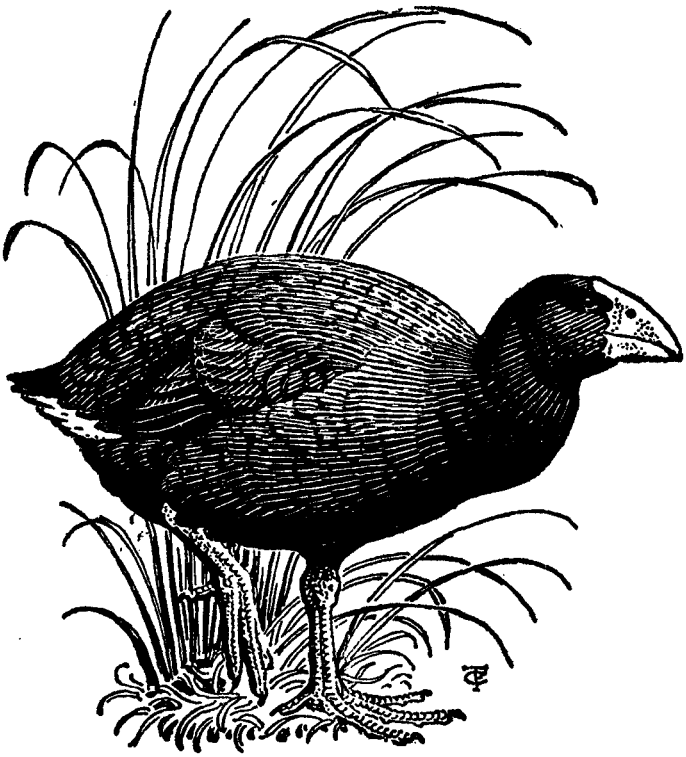
# NOTORNIS

Journal of the Ornithological Society of New Zealand



Volume 24 Part 4 December 1977

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NOMENCLATURE — Follow the OSNZ Annotated Checklist (1970) unless otherwise explained. Give scientific and common names (spelt with initial capitals) at first mention whenever possible.

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# NOTORNIS

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## BIRDS OF THE 1976 - 77 SNARES ISLANDS EXPEDITION*


By P. M. SAGAR



ABSTRACT

Four new species, Black Shag, Feral Pigeon, Shining Cuckoo and Long-tailed Cuckoo, and one new breeding species, Chaffinch, were recorded from the Snares in the summer of 1976-77. A total of 57 species (23 breeding species) have now been recorded from the Snares. The origins of the new recorded species are discussed. Several interesting band recoveries are presented.


### INTRODUCTION

The 1976-77 University of Canterbury Snares Islands Expedition was in the field from 9 November 1976 to 3 March 1977. A full research programme included a continuation of long-term studies of the breeding biology of the Snares Crested Penguin *(Eudyptes robustus)* and Buller's Mollymawk *(Diomedea bulleri);* breeding biology studies of the Snares Cape Pigeon *(Daption capense australe)* and Antarctic Tern *(Sterna vittata);* and a comprehensive collection of bird ecto-parasites.


Observations supplied by fellow expedition members, J. W. Early, G. D. Fenwick, Dr D. S. Horning and J. L. Woods, are gratefully acknowledged. All members participated in the band recovery and banding programme.


Place names mentioned in the text follow those of Warham (1967) and Horning & Horning (1974).

* University of Canterbury Snares Islands Expeditions Paper No. 32.

## SYSTEMATIC ACCOUNT

SOUTHERN BLUE PENGUIN *(Eudyptula minor minor)*

One bird was found in the sea off Mollymawk Bay on 14 January 1977. The bird was very weak and died within an hour. Spots of oil were found on the abdomen. This bird was preserved and is deposited in the National Museum, Wellington. Two records of single birds have been reported previously (Warham & Keeley 1969; Horning & Horning 1974), indicating that this is a rare, but regular, vagrant to the Snares.

BULLER'S MOLLYMAWK *(Diomedea bulleri)*

A bird, originally banded as a breeding adult by Dr L. E. Richdale in 1948, was observed incubating near its original nest-site (a Richdale nest peg was found). Fifty-one birds banded as breeding adults on the Snares in 1961 were recovered alive and healthy on the breeding grounds. Two birds, banded as chicks in 1972 on the Snares, were recovered alive and healthy as non-breeders.

The first adult of the 1976-77 season was seen on a nest on 6 December 1976 and the first egg was found on 1 January 1977.

LIGHT-MANTLED SOOTY ALBATROSS *(Phoebetria palpebrata)*

There were three sightings of single birds: flying along the North Promontory (9 January 1977); gliding over Sinkhole Flat (10 January 1977) and gliding along the south side of the South West Promontory (25 February 1977). Warham (1967) recorded the only other sighting of this species at Snares, a single bird gliding along the South West Promontory Razorback on 12 January 1967.

Giant Petrels: *NORTHERN GIANT PETREL (Macronectes halli)* and SOUTHERN GIANT PETREL *(M. giganteus)*

All but one of the giant petrels sighted were of the northern form with chestnut nail of the upper mandible. A single white phase specimen of the southern form, with an unmarked green bill, was seen 1 km off the Western Chain on 21 November 1976.

Giant petrel numbers remained low (1-5 seen daily off Observation Rock) during November and December. Numbers increased rapidly during January, especially off the penguin landing sites. The highest number recorded in the Station Cove - Ho Ho Bay area was 32, a number much less than the 100 - 125 recorded by Warham (1967) and Horning & Horning (1974). Numbers declined during February.

SNARES CAPE PIGEON *(Daption capense australe)*

Birds were found on eggs on 20 November at the North Promontory breeding colony. Two birds originally banded at Tory Channel were resighted at the Snares. One, found breeding at North Promontory, had been banded in June 1961 and the other, captured off Mollymawk Bay, had been banded in August 1963.

BROAD-BILLED PRION *(Pachyptila vittata)*

Horning & Horning (1974) reported live birds of this species on Rocky Islet, the first published record from the Snares.

On 10 December 1976 two large chicks, in light grey down, were seen in a deep horizontal crevice on Rocky Islet. A near fully-feathered chick was found in a jumble of rocks on the south side of the South West Promontory Razorback on 2 January 1977. This is the first record of this species breeding on the Snares Main Island.

AUSTRALIAN GANNET *(Sula bassana)*

A single bird was seen flying off the North Promontory on 20 November 1976. It was not observed diving. The only published previous sighting of this species is that of Horning & Horning (1974).

BLACK SHAG *(Phalacrocorax carbo)*

This species was seen frequently on all the islands of the Snares group. On 20 November 1976 16 were seen during a boat trip around Main Island. A flock of 25 was flushed from a stack off the south side of Broughton Island on 30 November 1976. Seventeen were counted on a rock between Toru and Wha Islets of the Snares Western Chain on 4 December 1976. The largest number seen at any one time was a flock of 49 flushed from the South Promontory penguin landing rocks on 2 February 1977. All birds seen were in immature plumage with streaky white/brown underparts and dark brown upperparts. This is a new species record for the Snares Islands.

Eleven recently dead shags were found between 12 November and 15 December 1976. The gut contents of eight were examined. Five stomachs contained a dark brown semi-tarry substance, two stomachs contained pieces of *Durvillea antarctica* fronds and one stomach was nearly full of feathers (? *Puffinus griseus*) and peat.

The semi-tarry substance may be digested algae as it had an algal smell and the appearance of badly-decomposed wrack. The pieces of *Durvillea* were quite fresh and probably were floating fronds broken by wave action. It would seem unlikely that a shag could cut a piece of frond from a *Durvillea* plant. The feathers and peat in the gut of bird 8 probably were scavenged. These data suggest that the birds died from starvation. Also, the dates of death suggest that Black Shags had recently arrived at the Snares, in early November. Further evidence for their recent arrival comes from the irruption of Black Shags in south-east Australia. In November 1976 birds banded as nestlings in north-western Victoria and south-western New South Wales were recovered from north-eastern New South Wales and southern Tasmania (C. J. R. Robertson, pers. comm.). Such long distance recoveries were abnormal. It is possible that some of these birds reached the Snares.

LITTLE SHAG (*Phalacrocorax melanoleucos* ssp.)

At least seven pied phase birds were present throughout our stay at the Snares. They were seen most frequently roosting in the *Senecio stewartiae* trees which overhang Boat Harbour. No breeding activity was recorded during the summer.

Pied phase Little Shags are uncommon in New Zealand, except in Northland (Falla, Sibson & Turbott 1970). This suggests that the birds seen at the Snares this summer were of Australian origin.

SHARP-TAILED SANDPIPER *(Calidris acuminata)*

A single bird was present throughout our stay. It was seen frequently feeding along the littoral zone in Boat Harbour and at the mouth of Muttonbird Creek. Warham & Keeley (1969) recorded the only other sighting, a single bird seen in November 1967.

ROCK PIGEON *(Columba livia)*

A single bird was first seen in the Biological Station area on 10 December 1976. It was caught the next day and its band numbers recorded. When released, it stayed in the area and fed until 3 January 1977, when it was last seen flying north. This domestic pigeon had been released at Invercargill on 9 December 1976 and had not returned to its loft in Palmerston North by 21 March 1977 (G. Stowell, pers. comm.).

The weather on 9 and 10 December was overcast with light north to north-easterly breezes.

SHINING CUCKOO *(Chalcites lucidus)*

A single specimen was found dead (48-72 hours) on Skua Point on 12 November 1976. This is a new Snares Islands record.

LONG-TAILED CUCKOO *(Eudynamis taitensis)*

A single bird was seen in *Olearia lyallii* canopy from 10 m, near the Biological Station on 29 November 1976. Calls were heard subsequently on three occasions, the last on 10 December 1976. Twice it was seen being chased across the *Olearia* canopy by a Blackbird *(Turdus merula)*. Both chases followed a period of intense Blackbird alarm calls. These may have been Blackbird responses to the hawk-like outline of the cuckoo. This is a new Snares Islands record.

YELLOWHAMMER *(Emberiza citrinella)*

Two were seen feeding in an area of *Poa astonii* at Seal Point on 13 and 14 November 1976 and a male was feeding on *Poa annua* seed heads near the Biological Station on 29 November 1976. Warham & Keeley (1969) recorded the only other sighting of this species, a mummified male found near the station.

CHAFFINCH *(Fringilla coelebs)*

Birds were seen and heard calling from the forest from November to January. A favoured area was the predominantly *Senecio* forest on the south side of Senecio Creek. On 18 December an abandoned nest with one egg was found 3 m up in the fork of a *Senecio* tree. This is a new Snares Islands breeding record.

GOLDFINCH *(Carduelis carduelis)*

Sightings of single birds and flocks of up to six were common during November. Sightings recorded by Warham & Keeley (1969) and Horning & Horning (1974) show this species to be a regular visitor to the Snares Islands, but no breeding has been recorded.

GREENFINCH *(Carduelis chloris)*

Sightings of from one to three birds were made during November. This species appears to be an uncommon but regular visitor to the Snares.

HOUSE SPARROW *(Passer domesticus domesticus)*

Numerous sightings of from one to fourteen birds were made in the Biological Station area from November to January. All birds were very wary and did not allow close approach. On our arrival at the Biological Station the mummified corpse of a male was found on the Castaway Hut floor and another caught under the roof of the Dangerous Goods Store. There was no evidence of breeding activity during our stay.

STARLING *(Sturnus vulgaris vulgaris)*

One bird was seen on two occasions in the vicinity of the Biological Station on 19 December 1976.

## DISCUSSION

Warham & Keeley (1969) suggested Australia, while Horning & Horning (1974) suggested New Zealand, as the origin of Snares Islands finches. Warham & Keeley supported their hypothesis by referring to their recorded increase in the variety of European passerines, the Australian Tree Martin *(Hylochelidon nigricans)*, waders of probable Australian origin and invasions of Australian insects. Horning & Horning noted that finches often arrived after a gale-force north-westerly, if the wind backed easterly, and also recorded two passerines of undoubted New Zealand origin.

Bird sightings during the 1976-77 summer suggest that species arrived from both Australia and New Zealand. Black Shag, Little Shag and Sharp-tailed Sandpiper are probably of Australian origin, while Shining Cuckoo and Long-tailed Cuckoo are probably of New Zealand origin.

Insufficient sightings of finches were made, except during November when *Poa annua* was seeding, and their origin remains conjectural.

Four new bird species (Black Shag, Rock Pigeon, Shining Cuckoo and Long-tailed Cuckoo), and one new breeding species (Chaffinch) were recorded for the Snares Islands during the 1976-77 expedition. There are now 23 breeding species out of a total of 57 bird species recorded from the Snares Islands.

ACKNOWLEDGEMENTS

The 1976-77 University of Canterbury Snares Islands Expedition was supported by a grant from the New Zealand University Grants Committee. The Royal New Zealand Navy provided transport to the Snares Islands in HMNZS *Taranaki*, and FV *Sapphire* returned us to Bluff. Their help and interest in this expedition was most appreciated. I thank Drs M. Crawley and J. Warham for criticising the manuscript.

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## A G M 1977: A LATER REPORT

### FIELD INVESTIGATION COMMITTEE

No requests for assistance or guidance have been received throughout the year.

Current national surveys:—

*Completed* —

Nankeen Kestrel — *Notornis* Dec.

Caspian Tern — *Notornis* Dec.

Australian Herons — Records being plotted and map compiled. To be written up early 1978.

*In progress* —

Reef Heron — completed and being written up but additional material still being received.

Shag Breeding Survey — information still being gathered. So far some information has been received from Northland, Auckland, Waikato, Hawkes Bay and Wairarapa in North Island; from Marlborough, Westland, Canterbury and Otago in the South Island. None of these returns is exhaustive and there is still much to be done. This survey has a further 2 years to run.

B. D. BELL, Convener

# THE BREEDING CYCLE OF THE WESTLAND BLACK PETREL (Procellaria westlandica)

By ALLAN J. BAKER and J. D. COLEMAN

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ABSTRACT

The breeding cycle of the Westland Black Petrel *(Procellaria westlandica)* is outlined from observations made in the 1970 and 1971 breeding seasons and from the literature. Adults arrive at the colonies in late March to excavate and claim burrows, reform pairs and build nests. Egg laying commences in early May and seems to be preceded by a honeymoon period. Most eggs are laid in a short peak period of about three weeks in May. Hatching begins about the third week in July following an incubation period of about 57-65 days. Chicks are brooded for up to two weeks and then spend the rest of their 120+ day fledging period alone except during feeding visits by the parents. Very heavy egg and chick losses were sustained in the two seasons studied and the disappearance of big chicks in September each season suggests that the colonies may be " birded." The long incubation and fledging periods relative to some other Procellariidae are interpreted as an adaptation to a sparse and variable food supply. Competition for food with summer breeding shearwaters such as *P. parkinsoni* seems the most plausible explanation for the winter breeding season of *P. westlandica.*

## INTRODUCTION

Although 30 years have elapsed since Falla (1946) reported the discovery of the Westland Black Petrel *(Procellaria westlandica)* (Fig. 1A), little is known about the general biology of this interesting species. Falla summarized fragmentary information then available on its breeding schedule which Jackson (1958) subsequently enlarged on and also commented briefly on mortality, breeding habitat, population estimates and putative history of breeding sites. It is now established that the *P. westlandica* breeding population is relatively small (Jackson 1958; Bartle 1974), and that its breeding sites are restricted to a precariously small geographic area in the coastal escarpment of the west coast of the South Island (Best & Owen 1976). Despite the aforementioned studies, the breeding cycle is known only in broad outline, and specific data on breeding success are lacking. Because such information is crucial in determining the status of the Westland Black Petrel we undertook a limited study of its breeding biology. We report here observations made on short visits to a study colony during two breeding seasons.

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## STUDY SITE AND METHODS

*Study Site*

For study purposes we chose a group of burrows (listed in Fig. 4 *in* Best & Owen (1976) as 100 burrows) in reasonably negotiable terrain with good access from State Highway 6. The colony chosen was situated near the top (ca. 250 m a.s.l.) of a steep north-east facing valley wall on the southern bank of Scotchman's Creek, approximately 2 km south of the Punakaiki rivermouth (see NZMS 1, S37, map ref. 855248). The valley wall is clad in luxuriant coastal vegetation (Fig. 1B) with an obvious altitudinal succession in species composition (see Best & Owen (1976) for a detailed description of the vegetation).

*Visits to study site*

We made a preliminary visit to reconnoitre the breeding sites of *P. westlandica* on 6-7 May 1968. Subsequent visits, on which this paper is largely based, were made as follows: 1970 — 20-21 June, 11 July, 1-2 August, 25-26 August, 29 September; 1971 — 5 May, 28-29 May, 11 June, 17 July, 7-8 August, 18 September. The second author also visited the colony on 24-25 May 1976.

*Fieldwork*

In 1970 we marked 50 occupied burrows with sequentially numbered pegs placed near the entrance of each one (Fig. 1C). In 1971 we marked another 31 burrows and emplaced wooden observation portals (150 x 150 x 25 mm) in the wall of nest chambers that were difficult to view through the burrow entrance. The portals were lodged firmly into place and covered with soil and leaf litter for concealment. To avoid disturbance the portals were installed when the birds were absent from their burrows.

During each of our visits to the study site we recorded the contents of all marked burrows. We weighed and measured accessible eggs and chicks, and also weighed, measured and banded adults, especially birds without eggs or chicks. The following measurements were taken with dial calipers accurate to 0.1 mm: bill length (exposed culmen), bill depth, bill width, tarsus length, middle toe length, length of straightened wing, tail length, egg length and egg width. Weight was recorded on spring balances accurate to 1 g for eggs and small chicks, and 20 g for large chicks and adults.

The cloacal condition of each banded adult was noted as a possible guide to sex (Serventy 1956), and a check was made on the development and size of the brood patch. We set up a control group of 25 burrows in 1971 to evaluate the possible effects of our observations on breeding success, and in these burrows we established only the presence or absence of adults, eggs or chicks.

The approximate ages of most chicks were assessed by comparison with growth curves of three chicks of known age, and with growth curves and teleoptile plumage development of chicks of *P. aequinoctialis* in Mougin (1970). The error of estimation is probably small in very young chicks but may be as great as ± 5 days in older ones.

## THE PRELAYING PERIOD

*Arrival at colonies*

Adults arrive at the breeding grounds in late March and early April (Jackson 1958; Bartle 1974). Rafts sometimes containing in excess of 1000 birds are found 1 to 2 km offshore before their nightly arrival at the colonies. At dusk the petrels fly inland to the coastal escarpment along which they often make several passes before turning up valleys in which the burrows are located. They usually circle overhead for several minutes before gliding into the canopy and dropping through to the forest floor. The birds seem able to locate their burrow from above the dense canopy with remarkable accuracy in some cases; one banded bird dropped to with 5 m of its burrow and other birds were seen to enter burrows close to their landing sites.

*The population at the colonies*

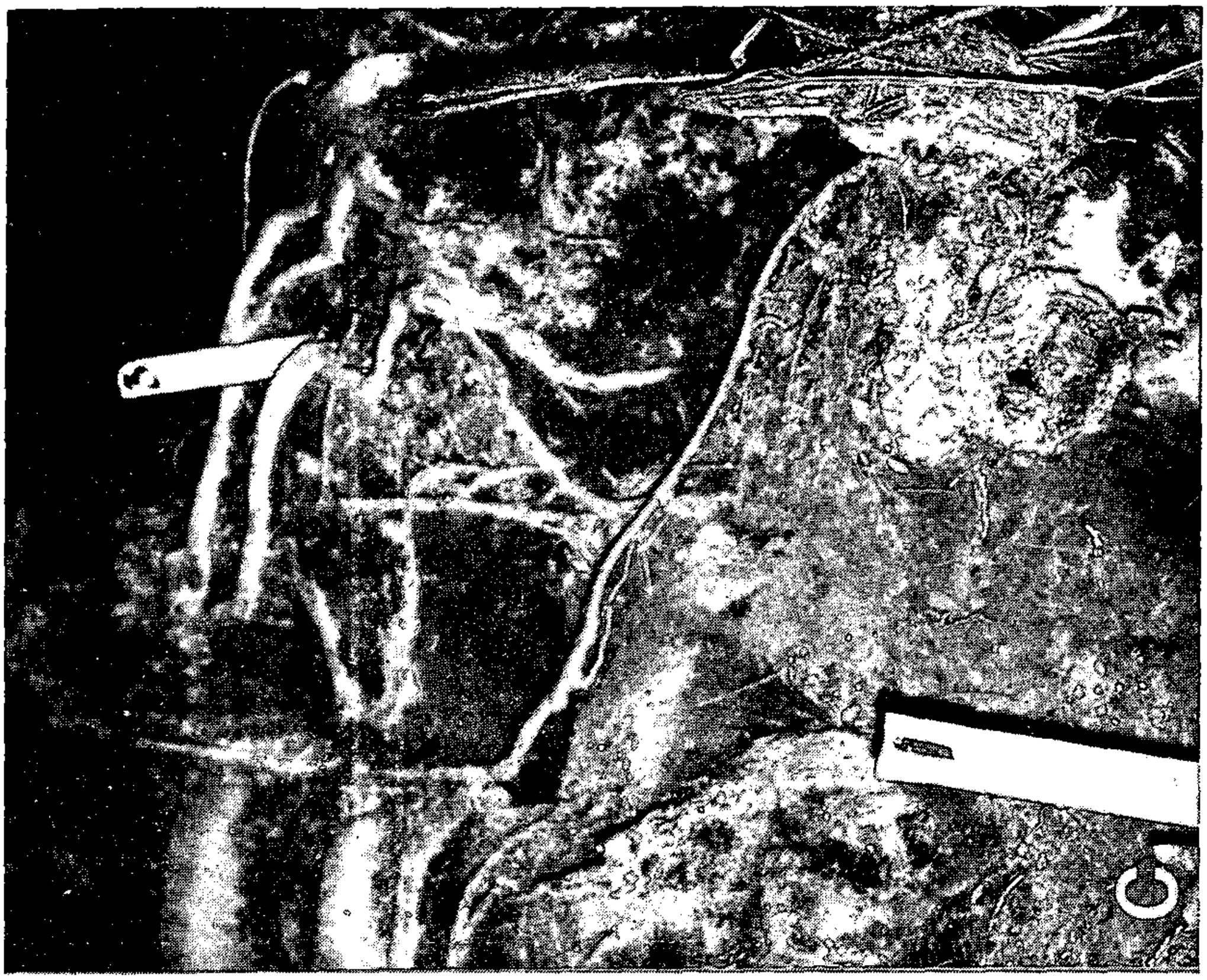
The population of Westland Black Petrels that frequents the breeding colonies has never been estimated accurately. Jackson (1958) judged the population to be between 3,000 and 6,000 birds, and felt that because there were numerous unoccupied burrows in the colonies, the population has undergone a decline. He also noticed a rapid decline over three years in the number of burrows occupied at one colony. More recently Bartle (1974) estimated the population at the colonies in 1972 to be between 6,000 and 10,000 birds and suggested that the apparent increase may in part be attributable to additional food supplies provided by offal from trawlers. Both of the estimates are hard to reconcile with Best & Owen's (1976) estimate of less than 900 occupied burrows in the colonies, unless there is a large number of unemployed birds.

The only index of population size that we obtained was on 25 May 1976, when one of us (JDC) estimated between 1,000 and 2,000 birds were waiting to come ashore at dusk. Without knowing how many of these birds were unemployed or how many were incubating eggs at that time, it is not possible to choose between the above population estimates. Clearly, more precise counts over several years are needed to ascertain whether population numbers are increasing or not.

*Prelaying activities*

Very few new burrows seem to be constructed near the beginning of the breeding season, but existing burrows are cleaned out and some


FIGURE 1 — A: Adult *Procellaria westlandica;* B: Breeding habitat of *P. westlandica;* C: Marked burrows at the study colony.


C


B

are enlarged by further excavation (Jackson 1958). Excavation reaches a peak in April (H. Best pers. comm.) and extends into early May, though restorative digging of collapsed burrows occurs through much of the breeding season. In April and early May, Westland Black Petrels commonly rest up in freshly cleaned out burrows. Jackson (1958) noted that birds were present during the day in many of the burrows that were occupied on 8 April 1956, and Falla (1946) reported similarly for 27 April 1946. We found 20 petrels in 39 burrows which had nests built in them on 5 May 1971; three burrows contained two birds (presumably pairs) and the remaining 14 had single birds. Birds we banded in early May were subsequently recovered only from burrows at which they were banded (n = 31 recoveries), so it seems likely that most breeding birds had established ownership of burrows by then.

Activity of birds above the ground is most apparent about three weeks before the onset of laying. The petrels are very vocal during this period and may be heard calling on the wing, on the ground or from their burrows. Courtship and copulation have been observed on the ground at this time too (Jackson 1958). Most of the activity at the colonies in May begins with the nightly arrival of birds from the sea, though birds in burrows, especially pairs, occasionally cackle vociferously during the day. The following observations show how vocal behaviour is tied to the daily arrival and departure of birds. On the evening of 24 May 1976, the incoming birds began arriving at 6 p.m., triggering vocalization which lasted through to 9 p.m. The petrels were quiet until 4 a.m. the following morning and then became very vocal again until departure for the sea at about 7.15 a.m. After the morning exodus the remaining birds at the colony lapsed into complete silence.

