.*). The difference in feeding pattern between the two species is but a further extension of the, very probable, similar feeding distinctions between the different-sized sexes ?

It is more than likely that the parakeets identify possible mates because of their relative size, behaviour and, as we ourselves recognize the difference between species, by the different coloured fronts to the head and the ear coverts and, perhaps, by the pitch of the voice. If this is so then this explains how selection for a mate, were hybrids available, would not be indiscriminate but favour the more ' correct ' size and colour. In other words not only are there barriers to interspecific hybridization but these same barriers tend to eliminate hybrids from the population by ' mopping them up ' selectively with the appropriate ' pure ' species. Hence the reduction in the Chatham Island parakeets over the three year period of regeneration of natural vegetation.

GEO. A. SMITH

158 Broadway,
Peterborough PE1 4DG,
England
22 October 1975

HENRIETTA MARY McKENZIE, 1897 - 1975

Nothing is here for tears, nothing to wail
Or knock the breast; no weakness, no contempt,
Dispraise or blame; nothing but well and fair.
Milton.

When Hetty McKenzie passed quietly away on 17 August 1975, the Ornithological Society and other kindred societies had occasion to mourn not only a " lady sweet and kind," but also an indefatigable worker whose life had been a shining example of service to the community.

Born at Thames in 1897, she moved with her family to Warkworth where she lived for fifteen years. In 1917 she started her training as a nurse at the Auckland Public Hospital, a fortifying experience; for among those she tended were casualties from World War One. In March 1918 Ross McKenzie, still under 21 but a ' veteran ' of the Somme and an amputee who had suffered serious concussion, but was no longer a hospital patient, returned to New Zealand. Though Ross and Hetty had been only slightly acquainted before, they soon became engaged. They were not married till 1921 after Hetty had completed her training and Ross had earned — or, as he puts it — scraped together enough money to build a house at Clevedon, the house on the knoll, which with its extensions is now so well-known to ornithologists from New Zealand and elsewhere.

As there was no trained nurse in Clevedon, Hetty at once began a voluntary nursing service. The nearest doctors came to depend upon her heavily; often and confidently calling for her help. She tended many convalescents. Serious cases she sometimes nursed in her own home; or she would bundle other patients off to hospital many miles away in an old 1929 Chevrolet of blessed memory. This service, which went on for nearly half a century, was greatly appreciated by the people of Clevedon and there was general rejoicing in 1953, when Hetty was honoured by Her Majesty Queen Elizabeth II and received the Coronation Medal. Regularly, but with some diffidence, did she wear it on Anzac Day parades.

Meanwhile, the family had been increasing, three girls and two boys; and in the 1930's there arose the problem of secondary education and boarding fees. The challenge was accepted. While Ross continued as an accountant, the family moved out of Clevedon to the Ness Valley and for nine years Hetty became a ' cow-cockie,' milking twenty cows. Although she had little knowledge of dairy farming, Ross had been brought up to it. With the help of such children as were not away at school, the venture succeeded by hard work and in spite of

hard times. Simultaneously, in the secluded Ness Valley, Hetty did her most demanding nursing. She was also involved in war work, church work and local affairs. She was Matron of the war emergency hospital at Clevedon, attending farewells and home-comings of local servicemen, one of whom was her elder son who went overseas as a radio-operator/air-gunner in the RNZAF. She also served on a committee to help the rehabilitation of those who returned. Involvement with the OSNZ began in 1941 and a trickle of birdwatchers began to reach the Ness Valley.

Emancipated from farming and with the family grown up, the McKenzies returned to Clevedon, but not to a life of leisure. The wonder was that one pair of hands could do so much. Hetty worked a long day. In 1964 she responded to an appeal for qualified nurses and for eighteen weeks she was on night duty as a Sister at Green Lane Hospital, going to and fro, a daily distance of forty miles, in the last of the three antiquated family 'Chevs.' Meanwhile, in more senses than one "Kiltarlity" was a hive of ornithological industry. For more than a decade Hetty performed the formidable task of despatching *Notornis*, about a thousand copies, plus notices, four times a year. From 1960 to 1975 she handled the sale and issue of back numbers. In 1965 she became Librarian, a post she retained till she went into hospital in March 1975.

Hetty was the last person in the world to claim that she was a serious ornithologist. But her powers of observation were acute. Ross's book was very much hers too; for it could not have been compiled without her flair for camping, driving and improvisation. Her great interest was in helping people, especially the young, the hungry or the injured. The 19 members of an expedition which explored Farewell Spit in 1961 still recall with relish the delicious dinner which she concocted in the old woolshed after a Forest Ranger had given a haunch of venison. On tour Ross and Hetty delighted in seeking out bird-watchers in all parts of the country from Spirits Bay to Stewart Island. The title "*In Search of Birds in New Zealand: How and Where to Find Them*" came from Hetty. She was the gentle power behind the throne, proof-reading, checking, never obtruding, always 'on the go' without fuss.