Westland Black Petrel burrows are not evenly dispersed over the nesting habitat, but are clumped in small groups or colonies (Fig. 1C). Numbers of burrows in the colonies vary considerably, averaging 30 and ranging from isolated groups of 1 or 2 to a maximum of 265 (Best & Owen 1976). Our study site included at least 100 burrows, which is the second largest concentration found in the extensive survey conducted by Best & Owen.

The burrows in the study colony are concentrated near the top of ridges, cliffs and spurs on the valley wall. A small group of 10 burrows is located in the bottom of a shallow gully running down the valley. Burrow location is apparently influenced by altitude; no burrows are located in the study site beneath an altitude of approximately 80 m a.s.l., which corresponds to about two-thirds of the distance down the valley wall.

Each group of burrows in the study colony is situated within easy access of take-off areas such as cliffs, knobs or leaning trees. Trees used for take-off are conspicuous by claw marks on the bark,

especially near the base. Birds in the lowest group of burrows use a gap in the canopy caused by windfall as a take-off area, launching themselves into the gap from surrounding trees.

Most of the burrows are excavated in soil denuded of vegetation, though some are located under entangled thickets of Kiekie *(Freycinetia banksii)*, Rata creepers (*Metrosideros* spp), Supplejack *(Rhipogonum scandens)*, Bush Lawyer *(Rubus cissoides)* or Ladder Ferns (*Blechnum* spp). The birds burrow preferentially in the deep soil of the forest floor, but occasionally they also penetrate the underlying sandstone.

Entrance tunnels leading to nest chambers usually face downhill to allow adequate drainage of the burrow. The shape and dimensions of burrows vary with the substrate in which they are excavated. Entrance tunnels in surface soil are often up to 2 m in length and 200 mm in diameter, whereas those in sandstone or among roots of trees are frequently as short as 1 m and have a diameter of 120 mm. Nest chambers are either located at the end of the tunnel or are displaced at right angles to it. Shorter tunnels of about 1 m or less are almost always offset at an angle to nesting chambers unless the topography or substrate is unsuitable.

Nesting chambers are roughly circular in ground plan with a diameter of approximately 500-600 mm and a height of about 200-300 mm. In areas with poor drainage the birds scrape earth into the centre of the chamber to form a nest mound, on top of which they usually place nest materials such as dead twigs, leaves and small pieces of tree fern fronds. We inspected a group of burrows in a gully bottom following a torrential downpour in which the gully became a rivulet; even though the burrows were flooded all nests except one were kept above water by natural drainage around the mound.

*Burrow and mate tenacity*

Westland Black Petrels show a marked tendency to return to the same burrow from year to year. Of 23 adults banded in 1970 and subsequently recaptured in 1971, 21 were found in the same burrow. The remaining two birds changed sites and were found breeding in adjacent burrows. Burrow tenacity is not confined to birds that had bred in the previous year; eight of the above 23 recaptures were unemployed in 1970. Of the eight unemployed birds, four were possibly pre-breeders because they prospected for burrows in August 1970, well beyond the time at which breeding could have been initiated (see beyond).

Unfortunately, our data on mate tenacity are very limited because we were seldom able to recapture both members of a pair. However, there is some evidence that breeding birds retain mates from year to year. Of four pairs banded in 1970, three were recovered in the same burrow in 1971. One bird of the fourth pair was found breeding in its 1970 burrow, but with a new mate. We were unable to locate

its previous mate on the colony, and the short duration of our visits did not allow us to attribute the dissolution of the pair to either death of the mate or divorce.

## THE EGG PERIOD

### *Egg Laying*

According to Jackson (1958) the Westland Black Petrel lays eggs over a period of approximately 5 weeks, extending from late May to early June. Falla (1946) reported "fresh eggs late in May," but it is not clear from his account whether these were among the first eggs laid in the colony or not. In 1970 all 14 eggs observed in the study burrows were laid before our first visit on 20 June. In 1971 no eggs were found in burrows on 5 May and all 52 eggs observed were laid by 11 June, with most (45) laid by 28 May. Hence the great majority (87%) of laying in 1971 was compressed into a short period of about 3 weeks in May.

The timing of the laying period seems to be very similar in different breeding seasons. Egg laying in 1976 was scheduled similarly to 1971; on 24 May 1976, most birds were found with eggs. Those without eggs included unemployed birds which would not subsequently lay (see beyond), so the actual number of breeding birds that had not laid by this date was probably quite low.

### *Egg dimensions*

Egg size of *P. westlandica* has been reported to the nearest 0.5 or 1 mm by Falla (1946) for nine eggs, Oliver (1955) for three eggs and Serventy *et al.* (1971) for 14 eggs. We were able to measure a larger sample of 26 eggs with greater accuracy (Table 1).

TABLE 1 Mean dimensions of samples of eggs of the Westland Black Petrel.

| Dimension | Sample | | | |
|---|---|---|---|---|
| | Falla (1946) (n=9) | Oliver (1955) (n=3) | Serventy et al. (1971) (n=14) | This Study (n=26) |
| Greatest length (mm) | 82 ± 1.0 | 81 ± 2.0 | 82 | 81.1 ± 0.42 |
| Greatest width (mm) | 56 ± 0.5 | 55 ± 1.0 | 55 | 55.6 ± 0.24 |

These four samples are all very similar in mean dimensions, and fall within the range of eggs of *P. aequinoctialis* (see Mougin 1970). Weights of freshly laid eggs were not recorded. However, 11 eggs after approximately 3 weeks of incubation averaged 130 ± 2 g which is similar to the 4½ oz. (128 g) given by Falla for freshly laid eggs. The mean rate of weight loss for five eggs near the middle of the incubation period was 7.6 g per 3 weeks, which extrapolates roughly to a weight loss of 20 g per egg during incubation. Some larger freshly laid eggs could therefore weigh as much as 150 g.

*Incubation and hatching*

The single egg is incubated in separate spells by both members of a pair. Both sexes therefore have well developed brood patches, the mean length and width being 81 ± 2.6 mm and 62 ± 1.2 mm respectively for 15 birds. The brood patch is heavily vascularized and completely denuded throughout the egg period. As in the closely related White-chinned Petrel, it seems that that female Westland Black Petrel on laying the egg does not immediately leave the burrow so that the male can take the first incubation spell. Three females that laid eggs on 28 May 1971 were found incubating on 29 May. Undamaged eggs were never left unattended during our visits. Of 170 inspections of burrows containing eggs we found single birds in attendance on 169 occasions and a pair in the remaining instance.

Hatching of Westland Black Petrel eggs is known to occur between early August and mid-September (Jackson 1958). In 1970 we first observed chicks on 1 August. The average mean weight of 13 chicks then was 230 ± 36.7 g, but they ranged from 90 g (hatching weight) to 485 g (about 2 weeks old). Thus in 1970 hatching must have commenced in mid-July. In 1971 we did not find any nestlings at the colony on 17 July, though the egg in burrow 0/7 was cracked and may have been pipping. Subsequent weighings of the chick in this burrow are consistent with a hatching date near this time. With one exception, perhaps because of interrupted incubation, all 52 fertile eggs had hatched before 8 August. Thirteen chicks weighed on our visit of 7-8 August averaged 430 ± 35.9 g, which corresponds to a mean age of about 10 days. Weights ranged from 220 to 670 g suggesting an age range of about 4-21 days respectively. These chicks must therefore have hatched between 18 July and 4 August. Eleven of the chicks were hatched from eggs laid before 28 May, so the minimum incubation period is 51 days and the maximum 68+ days.

Individual estimates of the incubation period are available for only three eggs. On the morning of 28 May a female with a red and distended cloaca typical of petrels about to lay (Serventy 1956), a well developed brood patch and an egg in the oviduct was located in burrow 3/5. It seems likely that she laid on this date. On 7 August a 540 g chick (about 14 days old) was found alone in the burrow.

Hence the incubation period for this egg must have been about 57 days. On 28 May another female was found in burrow 10/7 P without an egg and on 7 August a 280 g chick (about 6 days old) was found there, indicating an incubation period of about 65 days. On 29 May a bird (sex not determined) was found without an egg in burrow 10 P, and on 8 August a 370 g chick (about 8 days old) was present, giving an incubation period of about 63 days. These specific estimates of the incubation period are in accord with the general schedule for the colony; most laying in 1971 was completed by 28 May and hatching by 1 August, a period of 65 days.

## THE CHICK PERIOD

*Adult attentiveness*

After hatching the downy chicks are attended by the parents for approximately two weeks (Jackson 1958), but thereafter are left unaccompanied in their burrows except when parents return to feed them at night. The attentive period seems to be quite variable, however, ranging from a few days to more than two weeks. On 7 August 197, 23 of 35 chicks were attended; the remaining 12 were alone in their burrows and ranged in age from 4-21 days. During the day only one parent of a pair was ever found attending the chick so that the relieved bird must depart for sea the morning after changeover.

Prolonged spells of adult attentiveness were noted on three occasions. Two adults were found brooding small chicks that had been dead for some time and one bird was found in its burrow 25 days after we had removed its addled egg.

*Chick growth*

Growth and development of nestling Westland Black Petrels has never been studied in detail and all that is known about this critical aspect of the life history is that the chick requires at least three months in its burrow before fledging (Jackson 1958). A newly fledged chick was recovered by Falla (1946) in mid-December and Jackson later reported that fledging occurred throughout this month. Because of very heavy chick mortality it was difficult for us to get data on growth beyond about the first three weeks of life. Three newly hatched chicks in 1970 averaged 98.3 ± 8.33 g (Fig. 2A), and 23 days later the two survivors weighed 630 g and 750 g respectively. Thirty-four days later only the smaller chick was alive and weighed 870 g at an age of approximately 2 months. Three further chicks (Figs. 2B-D) were weighed twice during the nesting period in 1970, though their hatching weights were not recorded. Two chicks which weighed 180 g and 420 g on 1 August were reweighed on 25 August at 690 g and 930 g respectively. The third chick progressed from 799 g on 26 August to 1384 g on 29 September, and this was the heaviest chick we weighed during the study.

TABLE 2. Summary growth statistics for five samples of Westland Black Petrel chicks in 1970 and 1971.

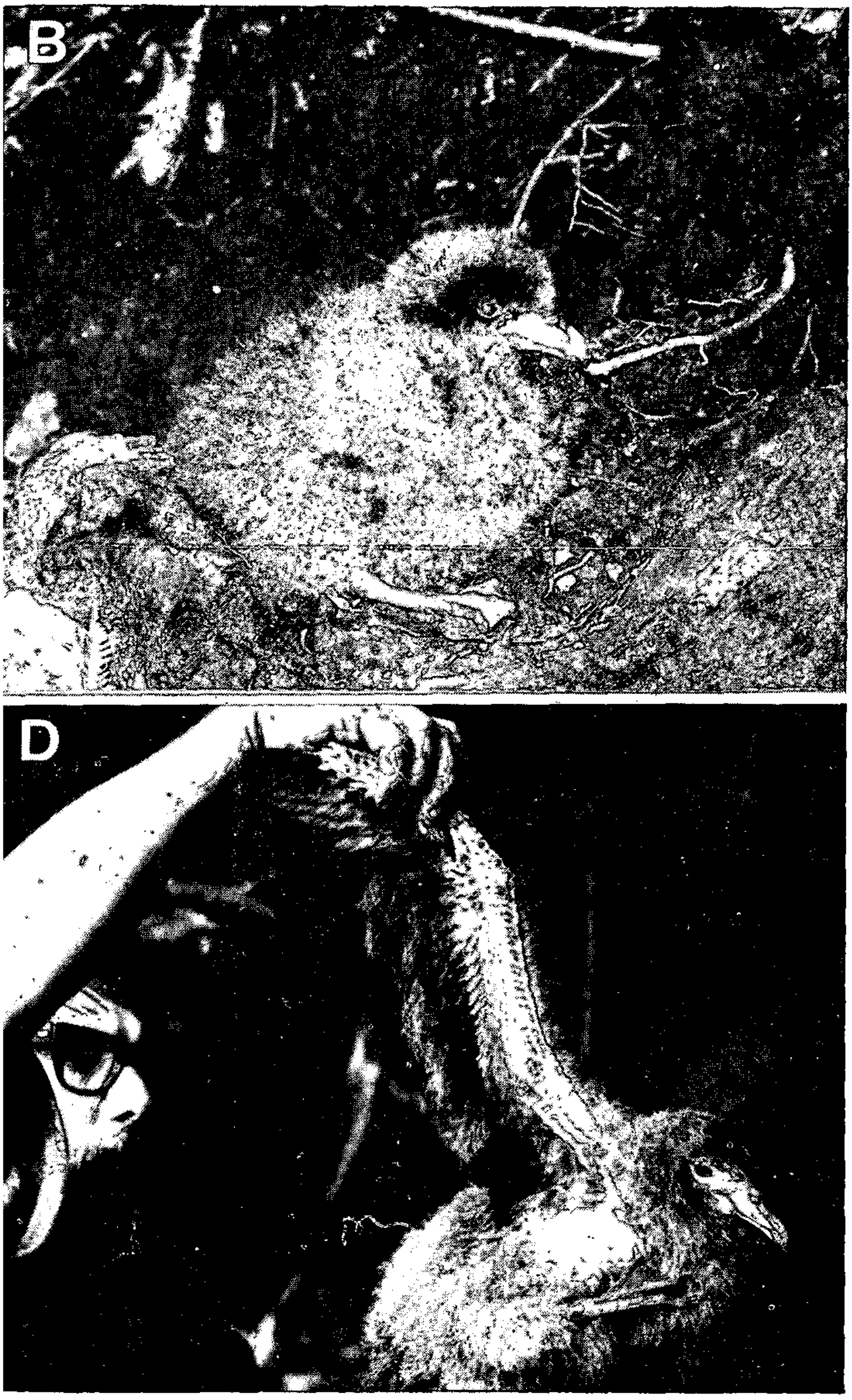
| Sample | Date | n | Mean ± S.E. | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Exposed culmen (mm) | Bill depth (mm) | Bill width (mm) | Tarsus length (mm) | Middle toe length (mm) | Body weight (mm) |
| 1 | 8.70 | 13 | 27.5 ± 0.59 | 13.9 ± 0.41 | 10.3 ± 0.44 | 29.3 ± 1.06 | 29.1 ± 0.99 | 250 ± 36.7 |
| 7 | 8. 8.71 | 13 | 31.1 ± 0.67 | 14.9 ± 0.28 | 12.4 ± 0.44 | 38.7 ± 1.51 | 37.0 ± 1.14 | 430 ± 35.9 |
| 25 -26 | 8.70 | 11 | 36.6 ± 0.78 | 17.7 ± 0.44 | 13.4 ± 0.45 | 49.7 ± 1.24 | 50.4 ± 1.85 | 754 ± 27.2 |
| | 18. 9.71 | 2 | 44.9 ± 0.70 | 19.7 ± 0.60 | 17.1 ± 0.10 | 61.6 ± 0.80 | 68.5 ± 1.70 | 870 ± 14.0 |
| | 29. 9.70 | 2 | 47.7 ± 1.60 | 21.9 ± 1.55 | 17.1 ± 0.55 | 63.1 ± 0.95 | 69.8 ± 3.95 | 1125 ± 260.0 |

An estimate of the magnitude and progression of the growth rate of the chick population on the colony was obtained from samples of chicks weighed and measured on dates of our visits (Table 2). We have included here data for both 1970 and 1971 because the breeding seasons were very closely synchronised in the two years, as they are in many other Procellariidae (Lack 1968). Within the sampling period there is clearly a sigmoid pattern of growth in all variables except body weight (one chick being extraordinarily heavy at 1384 g, possibly following a large meal the previous night), growth being rapid at first but slowing progressively in older chicks. This trend is best expressed in the long bones. For example, in tarsus length, the increments between successive samples in Table 2 are 9.4 mm for the first 7 days, 11.0 mm for the next 17 days, 11.9 for the following 23 and finally 1.6 mm for 11 days. Corresponding "growth rates" (increment/time) are 1.34, 0.65, 0.52 and 0.15 mm/day. Fledging was not observed as we were unable to visit the colony at an appropriate time. However, large chicks were present on 29 September in 1970 when one banded chick weighed 1384 g (in excess of adult weight — see below). This chick (L-13153) was sighted alive in its burrow on 28 November when it was fully feathered and close to fledging (J. R. Jackson, pers. comm.). As most chicks were hatched by 1 August the chick period appears to be at least 120 days and could be as long as 140 days.

*Oil spitting*

When handled or disturbed, small chicks characteristically exude copious quantities of dark straw-coloured oil with a strong fishy odour. The exudation of oil does not always seem to be accompanied by lunging movements as described by Armstrong (1951) and Warham (1956, 1967) for Antarctic Fulmars *(Fulmarus glacialoides)*, Great-winged Petrels *(Pterodroma macroptera)* and White-headed Petrels


FIGURE 2 — Growth and development of *P. westlandica* chicks. A: Chick about 2-3 days old with first down; B: Chick about 6-8 days old with second down appearing; C: Chick about 1 month old with feather shafts of teleoptile plumage appearing on body and wings; D: Chick about two months old with emergent primaries, secondaries and contour feathers.


B
D

*(Pterodroma lessoni)* respectively, though spitting chicks always orient themselves towards the source of disturbance. Chicks as young as about 7 days old were observed to spit oil, and they maintained this ability until the end of August when they were about 4-6 weeks old. By mid-September in 1970, the few surviving chicks weighed in excess of 800 g and when handled no longer spat oil. Presumably, they were then sufficiently large and aggressive to repel intruders without recourse to oil spitting.

## BREEDING SUCCESS

Breeding success (number of chicks fledged/number of eggs laid) was similar but very low in the two seasons studied (Table 3).

TABLE 3. Breeding success of Westland Black Petrels in 1970 and 1971.

| Year | Eggs laid | Eggs hatched | Chicks fledged | Hatching success | Chick success | Breeding success |
|---|---|---|---|---|---|---|
| 1970 | 35 | 26 | 2 | 74.3% | 7.7% | 5.7% |
| 1971 | 66 | 36 | 2 | 54.5% | 5.6% | 3.0% |

In 1970 we were unable to determine the exact number of eggs laid because some egg losses had undoubtedly occurred before our first visit to the colony on 20 June. Although only 14 eggs were found before hatching occurred we subsequently expanded our study in August to include a total of 50 burrows in which 26 chicks were present. Five of these chicks hatched from the 14 eggs we found so at least 35 eggs must have been laid in our study burrows. Because the data for 1970 exclude some egg losses during incubation the figures for hatching success (number of eggs hatched/number of eggs laid) and breeding success are overestimates. Conversely, the hatching success (35.7%) of our sample of 14 eggs is underestimated because we were responsible for the failure of three eggs. Excluding these latter three failures the hatching success is then raised to 45.5%, but the reliability of this estimate is suspect given the small sample size on which it is based. Chick success (number of chicks fledged/number of chicks hatched) in 1970 should be relatively unbiased, though it is possible that some very small chicks could have been lost before

we first inspected some burrows. Given the dates of our visits this source of error should be minimal, but in any event the estimate of chick success is conservative and can only err on the high side. The data for 1971 are less subject to the above difficulties because we followed 52 of the 66 eggs from laying onwards, but nevertheless any biases that may have been introduced by not observing all eggs through incubation can only have led to overestimates of breeding and hatching success.

Table 4. Egg and chick losses of Westland Black Petrels studied in 1970 and 1971.

| Stage of loss | Cause of loss or failure | Years | | Totals |
|---|---|---|---|---|
| | | 1970 | 1971 | |
| Eggs | Burrow collapsed | 1 | 4 | 5 |
| | Infertile | 1 | 1 | 2 |
| | Embryo died before hatching | 0 | 4 | 4 |
| | Egg smashed by adult | 0 | 3 | 3 |
| | Unknown | 7 | 18 | 25 |
| | | 9 | 30 | 39 |
| Chick | Predation | 1 | 1 | 2 |
| | Infanticide | 2 | 0 | 2 |
| | Fell over cliff | 0 | 1 | 1 |
| | Scratched out of burrow by sub-adults | 0 | 2 | 2 |
| | Unknown | 21 | 30 | 51 |
| | | 24 | 34 | 58 |

Losses of eggs and chicks on the colony are shown in Table 4. Most eggs lost simply disappeared from nests between our visits, always in the last 2-3 weeks before hatching commenced. It is possible that heavy predation of newly hatched chicks occurred (which would account for the apparent disappearance of eggs), but parents are fiercely aggressive at this time and remain in the burrows to brood their young. Furthermore, we did not find any remains of young chicks that had been eaten.

Only two eggs were found to be infertile. Three eggs were smashed by clumsy adults during incubation, possibly during change-over of mates. Of the four eggs that contained dead embryos, two had been pecked and the shell punctured by the incubating birds, and this may have eventually killed the embryos. The only other source of egg loss was from collapsed nest chambers in which case the sitting bird deserted the burrow and did not return.

Most chicks disappeared from their burrows when they were approximately 5-7 weeks old and weigh 800 g or more. Only two instances of chick predation were recorded and in both the skeletal remains bore teeth morks, possibly those of a rat, stoat or feral cat. Similarly, Jackson (1958) found only one instance of mammalian predation in three seasons of study, though he cited Penniket's (1955) report of a high stoat density on the colony. We did not see any obvious signs of stoats or rats on the colony other than the two chicks mentioned above and the remains of an adult that had been eaten. Wekas *(Gallirallus australis)* abound on the colony and may be responsible for some chick losses. One Weka was observed pulling flesh off the neck of a dead chick we placed on the surface and another attacked and killed an emaciated chick which it pulled out of a shallow burrow. It is doubtful whether Wekas are important predators of petrel chicks however, as many burrows have entrance tunnels too small to allow access to Wekas and because they do not venture far into burrows occupied by adults or large chicks. Two apparent instances of infanticide were noted: two adults with blood on their bills were found in burrows with freshly dead chicks that had been severely pecked about the head.

It is curious and perhaps not merely coincidence that in both breeding seasons heavy losses of larger chicks were sustained in September. The size of the chicks taken and the absence of any sign of predation suggest that the colony may be subject to "birding." We found boot marks around burrow entrances and a few portals dug up and removed from nest chambers which on our previous visit contained chicks. Additional information was obtained from concerned residents living near the colony; they were convinced that birding occurred though they were unable to provide corroborating evidence. The Wildlife Service has been alerted to watch for birding in the future, so it is to be hoped that their surveillance will lead to increased breeding success.

It is extremely unlikely that our observations contributed significantly to the heavy losses of eggs and chicks, especially in 1971 when we were careful not to unduly disturb incubating or brooding birds. The 25 control burrows were completely unproductive; no chicks survived in them in September. At the same time we also checked across the valley on the north wall of Scotsman's Creek where the largest concentration of about 265 burrows is situated (Best &

Owen 1976). No chicks were found in 50 used burrows we inspected so it seems that 1971 was a poor breeding season for Westland Black Petrels. Some caution is warranted in extrapolating these mortality rates to future years however, because periodic but short-term failures have been recorded in other Procellariidae (Richdale 1963; Mougin 1969, 1970). Long-term studies are needed to estimate accurately the average breeding success of *P. westlandica.*

## UNEMPLOYED BIRDS ON THE COLONY

It is extremely difficult to determine the status of birds at the colony without marked birds of known provenance. However, unemployed birds are common at the colony at certain times, and there is some indirect evidence that they may fall into two categories as outlined by Richdale (1963): non-breeders (presumably adults which may have previously bred but are not breeding in the year of observation) and pre-breeders (birds which are too young to have previously bred).

In May 1971, both breeders and unemployed birds were present on the colony. Of 81 used burrows only 15 apparently did not have eggs later laid in them, and thus the frequency of unemployed non-breeders was maximally 18.5%. However, caution is warranted in interpreting this figure because it is based on two assumptions — that all 15 burrows were occupied by different birds, and that "non-breeders" were actually failed breeders that had lost eggs at laying. Two burrows contained pairs that built nests, though eggs were never seen. Only two of the remaining 13 burrows were known to be occupied with lone birds being found there during the day, but the rest were excavated and appeared to be used. It was not possible to estimate accurately what proportion of the unemployed birds had had previous breeding experience; two banded pairs which bred in 1970 were present on the colony in 1971, but did not breed.

Birds presumed to be pre-breeders were first seen on 11 July, although they could have been present as early as 22 June. On 1 August the colony was subject to a large night-time influx of such birds. Although some may have been failed breeders returning after lengthy feeding forays, the dramatic upsurge in activity at the colony seems likely due to the arrival of pre-breeders. Virtually all burrows that were unused or had been occupied by failed breeders were re-occupied and excavated so that the colony appeared as it did in early May, with widespread occurrence of fresh soil and dung. Further support for the pre-breeding status of these birds was provided by their smaller size in some dimensions (relative to adults — see Table 5), their lack of a brood patch or any obvious dimorphism in cloaca size, and one bird had brown scapulars and belly contour feathers indicative of immaturity.

Of 15 burrows occupied by unemployed birds during the day in August 1970, six contained two birds and nine had lone birds. The pairs were very vocal and often called loudly during the day. Unemployed birds were present at the colony through most of August, and in September they ceased coming ashore so that the colonies were again quiet at night.

TABLE 5. Standard measurements and weights of breeding and pre-breeding Westland Black Petrels captured in 1970 and 1971

| Variables | Mean + S. E. Breeders (n=67) | Mean + S. E. Pre-breeders (n=30) | F value[1] |
|---|---|---|---|
| Exposed culmen (mm) | 50.4 ± 0.25 | 49.3 ± 0 38 | 6 014* |
| Bill depth (mm) | 22.9 ± 0.14 | 22.5 ± 0.22 | 617 n.s |
| Bill width (mm) | 18.8 ± 0.13 | 18.6 ± 0.19 | 0 311 n s |
| Tarsus length (mm) | 64.6 ± 0.21 | 63.6 ± 0 36 | 5.883* |
| Middle toe length (mm) | 73.0 ± 0.29 | 72.0 ± 0.44 | 4.141* |
| Wing length (mm) | 384 ± 1.2 | 386 ± 1.9 | 0.867 n s. |
| Tail length (mm) | 128 ± 0.7 | 125 ± 0.9 | 6.138* |
| Body weight (g) | 1199 ± 13.3 | 1117 ± 14.3 | 13.877*** |

[1]Significance levels denoted as follows: *** = $P < 0.001$, * $P < 0.05$ n.s. = not significant, $P > 0.05$

## DISCUSSION

The breeding cycle of *P. westlandica* outlined above shows some interesting similarities and differences with the other species of the genus and some well known Procellariidae. Most comparative data are available for the closely related White-chinned Petrel *(P. aequinoctialis)* which has been studied extensively in the islands of

the subantarctic and adjacent areas (Hall 1900; Matthews 1929; Murphy 1936; Falla 1937; Gibson-Hill 1949; Rowan *et al.* 1954; Hagen 1952; Paulian 1943; Rand 1954; Westerskov 1960 and Mougin 1970).

Procellariidae which have reached breeding age generally return each year to breed with the same mate in the same burrow. Because of low adult mortality and high mate fidelity in *P. aequinoctialis* on the Crozet Islands, divorce is rare (Mougin 1970), and this seems to hold for *P. westlandica* too. The arrival of adults at the colonies well in advance of laying is a feature of the breeding cycle of petrels. This long re-occupation period is used to prospect for and claim burrows, establish pair-bonds and build nests. In *P. aequinoctialis* the birds return singly and pairs reform in the burrows, and this is consistent with our observations of single birds and pairs in burrows in the Westland colony in early May. Mougin noted a pre-laying exodus in *P. aequinoctialis* about 15 days before the beginning of laying. There is a strong suggestion that *P. westlandica* has a similar honeymoon period as almost half the burrows containing nests in early May were uninhabited. In winter breeding species such as *P. westlandica* the honeymoon period could be even more important than in summer breeding species. For example, the winter breeding Grey-faced Petrel *(Pterodroma macroptera gouldi)* in northern New Zealand has an unusually long pre-laying absence of about 60 days, which is considerably longer than that of its summer breeding congeners (Imber 1976). The pre-laying absence is thought to be necessary to allow both sexes to gather and store further food reserves; females have to form large eggs and males have to fast during the first long incubation spell (Lack 1966). Although the duration of individual incubation spells was not determined in the present study, it is probably similar to that of *P. aequinoctialis* in which the range is 7-15 days (Mougin 1970), and hence considerable food reserves would be required to tide the birds over the lengthy sojourns at the nest.

Although the laying season in *Procellaria* is quite often prolonged (Hall 1900; Murphy 1936; Oliver 1955), the great majority of eggs are laid in a short peak period of about 3 weeks near the beginning of the season (Mougin 1970; this study). The reason for this synchrony in species which do not undertake large migrations is unknown; in the Short-tailed Shearwater *(Puffinus tenuirostris)* (cf Serventy 1963), the Sooty Shearwater *(Puffinus griseus)* (cf Richdale 1963), and the Greater Shearwater *(Puffinus gravis)* (cf Rowan 1952) the average laying date is almost constant from year to year and the laying season is very restricted (3 weeks or less). Lack (1966) interpreted this extreme synchrony as an adaptive response to allow chicks time to fledge and adults to complete breeding duties before migration. It is possible that because of the long incubation and chick periods in *P. westlandica* (and other *Procellaria*), synchrony is needed to allow adults sufficient time to achieve breeding condition in the following season.

The estimated incubation period of 57-65 days for eggs of *P. westlandica* is slightly longer than that of *P. aequinoctialis* of 50-60 days (Murphy 1936; Mougin 1970). The explanation for this long incubation period seems to be that it is the simplest way of retarding the rate of development of the chick, as there is a general correlation in birds between the durations of the incubation and chick periods (Lack 1948, 1966). Although such a strategy exposes the eggs to the risk of nest predation for a longer time, this is compensated for in burrowing petrels by the protection afforded by the burrows. The longer incubation period of *P. westlandica* (relative to *P. aequinoctialis)* may relate to the increased difficulty of gathering food in winter (see beyond).

The chick period is much longer in *P. westlandica* (120+ days) than it is for the winter breeding *P. cinerea* (82 ± 5 days) at Tristan da Cunha (Elliott 1957), or the Crozet Islands (100+ days, Barrat 1974), or the summer breeding *P. aequinoctialis* (91-105 days) at the Crozet Islands (Mougin 1970). As Lack (1968) has pointed out, the chick period is usually longer in petrels breeding at lower latitudes (where the seas are generally less productive), and he therefore advanced the hypothesis that the Procellariiformes have evolved different growth rates in response to the average availability of food for the young. The long fledging period of *P. westlandica* could therefore result from a rather sparse and variable food supply, as might be expected for a winter breeding bird at the latitude of the South Island. The shorter fledging period of *P. cinerea* at Tristan du Cunha is anomalous in this context and suggests that food supplies may be locally abundant there even in winter.

Given the evolution of a slow growth rate to combat sparser and more variable food supplies the question remains as to why *P. westlandica* (and some other Procellariidae) breed in winter. Two competing hypotheses have been considered by Lack (1966): (1) segregation of breeding seasons of congeneric species is due to competition for nesting sites, and thus the same burrows can be used alternately by different species (Lockley 1952), and (2) segregation results from competition for food during the breeding season (Bourne 1955, 1957). The first hypothesis can hardly apply to *P. westlandica.* Although its breeding distribution overlaps that of the summer breeding Black Petrel *(P. parkinsoni)* (see Falla 1946), both species have such long breeding seasons that they could not possibly alternate annually in the same burrows, and additionally, there is no shortage of potential breeding sites in the coastal ranges of Westland. Competition for food with *P. parkinsoni* (and perhaps other shearwaters such as *Puffinus griseus*) seems to be the most plausible explanation for the winter breeding season of the Westland Black Petrel.

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# SOUTHERNMOST OCCURRENCE OF WHITE-CAPPED NODDY (Anous minutus)

By K. E. WESTERSKOV

ABSTRACT

A White-capped Noddy (*Anous minutus* Boie, 1844) was seen in the afternoon of 3 April 1977 at the Taieri River Mouth, Otago. This is the 8th published record from New Zealand and the southernmost for the country (and the world). Correlation of timing with preceding weather patterns indicates that the bird came from Norfolk Island (and not the Kermadecs) and that it was wind-carried either during typhoon " Norman " which during 15-24 March swept southwards past Norfolk Island to western North Island or was caught in a strong southerly airstream passing Norfolk Island on 29 March and was carried south before an advancing cold front, making land-fall in Fiordland or coastal Southland.

## OTAGO OBSERVATION

On Sunday 3 April 1977 I was fishing at the Taieri River Mouth, Otago. It was a warm, calm and sunny day. I was c. 200 m from the river mouth on the northern side, and while sitting on my knees in the sand near the water's edge, baiting hooks with my back to the sea, I suddenly heard a loud harsh crackling bird call — " kriii-yaah " — in the air just behind me.

The momentary flash of thought registered the call of the Common Tern *(Sterna hirundo)*, a memory from the Denmark of my youth; this thought struck me as I quickly turned round and just behind me (some 6 m distance and 4-5 m above the beach near the water's edge) saw a slow-flying black tern with a silvery white cap, shining in the sun. I immediately recognized it as an adult White-capped Noddy with which species I had become well familiar during a visit to New Guinea (where in Port Moresby harbour I photographed this species and the closely related Common Noddy *(A. stolidus)* in August 1970 cf. Fig. 1); as well, I had seen it along the northern Queensland coast, near Cairns.

The noddy flew with measured wing-beat of the rather broad and short (for a tern) black wings in a straight line along the water's edge, closely pursued by 4 Red-billed Gulls *(Larus novaehollandiae scopulinus)*; the gulls did not attack the noddy but followed it closely — as out of curiosity — till out of sight.

The plumage of the noddy was uniform black, wings and tail also black, both upper- and undersides, and the bill black and thin, of length as head. I noticed the spread-out, slightly forked tail. Most

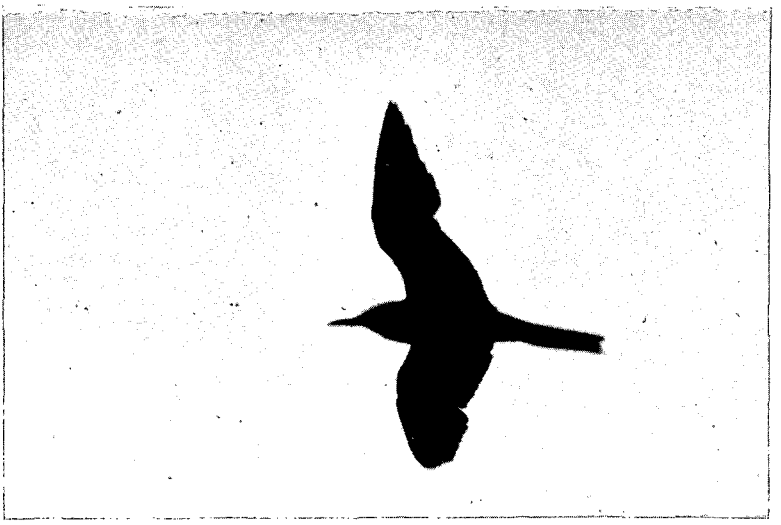

FIGURE 1 — White-capped Noddy photographed in Port Morseby harbour 25 August 1970. Note the comparatively short and broad wings and the slightly forked tail.
Photo: K. E. Westerskov

spectacular was the bright white cap from bill to nape. The bird's flight pattern was slightly different from the much longer (and narrower) winged White-fronted Tern *(Sterna striata)*, common in the area: the noddy moved its shorter wings in a shorter arc, more rhythmical and laboured than the longer winged species.

The observation was made at 1615 hours and the noddy was not seen again that day. The following afternoon I returned to the river mouth with camera and telephoto-lens in the hope of again seeing the bird and photographing it; but in spite of a careful scrutiny of all bays and all terns and gulls seen, there was no sight of the noddy. I re-visited the area on 8, 16, 17 and 23 April but did not see the noddy again. White-fronted Terns were always present, a flock of 50-150 rested with Red-billed Gulls and Black-backed Gulls *(Larus dominicanus)* on the spit on the southern side of the outlet. On 4 April there were 64 White-fronted Terns, 75 Red-billed Gulls and 2 Black-backed Gulls as well as 5 Pied Stilts *(Himantopus himantopus)* resting in a group on the southern spit.

## ORIGIN AND LIKELY ROUTE

The two nearest breeding stations to New Zealand of the White-capped Noddy are: Norfolk Island and the 6 km to the south lying Philip Island (Hull 1909: 659), a distance of 720 km to Cape Maria van Diemen: and Kermadec Islands where it breeds on the two Meyer Islets to the north-east of Raoul Island (Soper 1968: 71),

an equal distance of 1050 km to East Cape and Cape Brett, Bay of Islands. Further (northern) breeding grounds are so far removed that it is a reasonable assumption that the bird came from Norfolk or Kermadec.

Noddies are sedentary (Serventy *et al.* 1971: 236) and spend their lives on or near their breeding/roosting islands: " Abundant usually only within 50 miles of breeding or roosting islands " (King 1967: 82).

Occurrence far outside their breeding range is, therefore, exclusively a result of accidental catching up of noddies in cyclones and other forceful air-movements, probably of birds feeding at sea away from the islands. The few appearances in New Zealand are also most likely caused by exceptional weather; thus the White-capped Noddy observed resting with a flock of White-fronted Terns at Ocean Beach, Whangarei Heads, on the morning of 13 February 1965 was " probably sheltering from the effects of the Fijian hurricane, and . . . rather exhausted " (Robb & Robb 1965), and another noddy picked up dead in March 1975 was " blown into Houhora harbour during Hurricane Alison " (Edgar 1975: 331).

Presuming the noddy observed at Taieri River Mouth was a fairly recent arrival, weather patterns over the preceding month might indicate both (1) place of origin, whether Norfolk or Kermadec, and (2) possible course and time of aerial transportation to New Zealand waters.

A review of the 5 weeks preceding 3 April showed that there were two periods when weather developments were such that the bird could have been weather-carried to New Zealand. In either case it was quite clearly air movement from the region of Norfolk Island, and it is possible, provided the timing is accepted, to state that the origin of the bird was Norfolk, which furthermore is so much closer, and not the Kermadecs.

The first likely period of the noddy's journey is somewhere during the period 15-24 March (cf. Fig. 2). A tropical depression developed in the New Hebrides and was first recorded on 15 March; it rapidly grew in intensity, became known as typhoon " Norman " and moved in a southerly direction towards Northland. This tropical cyclone passed directly east of Norfolk Island in the early hours of 21 March, and any noddies fishing in the sea east of the island could easily have been caught into this clock-wise revolving, rapidly southward moving tropical depression and wind-carried reaching western Northland in less than a day.

In favour of this alternative are: (1) the shortest possible distance: (2) the direct Norfolk Island - Northland air movement carrying the bird. The cyclone spiralled southwards (its centre progressing some 300 km per day), total distance some 2400 km in 8 days before it petered out. The wind velocity associated with such typhoons

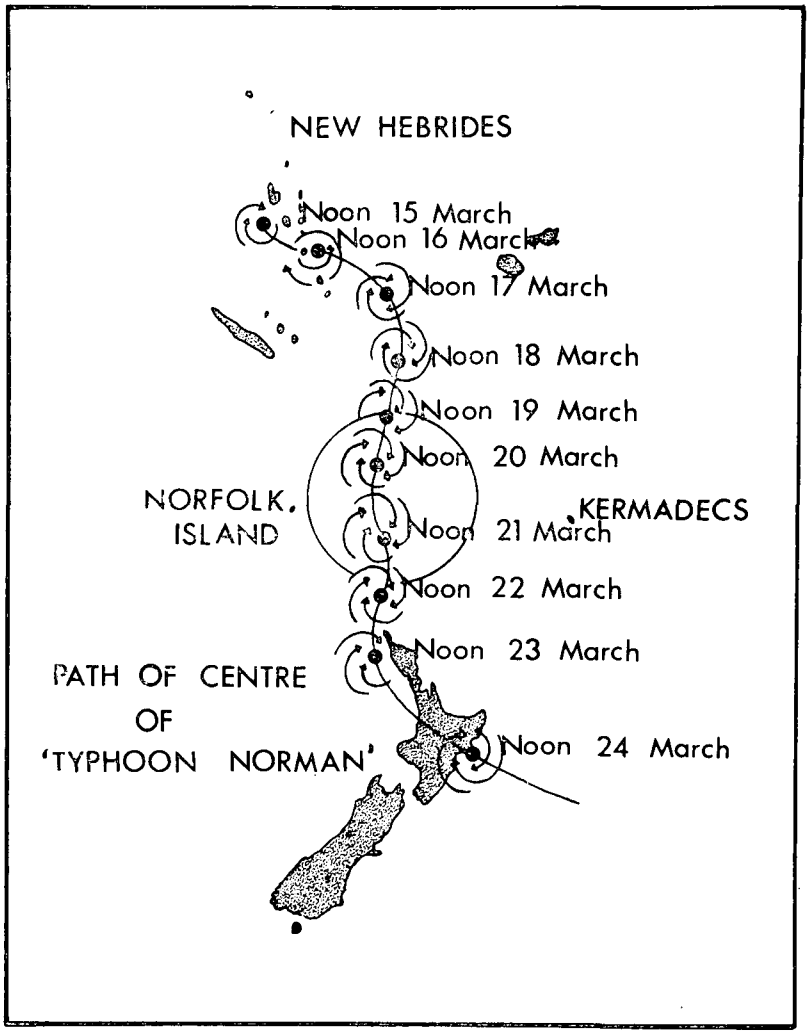


FIGURE 2 — Path of ' Typhoon Norman ' from the New Hebrides to New Zealand, 15-24 March 1977, which possibly carried the White-capped Noddy seen at Taieri River Mouth on 3 April; based on daily weather maps published by the New Zealand Meteorological Service. The large circle shown east of Norfolk Island is the 1005 mb isobar as recorded for midnight between 20 and 21 March.

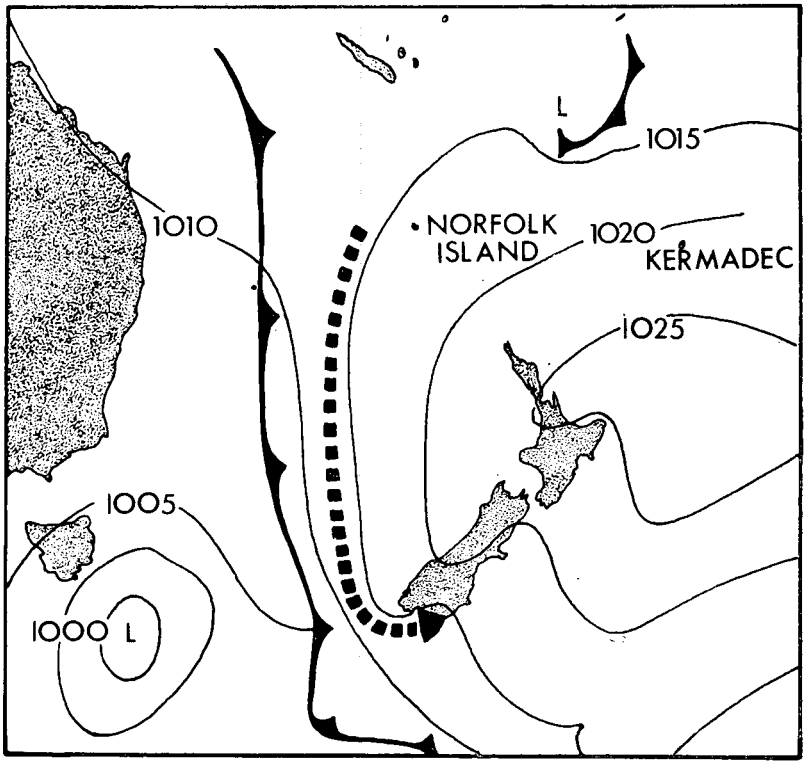


FIGURE 3 — Weather situation early on 29 March 1977 (modified from weather map of the New Zealand Meteorological Service) showing second possible arrival route of White-capped Noddy seen at Taieri Mouth on 3 April. The stippled arrow indicates possible flight path, considering changes brought about by rapid shifting eastwards of the cold front and low pressure system.

measures 120 km per hour and over, decreasing to some 50 km per hour at distances of 160-240 km from the centre (Taylor 1954: 252).

The second alternative was a situation developing on 29 March (cf. Fig. 3) when increasingly strong northerly winds, advancing in front of a strong cold front, moved eastwards from Australia and in the early hours of 29 March passed over Norfolk Island. This wind moving mid-Tasman in an almost straight north-south direction was influenced by a strong westerly wind developed by a low pressure system advancing rapidly across the Tasman from south-east of Tasmania. A bird caught up in this southerly (and later east-bent) air-stream would probably end up in Fiordland or southern Southland.

In favour of this second alternative are: (1) closer to noddy observation in time: (2) the bird would have made land-fall very close to point of observation a couple of days later: (3) lack of observations of noddies further north during this period, as after typhoon " Norman." Against this alternative counts the much longer travel distance involved, a minimum of c. 1900 km.

It is of interest to consider these two potential routes in the light of wind speeds and flight speed of the noddy. There are no published records of flight speeds of the White-capped Noddy, but for this purpose records of flight speed of the closely related (and almost similar-sized) Common Noddy and other terns will suffice. In his excellent early behaviour study, Watson (1908: 228) reported that 2 Common Noddies characteristically painted were transported 72 750 m from their breeding island, Bird Key in the Dry Tortugas, Florida Straits, to a nearby island, Marquesas Keys; they returned to their nest in 1 hour 45 minutes, corresponding to a ground speed of 42 km per hour. This figure is very close to flight speeds of two terns, measured by using a double theodolite system (Tucker & Schmidt-Koenig 1971): for Caspian Tern *(Hydroprogne caspia)* the mean recorded flight speed for 5 birds was 42 km per hour, and for 4 Royal Terns *(Thalasseus maximum)* 48 km per hour.

For this calculation the ground speed of the White-capped Noddy is estimated at a conservative 40 km per hour. This air speed, provided the bird flies with the wind, must be added to the wind speed as the bird moves within the advancing air mass independent of the ground. In both alternatives accepted in this paper, the noddy is shown to have moved with the prevailing wind towards New Zealand. In the case of typhoon " Norman " (ground speed 120+ km per hour), the effective forward speed could thus have been 160 km per hour or more, enabling a noddy to reach New Zealand from Norfolk Island in some 4-5 hours, provided it generally flew in the direction of New Zealand and not circled or tried to break out of the centre of the cyclone.

Considering the alternative of the longer but almost directly due south flight on 29 or 30 March, the likely wind speed of the southern wind movement in front of the advancing cold front can be estimated using the geostrophic wind equation (McIntosh & Thom 1969: 84); this equation which incorporates increased wind speed with decrease in isobar spacing and latitude indicated a wind velocity of 13 m per second near Norfolk Island (47 km/hour) on the day in question, increasing to 36 m per second (130 km/hour) west of Fiordland.

Provided the bird flew in a southerly direction and did not try to escape the rapdily increasing southerly airflow, it might have covered the 1900 km distance from Norfolk Island to Fiordland in as little as 15 hours, accepting as mean forward speed $(\frac{47 + 130 + 40}{2})$ km per hour.

While the above presented indications of origin, travel route, speed and land-fall of the observed White-capped Noddy are purely speculative, based as they are on the assumption that the bird was a recent arrival (within the preceding 5 weeks), they do incorporate a number of known facts (the bird's ground speed and meteorological conditions, such as wind direction and speed during the period). They also throw some light on the effects of severe weather conditions and show how a single or a few birds in incredibly short time may move (be moved) long distances.

It would be realistic to assume that not one but many birds were caught in such typhoons and strong winds and that many would — after being caught — try to re-orient and adjust their flight path for the home island; many would perish in the effort. It might be only the odd bird which for unknown reasons proceed with (not against) the wind and thus survive to reach distant shores. It seems fruitless to speculate that noddies could rest on the sea (after all, they are seabirds) if tired during such a flight or during the night; not only would the sea during the conditions prevailing be in turmoil, but noddies rarely if ever land on water (they roost on or at the nest or elsewhere on the roosting islands) and fish off the sea surface without landing or diving (Watson 1908: 193; King 1967: 82; Serventy *et al.* 1971: 235).

Large numbers of seabirds succumb in storms at sea as is well known by members of the Beach Patrol Scheme and is dramatically illustrated in the latest report of that activity (Veitch 1977) — 21 425 dead seabirds found on 3681 km of coast patrolled in 1975. A few of the seabirds caught up this way survive and live to reach our shores.

## ACKNOWLEDGEMENT

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# SEABIRDS FOUND DEAD IN NEW ZEALAND IN 1967

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ABSTRACT

During 1967, 1 137 kilometres of coast were patrolled by 38 members of the Ornithological Society of New Zealand and 2 228 dead seabirds were found. Localized wrecks of Blue Penguins *(Eudyptula minor)*, Fairy Prions *(Pachyptila turtur)* and Sooty Shearwaters *(Puffinus griseus)* were recorded. Meterological evidence shows that these wrecks coincided with unusually severe weather conditions.

## INTRODUCTION

This report summarises results of the Ornithological Society of New Zealand's Beach Patrol Scheme for 1967. During this year 126 beach patrol cards and 15 specimen record cards were filed covering 9 of the 15 geographical zones detailed by Imber & Boeson (1969). Nomenclature follows the *Annotated Checklist* (OSNZ 1970). In most cases binomials have been used, as it is not reasonable to identify subspecies from beach wrecked specimens. Trinominals are only used where confirmed identifications have been made.

## RESULTS AND DISCUSSION

The numbers of birds found, kilometres of beach travelled, kilometres of beach covered per month and per zone are presented in Table 1. In only four sections — Auckland West, Auckland East, Wellington West and Taranaki — was an excess of 100 km covered. *Kilometres travelled* is the sum of distances patrolled. *Kilometres covered* is the length of coast actually inspected monthly. Hence, if one kilometre of beach is patrolled 3 times in one month, 3 kilometres have been travelled but only one kilometre covered. The monthly and zonal distribution of more common species is listed in Tables 3 and 4. Details of the rarer specimens are recorded in Table 2.

Minor wrecks of Fairy Prions, Sooty Shearwaters, and Blue Penguins were recorded, otherwise mortality was at normal levels.

During December 1966 and January 1967 strong south west winds were recorded as shown by the following extract from the Meteorological Service records:— " The cold spell which had been affecting the country in the last week of 1966 continued for about the first ten days of 1967. South to west winds dominated during this period. The 18th to 25th January was a period of westerlies which terminated on the 25th with gale force winds " (Gabites 1967). This weather could account for the high number of birds (4 per km) ashore on Auckland West beaches in January 1967.