One of her most appreciated services was to visiting naturalists from overseas. How they came to enjoy her home-made bread, her fresh scones and apple shortcake! One of her greatest admirers was Joyce Grenfell.

The Ornithological Society offers its deep sympathy to Ross, his children and grandchildren. To know Hetty McKenzie was to love her. Need more be said?

R. B. S.

REVIEWS

The Life of Birds by Joel Carl Welty. 2nd Edition. W. B. Saunders Co., Philadelphia. pp. xii + 625. Many figures, photographs and tables. 1975. N.Z. $16.65.

This is a revised, enlarged edition of a one-volume survey of bird biology first published in 1962. It was then, in this reviewer's opinion, the best book for the general reader covering its field and despite several competing works, still seems to retain the lead although the price has soared meanwhile.

The book consists of 24 chapters reviewing the present state of knowledge of a wide variety of bird topics. A review of the orders and families of birds following " Peters " and Wetmore is accompanied by a brief survey of new techniques for assessing relationships based on analyses of body proteins, ectoparasites and so on. Then follow 3 chapters on anatomy, 3 on body functioning, 4 on behaviour and vocalisations, 4 on breeding and allied topics, 2 on bird ecology and population regulation and one each on zoogeography, migration and orientation, the origin and evolution of birds and birds and man. Each chapter is complete in itself, is copiously illustrated and ends with a short list of suggested further readings.

Welty has succeeded well in presenting succinct, modern, well-documented accounts of the various topics. His list of about 1700 references includes a few as late as 1974, but mostly his coverage is up to 1972 and for that reason some recent work such as that on continental drift and on the possible origins of birds from dinosaurs is not discussed. The book is not for specialists and these will note inconsistencies (e.g. on p. 317 the Manx Shearwater is named *Procellaria puffinus,* on p. 487 *Puffinus puffinus*) and some errors of fact and interpretation, but considering the scope of the work the factual accuracy seems high.

This book does not compete with Farner and King's *Avian Biology* which is more advanced, and it complements rather than competes with Thomson's *New Dictionary of Birds.* For Australasian readers a drawback is the bias towards studies made in America, Europe and Africa. Work undertaken in New Zealand is seldom mentioned and I noted not one reference to *Notornis.* Nevertheless the book can be fully recommended to those who need an up-to-date survey across the whole field of bird biology.

J. W.

Native Birds of New Zealand. A Microtone Colour Book. Text by D. H. Brathwaite. 32 pp., illus. in colour. Christchurch: Bascands Ltd. 1974. 90 cents.

Written by a well-known and widely-experienced member of the OSNZ, this profusely-illustrated booklet is one of a series covering such subjects as *'Auckland in Colour,' 'Christchurch in Colour,' 'The Maori in Colour,'* the related *'Wild Animals of New Zealand'* and *'Wildflowers of New Zealand'* as well as several titles on the National Parks.

The colour plates are first rate and are from such outstanding photographers as Don Hadden, John Kendrick, G. J. H. Moon, Peter Morrison and M. F. Soper. Don Brathwaite gives a novel turn to his descriptions of each species and its natural history, philosophising on the origin and development of the New Zealand bird fauna, crediting the Spotted Shag with "avian beauty," postulating on the reduction of the Blue Duck, musing on the Variable Oystercatcher, the Fantail, the Bellbird and so on. The author's interest in avian taxonomy shows through his text (he was a member of the Checklist Committee responsible for producing the *Annotated Checklist)* from his linking of the White-fronted Tern with the Roseate Tern to his discussion of the relationships of Rifleman, Parakeets and Robins.

All in all, you couldn't get anything better for 90 cents!

E. W. D.

The New Zealand Environment 1968-1974. A bibliography of material available through N.Z. public libraries; including a select list of overseas publications. Compiled by Nancy Ellis. 198 pp. Wellington: Nature Conservation Council. 1975.

"Dedicated to all New Zealanders who love their country," this bibliography is a compilation of great worth and practical usefulness. Its contents include: N.Z. Laws and Statutes, official reports and environmental impact reports, with subsequent sections listing publications on conservation, pollution, land use, waste disposal, energy, population and regional development with a selection of overseas publications "of a basic or thought-provoking nature." Everybody concerned with environmental matters whether as members of action groups or local body committees or simply as ordinary inquiring members of New Zealand society needs such a publication as this. Especially useful to know about are articles published in the less-often seen or more ephemeral periodicals. How many of us read the *Architectural Association (Auckland) Bulletin, Charisma, Designscape, N.Z. Local Government* or *National Park News* or even the *N.Z. Company Director*? To balance our appreciation of environmental matters against other people's, our reading must extend beyond *Forest and Bird* and *Notornis.* At the least we need some knowledge of what has been published of relevance to our general concern for the environment of the birds which we study. The NCC bibliography provides a painless way of achieving this end and instructs us where we might look in the future.