NOTORNIS 24: 239-245 (1977)

TABLE 1. Number of dead seabirds recorded and kilometres patrolled on each coast in 1967*

| Code | Coast | | MONTH Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | TOTALS Km cov | Birds | Birds Km month |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AW | Auckland West | Km | 32 | 5 | - | 37 | 34 | 11 | 50 | 4 | - | 3 | 108 | 135 | 419 | | |
| | | birds | 143 | 6 | - | 19 | 51 | 25 | 16 | 3 | - | 5 | 359 | 145 | | 772 | 1.84 |
| T | Taranaki | Km | 10 | - | 12 | 10 | 15 | - | 16 | 25 | 4 | 13 | - | 10 | 115 | | |
| | | birds | 5 | - | 5 | - | 5 | - | 8 | 4 | 4 | 6 | - | 29 | | 66 | 0.57 |
| WW | Wellington West | Km | - | 42 | 19 | 32 | 20 | - | - | - | - | 11 | 72 | 2 | 198 | | |
| | | birds | - | 73 | 7 | 23 | 41 | - | - | - | - | 2 | 689 | 14 | | 849 | 4.28 |
| WD | Westland | Km | - | - | - | - | - | - | - | - | - | - | 6 | - | 6 | | |
| | | birds | - | - | - | - | - | - | - | - | - | - | 3 | - | | 3 | 0.50 |
| AE | Auckland East | Km | 58 | 4 | 20 | 3 | 23 | - | 32 | 11 | 14 | 48 | 48 | 24 | 285 | | |
| | | birds | 99 | 2 | 189 | 2 | 59 | - | 36 | 10 | 13 | 22 | 61 | 23 | | 516 | 1.81 |
| BP | Bay of Plenty | Km | - | - | 5 | - | - | - | - | - | - | - | - | - | 5 | | |
| | | birds | - | - | 6 | - | - | - | - | - | - | - | - | - | | 6 | 1.20 |
| EC | East Coast | Km | - | - | - | - | 6 | - | - | - | - | - | - | - | 6 | | |
| | | birds | - | - | - | - | 4 | - | - | - | - | - | - | - | | 4 | 0.66 |
| O | Otago | Km | 2 | 7 | - | - | 2 | - | - | - | - | - | - | - | 11 | | |
| | | birds | 2 | 7 | - | - | 0 | - | - | - | - | - | - | - | | 9 | 0.81 |
| WS | Wellington South | Km | - | - | - | - | - | - | - | - | - | - | - | 2 | 2 | | |
| | | birds | - | - | - | - | - | - | - | - | - | - | - | 3 | | 3 | 1.50 |
| Total Kilometres Travelled (Not listed above) | | | 102 | 58 | 61 | 82 | 100 | 11 | 103 | 40 | 18 | 75 | 314 | 173 | 1137 | | |
| Total Kilometres Covered | | | 102 | 58 | 56 | 82 | 100 | 11 | 98 | 40 | 18 | 75 | 234 | 173 | 1047 | | |
| Total birds recorded | | | 249 | 88 | 207 | 44 | 160 | 25 | 60 | 17 | 17 | 35 | 1112 | 214 | | 2228 | |
| Birds/Kilometre covered/month | | | 2.44 | 1.51 | 3.69 | 0.53 | 1.60 | 2.27 | 0.61 | 0.42 | 0.94 | 0.46 | 4.75 | 1.23 | | | 2.12 |

* No patrols were reported from Fiordland, Wairarapa, Canterbury North, Canterbury South, Southland and North Coast South Island

TABLE 2 -- Seabirds of which 1 to 5 specimens were found dead in 1967. Coast and Month of discovery given.

| SPECIES OR SUBSPECIES | NUMBER FOUND | COAST(S) | MONTH(S) |
|---|---|---|---|
| Diomedea exulans | 5 | AE, AW (4) | Jan, Mar, May, Dec (2) |
| epomophora | 2 | WW, O | Feb (2) |
| chrysostoma | 1 | AW | Jan |
| bulleri | 3 | AE, AW (2) | Jan, May, Nov |
| cauta salvini | 2 | AW (2) | Jan, Dec |
| Phoebetria palpebrata | 2 | AW, WW | May, Nov |
| Pterodroma spp* | 2 | AW | Jul (2) |
| cookii | 4 | AW (2) AE (2) | Apr, May (2), Dec |
| Pachyptila vittata | 5 | AW (2), T, WW (2) | May (2), Oct, Nov (2) |
| desolata | 4 | AW, WW (3) | May, Oct, Nov (2) |
| Procellaria spp* | 1 | AW | Apr |
| cinerea | 1 | AW | Nov |
| Puffinus spp* | 1 | T | Jul |
| huttoni | 3 | AW, WW (2) | Nov (3) |
| Pelagodroma marina | 3 | AE, AW, WW | Jan, Nov (2) |
| Phalacrocorax carbo | 4 | AE, (2), T, WW | Jan, Feb, May, Sept |
| varius | 3 | T, AE (2) | Aug, Oct, Nov |
| melanoleucos | 1 | AE | Mar |
| Stictocarbo punctatus | 2 | O, AW | Jan, Feb |
| Larus spp* | 1 | WW | Nov |
| bulleri | 2 | O | Feb |
| Sterna spp* | 1 | AW | May |
| Hydroprogne caspia | 3 | AE | Oct, Dec (2) |
| TOTAL | 56 | | |

* Species could not be identified by patroller.

TABLE 3 — Monthly Distribution of the more common seabirds found dead in 1967.

| SPECIES OR SUBSPECIES | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | TOTAL BIRDS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Eudyptula minor | 79 | 4 | 176 | 8 | 33 | - | 15 | 5 | 5 | 3 | 126 | 30 | 484 |
| Diomedea cauta | 1 | 3 | 1 | 1 | - | - | - | - | - | - | 5 | 2 | 13 |
| Macronectes giganteus | 3 | - | - | - | - | - | 4 | 2 | - | 1 | 2 | 1 | 13 |
| Daption capensis | - | - | - | - | - | 1 | 1 | - | 1 | 2 | 6 | 2 | 13 |
| Pterodroma macroptera | 3 | - | - | - | - | 2 | 2 | 1 | - | 1 | 3 | 2 | 14 |
| lessoni | 1 | - | - | 1 | 2 | - | - | 1 | - | 1 | 9 | 7 | 22 |
| inexpectata | 1 | - | - | - | 1 | - | - | - | - | - | 2 | 2 | 6 |
| Pachyptila species | - | 14 | 1 | - | 4 | - | 2 | - | - | 1 | 232 | 1 | 255 |
| belcheri | - | - | - | - | - | - | - | - | 1 | - | 5 | - | 6 |
| turtur | 5 | 36 | 1 | 6 | 17 | 2 | - | 1 | 1 | 4 | 155 | 5 | 233 |
| salvini | - | - | 3 | - | 1 | - | - | - | - | - | 2 | - | 6 |
| Puffinus carneipes | 4 | 1 | - | 1 | 6 | 3 | 4 | - | - | - | 7 | 3 | 29 |
| bulleri | 6 | 4 | 3 | - | 4 | 3 | 1 | - | - | 2 | 10 | 4 | 37 |
| griseus | 90 | 4 | 15 | 3 | 41 | 12 | 2 | - | - | 3 | 430 | 102 | 702 |
| tenuirostris | - | - | - | 1 | 5 | 2 | - | - | - | - | 10 | 21 | 39 |
| gavia | 17 | 6 | 2 | 9 | 6 | 1 | 3 | 2 | - | 4 | 16 | 6 | 72 |
| assimilis | - | - | - | - | - | - | 1 | 1 | - | - | 11 | 1 | 14 |
| Pelecanoides urinatrix | 17 | 3 | - | 5 | 12 | - | 5 | 2 | 4 | 8 | 25 | 5 | 86 |
| Sula serrator | 8 | 1 | - | 1 | 11 | 2 | 3 | - | 1 | - | 11 | 5 | 43 |
| Larus dominicanus | 7 | 4 | 2 | 5 | 8 | - | 11 | 1 | 1 | 1 | 9 | 4 | 53 |
| novaehollandiae | 5 | 1 | 2 | - | 1 | - | 5 | - | 2 | 2 | - | 6 | 24 |
| Sterna striata | 2 | 1 | - | - | - | - | 1 | 1 | 1 | - | 2 | - | 8 |
| TOTAL | 249 | 82 | 206 | 41 | 152 | 28 | 60 | 17 | 17 | 33 | 1078 | 209 | 2172 |

TABLE 4 — ZONAL DISTRIBUTION OF THE MORE COMMON SEABIRDS FOUND DEAD IN 1967

| SPECIES OR SUBSPECIES | COAST | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | AW | T | WW | WD | AE | BP | EC | O | WS | TOTALS |
| Eudyptula minor | 92 | 10 | 114 | - | 262 | 6 | - | - | - | 484 |
| Diomedea cauta | 7 | - | 4 | - | - | - | - | 2 | - | 13 |
| Macronectes giganteus | 5 | 1 | - | - | 7 | - | - | - | - | 13 |
| Daption capensis | 6 | 1 | 5 | - | 1 | - | - | - | - | 13 |
| Pterodroma macroptera | 8 | - | - | - | 6 | - | - | - | - | 14 |
| lessoni | 13 | - | 9 | - | - | - | - | - | - | 22 |
| inexpectata | 4 | 1 | 1 | - | - | - | - | - | - | 6 |
| Pachyptila species | 5 | - | 248 | 1 | 1 | - | - | - | - | 255 |
| belcheri | - | - | 5 | - | 1 | - | - | - | - | 6 |
| turtur | 26 | 3 | 197 | - | 6 | - | - | - | 1 | 233 |
| salvini | 2 | - | 3 | 1 | - | - | - | - | - | 6 |
| Puffinus carneipes | 14 | - | - | - | 15 | - | - | - | - | 29 |
| bulleri | 18 | - | 3 | - | 16 | - | - | - | - | 37 |
| griseus | 431 | 15 | 171 | 1 | 84 | - | - | - | - | 702 |
| tenuirostris | 34 | - | 5 | - | - | - | - | - | - | 39 |
| gavia | 32 | 2 | 15 | - | 23 | - | - | - | - | 72 |
| assimilis | 4 | - | 8 | - | 2 | - | - | - | - | 14 |
| Pelecanoides urinatrix | 14 | 6 | 37 | - | 28 | - | - | - | 1 | 86 |
| Sula serrator | 21 | 2 | 2 | - | 18 | - | - | - | - | 43 |
| Larus dominicanus | 17 | 8 | 12 | - | 8 | - | 4 | 3 | 1 | 53 |
| novaehollandiae | 1 | 16 | 1 | - | 6 | - | - | - | - | 24 |
| Sterna striata | 3 | 2 | 1 | - | 2 | - | - | - | - | 8 |
| TOTALS | 757 | 67 | 841 | 3 | 486 | 6 | 4 | 5 | 3 | 2172 |

The high incidence of birds on the Auckland East beaches in March (9.5 birds per km) was probably due to the high frequency of north easterly winds recorded during this period. A wreck of Blue Penguins *(Eudyptula minor)* at a rate of 10 per km on Tokerau Beach and 2 per km at Mangawhai, can be directly related to this weather. Similar wrecks in Northland have been described by Crockett & Kearns (1975).

The wreck of Fairy Prions *(Pachyptila turtur)* occurred on Wellington West beaches during November with 2.1 birds per kilometre. A large number (232) of wings only, listed as *Pachyptila* species are likely to have also belonged to Fairy Prions. During 1967 only small numbers of the usual Indo-Atlantic prion species *P. belcheri* (6), *P. desolata* (4), *P. salvini* (5), and the local southern *P. vittata* (5) were found on our coasts.

The transequatorial migrant Scoty Shearwater *(Puffinus griseus)* returning from the North Pacific were wrecked on Auckland West and Wellington West beaches during November-December. Usual numbers (39) of the Short-tailed Shearwater *(Puffinus tenuirostris)* came ashore. Other migrant shearwaters *(P. bulleri* and *P. carneipes)* were apparently not affected. Adverse weather conditions were the probable cause of this mortality as shown by the following extract from the Meteorological Service monthly report:— " From the 5th to 7th November a deep depression crossed the South Tasman Sea and moved past Campbell Island while two associated troughs crossed the country. Winds were mainly between northwest and southwest reaching well beyond gale force in some areas, especially about Cook Strait. Six days of strong westerlies followed. Westerly conditions again prevailed between the 22nd to 24th November " (Gabites 1967).

In addition to seabirds, 28 land or freshwater birds were found, *viz:*— 2 Black Swans, 2 Grey Ducks, 2 Harriers, 1 Californian Quail, 2 Pheasants, 2 Domestic Fowl, 3 Variable Oystercatchers, 1 Rock Pigeon, 1 Dove sp., 1 Rosella, 1 Budgerigar, 1 Skylark, 1 Song Thrush, 5 Blackbirds, 1 Tui and 2 White-backed Magpies. These are not listed in the tables.

## ACKNOWLEDGEMENTS

Beach patrolling is a time-consuming, and sometimes expensive, recreation. Credit is due to the 38 members and friends who contributed cards during the year. Members taking part were:—

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## A G M 1977: A LATER REPORT

The following reports for presentation at the Annual General Meeting were received too late for publication with the others in the September *Notornis*.

### CARD COMMITTEE REPORT

Two further original paintings, Yellowhead and Wrybill, by Mrs Janet Marshall were used for this year's cards. Mixed packs of the previous year's cards were also available. Sales remained at 60,000 but profits, $4,200, were higher because no printing was involved. Also Mrs Marshall met the cost of distributing the brochures as she included one featuring her own prints. This resulted in a saving of some $700.

The next cards will feature Kakapo and Pied Tit. Distribution will be handled from Auckland with Mr Russell Thomas as convener. The brochures will continue to be circulated from Wellington.

On behalf of the Society I would once again thank the Royal Forest and Bird Protection Society for addressing the brochure envelopes and Wellington members for their continuing help with sorting and packaging, and my wife for handling the dispatch. I would also like to extend the Society's thanks to Mrs Marshall for her valuable contribution. As this is my final year as convener I would ask all to support the Christmas Card Scheme under its new convener.

B. D. BELL, Convener

# CLASSIFIED SUMMARISED NOTES

Compiled by A. T. EDGAR

Selected extracts from notes sent to me during 1976-77. 1977 Cattle Egret records are not included as these will be published elsewhere. A correction to *Notornis* 23: 342 appears under White-winged Black Tern. My grateful thanks to all my correspondents who, over the 15-year period 1963-1977, have provided the mass of material from which successive CSN have been compiled.

List of Contributors, 1976-77:—

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E. & O. E.

BROWN KIWI *(Apteryx australis)*

Takou Bay, 15/6/77, a fresh egg in a hole, in a pile of soil, sticks and logs formed during mechanical clearing of gorse and scrub (ATE). Little Barrier, May 1977, a juvenile found dead in a small

freshwater rock pool; around the eye of another young bird were three ticks, which were removed and the bird released (RCM). Ponui Island, 6/12/76, made and female calling 2200-2300 hours 8/12/76; nest with one egg found on 8/12/76 by P. Chamberlin in a small hole about 20 metres from where a cast egg was found the previous season (HRMcK). Reliable report of one in Wanganui township, July 77 (AP). Upper Copeland, November 76, calls heard at Douglas Rock Hut and Welcome Flat Hut (SCS). Stewart Island, Port Adventure, January 76, five birds seen feeding by day — two single and a group of two adults and one half-grown bird (GF); March 76, calls around Fred's camp; probes, footprints and feathers caught in hook grass along tracks to Freshwater Landing and Mason Bay; no sign found on the eastern side of Thomson ridge (PMS); December 76, tracks on sand dunes at Mason Bay, one bird seen at 1400 hours in tussock near Island Hill (PJM).

LITTLE SPOTTED KIWI *(A. oweni)*

Okarito State Forest, night of 3/10/76, twelve birds heard calling in one area, two within a few feet of a parked car (HFH).

LITTLE BLUE PENGUIN *(Eudyptula minor)*

Sandford's Fish Factory, Tauranga, March 77, three, whole, found inside a large kingfish (KF). Snares Islands, 14/1/77, one in sea off Mollymawk Bay, very weak and died within an hour, spots of oil on abdomen (PMS).

WHITE FLIPPERED PENGUIN *(E. albosignata)*

A bird banded at Motunau Island was found in July 75 at Pouawa, north of Gisborne, by G. Anderson (JCH).

ROCKHOPPER PENGUIN *(Eudyptes crestatus)*

Okitu, near Gisborne, 6/12/76, one came ashore; fat and in perfect condition, pure white droppings; kept overnight to save it from prowling dogs and released next morning (AB). Dunedin, moulting birds ashore at Blackhead Quarry 30/1/77 and at Ocean View, Brighton, 8/2/77, banded and released on completion of moult; one ashore at Oyster Bay, S.E. Otago, 22/2/77, identified by photograph (AW). Snares Islands, Penguin Slope, 3 moulting 17/1/77, 5 moulting 18/1/77; 19/1/77, 2 yearlings just beginning to moult, Boat Harbour landing rocks; 29/1/77, one moulting, Station Cove landing rocks; 2/2/77, one just beginning to moult, vicinity of station; 5/2/77, one just completed moulting, Station Point and two on Penguin Slope (PMS).

FIORDLAND CRESTED PENGUIN *(E. p. pachyrhynchus)*

19/2/77, one on Kapiti Island, resting among flax (SP). Brighton Beach, Dunedin, one on 2/2/77, banded and released at Taiaroa Head (AW). Jack Bay, S.E. Otago, 28/1/77 (J. Hamel). Snares Islands, single yearlings 22/11/76, 3/12/76, 17/1/77 (in fat moult condition) and 19/1/77; 11/2/77, two recently moulted (PMS).

SNARES CRESTED PENGUIN *(E. p. atratus)*

Snares Islands, pairs with downclad chicks, 9/11/76; chicks leaving colonies for sea during late January; yearlings moulting during early February; adults in fat moult condition returning to the colonies

during late February-early March (PMS). Single birds ashore at St Clair beach 29/1/77 and Brighton beach 2/2/77, banded and released at Taiaroa Head; Papanui Inlet 27/2/77, one dead, moult near complete; Tautuku mouth, S.E. Otago ,one in moult 26/2/77, identified by photograph (AW).

ERECT CRESTED PENGUIN *(E. p. sclateri)*

Snares Islands, yearlings in fat moult condition 4/2/77 and 11/2/77; a recently moulted bird on 16/2/77 and a moulting bird on 1/3/77 (PMS).

SOUTHERN CRESTED GREBE *(Podiceps cristatus)*

Waikato river just below Taupiri mountain, near bridge, one reported 15/5/77 (RCM). Ref. *Notornis* 23/262, a single bird present on Lake Rotorua in June 76, at the same place as one was seen in December 75 (AP). Lake Elterwater, a pair raised 3 young in 1976/77 season (TJT, BDH, CS, *et al*). Westland, Lake Ianthe, 31/10/76 (GG); 26/1/77, a pair, head shaking display (BB). Lake Mapourika 13/1/77, 3 near boating wharf, and Saltwater lagoon 20/1/77, 2 adults (KLO). Canterbury, Lake McGregor, 2/1/77, two pairs, each with two young. One lot of chicks very pale in colour, downy, seen to be fed by adult; the other pair sleeping. Each family had one adult on guard. An adult dived for 48 seconds and surfaced for 12 seconds; a chick dived for 24 seconds; it piped in a high insistent voice each time the parent surfaced, and was fed (BB); 12/1/77, total of 10 birds on lake (ARL). Lake Grassmere, 10/3/77, 1 (ARL); also recorded in January 1977, one on Lake Emma, 2 on Maori Lakes, 2 at south end of Lake Heron, 5 adults and a half-grown young on Lake Clearwater (BDH).

N.Z. DABCHICK *(P. rufopectus)*

Aupouri Peninsula lakes, only two recorded, Jan 77 (ATE). February 77, Dargaville Lakes, 67 (PJM), Muriwai Lakes, 57 (SMR). On Lake Kereta a family group of two adults and two young about two-thirds grown; one young bird attached itself to the parent's rear and was towed along for about 5 minutes, during which the feet of the juvenile were visible paddling at the water surface. We assumed that attachment was by means of the juvenile's beak, until we could see clearly the beak raised above the level of the adult's back; we then wondered if the juvenile's head or neck were being held between the parent's wing tips. On another lake the same thing was being observed by A. and L. Howell, who were fairly sure that attachment was by the juvenile's beak. Presumably this behaviour is the equivalent to riding on the parent's back by young birds which are too big to do this any longer, but are not yet independent (BRK). One on a small lake at Karioitahi, Waiuku, 29/5/77 (BB). Clevedon river, one in salt water below cruising club landing (GKMcK). Lake Ngaroto, singles 17/9/76 (ARL) and 6/8/77 (BHS). Lake Rotorua, Motuatara Point, winter count 6/6/76, 38; 6/6/77, 55; Lake Rotomahana, 19/5/76, 19 (AP). Lake Rotoehu, 8/8/76, 19 (AP), 13/5/77, 32 (CHL). Also recorded from Lakes Okareka, Rotoiti and Rotoma (RWJ, JCH). Lake Whakamaru, 22/12/76, 2 (JCH). Lake Rotopounamu, two pairs 25/2/77 (TGL) and 26/5/77 (HAR). Hinemaia dam, near Taupo, 25/4/76, three adults feeding one fully fledged young (AP). Wairoa 25/11/75, 2; Lake Tutira 17/8/76, 6; 16/2/77, 12; Whirinaki, Napier,

16/2/77, 5 (JCH). Fernhill, 25/9/76, 6 (KVT). Manawatu, several permanently on all the larger dune lakes. C. McLennan reports that one on his lake near Waitarere courts and attempts to copulate with decoy ducks during the shooting season (HAR). Lake Horowhenua, 26/3/77, six, still in summer plumage, the first seen this season; numbers increased to 21 by 28/5/77 (EBJ). Bred successfully at Waimeha lagoon 1976 (CAF). Marton sewage ponds, 11/7/77, 28, apparently in pairs, in rich plumage and all with raised eye-pattern backsides. Waingawa ponds near Masterton, 21/5/77, 7; 30/7/77, 8 (BDH).

AUSTRALIAN LITTLE GREBE *(P. novaehollandiae)*

Lake Tarawera, one on 27/8/77 (AP). Lake Elterwater, 24/1/77, two in rich breeding plumage skulking very warily in partly submerged willows. Remained apart; chatter-call and surface-skimming chase of one by the other seen the only time they both appeared (BDH). Pukepuke Lagoon, 13/11/75, one (WJP). Diamond Lake, near Glendhu Bay, Lake Wanaka, 12/3/77, pair with 3 young (MFS).

HOARY HEADED GREBE *(P. poliocephalus)*

Pukepuke Lagoon, one present 3/6/76 till 29/6/76 (WJP). Diamond Lake, near Lake Wanaka, 12/3/77, one bird thought to be this species. On a subsequent visit, of six small grebes on the lakelet, five were a pair of Little Grebes with three large young. The sixth bird was pale sandy grey, kept to itself, was extremely suspicious and had a different call note (MFS). Te Anau, Lagoon Creek, 28/10/76, nest building on old site; 17/11/76, re-building on new site; 1/12/76, nest, 4 eggs; distraction display, broken wing action in water, displaying white wing bar (MLB). Three young said to have been reared from this nest. 23/3/77, 5 birds present, 2 eggs being incubated (RRS). Dawson Dam, 5/2/77, one full sized juvenile; drab pale grey, darker on crown, nape and back, no crest, no black chin stripe (MLB).

WANDERING ALBATROSS *(Diomedea exulans)*

Manutuke, near Gisborne, storm-driven juvenile, out of nest 2-3 months, picked up and released at sea 23/4/76 (AB).

ROYAL ALBATROSS *(D. epomophora)*

Snares Islands, groups of up to 7 birds seen offshore Nov. 76-March 77 (PMS).

BULLER'S MOLLYMAWK *(D. bulleri)*

Snares Islands, first bird seen ashore at breeding colonies 6/12/76; first egg recorded 1/1/77 (PMS).

SHY MOLLYMAWK *(D. cauta cauta)*

Off Foxton beach, 2-3/10/76, 30, mainly passing north (JLMM).

LIGHT MANTLED SOOTY ALBATROSS *(Phoebetria palpebrata)*

October 76, one dead on top of cliffs at Urenui (REL). 5/3/77, one 15 miles off New Plymouth fed on fish scraps from launch (DD). Snares Islands, 9/11/76-3/3/77, flying singles recorded on 9/1/77, 10/1/77 and 25/2/77 (PMS).

NELLY *(Macronectes giganteus)*

July 77, one far up Hokianga harbour, off Kohukohu wharf (KB). Bay of Plenty, off Mayor Island, 28/6/75, 15; Penguin Reef, 12/7/75, 20 (PCL). Foxton Beach, 14 going north, 23/10/76; Ngauranga outfall, 15/11/76, 20 (JLMM). Petone, 7/2/76, 7 (JCH). Snares Islands, groups of up to 5 birds of the northern race *halli* seen offshore November-December 1976; numbers increased rapidly during January 77 as Snares Crested Penguin chicks took to the sea, largest group seen was one of 36 birds. A white phase bird of the southern race *giganteus* was seen off Western Chain on 21/11/76 (PMS).