E. W. D.

ABOUT OUR AUTHORS

JIM WATT, a past Treasurer of the Society, ranks ornithology as his major hobby, and one which compliments his other interests of nature conservation, photography, tramping and maritime history. He is a graduate of Lincoln College and Colorado State University and works as a scientist in DSIR's Soil Bureau. His professional interests relate to all aspects of land-use management, and particularly to the integration of soil science, soil conservation, hydrology and watershed management. Among his ornithological 'highs' he lists watching the dawn display of the sharp-tailed grouse in Colorado, the XIVth International Ornithological Congress's week-long excursion around the bird islands of Scotland in 1966, and regular returns to Stewart Island. Although he has lived most of his life in Dunedin, Jim and his wife Colleen and family have recently moved to Hawke's Bay.

PETER DILKS is a technical officer who has been employed by Ecology Division, DSIR, since late 1968. Initially, he worked at Havelock North on the breeding biology of Mynas and on the food and feeding of feral pigeons, but in 1974 he was transferred to Nelson where he now works on birds in the South Island beech forests. He has been involved with the OSNZ since 1962 mainly through participating in the Nest Record, Beach Patrol and Bird Mapping Schemes.

KATHLEEN C. HARRISON has maintained a life long interest in ornithology although had little opportunity during her early youth spent in the industrial north of England, to study the less common species of birds. It is only over the past two or three years that she has been able to devote the time and patience to bird-watching and she combines this activity most pleasantly with her many and varied interests such as rock climbing, photography and sketching.

PHILIP A. G. HOWELL is a technician in the Physics Department of the University of Canterbury who has had a life-long interest in natural philosophy. He has recently resumed a specific interest in forest and birdlife, after having to set it aside during some three decades devoted to communications technology.

PHILIP ZEIGLER, author of the observations on the development of feeding in captive Keas reported in the June issue of *Notornis,* is currently a Research Associate of the American Museum of Natural History, New York City, and director of an inter-disciplinary training programme in Animal Behaviour involving the Museum and the City University of New York. He received his Ph.D. degree from the University of Wisconsin where he was trained in both Neurophysiology and Psychology. This was followed by a Postdoctoral Fellowship at the University of Cambridge where he worked under W. H. Thorpe and R. A. Hinde (and shared the tea room table with the present Editor of *Notornis* !). It was at this time that he developed an interest in the neural control of species-typical behaviour in birds. Subsequently he has devoted himself primarily to the study of neurobehavioural mechanisms underlying avian feeding behaviour employing anatomical,

physiological and behavioural techniques. The sabbatical year in New Zealand offered an opportunity to spend some time in the field. He had hoped to study the feeding behaviour of native parrots under more natural conditions. The study reported in *Notornis* represents a realistic compromise between the impoverishment of a laboratory environment and the exigencies of the field.

NEW FROM WILDLIFE

Sound Library Catalogue. Edition No. 3. 25 pp. Wellington: Wildlife Service, Department of Internal Affairs. May 1975.

New recordings incorporated into the Wildlife Sound Library necessitate another edition of the catalogue. Although the subjects are mainly birds, they range as far as mammals, reptiles, amphibians and insects, concluding with the song (call ? or buzz ?) of a N.Z. Blowfly *(Calliphora quadrimaculata)* recorded on Little Barrier Island.

OSNZ members are reminded that the library can supply tape copies on loan or permanently on the borrower's own tape. Tapes are copyright but special arrangements can be made for wider use.

Wildlife — a review. No. 6, 1975. New Zealand Wildlife Service, Department of Internal Affairs. 58 pp.

Once again Wildlife has done its commendable public relations act by telling us what has been going on throughout the past year. Topics in this issue include: The honorary wildlife ranger scheme, R. T. ADAMS; Paradise Shelduck, M .J. WILLIAMS; New Zealand Shoveler, T. A. CAITHNESS; Black Swan, M. J. WILLIAMS; The timing of breeding of the Red-billed Gull, J. A. MILLS; Introduced predators and the South Island Robin, P. J. Moors; The Black Tomtit, H. A. Best; The Black Petrel, M. J. Imber; Kakapo, D. V. MERTON, concluding with a report by G. R. Williams on the International Symposium on the Conservation of marine birds held in Seattle in May 1975, and followed by a list of scientific publications.