ANTARCTIC FULMAR *(Fulmarus glacialoides)*

September 76, Kapiti Island, during a storm, one rested on the water in full view, 25 m from shore; previous records of beach specimens, but this may be the first live record (MLF).

CAPE PIGEON *(Daption capensis)*

Winter 1977, one flying over Northern Wairoa river just south of Dargaville (CDC). Penguin Reef, Bay of Plenty, 12/7/75, 40 (PCL). A bird banded in 1957 at Cape Campbell and one banded in 1963 in Tory Channel were recaptured between the Snares and Auckland Islands in January 1977 (JAB).

GREY FACED PETREL *(Pterodroma macroptera)*

Seen at dusk off Kawau 30/4/77 and at dawn as they headed out to sea 20 miles off Cape Brett, 1/6/77; calls heard soon after dusk 25/7/77 over Leigh Marine Lab., birds coming and going from Goat Island colony (TGL). Add Piha to list of locations of small colonies, Auckland West Coast (SMR). Cuvier, a fully fledged juvenile seen at night, 21/1/77 (PCL). Ohope (near Whakatane) west end, eleven fresh burrows, two of which occupied 8/8/76 (AP). Taranaki, Pukearuhe colony, young in some burrows 17/10/76, no sign of predation (RRW).

GADFLY PETREL (*P. externa* subsp.)

After a severe southerly storm a bird was found 30 km from the sea at Kanakanaia, north of Gisborne. It had a jet black cap surrounded by a ½-inch white collar; traces of grey down were still adhering to the middle of its back. After dosing with codliver oil it was released on the beach and flew strongly, but was harassed by several Black-backed Gulls (AB).

MOTTLED PETREL *(P. inexpectata)*

One, picked up 30 km inland from Gisborne 28/6/77, died overnight (AB). Snares Islands, first egg found 21/12/76, first chick found 13/2/77 (PMS).

COOK'S PETREL *(P. cooki)*

Heard at night, 3/1/77, Cuvier Island (BB). One landed in the grounds of Government House, Auckland and was later released, 31/3/77 (TGL).

BROAD BILLED PRION *(Pachyptila vittata)*

Snares Islands, 30/11/76, freshly killed adults in a skua midden on Brougton Island; 10/12/76, two large chicks in light grey down in a deep crevice on Rocky Islet; 2/1/77, a near fledged chick found in a cave on the main island (PMS).

FAIRY PRION *(P. turtur)*

Huge flocks (*turtur* and *desolata*) feeding around Penguin Reef, Bay of Plenty, 12/7/75 (PCL). Snares Islands, November 76-March 77, regularly seen feeding offshore; incubating birds from 12/11/76, first chicks seen at the beginning of January, these fledged about mid-February and all were gone by 21/2/77. This species is readily taken by Southern Skuas (PMS).

FLESH FOOTED SHEARWATER *(Puffinus carneipes)*

Numerous between Cuvier and Kawitihu Islands and inside Great Mercury, 23/1/77 (TGL). 40+ off Mt Maunganui, 31/1/76 (AP). Hauraki Gulf, mid-March, about 200 (RH).

BULLER'S SHEARWATER *(P. bulleri)*

Kaituna cut, Maketu, 25/1/76, 150+ close inshore, heading east (AP).

SOOTY SHEARWATER *(P. griseus)*

Foxton beach, 9/1/77, 7/3/77, c. 1000 per hour moving south 0700-0800 hours on each occasion (JLMM). Otago Peninsula, 1-12/11/76, large flocks observed as far as the eye could see, feeding and flying south. At the peak (5-7 November) estimated 10,000 just off Taiaroa Head. Skipper of Research boat Munida reported a continuous stream of birds from Taiaroa Head to six miles south, the largest number he had seen for a long time. From past records the birds were 5 weeks late in returning south (AW). Snares Islands, first surface eggs found 19/11/76, first chipping egg found on 6/1/77; during periods of high winds a continuous stream of birds could be seen flying to within 50 metres of the shore during the day; large flocks on the sea close inshore seen feeding on hyperiid amphipods and euphausids (PMS).

WHITE FACED STORM PETREL *(Pelagodroma marina)*

After a spell of stormy winds from a westerly quarter the evening of 18/2/76 was calm and cloudless. I was on a high ridge on a farm 10miles north of Taumarunui at sunset when a bird passed only 4 metres from me, flying well on a southerly course, silhouetted against the western sky. Colour pattern could not be distinguished but it had the dangling legs and bouncy flight of a storm petrel and its size seemed correct for this species (WSS). Small numbers seen 1/6/77 about 20 miles offshore, north of Poor Knights (TGL).

BLACK BELLIED STORM PETREL *(Fregetta tropica)*

3/3/77, seen 10 km off Snares during our return to New Zealand and we continued to see them till dark when we were 15 km off Big South Cape (PMS).

DIVING PETREL *(Pelecanoides urinatrix)*

Abundant around Sugarloaf and Pinnacles (Poor Knights) 13/8/77 (PJM), Mercury Bay 24/7/76 (TGL), Mayor Island 28/6/75 and Penguin Reef 12/7/75 (PCL). Snares, 1976-77, heard calling from just outside their burrows shortly after darkness each night during November and December, infrequently during January and February; dead downclad chick found in tussock 6/12/76, fully feathered chicks alive in tussock 10/1/77 to 24/2/77 (PMS).

GANNET *(Sula bassana)*

Poor Knights, gannets numerous around Pinnacles 1/6/77 (TGL); 13/8/77, a large colony on Sugarloaf and smaller colonies on each of the Pinnacles; many birds seen carrying nesting material; one bird was carrying a piece of Neptune's Necklace near the Sugarloaf when another flew up beneath and stole it in mid-air (PGM). 13/2/77, colonies on Coromandel islands still contain many adult birds, indicating a somewhat later breeding than usual; young birds noted exercising their wings (SMR). Buffalo Beach, one or two birds May-June 1976, increased to 40 in July; 26/7/76, twelve birds 50 m from shore, fishing a concentrated school about 6 m diameter, showed great dexterity in avoiding collision during dives (ABJ). Muriwai, 2/12/76, strong westerly, 30 gannets on cliff tops on the mainland side of the recently occupied island-like promontory taken over by gannets as a roost in the last few years (AR). Tolaga Bay, Gannet Rock, 29/11/75, about 170 occupied nests, an increase in recent years; about 20% of nests contained young birds (GF). Snares, 20/11/76, one seen flying offshore but no feeding seen (PMS).

BLACK SHAG *(Phalacrocorax carbo)*

Firth of Thames, 28/11/76, 24; 26/6/77, 64; but on 23/4/77 82, and on 10/5/77 115, some with white flank patches and crests, flew in, in groups, at high tide; remained on a shell bank for about 2 hours, then dispersed towards Waitakaruru (BHS). Maketu, 12/2/77, 25 (PCL). Westshore, H.B., 13/2/77, 52 (NBM). Manawatu estuary, 20/2/77, 25; Ohau river mouth 4/1/77, 33 (HAR). Snares Islands Nov. 76-March 77, flocks of up to 50, all birds appeared to be in immature plumage, with whitish or brown underparts (PMS).

PIED SHAG *(P. varius)*

Pakihi, 14/1/77, Black-backed Gulls circling round a Pied Shag swimming towards the shore with an eel protruding from its bill; the shag later found dead on the foreshore, eyes bulging, the eel firmly wedged, head first, in its throat (JMcC).

LITTLE BLACK SHAG *(P. sulcirostris)*

Mangonui harbour, numbers up to 64 on 7/5/77 (ECMC). Poor Knights, a single bird on east coast of Aorangi, 13/8/77 (AHG). Muriwai Lakes, 6/2/77, 13 (SMR). Manukau counts, 21/11/76, 3; 3/7/77, 135 (BB). Firth of Thames counts, 6 on 28/11/76 and on 26/6/77 (BB). Port Jackson, 5/6/77, 4 (PJM). Buffalo Beach, up to 80, June 77 (ABJ). Kawhia, 3/7/77, 4 (JHS). Tauranga, eastern harbour, absent September-February; March-early August, packs of up to 100 in Welcome Bay, Waimapu estuary, mouth of Wairoa river; usually fish in main harbour channels when sprats are running in or

out on the tide (KF). Sulphur Point, 19/6/77, 120 flew out of Waikareao estuary 2 hours after high tide; later counted c. 200 on pylon opposite Matapihi bridge and 90 on sandbanks in channel to east (JHS). Thornton beach 25/4/77, 40. Lake Rotorua 17/1/76, a huge raft, estimated 500 birds (PCL). Tolaga Bay 11/4/77, one; Lake Tutira 16/2/77, 5 (JCH). Hawkes Bay, Westshore, 13/2/77, 85 (NBM); Ngaruroro 1/5/77, 80 (KVT). Taranaki, one at Waingona mouth Sep. 76, 3 at Waitotara mouth 28/11/76, 4 on Oaonui coast 26/2/77 (RWW, DGM). Manawatu, estuary, 17/4/77, tight flock of 10 herding and diving after fish (HAR), and two on Lake Horowhenua (EBJ); 13/10/75, party of 9 paid a fleeting visit to Pukepuke lagoon (WJP). Lake Wairarapa, Oct. 76, at least 2 nests in a large colony of *carbo* and *melanoleucos* (DS, CHL). One at Paremata 2/5/76 (JCH), 3 at Petone 12/8/76 (JLMM). Lake Wainono, Feb. 77, 3 (RJP). Otago harbour 9/11/75, eleven, scattered, observed by Dr G. van Tets (AW).

LITTLE SHAG *(P. melanoleucos)*

Lake Taupo, at Waihora Bay, there is a half submerged cave; water is about 10 ft deep at the entrance, which is 8 ft across at the water line and extends upwards to about 6 ft above water level. The cave narrows towards the back, where a rock 2-3 ft above the water provides a site for 5-6 shag nests — no room for more. Shags have nested in this cave and raised chicks for five years up to 1975. Within a few feet of the cave entrance attempts to build nests on small bushes growing on the cliff face have been unsuccessful; the bushes are not strong enough to take the weight of nest and birds, and the area is much exposed to strong winds. On Motowhara, near Karangahape Cliffs, there are about 20 shag nests on vines or small trees covered with vines, plus about 10 Black-backed Gull nests on the rocks beneath the shag nests, some almost within pecking range (TBST). Waitarere, colony of 80 pairs in macrocarpas overhanging lake, Turnbull's Lagoon; Kaputara colony seems to be declining (HAR). Snares, Nov. 76-March 77, up to seven pied phase, in Boat Harbour (PMS).

SPOTTED SHAG *(Stictocarbo punctatus)*

Opua, Bay of Islands, 18/8/77, one bird, roosting on beacon in channel; black on throat and back of neck, partial crest (D. E. Calvert). Bethell's Beach 22/8/76, 30+, some with plumes, many with double crests. Hauraki Gulf Census 13/2/77, 3480, of which 754 at Tarahiki and 2215 on Coromandel Islands. It is thought that the population is reaching saturation point in that practically all suitable nesting habitat is occupied. There is a great deal of movement and change of roosting sites from one side of the Gulf to another, depending on weather conditions (SMR). 20/8/77, one, pale plumage, at Kawhia (JHS). A juvenile on beach between Mokau and Awakino rivers, 25/4/77 (RWW). Manawatu estuary, one juvenile 11/6/77 (JLMM), one 19/6/77; one adult and 2 juveniles wrecked between Waitarere and Manawatu river on 17/7/77 (HAR). Somes Island colony 1976, 11 chicks (RB). Nelson, between 24/4/77 and 15/5/77 a number of juvenile and adult birds were found dead in Tasman and Golden Bay region. 40 were accounted for and it is probable that a large kill took place; reports of deaths as far away as Wellington were recorded. All shags handled were badly emaciated. Two sent for laboratory

analysis contained in their proventriculus intestines (a) 60 ascarid worms, one acanthocephalid worm, (b) 170 ascarid worms, 20 acanthocephalid worms. At the initial outbreak of deaths there was a drastic weather change, fresh snow falling on the mountains and a pronounced drop in temperature, which may have affected shags already sick and vulnerable (KLO). 27/6/77, 0900 hours, Nelson Haven covered with Black-backed Gulls and Shags, mostly Spotted. As the tide receded over 1000 shags flew down the haven towards the harbour. I have not seen so many birds on the haven before or since; at this time large quantities of krill were reported (J. Hawkins). Lake Wainono, Apr-May 77, c. 100 fishing for smelt and probably other fish (RJP).

BLUE SHAG *(S. p. steadi)*

Stewart Island, December 76, birds observed were very tame, and allowed close approach — one photographed at a range of one metre (PJM).

WHITE FACED HERON *(Ardea novaehollandiae)*

Little Barrier, May 77, one present on three days, feeding in the grass paddock near generator (RCM). Hamilton 27/8/76, a nest in a leafless oak (TC). Mayor Island, 16/2/77, one on shores of Blue Lake, in crater (JFC). Sanson, 1/2/75, 3 large young in nest, 15 metres, in *Pinus radiata* (CHL). Lake Ianthe, nest, 10 m from ground in rimu (GG). Routeburn Flats Hut, 685 metres a.s.l., one in backwater (PC). Stewart Island, 6/1/75, 2 at Port Adventure (GF); December 76, one at Moses corner, several at North Arm (PGM). 28/9/76, one perched on ship's foremast 35 miles WSW from Maunganui Bluff, Dargaville beach; disappeared after half an hour (NC).

WHITE HERON *(Egretta alba)*

1977, Far North, single birds Paua and Te Hapua, April-June; Mangonui and Tauranga Bay, May; May-June, Kaimaumau, at least 8; Rawene, 2; singles at Russell, July and Oakleigh, April (KB, ATE, MH, PJM). North Kaipara, one in March, two more in April (MEW); Kaukapakapa, April (5), May (3), June (7) (DFB). Manukau, April-July, reported at Kirk's, Pahurehure and Waimahia Inlets, Weymouth, two at Puketutu (BB, K. Fisher, TRK, HRMcK, SMR). One at Waiuku, 5/9/77 (AP). Firth of Thames, 1976, January, one (RH); November, one at Waitakaruru (PCL); 1977, Miranda, March-July (BB), Hauraki Plains near Piako river, August, two (BHS). Waikato, June 1977, one at Kokopu, Whangamarino by F. Thompson (BB). Bay of Plenty, 1976, one-two birds at Maketu, March-Sep.; one at Little Waihi, May; 1977, Maketu, one-three, Feb.-May; Matata, one in April, singles at Tarawera mouth and Whakatane, June (PCL, AP, RMW). Korito lagoon, Wairoa, 1975, July-Sept., 4-7; 1976, June, 1; August, 2; 1977, May, 2 (GF). Whakaki lagoon, 1976 Aug-Sep, 3 (JCH). Hawkes Bay, 1976 Sep, Fernhill, June 1977, Ngaruroro, singles (KVT). Manawatu, Lake Horowhenua, 1976, singles June, Oct, Nov (EBJ, AP); 1977, estuary, one in January and April (JLMM); one at Barrett's Lagoon, May (DGM); Omata, April-May, one-two; Onaero river, April; Waitara river, April-May (RWW). Nelson, 1976, Waimea Inlet, August, 5; Sep, 3; Oct, 4; Nov-Dec, one; Moutere, July-Sep, 2; Westhaven, July, one. 1977, Waimea, 2 in February and April; 5 March-May, 6 in June, 3 in July; Corder Park, one April-July and late August

(KLO, J. Hawkins). Farewell Spit 1977, singles Feb and April (BR). Ashley river mouth, 3/4/77, one (AH). Spencerville, 8/7/76, one feeding on small (15 cm) eels; one of these was skewered with the bill, others snapped up, swallowed head first; bill washed in water after each one was swallowed (RG). Victoria Lake, 1977, two in June, 3 in July; two appear to be a pair and have been seen moving twigs in a nearby tree (PMS). Lake Wainono, up to 5 irregularly present 1975-77 (RJP). Lake Benmore, Ahuriri arm, 20/5/77; two miles upstream in Opihi river, 1/6/77 (BDB). Clutha valley, Greenfield, one at a farm pond, 21/5/77 (PC).

LITTLE EGRET *(E. garzetta)*

Rawene, August 77, 2 (KB); one on 13/8/77, feeding busily 20 yards from ferry ramp, stabbing at crustaceans and rushing in and out of the water's edge, taking no notice of observer only 6-7 yards from it, was in full nuptial plumage (MPK). North Kaipara, a small egret, probably this sp., Aug-Sep 76 (MEW). Whangateau harbour, March-May 1977, 1-3 birds (LH, GJHM). Parau, one stayed till 12/10/76; one again present 7/6/77, showing back plumes; also seen in July (CS). Waimimiha Inlet, Manurewa, June 76 (K. Fisher); one at Waiuku, 5/9/77 (AP). Ahuriri, 23/6/77, 2 (KVT). Matata, 25/7/76, one (AP). Taranaki, April-May 1977, two, probably three birds at mouths of Waiwakaiho and Waiongona rivers (RWW). Manawatu estuary, one Apr-June 77 (LJD, JLMM, HAR), Waikanae, 5/5/77, one (LG). Nelson, Waimea Inlet, 1976, two-three present Aug-Oct, one Nov-Dec. 1977, January, 2; February, one; April-May, 2; June, 3; July, 4; Takaka, 1976, one July-August (KLO), 4 in September (RG). Puponga, July 1976 (KLO). Grey river mouth, May-June 77 (CSL, PGS). Taramakau mouth 18/8/77 (PGS). Single birds at Waipara mouth 20/10/75 (PH), Lake Wainono May 77, Taieri mouth Sep 76, Karitane Autumn 1977 (RJP), Lake Benmore, Ahuriri arm, 30/5/77 (BDB).

CATTLE EGRET *(Bubulcus ibis)*

Waikato, 1976, 24 birds at Rangariri, many assuming breeding plumage by 3/10/76 (BB, HRMcK *et al*). One at Meremere, already coloured by 13/9/76 (DWW) and two, still white, on 1/10/76 (HRMcK). Lake Ngatoro, two, coloured, 24/9/76 (ARL). Nelson, 1976, one on a stony beach at Pakawau, July; Takaka, 8 in July; 6, one with apricot plumes, in September; Aorere valley, six in August; Motueka, 2 in September (KLO).

BITTERN *(Botaurus stellaris)*

Northland, bitterns have an unfortunate habit of loitering on farm roads or even main roads; this can cause casualties if cars do not stop to let the bird move off; one observer, bending down to tend an injured bittern, suffered a stab from its beak which fortunately missed his eye (ATE, MPK *et al*). Swamp on road Taheke-Motukiore, 6 birds, 1977 (KB). Ohiwa harbour, 2/5/76, one on road verge, apparently feeding on some carrion, undisturbed by passing traffic; Gisborne, Matawhero loop, June 76, 4 in a recently developed habitat (AB). Taranaki 1976-77, reported from Waitotara mouth (3), Omata, and Barrett Lagoon, first sighting in this locality for many years (Mrs Marfurt, DGM, RWW). Manawatu, 1977, recorded from dune lakes;

5 at Lake Ngakawau, Waitarere (JLMM, HAR). Kaikoura, 14/5/77, one on a beach 5 km south of Peninsula, seen by T. Mackie (JAC). Clutha river near Lowburn, one flying up river into a strong head wind (PC).

GLOSSY IBIS *(Plegadis falcinellus)*

Lake Ngaroto, one present Aug-Oct 76, July-August 77 (BHS, ARL). Manawatu estuary, Dec 76-Jan 77, 2 (JLMM); Turnbull's lagoon, Waitarere, 17/7/77, one, feeding along lake shore with Pukeko (HAR). Late 1976, one north of Waverley (DJ). Lake Wairarapa, one present April and November 1975, April 76; 25/1/77, two on a tidal flat with Pied Stilts and Paradise Duck (DS). April 77, one at Waimea Inlet, Nelson (KLO). 3 at Farewell Spit in April, one on 27/7/77 (BR); Taupata stream, 29/7/77, one (MLF). Lake Ellesmere, 1977, one in July (PMS); Lake Wainono, 1977, 4 in February, 3 in March (RJP). Invercargill estuary May 77, seen by B. Boyle (BDB).

WHITE IBIS *(Threskiornis molucca)*

Records of single birds from Awanui, August 77 (MH); Waima, August 1977, in the same area where one was present in 1975 (KB); Lake Whangape, 4/11/76 (JC); Lake Hakanoa near Huntly, June 77 (BB); Maketu, irregularly present for about 15 months till September 1976, and in May-August 77 (AP, PCL, RMW); Manawatu estuary December 76-April 77 (JLMM, HAR). On 19/6/77 the Maketu bird was on the inner part of the ocean beach picking up sticks; it later flew to a lagoon and after a while put the sticks down and commenced preening (BB).

ROYAL SPOONBILL *(Platalea leucorodia)*

Awanui, Aug-Sep 77, 3 (MH). Hawkes Bay, Westshore, 18/12/76, 5 (four with thick tufty plumes on nape); 1977, Feb, one; June, 4; August, 3 (KVT, NM, JCH). Maketu, singles 23/5/76, 3/10/76 (AP). Manawatu estuary, 1976, 18 in August, 7 in September; only 2 Oct-Nov, 10 in December. 1977, January, 15; Feb-May, 30-33; June, 26; July, 25 (LJD, JLMM, HAR). Rangitikei estuary 13/2/77, one (LJD). Blenheim, Wairau Bar, 4, 8/12/76 (RC). Nelson, Tasman Bay (Waimea-Motueka) 1976, July c. 10; Aug-Sep, 9; Oct-Nov, 4; 1977 Jan, 11; Feb, 14; March, 16; April-May, 12-13; July, 11; (MLF, RG, KLO). Farewell Spit, Sep 76, 8; 1977, January, 2; July, 17 (BR, KLO, MLF). Bromley Ponds, Christchurch, one all 1975 winter (W. Rogers, per JRJ). Lake Wainono, Nov 76-Feb 77, maximum 13 (RJP). Okarito, 27-30 Oct 76, one (GG). Fortrose, fairly regular; 10 on 28/11/76, 6 on 2/1/77 (LL); Waituna, 6 on 29/12/76 (MLB).

YELLOW BILLED SPOONBILL *(P. flavipes)*

The bird reported and photographed by A. Billing at Unahi Road near Awanui on 23/8/76 apparently did not stay, but in August-September 1977 one was seen in approximately the same area (KB, MH). PJM sends a report of a possible sighting of the 1976 bird at Lake Ngatu, 5 km west of Unahi, on 12/5/76, by Mrs Harlow. If correct, this might mean that the bird had been around for about 3 months.

CANADA GOOSE *(Branta canadensis)*

Kohukohu, Hokianga, 1/8/77, 12 flew up Mangamuka river (KB). Lake Waikare, 30/9/76, 11 (BB). Whakaki lagoon, 22/9/76, 19; New Plymouth, Lake Mangamahoe, 11/1/77, 22, breeding (JCH); Barrett Lagoon 30/5/77, 6 (DGM). Taupo, Hinemaia Dam, 25/4/76, 19; Lake Rotoehu, September 76, one (AP). Westshore, H.B., 2, June and August 1977 (NBM, KVT). Lake Horowhenua, 4/12/76, one (EBJ). Lake Elterwater, 23/1/77, 9 (TJT). Hilderthorpe, north of Oamaru, 6/3/77, 7 on coastal lagoon (TCD).

PARADISE DUCK *(Tadorna variegata)*

Aupouri Peninsula dune lakes, Jan 77, over 1100 (D. E. Crockett). Dargaville Lakes, Feb 77, 295 (PJM). South Auckland, breeding Waiuku, Mangatangi and near Kaiaua (BB). Matata, 7/5/77, 120 (PCL). Hawkes Bay, Westshore, 13/2/77, 263 (NBM); Te Pohue lagoon, 29/1/77, 80+ (RMW). Barrett Lagoon, New Plymouth, 16/1/77, 23 (DGM). Dog Hill, Ward, a pair made two diving attacks on a harrier, 9/4/77 (TJT).

MALLARD *(Anas platyrhynchus)*

Kawhia, 3/7/77, 297 mallard/2 grey duck (JHS); Matata, 25/4/77, v. 1000 mallard/30 grey; 7/5/77 c. 3000/100 (PCL). Hawkes Bay, Westshore, 13/2/77, 3145 mallard/14 grey (NBM); Te Pohue lagoon, 29/1/77, 50/4 (RMW). Hamilton, University of Waikato Lake, 9/10/76, an adult with 34 ducklings, all feathered but of different sizes; over the next two weeks the party broke up and the ducklings became increasingly independent (TC).

GREY TEAL *(A. gibberifrons)*

February 1977. Dargaville Lakes, 47 (PJM); Muriwai Lakes, 31 (SMR); Wiroa Island (Mangere), 40 (RBS). Pokeno valley, 31/10/76, pair with 6 young (DAL). 7/5/77, Matata, 100; Maketu, 26 (PCL). Ahuriri 23/6/77, 120 (KVT). Manawatu dune lakes, number increasing 1977 (HAR).

BROWN TEAL *(A. aucklandica chlorotis)*

Helena Bay, June 76, 62 (RA). Takou river, 13/3/77, 30; Kaeo river 12/3/77, 22 (ATE).

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

Scarce in the far north — odd birds at Aupouri peninsula dune lakes and on ponds around Kerikeri; Dargaville lakes, Feb 77, 15 (ATE, PGM). Matata, 7/5/77, c. 300 (PCL). Westshore, H.B., 13/2/77, 74 (NBM). Foxton No. 2 lake, 30/12/76, 20; 23/4/77, c. 500 (JLMM).