Checklist of the Birds of Australia. Part 1. Non-Passerines. By H. T. Condon. RAOU, 1975.

The last checklist of Australian birds appeared in 1926. The present long-awaited work will be of very great interest to all OSNZ members concerned with taxonomy and distribution. Some of the name changes are likely to influence us on this side of the Tasman also. A special feature of the list is its extensive synonymy, both of species and of genera. A review by Mr D. H. Brathwaite will appear in the March issue of *Notornis.*

SUMMER SCHOOL OF ORNITHOLOGY, JANUARY 1975

If those members of the course who did not obtain notes of David Dawson's lecture, " Food, Feeding Behaviour and Habitat in Birds " will now apply to the organiser at the undermentioned address copies will be forwarded together with the notes on Don Brathwaite's lecture which will be forwarded to all members of the course early in the New Year.

F. H. Boyce,
19 Marybank Road,
Nelson.

XVIth INTERNATIONAL ORNITHOLOGICAL CONGRESS

The RAOU has published abstracts of papers presented at the IOC as a supplement to Volume 74 of *The Emu,* April 1975. Of particular interest to New Zealand ornithologists are:

A. J. BAKER. Systematics and evolution of Australasian oystercatchers; W. R. P. BOURNE. The evolution of the Petrels; T. A. CAITHNESS. Population ecology of the N.Z. Shoveller; J. A. D. FLACK. Aspects of the ecology of the N.Z. Robin; M. J. IMBER. Ecology of the Black Petrel; J. A. MILLS. Timing of breeding in the Red-billed Gull; H. OELKE. Population decrease of Adelie Penguins in the Ross Sea sector of Antarctica; C. J. R. ROBERTSON & L. E. RICHDALE. The breeding phenology of the Royal Albatross; M. J. WILLIAMS. Creching behaviour of Shelduck; J. KIKKAWA. Niches of birds in *Nothofagus* forests; F. TRILLMICH. Territorial and foraging behaviour of the South Polar Skua at Cape Hallett; J. L. CRAIG. Co-operative breeding of Pukeko; Y. LE MAHO, B. DESPIN & J. L. MOUGIN. Importance of weight in thermoregulation of penguins; J. WARHAM. Relations of size of body among Procellariiformes; P. F. JENKINS. Cultural transmission of patterns of song and origin of dialects in the Saddleback; D. F. PARMALEE & S. D. MACDONALD. Birds of the ecosystem of the Antarctic ice-pack; K. E. WESTERSKOV. The Southern Crested Grebe in New Zealand.

For anyone not lucky enough to have got to Canberra in August 1974, this Supplement will provide some measure of consolation; $A4 from RAOU, P.O. Box 5236 BB, GPO, Melbourne, Vic., Australia 3001.

★

PHOTOGRAPHS OF AUSTRALIAN BIRDS

The Australian Museum is at present compiling a National Photographic Index of Australian Birds and have suggested that some of our members who are photographers may have colour transparencies which should find a place in their collection. They are concerned only with species which occur in the official Australian Checklist but which includes several seabirds breeding in N.Z. and offlying islands. The Museum would appreciate the opportunity of placing such transparencies before their Selection Panel after which they would be returned promptly, prints having been taken for their collection. The photographers' exclusive copyright would remain unimpaired.

If a photograph is selected for publication in the Reader's Digest "*Complete Book of Australian Birds*" (with which the scheme is assisting) the photographer receives $40 less a 10% levy paid to the Museum. I can supply further information on submission procedure for those interested.

PETER GAZE, Secretary

REQUEST FOR INFORMATION ON 1975 INFLUX OF AUSTRALIAN SPECIES

During the late summer and autumn of 1975 a number of Australian birds appeared in New Zealand in unusually high numbers, including Little Egret, Cattle Egret, Glossy Ibis, White Ibis and Nankeen Kestrel. Hoary-headed Grebe, Nankeen Night Heron and Grass Whistle-duck have also been reported. Finally, a Little Black Shag found dead at Lake Paringa on 20 June had been banded as a nestling at Lake Brewster, New South Wales, on 20/2/74 — the first recorded movement of a shag across the Tasman according to David Purchase of the Australian Banding Office.

An attempt is being made to collate all New Zealand records for 1975, so members who have seen these Australian species are asked to report them either to their Regional Representative or to the organiser:

Dr Ben D. Bell,
P.O. Box 30466,
Lower Hutt.

Records of White Heron are also being received, as well as Royal Spoonbill: although there is a resident population of both species in New Zealand, more may have crossed the Tasman this year. It is possible that some of the other species might colonise as a result of the present influx, so records through to the end of the year will be of value. Reports of Nankeen Kestrels will be passed on to Brian D. Bell who is examining this species separately.