BLUE DUCK *(Hymenolaimus malacorhynchus)*

1976, March, Wairoa stream, Parahaki Hut, Urewera, 3; reported from five localities in Rotorua district (AP). Glenrae river headwaters, 24/1/77, 2 (RG).

N.Z. SCAUP *(Aythya novaeseelandiae)*

Aupouri peninsula dune lakes, Jan 77, 59 (D. E. Crockett). Dargaville Lakes, Feb 77, 284 (PJM). 1976-77, small numbers at Matata, Tarawera estuary, and Te Pohue lagoon (RMW et al). Lake

Tutira, 16/2/77, 90 (JCH). Plentiful 1976-77 on ponds and lakes around New Plymouth, especially Lake Mangamahoe where there is a large population (RWW, DGM, JCH). Lake Wainono, March 77, 3 (RJP).

AUSTRALASIAN HARRIER *(Circus approximans)*

Karikari peninsula, May 77, one hovering and quartering over a Pied Shag colony; when shags vacated their nests on approach of observer the harrier dropped vertically on to one nest, remained on it for about a minute, but was not seen to take anything (AHG). Two harriers in constant attendance at an inland shag colony at Kerikeri, August 77; frequent low swoops caused swimming shags to dive (ATE). Papakura, 6/7/77, one chased off by a N.Z. Pigeon (BB). Bulls, 23/11/75, 7 eggs in a nest among lupins (CHL). Altitude records, Mt Egmont, 19/2/77, 1350 m (DGM); Lake Harris basin, Routeburn, 19/2/77, soaring over subalpine scrub at 1200 m (PC). Kowhiterangi, August 77, while I was using a " squeak bottle " under a tree on the edge of bush, a harrier which had been mewing overhead squeaked agitatedly, swooped down to 8-10 feet above me, hovered for 30 seconds after it saw me and flew up again; as I continued to use the lure this set of actions was repeated four times (PGS).

N.Z. FALCON *(Falco novaeseelandiae)*

Taupo, foot of Mt Tauhara, 14/5/77, one flying over farmland disturbing starlings (GE). East Mt Egmont, 9/4/77, attacking a pipit (MJT). Ward, June 76, one made several diving attacks on an aviary close to the house (TJT). Hooker Glacier, Mt Cook, 20/10/76, pair occupying a large rock cleft 100 metres above terminal face of glacier; hedge-sparrows, chaffinches and yellowhammers present in the area (GG). Glendhu Bay, Lake Wanaka, immature bird on a telegraph post, plucked and ate a female house sparrow; Lower Arawhata river, 10/7/77, one chasing a harrier downstream; further upstream, a pair calling to each other (PC). Harrison Valley, Fiordland, one seen to chase a kea (TRH).

CHUKOR *(Alectoris chukar)*

February 76, 5 at L. Aviemore, 15 at L. Waitaki, 12 at Lindis Pass (JCH). April 77, abundant at Mt Hutt, calling freely in the middle of the day (RG).

BROWN QUAIL *(Synoicus ypsiliphorus)*

Maketu, a count of 15 on 25/9/76 indicates increasing numbers in the area (AP). Manawatu, not uncommon, but usually seen along the eastern edge of the coastal dunes; one at Pukepuke lagoon 30/4/76 (WJP).

BANDED RAIL *(Rallus philippensis)*

Whangateau, Feb 77, in tidal creek; adult and chick near old rubbish tip (KJT). Whitianga, Cook's Beach, Jan 77, 2 adults and two juveniles; single birds also observed (SCS). Tahuna, 30 miles from Thames coastline, 21/3/76, one on roadside; no apparently suitable habitat nearby (AP).

WEKA *(Gallirallus australis)*

North Island — ssp. *greyi;* Bay of Islands, 1977, present from Clendon Cove throughout Cape Brett Peninsula, plentiful at Whangamumu (D. E. Calvert); March 77, adult and four half-grown chicks at Horeke (KB); Waipu, breeding; calls frequently heard in evening (TGL). 1977 liberation in Waitakere ranges; in August 76 no sign found of birds liberated at Bethells 15 years ago (JFS). South Island — spp. *australis;* Lake Sumner, Oct 75 (RG). West Coast, 1976-77, seen at Kamaka, Grey Valley, and in Taramakau valley at Kumara junction, Kumara and near Dillmanstown (JRJ); Kotari, 31/12/76, adult with 5 half grown chicks, calls constantly heard (WAW); Copland valley, 21/11/76, pair and 3 half grown chicks at 426 metres a.s.l., birds seen at 730 m (SCS); Transit Valley, Dec 75, one around hut 1013 metres a.s.l., but departed to tree line on approach of bad weather (TRH).

MARSH CRAKE *(Porzana pusilla)*

Te Teko, 21/7/75, one being chased by a Spotless Crake (PCL). Waitarere, Lake Ngakawau, 29/4/77, one called by Spotless Crake tape (HAR). Nelson airport, one, 10/2/77 (KLO). Kurow, 11/2/76, group of six in weed-grown stream (JCH).

SPOTLESS CRAKE *(P. tabuensis)*

1977, Raio (near Pukenui) in mangroves on edge of muddy creek; reported from near Lake Ohia (ATE). Tawharanui reserve, June 77, 8-10 in raupo (SMR). Tiritiri island, widespread (MJT). Hunua, Wairoa dam, September 76, 6-7 pairs in shortish cutty grass, blackberries and drowned willows at head of dam; came out on to willows and drowned bracken at dusk (BB). Whitehall, Cambridge, one up a willow tree (BHS). Whakarewarewa Forest Park, found in three localities (RWJ). Lake Rotoehu, 3 or more feeding on lake edge in raupo, with two bitterns (AP). Tangoio, 16/3/76 (JCH). Oakura, Taranaki, one killed by car, March 77 (REL). Manawatu, many records from dune lakes; 6 calling at once at Lake Ngakawau, April 77 (HAR). Wanganui, Lake Kaitoke, 8/7/76 (IWJ).

PUKEKO *(Porphyrio porphyrio)*

Coromandel, Port Jackson, June 77, 10 (PJM). 1976, Sep, Mercury Bay Golf Course, 15; June, Whitianga-Coroglen, 17; September, Coroglen-Hikuai, 54; July, Hikuai, 20 (ABJ). Manawatu, influx to coastal areas during winter, e.g., 81 at Manawatu estuary and 86 at Turnbull's lagoon, Waitarere, 17/7/77 (HAR). Heathcote-Avon estuary, Oct 76, 48; 1977, January, 19, February, 1, March 6 (BA). Wickliffe Bay, Otago Peninsula, again bred successfully, 1976 (AW).

AUSTRALIAN COOT *(Fulica atra)*

Poutu, Lake Kahuparere, Feb 77, 6 (PJM). Hamilton Lake, 1976 Aug-Oct, 2-3, tame; 6/5/77, one with well grown young (TC, DWW, JPW). 1977, good populations reported on Lakes Rotoiti and Rotoma; Lake Okareka, 18/2/77, 11 and 2 juveniles in Acacia Bay, 75, 2 juveniles on the Tarawera side of the peninsula guarding Acacia Bay (RWJ). Lake Whakamaru, near power station, 16/8/76, 28 (IWJ). Hawkes Bay, Te Pohue lagoon, 9/1/77, 2 (RMW); Lake Tutira, 16/2/77, 100+ (JCH). Wanganui, Lake Virginia, 11/1/77, c. 120 (JCH). Lake Elterwater, 24/1/77, 3-4 seen and others heard

(BDH); also recorded by TJT, CS). Amberley beach, North Canterbury, 3/3/77, one on a tiny lagoon (KCH). Maori Lakes, 9/1/77, 7+ (BDH). Alexandra, Upper Lane's Dam, small colony apparently recently established; 13/3/77, pair with two chicks, pair with 3 chicks, one lone adult — total 10 birds (PC). Lake Paringa, 27/1/77, 2 (BB).

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

Whangarei, 1977, March, 940; July, 719 (D. E. Crockett); Manukau, Nov 76, 3177; July 77, 20636; Firth of Thames, Nov 76, 1451; June 77, 7430 (BB). Kawhia, 1977, 2656 in February, 1248 in July; Aotea, July 77, 340 (JHS). Manawatu, range from 5 on 30/10/76 to 71 on 8/5/77 (HAR). Farewell Spit, January 77, 4312 (ATE). Ashley mouth, 6/1/77, 147 (BDH). Heathcote-Avon estuary, monthly counts 17/10/76-26/3/77, 438, 402, 537, 1356, 3710, 2387 (BA); Lyttleton upper harbour, 1/2/77, 120; South Brighton, 22/2/77, c. 5000 (GG). Albino birds observed at Owaka, 14/10/76 (DC), Lower Portobello 21/10/76 (AW), Sular beach, 23/10/76 (Mr Lockerbie per AW). Arawata river near Waipara hut, 10/7/77, one ? an early arrival or over-wintering (PC). Southland coastal count, 2/1/77, 2036; 30/7/77, 1056 (RRS). Old Neck, Stewart Island, 7/5/77, 72 (LEH).

VARIABLE OYSTERCATCHER *(H. unicolor)*

Recorded from many localities around North Island. Waipu, 8/1/77, several patches of opened tuatua and pipi shells near a nest, from which chicks had hatched some days earlier (AHG). Pey Bay (Mercury Bay), 10/4/77, 8 blacks and one with a white belly, noisy, aggressive chasing, sometimes flying as a group quite far out to sea; a pair breeds regularly in this bay (JHS). Manawatu estuary, maximum 17 on 8/5/77 (HAR). Muriwai lagoon, Gisborne, 9 blacks, 9/4/77 (JCH). 2 blacks at Black Reef, H.B. (KVT). Lake Wainono, one black, Feb 77 (RJP). Broken wing display at Okarito 27/1/77 (BB).

SPUR WINGED PLOVER *(Lobibyx novaehollandiae)*

Rere, Gisborne, 10/4/77, 4 (JCH). Near Mamaku, two August 77 (AP, MDW). 11 on newly cultivated land at Waipawa, 1977 (PDG); reported at Pakipaki, August 77 (NBM). Two reported 3 miles south of Wanganui, March 77 (DJ). Manawatu, common and breeding Waitarere-Tangimoana, in dunelands (HAR); Feb 77, 7 at Manawatu estuary, 26 at Rangitikei estuary (LJD). Bred at Paekakariki 1976 and 1977; sighting at Pauatahanui Inlet 1976 (MLF); 1977 sightings at Woburn, Wainuiomata coast road, Orongorongo (SC, PDG). Wairarapa, continued breeding south of lake; sightings north of lake and near Featherston (DS, HC, MLF). Nelson, Waimea West, ten on a paddock 17/8/77 (J. Hawkins). Taupata creek, 2 in February 1977; Farewell Spit, 9 on farm 12/8/77 (BR). North Otago, irrigation from the Waitaki scheme has produced ideal conditions; August 1976 sightings at Hilderthorpe, Kakanui, Waiareka (MDD); January 1977, 11 at Otaika, 18 in 5 localities in Waitaki valley (JCH); Waihaorunga, 600 metres a.s.l., a pair, 13/10/76 (GG). Otago peninsula, young birds at Wickliffe Bay, November 76 (AW). March 77, Buller, regularly seen in moderate numbers; Harihari and Whataroa districts, numerous and well established; sightings at Jacobs and Manakaiaua rivers and at Paringa (KLO) and in January 11 at Bruce Bay (BB).

GREY PLOVER *(Pluvialis squatarola)*

Farewell Spit, January 1977, 4 (BB).

GOLDEN PLOVER *(P. dominica)*

1976-77 season has produced an interesting set of records, relatively large flocks appearing for short periods at various localities. Paua, 200 on 24/10/76; Rangiputa, 3 on 28/10/76 (JHS); the usual summer influx at Paua was not recorded — only 12 in December 76 and 6 in March 77. 10 on a coastal farm at Kerikeri mid-October (ATE). Whangarei, 37 in November, 17 in March (D. E. Crockett). Waipu, 8 on a cultivated paddock, 11/12/76 (TGL). Manukau, a single bird on 19/9/76, 3-17 in October, 41 in November, 9-17 December-January, c. 50 in February, 26 and 7 on two dates in March 77 (BB, AH). Firth of Thames, October, 3; 28/11/76, 246, of which 37 were at Waitakaruru, 206 at Piako (BB). Bay of Plenty, Sulphur Point, 27/11/76, one (PCL); 6 in December, 8 in February, 10-19 in March and 16 on 5/4/77 (KF); Maketu, 25/11/76, 30+ (AP), 13/2/77, 10 (PCL), a record 104 on 15/1/77; one over-wintered, still present in June. Little Waihi, 15/11/76, 24; Ohiwa, 21/11/76, 34 (AP); Ohope Spit 28/12/76, 51 (RMW). Gisborne, Muriwai lagoon, 9/4/77, 2 (JCH). Hawkes Bay, Ahuriri, 13/11/76, 11 (one flew up and chased a Black-backed Gull); 29/1/77, c. 50; 26/2/77, 130, in one big group in the bay; 19/3/77, 23 (KVT). Manawatu estuary, present 23/10/76-8/4/77, 14-15 in Oct-Jan, 32 on 20/2/77 (LJD, JLMM, HAR). Nelson, 11/12/76, 7 (KLO). Farewell Spit, Jan 77, 49 (BDB). Ashley mouth, 16/1/77, 6 (BDH). Lake Wainono, Nov 76-Feb 77, up to 3 (RJP). Clutha mouth, 24/10/76 (PS). Southland summer count (2/1/77) was a record — Fortrose 53, Awarua Bay 24, Invercargill estuary 189, Riverton 5, total 271; none recorded on winter count — 30/7/77 (RRS); 32 at Colyer's road 18/3/77 (MLB).

N.Z. DOTTEREL *(Charadrius obscurus)*

Numerous reports from Auckland province. Waipu, 1976-77, about nine pairs; 32 birds on 9/4/77. On 8/1/77 a parent bird put on a fantastic performance, feigning broken wing, broken leg; tail drooped, feathers ruffled, frantic rushing about colliding with everything that could be bumped into; as soon as we moved away it settled on the eggs. In several years of close observation, photographing and measuring eggs, I have never seen anything like this display (AHG). Manawatu, 14-19/12/76, a juvenile, on north side of estuary (HAR, EBJ). Awarua Bay, Southland, 7 on 19/3/77 (MLB).

BANDED DOTTEREL *(C. bicinctus)*

Paua, flocks of local migrants usually arrive in January, reach a peak about March and are gone by August. A few pairs breed in the Far North. PCL recorded 10 pairs at Te Paki mouth, 6 pairs at Te Werahi, December 74; generally one or two pairs around Spirits Bay, Paua, and near streams at 90 mile beach; PGS found birds on the peninsula which runs from Te Kao down to the harbour, Sep-Oct 76. Tukituki river bed, 4/9/76, a hen bird with pale greyish plumage, a pale greyish neck band and no chestnut, only a touch of fawn on sides of breast, settled on a nest with 3 eggs; the ground colour of the

eggs was greyish, almost the colour of wood ash (JLL). Alexandra, 25/5/77, the first over-wintering birds seen here, two on the muddy floor of a new irrigation dam near the airport; 3 on 26/6/77, one on 10/7/77 (PC). Southland counts, 2/1/77, 307; 30/7/77, 32 (RRS).

LARGE SAND DOTTEREL *(C. leschenaulti)*

Manukau, one 14/11/76 - 19/3/77 (BB). Farewell Spit, Jan 77, 2 (JHS).

ORIENTAL DOTTEREL *(C. veredus)*

Lake Wainono, Jan 77, one (RJP).

BLACK-FRONTED DOTTEREL *(C. melanops)*

Bay of Plenty, Thornton, 15/5/77, 2 adults and two juveniles (PCL); Maketu, June-July 77, 6-7 birds (BB, PCL, AP). Turakina beach, 8/7/76, 3 (IWJ). Fielding sewage ponds, 10/7/77, 32, including 5 immature (BDH); Longburn, a flood in late June 76 ruined the feeding spot, but the situation is back to normal this winter — maximum count, 3/7/77, 54; they seem to arrive at the sludge pool about 90 minutes before sunset, from Manawatu river and from small ponds around freezing works (MDD, HAR). Te Ore Ore gravel pit, 1976, a three-egg clutch followed by a two-egg clutch, all hatched safely; 24/2/77, 9 present; 7 juveniles feeding in a group; Masterton sewage ponds, 28/5/77, winter flock of 20, including 5 young, on stock-trampled mud bordering pools of water lying in the paddock (MDD). Papawai, July 77, 9 near sewage ponds (MLF, SC). Tauherinikau, 28/8/77, 21 (DP, SC). Ruamahanga flood gates, 14/11/76, a nest, 3 eggs, on gravel only four metres from edge of road (CHL).

WRYBILL *(Anarhynchus frontalis)*

Paua, 5/7/77, a record 174; 2/8/77, 154 and only 2 on 19/8/77 (ATE). Whangarei, 17/7/76, 154; 12/3/77, 228; 9/7/77, 212; well above previous counts (D. E. Crockett). Mangawhai Spit, 23/5/77, 16 (GE). Tapora, 10/10/76, 33; 19/6/77, 106 (LH). Manukau, 21/11/76, 33; 3/7/77, 607. Firth of Thames, 28/11/76, 81; 25/6/77, 2240 (BB); 5/8/77, 2500+ on a big shellbank opposite beach access (BHS). Port Waikato, 9/5/76, 8; 27/6/76, 5 (AH). Bay of Plenty, Sulphur Point, 1976, May, 70; October, 30; mid-November, 17; 1977, January, 14-60; February-April, c. 100 (KF); May, 73 (DJB); June, 53 (JHS). 1976, one-two birds at Maketu, Little Waihi and Rangitaiki mouth (AP, RMW). Ngaruroro estuary, Oct 76, 2; June 77, 3 (KVT). Manawatu, numbers fluctuate throughout the season, maximum count 37 on 13/3/77 (HAR). Ohau estuary, 4/9/77, 14 (BDH, WFC). Lake Grassmere, 24/1/77, 2 adults, bands still visible (BDH). Nelson, 5/5/77, 18; 11/6/77, 3 (KLO), 20/8/77, 3 (FHB). Farewell Spit, Jan 77, 27 (BDB). Ashley river mouth, 20/8/76, 20 (GG). Brooklands, 24/7/76, one with 88 Banded Dotterel (RG). Rangitata river, Erewhon area, 7-12/1/77, 9 on north bank channel below Potts homestead and 17 on lower Potts river below airstrip. Several flying young seen on 8 Jan, thereafter adults only, well spread on river margins; none on main Rangitata bed (BDH). Lake Benmore, 19/2/76, 17; 26/1/77, 3 (JCH). Awarua Bay, 19/3/77, one with a stint and turnstones (MLB).

LONG-BILLED CURLEW *(Numenius madagascariensis)*

Paua, Sep-Nov 76, 4; 23/12/76, 6; 8/3/77, 2;; none seen April-July; 2/8/77, 2; 19/8/77, 3; 16/9/77, 4 (ATE). Kaipara, 5/12/76, 18 (AH); 27/12/76, 12+; 10/3/77, one (RBS). Manukau, 25/9/76, 4; 31/10/76, one; 21/11/76, 3; 12/3/77, 2 (BB). Firth of Thames, 3/9/76, 14; October, 16; November, 19 (BB), December, 13-19 (DAL, AH); 24/2/77, 6 (MSF); 13/3/77, 14 (RBS); 12-29/3/77, 3 (BB, JHS); 5/8/77, 2 (BHS, ARL). One seen to capture and eat mud crabs, gradually working them along the bill till swallowed whole (DAL). Kawhia, 19/2/77, 3, first record for this area (TBST). Bay of Plenty, Maketu, 1976, 6 in January, 3 Aug-Sep, one in November, 7 on 25/12/76 (AP, PCL); Sulphur Point, 6-10/1/77, one (KF). Manawatu, 4/12/76, 2; 1977, Jan-April, 3, one on 8/5/77 (JLMM, HAR). Farewell Spit, one on 2/9/76 (KLO), 16 in January 77 (BDB). Parapara Inlet, Golden Bay, 21/2/77, one (LT). Heathcote-Avon estuary, one, 4-15/9/77 (BA, PMS). Otago ,one at Papanui Inlet, 27/12/75; one at Purakanui beach, 19/1/76 (AW). Southland, 30/7/77, one (RRS).

ASIATIC WHIMBREL *(N. phaeopus variegatus)*

Paua, one on 27/9/76; 24/10/76, 34; 9 in November, 5 in December; 8/3/77, 4; one on 19/8 and 16/9/77. Rangiputa, 25/10/76, 23; 28/10/76, 12 (ATE, JHS). Whangarei, July 76, 5 (MPK). Kaipara, 27/12/76, at least one; others may have been present (RBS). Manukau, 19/3/77, 3 (DAL). Firth of Thames, 28/11/76, 24; 26/6/77, 1 (BB). Kawhia, 1977, one in February, 2 in July-August (JHS). Bay of Plenty, Sulphur Point, 14/11/76, 3; 9/1/77, one (AP, KF); Ohiwa, 12/12/76, one (RMW). Muriwai Lagoon, Gisborne, 9/4/77, one (JCH). Hawkes Bay, one (?subsp.) December 76, stayed for a month (KVT). Lake Wairarapa, 14/11/76, one (JAC). Ashley river mouth, one, 6/1/77 and 3/4/77 (BDH, AH). Invercargill, 2/1/77, one ?ssp (RRS).

AMERICAN WHIMBREL *(N. p. hudsonicus)*

Paua, 24/10/76, one (JHS). Firth of Thames, 28/11/76, 2 (BB). Farewell Spit, Jan 77, one with a flock of Asiatic Whimbrels, sunning in a depression in the sandhills, necks stretched, wings spread, rumps exposed (GS).

LITTLE WHIMBREL *(N. minutus)*

Whangarei harbour (Takihiwai) 13/3/77, 2 (PJM).

ASIATIC BLACK-TAILED GODWIT *(Limosa limosa)*

Waipu, 9/4/77, a Black-tailed Godwit ?sp, in colour (AHG). Manawatu, 8/3/77, one; black tail, white rump and light underwing well seen (EBJ). Lake Wairarapa, N.E. shore, two on 19/12/76 (MDD, SC); 13/2/77, one (MLF et al). Lake Wainono, Nov 76, one; May 77, 2, still in non-breeding plumage. Lake Ellesmere, Feb 77, one (RJP).

HUDSONIAN GODWIT *(L. haemasticta)*

Waipu, 12/3/77, 2 (MPK). Manawatu, 14/12/76, 2; the only godwits on the beach; smooth appearance, straight bills, white rump, black tail, narrow wing bar, dark underwing (EBJ).

BAR-TAILED GODWIT *(L. lapponica)*

Paua, 1500 on 17/9/76, c. 3000 Oct 76-Jan 77; 700 in July, 800 in August, 2000 on 16/9/77 (ATE). Rangiputa, Oct 76, 3000 (JHS). Whangarei, 12/3/77, 3768; 9/7/77, 433 (MPK). Kaipara, Jordan's, 5/12/76, 1350 (AH); winter counts, Tapora, 19/6/77, 505 (LH); Kelly's Bay, 16/7/77, 130 (CDC). Whangateau harbour, 14/11/76, 450; 30/12/76, 549 (LH). Manukau, 21/11/76, 18983; 3/7/77, 1501 (BB). Firth of Thames, 28/11/76, 10549; 26/6/77, 628 (BB). 19/2/77, Kawhia, 3887; Aotea, 1556; August 77, Kawhia, 400; Aotea, 257 (JHS). Buffalo beach, 120 on 3/10/76, first of the season; large flocks in Whangapoua harbour 31/12/76 (ABJ). Bay of Plenty, Sulphur Point, 1977, February, 4000 (KF); March, 3000 (PCL); June, 270 (JHS). Little Waihi-Maketu, Feb 77, c. 500 (PCL); winter count at Maketu, June 77, 38 (AP). Port Ohope Spit, 1976, June, 157; December, 2000 (RMW). Westshore, H.B., Aug 76, 18 (JCH); 13/2/77, 375 (NBM). Manawatu, present all months, 450 on 26/2/77; wintering birds, 35 (JLMM, HAR). Small numbers at Lake Wairarapa, 1976-77 (MDD). Farewell Spit, Jan 77, 14861 (BB); 28/7/77, 800, and 300 at Taupata creek (MLF). Nelson Haven winter flock, 120; a very strongly coloured bird on 31/8/77, much more so than the few birds which showed colour in March (J. Hawkins). South Brighton, about 3000 in estuary on 22/2/77; 8-9/3/77, about 1000 in the same area, restless and circling; 11/3/77, less than 500 at the same state of tide (GG). Southland, flocks arrived 22-23/9/76 (MLB). Counts, 2/1/77,4785; 30/7/77, 871 (RRS). Stewart Island, Old Neck, 7/5/77, 250 (LEH).

LESSER YELLOWLEGS *(Tringa flavipes)*

Farewell Spit, January 77 (S. Cook).

GREENSHANK *(T. nebularia)*

Manawatu estuary, 13/10/76, one (EBJ). Puponga Inlet, Jan 77, one (MLF). Awarua Bay, Southland, one on 2/1/77, 30/1/77, 19/3/77; one on 10/9/77 (MLB, RRS).

WANDERING TATTLER *(T. incana)*

Near Rahotu, Taranaki, 26/2/77, one on a rocky coastline; call identified when flushed (DGM). Kaikoura, two on 24/12/76 (JAC).

SIBERIAN TATTLER *(T. brevipes)*

Spirits Bay, 24/12/76, one on reef (GF). Kaituna cut, 28/11/76, one; call heard and nasal groove seen (AP). Mt Maunganui, 8/5/77, one feeding around rocks at low tide; fed for 30 minutes then preened; thrice repeated " troo-ee " on wing (PCL). Ngaruroro, H.B., one seen on three occasions 5/2/77 - 9/4/77 (KVT). Kaikoura, one on 2/10/76 (JAC), two on 10/10/76 (RG). Tattler sp., Awarua Bay, Southland, one on 2/1/77, two on 19/3/77 (MLB), one on 10/9/77 (RRS).

TEREK SANDPIPER *(Xenus cinereus)*

Kaipara, Jordan's, 10/3/77, one (RBS). Firth of Thames, one on 23/11/76 and four subsequent dates up to 9/1/77; two on 24/2/77, three 12-29/3/77; two 23/4/77 - 11/6/77, one 26/6/77 and 5/8/77 (BB, ARL, DAL, HRMcK). On 12/3/77 three were standing together on a piece of driftwood (JHS); lying in salicornia, playing with a straw (BB); 11/6/77, feeding, running in short bursts, bill and head extended,

then snapping up some small round object (? crustacea or crab) with its bill, on the mud and sand of falling tide; no probing action. 5/8/77, high tide, one on a swampy paddock behind the shell bank along with turnstones and curlew sandpipers, most of which were resting; the Terek was busily feeding, stepping along quickly, pecking from side to side in a jerky manner, occasionally darting forward to snap up a food item and sometimes probing vigorously, 2-3 times in the same place (BHS). Manawatu, one on 28/12/76 (HAR). Farewell Spit, Jan 77, one (BDB). Lake Ellesmere, Kaitorete Spit, December 76, one (RJP).

TURNSTONE *(Arenaria interpres)*

Paua, 1976, 600 on 24/10, down to 2-300 Nov-December; 822 on 8/3/77, 250 on 21/4/77; only 46 found in July but 200 in August (ATE). Rangiputa, 300 on 25/10/76 but 500 on 28/10/76 — evidently on the move southwards (JHS). 24/1/77, 4 on 90 mile beach, Bluff-Te Paki (RWJ). 4 over-wintering at Aurere (south end of Tokerau beach) 3/7/76 (PGS). Whangarei, 12/3/77, 19; May-July, only single birds recorded (PGM). Waipu, 29/1/77, 34 (TGL), 9/4/77, 14 (AHG). Mangawhai Spit, 28/5/77, 6 (GE). Tapora, 5/12/76, 285; 19/6/77, 87 (LH). Tiritiri Matangi island, two, 12/12/76 (LH). Manukau, 21/11/76, 197; 3/7/77, 54. Firth of Thames, 28/11/76, 176; 26/6/77, 101 (BB); on 9/4/77 HRMcK found 250 on a paddock at Kaiaua school, the biggest flock so far recorded in Firth of Thames. Bay of Plenty, Tauranga harbour, 1976, 6 in November, 8 in December; Kaituna cut, 19/11/76, 8; 28/12/76, 15; Ohiwa, 21/11/76, 10 (KF, AP); records of 1-3 birds on other dates; one at Sulphur Point, June (JHS). Ahuriri, H.B., one, 13/11/76 (KVT). Manawatu, present 23/10/76-18/3/77, maximum 13 on 23/10/76 (JLMM). Waikanae, 4/1/77, 6 (MDD, HAR). Farewell Spit, Jan 77, 1635; 30/7/77, 50 (MLF). Lake Grassmere, 24/1/77, 60 (BDH); 25/1/77, 20 (TJT. Kaikoura, Feb 77, 40-50 (ATP). Lake Wainono July 1976, one; Sep 76-May 77, up to 30 (RJP). Greenpark, Lake Ellesmere, May 77, 4 (AH). Clutha mouth, Nov 76, 10 (AW, PS). Southland, 1977, January count was low at 794; July, 351 (RRS).

SNARES ISLAND SNIPE *(Coenocorypha aucklandica huegeli)*

Found throughout the main island and Broughton island, in all habitats from tussock to forest. Nests containing 2 eggs each found on 20/11/76, 5/12/76 and 31/12/76; chicks seen from early December through to early March (PMS).

KNOT *(Calidris canutus)*

Paua, 1976, August, 400; Sep, 500; Oct, 3000; Nov, 100; 100 in July 77, 400-500 August-September (ATE). Rangiputa, 25/10/76, 2000; 28/10/76, 4000 (JHS). Whangarei 12/11/76, 65; 12/3/77, 114; 9/7/77, 43 (D. E. Crockett). Kaipara, Jordan's, 5/12/76, 2500 (AH); Tapora, 19/6/77, 36 (LH). Manukau, 21/11/76, 6152; 3/7/77, 270. Firth of Thames, 28/11/76, 11103; 26/6/77, 422 (BB). 26/10/76, 30 feeding by probing in salicornia; when hit by a hailstorm they lifted to 2 ft above ground; when some dropped to resume feeding those above closed ranks and hovered till the hail ceased (BB). Kawhia, 19/2/77, 3 (JHS). Bay of Plenty, Sulphur Point, 22/12/76, 6 (KF); Maketu, Jan 76, 22, a good count for this area; 4 on 26/6/77 (AP).

Westshore, HB, 4/3/76, 48 (JCH). Manawatu, present 9/9/76 - 11/6/77, maximum 85, December-January (JLMM); 6/6/77, 15; 29/6 - 17/7/77, 2 (HAR). Farewell Spit, Jan 77, 22537 (BDB). A rare bird in Nelson Haven, 2 on 7/3/77, with godwits (J. Hawkins). Heathcote-Avon estuary, a small flock arrived 15/9/77 (PMS). Lake Wainono, Sep-Dec 76, up to 13 (RJP). Clutha mouth, one, 24/10/76 (PS). Southland count 2/1/77, 113; none on 30/7/77 (RRS).

SHARP-TAILED SANDPIPER *(C. acuminata)*

One at Te Paki stream, 24/1/77 (RWJ). Paua, 3/3/77, a record flock of 39 (ATE); Rangiputa, 28/10/76, 3 (JHS). Ruakaka, 17/7/76, one (MPK). Manukau, 24/11/76 and 11/3/77, 13 (BB, SMR). Firth of Thames, 17/10/76, 10 (BB), 31/12/76, 23 (DAL); 12/3/77, 15 (HRMcK). Bay of Plenty, Maketu, a build up from 3 on 25/9/76 to 10 in October, 14 in November, 16 in December; 1977, 20 in January, 13 in February (PCL, AP). Ahuriri, HB, 19/2/77, 29 (KVT). Manawatu, present 23/10/76 - 9/4/77, 12 on 16/1/77 (JLMM), 17 on 5/2/77 (HAR). Farewell Spit, Jan 77, 7 (BDB). Lake Grassmere, 24/1/77, 3 (BDH). Lake Wainono, Oct 76-March 77, up to 6 (RJP). Southland, 29/12/76, 9 (MLB), 2/1/77, 13 (RRS). Snares, one present Nov 76-March 77, seen feeding along littoral zone at low tide and roosting among olearia debris at a stream mouth (PMS).

PECTORAL SANDPIPER *(C. melanotus)*

Karikari Peninsula, 6/3/77, 5 preening on edge of small lake (GJHM). Miranda, 17/10/76, 3 (AH), 26/10/76, 2 (BB). Taranaki, 26/2/77, one feeding with Pied Stilts in shallow fresh water, at Pungaereere stream near Rahotu (DGM). Manawatu, 30/10/76, 3 (HAR), 28/2/77, one (JLMM). Farewell Spit, Jan 77, one (BDB). Taumutu, Lake Ellesmere, 15/1/77, one in perfect breeding plumage, bright yellow legs (BDH). Lake Wainono, Apr 77, one (RJP). Southland, 29/12/76, one at Waituna (MLB); 2/1/77, one at Waituna, one at Invercargill (RRS).

BAIRD'S SANDPIPER *(C. bairdii)*

Manawatu, 23-31/10/76, one (JLMM, HAR).

CURLEW SANDPIPER *(C. ferruginea)*

Paua, 7-8 birds present Sep-Oct 76 and Jan 77; 8/3/77, 4; 21/4/77, 10, one red; 5/7/77, 5; 2/8/77, 10, one red; 19/8/77, 6 (ATE). Whangarei, 1977, March, 4; July, one (MPK). Manukau, 1976, 7 in November, 9 in December; singles February and April 1977 (BB, RBS). Firth of Thames, census figures, Nov 76, 22 and June 77, 19, but from mid-October 76 and in each month from Dec 76 to April 77 individual observers have recorded counts of 34-37 birds at Miranda and RBS considers that the population over this period was 40+; he also recorded 23+ on 11/7/77 and BHS counted 20 (one red) on 5/8/77. Bay of Plenty, Maketu area, a build-up from 3 in September to 13 in November 76; 2 on 12/2/77 (KF, AP, PCL). Ahuriri, HB, 18/12/76, 5 (KVT), 31/1/77, one (RMW). Manawatu, present 2/10/76 - 13/6/77; 3 in November, 8 in January, 10 in April, 8 on 8/5/77, 4 on 13/6/77 (LJD, HAR, JLMM, EBJ). Lake Wairarapa, N.E. shore, 15/1/77, 4 (MDD). Farewell Spit, Jan 77, 5 (AP). Nelson Haven, 1/9/77, one, partly in breeding plumage, seen on four consecutive days feeding vigorously in a pond and along tide line (J.

Hawkins). Lake Wainono, 1976, Sep, 4; Nov, one; 1977, one in January, two in March (RJP). Clutha river, 24/10/76, one; 30/10/76, 4; 1/11 and 14/11/76, 5 (AW, PS). Southland, 29/12/76, 6 at Waituna (MLB); 2/1/77 count, 13 (RRS).

DUNLIN *(C. alpina)*

Miranda, one seen 12/3/77 (JHS), confirmed on 29/3/77 (BB).

RED-NECKED STINT *(C. ruficollis)*

Paua, 24/10/76, 10; 1977, 6 in March, 7 in April; 2/8/77, 6, winter plumage (AE). Rangiputa, 28/10/76, 5 (JHS). Tapora, 10/10/76, 4; 5/12/76, 12; 19/6/77, 2 (LH). Manukau, 1976, October, 5-8; November, 9; December, 13; 1977, Feb-March, 11; one in June; 4/7/77, 5 on paddock, 9 on shellbanks, one well coloured and two part coloured (BB, AH, DAL). Miranda, Nov-Dec 76, 9; 1977, January, 8; Feb-March, 5; April, 3; 26/6/77, one (BB, AH, DAL, GJHM, HRMcK, JHS). Bay of Plenty, Oct-Nov 76, 6 (AP). Westshore, HB, 18/11/76, one; 3/1/77, 3; 13/2/77, 2 (KVT, RMW, NBM). Manawatu, singles 13-14/10/76 and one in breeding plumage, 8/4/77 (LG, EBJ, HAR). Farewell Spit, Jan 77, 7 )BDB). Lake Ellesmere, one at Taumutu, 15/1/77; February 77, 53 at Greenpark (RJP). Lake Wainono, 1976, 2 in November, one in December (RJP). Southland, Waituna, 29/12/76, 13 (MLB); 2/1/77 census, 20 (RRS).

SANDERLING *(C. alba)*

Waituna, Southland, 29/12/76 and 2/1/77, 4 (MLB, RRS).

PIED STILT *(Himantopus himantopus)*

Paua, July 77, c. 300, sheltering from cold SW wind behind small mangrove plants (ATE). Whangarei, July 77, 776 (MPK). Manukau, 21/11/76, 878; 3/7/77, 3993 (BB). Mangere, 13/11/76, a nest with six eggs (MSF). Firth of Thames, 28/11/76, 2186; 26/6/77, 1945 (BB). Kawhia, 19/2/77, 270; 3/7/77, 285 (JHS). Mercer, 2/6/77, 420 in a flooded field (BB). Westshore, HB, 13/2/77, 1173 (NBM). Manawatu, present all months, maximum 400+ on 7/5/77 (JLMM). Southland counts, 2/1/77, 657; 30/7/77, 301 (RRS).

BLACK STILT *(H. novaezealandiae)*

Smudgy birds, Puketutu, 21/11/76, one; Firth of Thames, 26/6/67, 3 (BB). Kawhia, 19/2/77, 3; 3/7/77, 10, of which 7 black, with brown feathers round eye; one white flecks on belly; two, white face, belly and under tail, smudgy lower breast; all robust, distinctive call, red iris. Unusually, they mingled with Pied Stilts but tended to group separately in flight; August 1977, 4 (JHS). Lake Wainono, Nov 76, one defending feeding territory against Pied Stilts (RJP). Mandeville, near Gore, 16/9/76, a smudgy bird on a roadside pond with, but apart from, 13 Pied Stilts, which had 4 nests; behaviour differed from the Pied Stilts, repeated single call of different timbre; flew towards Mataura river, not seen on five later visits over the following three days (MLB).

ORIENTAL PRATINCOLE *(Glareola maldivarum)*

Lake Wainono, one present 28/3 - 1/4/77; catching insects both aerially and on the ground; on wing, showed chestnut underwing coverts (RJP). May 1977, one on paddocks at South Turnbull, present for

about two weeks, mostly observed feeding on the ground; olive brown above, darker on head; rump and tail white, black tip; buff throat enclosed by a distinct black line from eye to eye; breast buffy, abdomen white (DM).

SOUTHERN SKUA *(Stercorarius skua lonnbergi)*

Muriwai, Gisborne, 9/4/76, harassing one of a flock of White-fronted Terns (JCH). Lake Wainono, one, Nov 76 (RJP). Snares, most eggs hatching in the second week of November 1976. Mottled Petrels, Fairy Prions and Diving Petrels formed the bulk of prey found in middens (PMS).

POMARINE SKUA *(S. pomarinus)*

Mangonui, one of three skuas in the harbour in Feb 77 had a white rump and may have been a sub-adult Pomarine (ECMC). Hauraki Gulf, 7/11/76, one (BB); 15/1/77, dark phase off Rakino; 23/1/77, Cape Colville-Cuvier, 3 (PCL). Foxton beach singles 6/2 and 3/3/77, identified by large white areas on wings and white rump (JLMM). Farewell Spit, Jan 77, one certainly, two probably this species (BDB).

ARCTIC SKUA *(S. parasiticus)*

Numerous records Oct 76-April 77, usually of one or two birds, but small parties reported in April, at the time of northward movement, e.g., Waipu, 12 (AHG), Devil's Point, Mercury Bay, 5 (JHS), Ohope, 3 and Maketu, 6 (PJM). Regularly seen offshore and over lagoon at Lake Wainono, Dec 76-May 77 (RJP). Buffalo Beach, Coromandel, two on 1-5/5/76 (ABJ). 21/1/77, of three which were chasing terns in the channel, one landed on Paraparaumu beach (MT).

BLACK-BACKED GULL *(Larus dominicanus)*

Lake Rotoehu, 24/12/76, nest, 3 chicks, on iron roof of a maimai, 100 m offshore; Little Shags also nesting on the maimai; eggs broken and chicks killed, probably by the gulls (CHL). Millerton burning mine, Nov 76, 80 nests, 60 occupied, 9 with newly hatched chicks (JCD). Waimakariri gorge, 4/12/76, up to 1000 nesting over 1 km of riverbed; some chicks nearly fledged, some hatching, many nests 1-3 eggs. Heathcote-Avon estuary, 1/2/77, large numbers returning, with young (GG). Mr Harris, Chief Keeper at Dog Island lighthouse, reports that in 1976 gulls arrived in late August as usual but by mid-September all had left the island and apparently will not nest there this year (PER).

RED-BILLED GULL *(L. novaehollandiae)*

There had been no nests on Mill Island, Russell, for 5-6 years, but in 1975, regarded locally as a summer of bad weather, nesting gulls colonised the whole top of the island. In 1976 only the eastern end of the island was occupied, gull numbers about half that of 1975 (GC). Ngaruroro, 22/5/77, a juvenile fishing like a tern — looking down, hovering, diving, and fully submerging before surfacing and flying off; this was repeated three times (KVT). Riverton estuary, 1976, a small breeding colony, about 100 birds, on and in a maimai (RRS).

BLACK-BILLED GULL *(L. bulleri)*

Kawhia, 19/2/77, 2 immature (TBST). Miranda, 1/9/76, 50 (JHS); 31/12/76, 17 nests (DAL). Firth of Thames count 26/6/77,

131 (BB). Maketu, 26/6/77, 3 (AP); Sulphur Point, 6/6/77, 11 adult, 3 immature (JHS); Tarawera estuary 31/7/76, 5 (RMW). Wairoa bridge, Feb 77, 130; June 77, 150, plus 130 at Wairoa river mouth; 13/3/77, 20 at Mohaka river mouth (GF). Ngaruroro estuary, 5/3/77, 400 (KVT). Southland coastal count, 2/1/77, 3553 (RRS).

BLACK-FRONTED TERN *(Chlidonias hybrida)*

Rangiputa, 28/10/76, a puzzling tern, thought to be sub-adult of this species, with Little Terns (ATE, JHS). Kaipara, off Ruawai, 11/2/77, two small grey terns, probably this species (BSC). Bay of Plenty, April-July 77, Matata, up to 9; Tarawera estuary, up to 5; Thornton-Rangitaiki mouth, up to 30 (PCL, RMW). Ngaruroro estuary, 17/4/77, 40 (KVT). Manawatu, singles Dec 76-Feb 77, 6 on 6/5/77 (JLMM). Wellington harbour, 2 in May, one in June (MLF, AP).

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

*Correction:*— Notornis 23, page 342 should read — Wainono, one in non-breeding plumage (RJP). Thornton, one seen at intervals 1976-77 season, 2 on 4/6/77 (RMW). Nelson, 2 at Boulder Bank 1-3/1/77, 2 over a pond at Nelson Haven 3-6/2/77; one at Rough Island 14/2/77 (J. Hawkins, BDB, PG, CO'D).

GULL-BILLED TERN *(Gelochelidon nilotica)*

September 76 - April 77, one to six birds reported from Seagrove, Karaka and round to Waimahia inlet of Manukau harbour (BB). Waitemata harbour, 15/5/77, one (RG). Kaipara, Jordan's, 2/7/77, 3 (DFB, SPC). Lake Horowhenua, 15/9/76, 2 (BDH).

CASPIAN TERN *(Hydroprogne caspia)*

Waipu, 23/12/76, one carrying a fish as it flew inland and landed in a paddock; no sign of young birds (TGL). Kawhia, 19/2/77, 104 (JHS). Parnassus, one at Waiau bridge, 15/8/76 (JRJ). Lake Benmore, 19/2/76, 7; 26/1/77, 6 (JCH).

FAIRY TERN *(Sterna nereis)*

Whangarei, 4 at Portland, 12/11/76 (D. E. Crockett). Waipu, two pairs; one pair had two newly hatched chicks on 8/1/77; a pair nested in the same area the previous season and have been seen right through the year until now (AHG). Mangawhai, 14/11/76, a count of 12, the same number as recorded in 1973, since when there has been no record of nesting (SMR); this compares with 3-4, the most seen simultaneously on visits by several members during the past year (MJT). Tapora, 5/12/76, two birds, a nest with 2 eggs (LH). Tauranga, Sulphur Point, KF reports two present on 1/3/76 and on 25/3/76 one at Maungatapu (SE end of harbour, 3 miles from Sulphur Point). No sighting for six months, then one at Sulphur Point 21/9-8/10/76; it mobbed me on 13/10 and 17/10/76, once with a fish in its beak; 27-30/10/76, two birds, one of which mobbed me; both mobbed me on 8-9/11/77, and two were seen together on 26/11. This was the last time two were seen together; by that date 9 Little Terns had arrived in the area. A single *nereis* remained, sometimes seen at Maungatapu but usually at Sulphur Point. During November-December KF, PCL and AP saw it offering fish to one of the Little Terns, on one occasion with its wings spread as if in courtship display. Usually

the Little Tern was unresponsive but on 6/1/77 accepted the fish and ate it. Mobbing ceased in December; the bird was still present on 25/4/77 (KF), 28/5/77 and 6/6/77, by which date it was going into eclipse (JHS). KF suggests that three of the birds seen in January-March 77 and provisionally identified as *albifrons* may in fact have been *nereis;* they tended to sit away from known *albifrons* and with the known *nereis;* the black on the head did not extend to the bill and was rather rounded in front of the eye, and when at rest they lacked the dark line on the flight feathers along the lower edge of the folded wing (DJB).

LITTLE TERN *(S. albifrons)*

Rangiputa, 28/10/76, 68; Mangonui, March 77, 2 (ATE). Whangarei, 12/11/76, 14 (D. E. Crockett). Kaipara, Jordan's, 3/12/76, 4 (AH); Tapora, 6/3/77, 25 (LH). South Manukau, 3 on 10/10, 5 on 31/10, 16 on 17/11/76; 20 on 12/3/77; of 19 on 19/3/77 at least 5 had yellow bills (BB, AH). Miranda, up to 14 on 28/10/76; 12 on 15/12/76, all with dark bills and reduced caps; 24/2/77, 14 (MSF); 23/3/77, 16, 5 with yellow bill, dark tip (JHS); 23/4/77, of 8 birds, six were in breeding plumage, one displaying, head high, strutting, chattering; 10/5/77, of seven, two seen in aerial display, chittering call (BHS). Bay of Plenty, Sulphur Point, numbers built up from 3 on 27/10/76 to 8 on 8/11, 9 on 23/11, 11 on 27/11/76, 12 on 10/1 and until 13/3/77; 7-10 up to 19/4/77, 4 on 25/4/77 (KF, PCL). Maketu, one, May and November 76; Rangitaiki mouth, 2, November and December (AP, RMW); Ohiwa, 4, Nov-Dec 76 and 26/3/77 (AP, RMW, DJB). Manawatu, one Oct-Nov 76 (HAR). Farewell Spit, Jan 77, 4 (BDB). Nelson, 14/2/77, one (J. Hawkins); Heathcote-Avon estuary, 18/1/77, 2 (BDH); Lake Wainono, Nov-Dec 76, one (RJP).

WHITE-FRONTED TERN *(S. striata)*

Flocks of about 1000 birds at Matata, 8/4/77, at Port Jackson, 5/6/77 (PJM), and at Buffalo Beach, 19/6/77 (ABJ). A dead bird found at Lake Rotorua, 30/8/77 (AP). Early March 77, Whatariki beach near Cape Farewell, 600 on beach at low tide, making a terrific chattering; two days later at Patarau beach, about 500; two hours later almost all had gone; may have been preparing to cross the Tasman (ATP). No nesting in Invercargill estuary since 1969, until on 31/10/76 71 one-egg and two-egg nests were found adjoining the Caspian Tern colony. On next visit (28/11/76) no birds or eggs were found; there had been no big tides and the Caspian colony was intact. 9/1/77, 300 nests at Tiwai Spit, Awarua Bay, where by 9/1/77 there were 290+ chicks, most flying (MLB).

GREY TERNLET *(Procelsterna cerula)*

Pataua beach, near Whangarei, 13/2/77, one dead (D. Shand). Poor Knights, Aug 77, two flying, between Aorangi and Tawhiti Rahi (AHG). Unconfirmed reports from Matata beach, Jan 76 and from Whakatane river, Oct 76 (AP).

N.Z. PIGEON *(Hemiphaga novaeseelandiae)*

Waiotira, 1/9/76, feeding on fresh young willow shoots (TGL). Copland Valley, 730 metres a.s.l., Nov 76 (SCS).

ROCK PIGEON *(Columba livia)*

Karaka, 19/2/77, seven racing pigeons rested and drank salt water from mudflat on a very hot day; others used tidal creek; birds skirt the shoreline, do not cross the open water of Manukau harbour (BB). Many resting in large sea caves, Tolaga Bay, 1975 (GF). Mount Maunganui, of recent years enormous numbers have built up in the dock area, where there is a flour mill. Poisoning has been done, but numbers soon build up again. They fly to Motuotau (Rabbit Island) to roost (KF). Lake Waitaki gravity dam, breeding 1976-77; population down to c. 120 in Jan 77, after Pest Destruction activity (JCH). Snares, a racing pigeon caught on 11/12/76 stayed in the vicinity till 4/1/77, when it flew north; a Palmerston North bird released at Bluff, it had not returned to its loft by 15/3/77 (PMS).

MALAY SPOTTED DOVE *(Streptopelia chinensis)*

Titirangi Golf Course, 1/4/77 (CS). Manurewa, Waimahia Inlet, regular 1976/77, one to three (K. Fisher).

WHITE COCKATOO *(Cacatua galerita)*

Vinegar Hill, Tikipunga, and Jordan Valley road, Whangarei district, one reported Aug 77 (MKT). Kaiaua hills, in manuka and maize, 1976 (RH). Mangahoe road, Turakina valley, 30/1/77, 14 (LJD).

KAKA *(Nestor meridionalis)*

North Island subsp. *septentrionalis;* Kerikeri, one around Stone Store basin Aug-Nov 76 and again June-July 77 (ATE). North Auckland, one at Leigh Cove and Mathieson Bay, Apr-May 77 (KJT). Auckland, One Tree Hill area, one in Oct 76, and in Aug 77 in a walnut tree (RT). June-July 77, Cornwall Park, 2, seen feeding on bare deciduous trees, presumably on insects (SMR). South Auckland, Brookby, Aug-Oct 76, eating taraire berries; Maraetai, Sep 76, two working on branches of dead gorse; Pukekohe East, Aug 76, nipping off bamboo leaf shoots (HRMcK). July 77, Patumahoe and Ngatea, in private gardens, on banksia and flowering gums (BB). Mayor Island, Feb 77, numerous (JFC). New Plymouth, Tukapa Street, 3-25/10/76, one irregularly present in a large puriri (RWW, GD); Bell Block, 20/5/77, one found dead (REL). Wellington, mid-June 77, reports of one at Woburn, Day's Bay and Waterloo road, Lower Hutt (PCB, HO, RAF). South Island subsp. *meridionalis:* Copland valley, 21/11/76, 436 metres a.s.l., flying very high and calling (SCS). Haast Pass, 21/2/76, one; no response to taped calls (JCH). Hurunui river, south branch, present eastwards to Lucy stream, Nov-Dec 76 (RG). Stewart Island, Port Adventure, up to 13 roost in rata by camp each night, Jan 76 (GF).

KEA *(N. notabilis)*

Motueka river valley, Mt Campbell radio repeater station, 11 birds, causing damage to aerials, etc; 5 captured, banded and released at Whangamoa saddle, Nelson, 30 miles away; one of these was later shot; it had returned to the general area of capture — Takaka hill, a mile north of limeworks (KLO). 1976-77 apparently a favourable breeding season; a party of 16 in South Young included 11 young, a party of 12 in North Wilkin included 8 young (PC).

EASTERN ROSELLA *(Platycercus eximius)*

Hihi (Doubtless Bay), Jan 77, feeding on ground, nipping off plantain seed heads (RWJ). Kohukohu, feeding on acmena berries, in association with blackbirds (KB). Apparent increase in Coromandel peninsula, 1977 (BB). Paraparaumu, 19/2/77, 5 (JLMM) and at Maungakotukutuku (WFC, MLF).

RED CROWNED PARAKEET *(Cyanoramphus novaezelandiae)*

Manitaha, Bream Islands group, 14/5/77, 3 flew to Bream Head, others seen and heard (PJM). Tiri Tiri island, breeding well, following releases in 1974-76 (MJT). Parakeet sp; again heard and seen at Waiotira, Jan-Feb 77 (TGL). Heard in cut-over forest, Oparara basin, Karamea (KLO).

SHINING CUCKOO *(Chalcites lucidus)*

Heard at Mangonui 12/9/76; Kerikeri, 3/10/76 - 15/3/77 (ATE). Snares, one found dead near station, 12/11/76 (PMS).

LONG TAILED CUCKOO *(Eudynamis taitensis)*

Huia, seen and heard 17/2 - 15/3/77 (JFS). Massey University campus, a single bird calling regularly for 30 minutes about midnight 19/10/76, while apparently circling overhead; conditions were very cloudy (MDD). Lake Wombat, Franz Josef area, 29-30/10/76 (GG). Copeland valley, 22/11/76, calling continuously, late p.m. and morning till 1000 hours; one flew over hot pools calling a rapid " wetch wetch wetch " (SCS). Haast Pass 21/12/76 (JCH); Lakes Matheson and Hawea, Jan 77 (BB); Dart Hut, 7/1/77, one in stunted beech 970 metres a.s.l., a very high altitude for the species (PC). Snares, 29/11 - 9/12/76, seen and head; Blackbirds giving unusual alarm calls, and one pursued a cuckoo flying over the olearia canopy on 8-9/12/76 (PMS).

MOREPORK *(Ninox novaeseelandiae)*

Huia, 23/1/77, two hunting; still light enough to see them catching large insects in talons, then sit on a branch and transfer the insect to their beaks, parrot fashion. A young bird, when fed a large cicada, clutched it in its talons, decapitated it with its beak, pecked wings and thorax, then manoeuvred it till it was in position to be gulped down (JFS). Tapu saddle, Coromandel, young birds heard late afternoon 24/10/76 (BB). Ngakaroa, Gisborne, a pair nested in a box under the roof of a shed, access by a broken window pane; 3 young independent by 15/1/76; the whole family used the rafters for a daylight roost for some months (AB). Wairoa, Sep 75, one roosted by day in a grapefruit tree for eight days; held its prey by its right claw; six house sparrows, two goldfinches (GF). Horahora road, Maungatautari, 28/5/77, one sitting in the middle of the road at 2000 hours (PCL). SE corner of Lake Rotoma, 1/5/76, one seen on forest floor, 1600 hours (AP). Ratapihipihi reserve, New Plymouth, three responded to taped calls, one followed the recorder for about 100 metres (JCH). Stewart Island, only two heard 15-27/12/76; calls not a clear " more pork " but more of a " bul bul " (PJM).

LITTLE OWL *(Athene noctua)*

Maitai Valley, Nelson, June-July 77, two calling at dusk, then spasmodically throughout the night (KLO). A pair at the Key, Te Anau highway; the furthest NW sighting to date in this area (RRS). Common in Central Otago (PC); Feb 76, recorded at Kurow, Tarras, Lakes Aviemore and Waitaki (JCH).

SPINE TAILED SWIFT *(Chaetura caudacuta)*
90 mile beach, 8/5/75, one dead (TGM). Just south of Hampden, 1/6/77, a swift with a square tail flew in front of us and over a plantation (BDB, RNN).

FORK TAILED SWIFT *(Apus pacificus)*
Whau Valley, Whangarei, 29/8/77, one flew overhead at about 20 m., heading up the valley towards the dam, into a stiff southerly, with measured wing beats; 20 minutes later it returned, flying down the far side of the valley. Long sickle shaped wings, deeply forked tail; attention was first drawn to the bird by a shrill, rather piercing single note, regularly repeated (JCSK).

KINGFISHER *(Halcyon sancta)*
Taranaki, nest at Waitaanga saddle, Feb 77 (GD); foreshore, Greenwood Road, Okato, 11/9/76, 10-12 birds (REL). Routeburn Flat, 6/4/77, one in backwater of river at 685 metres a.s.l., a high altitude for the species (PC). Waihopai river, Invercargill, arrive end of March, leave early October (MLB).

KOOKABURRA *(Dacelo gigas)*
Two on a tree between Whangateau and Omaha, 3/5/77 (MJT). Paraparaumu, Feb 77, one seen at Maungakotukutuku (LG).

RIFLEMAN *(Acanthisitta chloris)*
S.E. corner of Lake Rotoma, 1/5/76; tawa forest N. of Lake Rotoiti, Jan 77; Whaka forest in redwoods, Sep 76; 80+ counted between Lake Waikaremoana and a lagoon above Lake Waikareiti, Apr 77 (AP). Mount Holdsworth, a nest 12 m. up a beech tree, adults feeding young 22/11/76 (RHDS). Banks Peninsula, Oct 76, patchy distribution; three pockets of vigorous population, inhabiting bush, scrub, hedgerows and gardens (WFM, FH, EG).

ROCK WREN *(Xenicus gilviventris)*
Mt Aspiring National Park, Jan 77, several pairs, S. Young, Siberia and North Wilkin regions (PC). Homer Tunnel, north side, 21/1/77, two; one of them, approaching, hopped up and down almost vertically 3-4 inches for some time, then flew to join the second (ARL). Rather unapproachable in Tutoko and Harrison valleys, tame in Transit valley; one carrying a feather on 12/11/77 (TRH).

TREE MARTIN *(Hylochelidon nigricans)*
Rangitukia, East Cape area, 9/4/75, c. 20, with Welcome Swallows (JCH). Matata, 25/4/77, one with a flock of c. 40 Welcome Swallows, hawking insects over the river; it was observed resting on the sand on the southern bank and some rocks on the north bank. Once noticed, the paler underparts and white rump are very obvious; size difference between martin and swallow is not noticeable but with its square tail the martin tends to look more chunky. Flight less smooth and more fluttering than that of the swallows, and it was more inclined to pick insects from the water surface, getting a ducking in the process (PCL).

WELCOME SWALLOW *(Hirundo neoxena)*
12/6/77, one settled on a vessel 23 miles SSW from Cape Maria van Diemen (19 miles west of 90 mile beach) and stayed for

2½ hours till the ship was 4 miles off Cape Reinga, when it flew off towards the land (NC). Ahipara, 28/2/77, occupied nest 2 ft from floor of a small shallow sea cave (GF). Poor Knights, 13/8/77, 2 at a large cave on west coast of Aorangi (PJM). Auckland area, New Lynn, 3/2/77 (CS); Ngapuhi road, Remuera, Sep 76 - Jan 77, one-four birds; first sighting here in 5 years' residence (MPB). Whitford, nesting on a beam under roof of carport, 4 young flew 5/11/76 (JB). Raglan, 4/6/77, flock of 150 over reservoir (GE). Coromandel, May-June 77, 20 at Buffalo Beach, 18 at Matarangi beach (ABJ). Rangitukia, April 75, 30; Tolaga Bay, 10/2/77, 8 flying up and down main street (JCH). Horahora, Mangatautari, 24/5/77, 3; have been in the vicinity for about a year (PCL). East end of Lake Rotoiti, a nest, 3 young, 19/12/76 (CHL). Westshore, H.B., 13/2/77, c. 100 (NBM). Mt Damper Station, Mangapapa road, Tahora, 27/7/76 (REL); Waitotara mouth, 28/11/76, 12 (RWW). Wanganui, Rapanui, Dec 76, 20 at a small lake (EGJ). Judgeford and Pauatahanui, Feb 77 (RSS, WFC). Kapiti, 11-14/9/76, over a lagoon at north of island (MLF). Masterton, breeding at Te Ore Ore gravel pits (RHDS), c. 30 birds Jan-Feb 77; Ruamahanga river near Gladstone 25/2/77, 35, sunning on rocks or hawking nearby (MDD). West Coast, Kumara, 14/11/76, a pair (JRJ). Waimakariri gorge 4/12/76 (GG). Small flocks moving south, Oamaru March 77, Dunedin May 77; a few pairs breed around Lake Wainono, influx to lake late Feb-September (RJP). Hilderthorpe, 5/3/77, three over an irrigation pond near the sea (TCD). Southland, 1976, again abundant late autumn-late spring; odd birds still present at Lake Murihuku, Nov 76; one at Round Hill ponds 22/12/76; no evidence of breeding (RRS). Waimatuku, 13/3/77, 24 (MLB). Stewart Island, Old Neck, 7/5/77, 4 (LEH).

PIPIT *(Anthus novaeseelandiae)*

N. Mt Egmont, Tahurangi Lodge, 1524 m., 19/2/77, 2 on moss slopes (DGM). Plimmerton, 20/8/76, two on scree slopes adjacent to Paekakariki road; Rimutaka State Forest, two on a shallow stony stream (JLMM). Lake Wainono, late summer to winter visitor; nearest known breeding grounds Hunters Hills, 15 km away (RJP). Western Dart, vicinity Margaret Burn, Pass Burn, common among short tussock and mineral matter, 1200-1500 m., Jan 77 (PC).

HEDGE SPARROW *(Prunella modularis)*

Clevedon, not seen for some years (HRMcK). Wairoa dam, Hunua, several heard 27/9/76; still in good numbers Tapu-Coroglen (BB). Taranaki, Oakura, 2/1/77, responded to taped calls as, on three occasions, did a stoat (JCH). Ward, April 77, group of 6 at sheep yards on a wet day (TJT).

FERNBIRD *(Bowdleria punctata)*

Pakiri tidal estuary, 13/11/76 (BB). Te Toro, Waiuku, 11/9/76 (DAU). Turakina estuary, 8/7/76, many seen and heard (IWJ). Ngakawau river, Buller, many seen and heard on pakihi, 11/5/77 (KLO). West Coast, Kokiri 28/12/76 (WAW); inland from Okarito, and reported at Tatare, Oct 76 (GG); Okuru, Feb 76, answered taped calls (JCH). Deadman's swamp, Hollyford valley, 5/12/76 (MLB). Snares, 1976/77, the commonest passerine on the island, present in all habitats from near shore to forest; eggs found late Nov to late January (PMS).

BROWN CREEPER *(Finschia novaeseelandiae)*

Franz Josef area, response of a party of 10 to a squeak bottle was an excited chattering, which ceased when the lure was silent but was resumed 50 yards further on when it was used again (PGS).

WHITEHEAD *(Mouhoua albicilla)*

Little Barrier, birds feeding on the forest floor, apparently on insects, May 77 (RCM). Toatoa, 30/12/75 (JCH). E. Mt Egmont, Stratford Mountain House, Feb 77 (DGM). Manawatu, Tiritea dam, seen on several occasions 1976-77 (JI). Hinakura, Eastern Wairarapa, reported 21/11/76 (RHDS).

YELLOWHEAD *(M. ochrocephala)*

Nelson, Whangamoa saddle, 8/9/76, one with a flock of brown creepers and silvereyes (RG). Arthur's Pass, one seen to eat fungi from a tree trunk (AP). Dart, Jan 77, rather thinly distributed all the way to near Dart Hut, 940 m (PC). Rare in Harrison and Tutoko valleys, Dec 75 (TRH).

GREY WARBLER *(Gerygone igata)*

Waioeka river, Jan 77, on 40 yards of track I called up ten grey warblers, including a family of 5; I have never seen such aggressive or defensive behaviour as that displayed by the parent birds, which continually flew to within inches of my face (AB). Waihaorunga (near Waimate) 600 m., a nest 5 m. up in Oregon pine, opening facing NE, 13/10/76 (GG).

FANTAIL *(Rhipidura fuliginosa)*

Black fantails recorded at — Gisborne, 27/3/77; Mt Egmont, 6/6/77 (JCH); Mt Bruce, 5/4/77 (DJ); Tawa, 14/6/76 (MT) and Eastbourne, 25/4/77 (WAW); several near Greymouth (PGS); one at Okuru, 22/2/76 (JCH). Coromandel, small numbers 23-25/10/76; not recorded at Mt Maumaupaki in Oct 76 or in May 77, small numbers only on Crosbie's Settlement track further south (BB). Wairoa, 27/2/77, one with a white tail; May 77, one with no tail, hawking insects with the same movement and skill as normal birds (GF).

PIED TIT *(Petroica macrocephala toitoi)*

Apparently increasing in Hunua ranges and in Coromandel, 1976/77 (BB).

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

Lake Rotoiti, 15/2/76, three young fed near township (PJ). Banks Peninsula, confined to the last patches of bush, Summit road (WFM).

BLACK TIT *(P. m. dannefaerdi)*

Common throughout forested areas on Main and Broughton islands; seen feeding on the ground and hawking flies off a sealion; nests in cavities of logs which give some protection from the weather, eggs found early Nov-mid-Dec 76 (PMS).

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

Motu, 30/12/75, 4 (JCH). Paradise Valley Springs, Rotorua, 1/5/76 (AP). Waitaanga saddle, Feb 77, 3 (GD).

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

Tasman National Park, one seen on west side of Canaan valley, 9/2/77 (WAW). Two in cut-over forest, Oparara river basin, Karamea, 11/5/77 (KLO). Westland, frequent at Baxter's Creek and Moonlight river; 1/10/76, only few in S. branch, Hurunui river, in contrast to main branch. Eskhead Station homestead, 6/12/76; must have flown at least 6 miles from nearest known population, over open country (RG).

SONG THRUSH *(Turdus philomelos)*

Gisborne, a pair used the same nest for three successive clutches, 4, 3 and 2 eggs, last hatching 23/2/76 (AB). Snares, present in small numbers in forested areas Main and Broughton Islands; occasionally seen feeding in tussock areas; shy, did not allow close approach; nests found in forks of Olearia and on fern crowns, 3-4 eggs (PMS).

BLACKBIRD *(T. merula)*

Okaihau, when we first arrived on the property in Dec 65 a young hen Blackbird joined us in our efforts to establish a vegetable garden, showing no fear of us, but markedly less confident with the children or with strangers. Year by year this friendliness continued; she would follow the rotary hoe wherever we used it and go up to 400 yards from her home ground. Her mate or mates never became tame; she raised two broods a year, but with less success than other Blackbirds in the area, sometimes only one chick surviving; we wondered if this was due to unsuitable diet as she frequently fed the chicks on food items from the household scrap heap. From the time she was 7 years old it appeared that moulting was becoming a more prolonged and debilitating effort; at age 9 this was even more apparent; she did not nest the following spring and died at age approx. 10 year 4 months (WSS). Rotorua, soft sub-song 2-9/5/77, under a japonica tree; clearly audible but quite different from normal song (RWJ). Gisborne, 26/10/77, a pair, which had a nest with newly hatched young, vigorously attacked a weka (JCH). Hastings, 31/10/76, just before 6 a.m., alarm calls from a pair of blackbirds. On the next door lawn were four fledglings in an evenly spaced group, all in a "freeze" position, beaks pointing upwards; 3 metres away a cat was crouching quietly. They were not, I think, ready to leave the nest, which was above them in a thick japonica bush, and apparently intact. Having chased the cat away I picked up 3 of the chicks and as the nest was inaccessible, put them on top of the fence, in sight of the parents; the fourth chick hopped under the japonica. As each chick was picked up it unfroze after a few seconds, struggled and emitted piercing screeches. Five days later two were being fed by the parents, the other two apparently perished (KVT). Snares, present in small numbers on Main and Broughton Islands, very flighty, did not allow close approach, likely to desert nests, of which 8 were found, eggs 2-4, in Olearia forks and fern crowns (PMS).

SILVEREYE *(Zosterops lateralis)*

Auckland, 15/11/76, 0600 hours, one bathing by fluttering its wings in the dew-covered leaves of a wattle, and later in a plum tree (AR). Whakaki lagoon, 22/9/76, late afternoon, 20 birds catching insects on the wing, in a weaving bat-like fashion, after the manner of swallows (JCH). Manawatu, very few in 1976 winter; 1977, came to fat in May, numerous since (EBJ). Snares, forest areas of Main and Broughton islands; most frequently seen feeding in *Hebe elliptica;*

3 nests with well feathered young found in *Hebe,* third and fourth weeks of Dec 76; adults seen to feed the young birds green Lepidoptera and craneflies; a bird heard singing late Feb 77 (PMS).

BELLBIRD *(Anthornis melanura)*

Tutukaka, Nov 76 (DW). Plentiful Tapu-Coroglen, Oct 76 (BB). Mercury Bay golf course, flock of 50 arrived 15/4/77, still there 30/6/77 (ABJ). Wairoa, June 77, numerous in town areas, on puriri and eucalyptus (GF). Nelson, Lake Rotoiti, 31/1/76, on a beech tree, probing bark, in which were small white insect eggs (PJ). Okarito, 6/6/67, extraordinary response to " squeak bottle "; one of three puffed out its feathers, assuming a round squat shape when perched on a branch and positively shouted back at me for about 3 minutes, then relaxed and uttered bell notes; the other two excited, uttered occasional small notes, but left the attack to the leader which was 6-9 ft from me all the time; at Alex Knob, Franz Josef, six within a few feet of me, again with a leader which kept up persistent shouting (PGS). Franz Josef, nest 16 metres up in a rata tree, 30/10/76; Wanaka, 25/10/76, feeding on flowering kowhai (GG).

TUI *(Prosthemadera novaeseelandiae)*

Kamo, Tuis always used to come when flax was in flower; in 1977 a group of mynas arrived every forenoon; worked on each flax flower which had opened; only when the flowers were dead and mynas ceased their visits did a solitary tui appear, once only (AHG); Kerikeri, similar displacement of tuis by mynas in the flax flowering season (ATE). Waipu, 19/8/76, tui pursuing silvereyes for 30 metres, chase ending in a dense liquidamber tree (TGL). Huia, newly hatched tuis fed on nectar from flowering gum and Callistemon; 13/1/77, fledgling tuis on a pohutukawa tree being fed on nectar, and also feeding themselves on Pohutukawa flowers (JFS). Wairoa, June 77, regular visits to garden by tuis — my first sighting of a tui in town for over 2 years (GF).

YELLOWHAMMER *(Emberiza citrinella)*

Tokerau beach, July, pecking at seaweed; 90 mile beach, July, feeding on the wet sand, apparently on some animal matter (ATE). Invercargill estuary, 5/9/76, 45 feeding in spartina grass (MLB). Stewart Island, March 76, one near Fern Gully (PMS); Dec 76, near Oban and on Mason-Freshwater flats (PJM). Snares, Nov 76, 2 feeding on seed heads of *Poa annua,* one on those of *P. astonii* (PMS).

CIRL BUNTING *(E. cirlus)*

Ward, male in full song dawn-dusk, 23/1/77; family group seen (BDH); Awatere valley, two miles from river mouth, Oct 75 (TJT). Feb 76, reported from Hawea, and from various localities in Waitaki valley, where in Jan 77 fewer were observed than in previous years (JCH).

CHAFFINCH *(Fringilla coelebs)*

Snares, Main and Broughton islands, Nov 76-Jan 77, very small numbers; males heard calling, generally from predominantly *Senecio* forest; one nest found, 3 m. up in fork of *Senecio* just under the canopy, nest made of *Poa astonii,* wood fibres, lining of moss on the outside and feathers on the inside (PMS).

GREENFINCH *(Carduelis chloris)*

Matata, 15/5/77, feeding on berries of boxthorn (PCL). Gisborne, Nov-Dec 75, an albino; taking maize, which was snatched from its beak by a sparrow; perhaps the same bird seen Sep-Oct 76 (JCH). Snares, Nov 76, male and female feeding on *Poa annua* seed heads; male and two females on landslide area (PMS).

GOLDFINCH *(C. carduelis)*

Snares, Nov 76, 2 feeding on *Poa annua* seed heads, later a flock of 6; two on landslide area, within forest (PMS).

REDPOLL *(Acanthis flammea)*

Aupouri peninsula, 1977, around dune lakes near Waihopo (ATE). Mangawhai, 14/11/76, on edge of pinewood at base of spit (BB). East Mt Egmont, Manganui ski ground, 1200 m., common 19/12/77 (DGM). Bulls, Dec 75, large numbers breeding in willow plantations and scrub along banks of Rangitikei river; not common on farmland away from the river (CHL). Rabbit Island, Nelson, flock of 150, 22/8/76 (FHB). North Esk river, 30/11/76, flock of 150 feeding on beech seed on floor of dense mountain beech forest (RG). Snares, up to 10 birds regularly seen and heard from Dec 76, in tussock and *Hebe* area of Sinkhole flat; 4/2/77, female and 7 juveniles feeding on *Poa annua* near station (PMS).

HOUSE SPARROW *(Passer domesticus)*

Campbell Island, 5/7/76 - 1/2/77, two males and a female at hostel; may be nesting; one bird seen flying out from under corrugated iron roof of wharf shed (MM). Snares, Nov 76, 2 dead males found; up to 8 birds seen round station Nov 76-Jan 77, shy and retiring, no evidence of breeding (PMS).

STARLING *(Sturnus vulgaris)*

Poor Knights, 13/8/77, small flocks on Aorangi and Tawhiti Rahi (PJM). Cuvier, Jan 77, flocks engaged in aerobatics over pohutukawas; single birds "exploding" from long grass, like pheasants (BB). Auckland, 20/4/77, mimicking song of grey warbler (MJT). Large flocks fly to roost on Rabbit Island, off Mt Maunganui, but many birds breed and roost around Matapihi peninsula and Tauranga town area (KF). Hawkes Bay, Ahuriri, 23/4/77, about 1000 landed on mudflat to forage, then broke up into two groups, one group settling again where they had arisen, the other group flying to the middle of the estuary and settling on another sand flat (KVT). Tatare, Oct 76, four chicks in the pocket of a man's coat hanging in a farm shed (GG). Snares, a bird seen flying over the station at least twice on 19/12/76, not seen to land (PMS).

MYNA *(Acridotheres tristis)*

Northland, several instances of mynas pecking at road-killed animals — hedgehog, harrier and a myna; a flock of 50 mynas gathered in an apple orchard at Kerikeri and caused much damage to the crop by pecking ripe fruit on the trees (ATE). Bay of Plenty, near Rangitaiki river bridge, 8/4/77, a partial albino; head not as dark as normal, back and breast brown, wings and tail except for middle pair of feathers, white (PJM).

NORTH ISLAND KOKAKO *(Callaeas cinerea wilsoni)*

Coromandel peninsula, Oct 76, a possible heard on Mt Moehau, a probable at Tapu saddle; April-May 77, one feeding on mahoe and coprosma berries at Mt Maumaupaki; Golden Cross, 3-4 birds Oct 76, one in Feb and April 77, in mixed forest with kamahi and tawa predominant; big timber trees (kauri, totara, rimu) were cut out some years ago; where the kokako were found the tawa was smaller than in nearby bush, and there were no very large trees at all in the area (BB, SMR, MSF et al). Otanewainuku, near Te Puke, a further report, 27/12/76, 3 in tawa trees on roadside only 100 yards in from road, at least 2 others calling; singing noticeably tapered off after 0700 hours (SCS).

SOUTH ISLAND KOKAKO *(C. c. cinerea)*

A possible sighting in Nov 76, south bank of Paringa river 2 miles upstream from main road bridge, by Mr T. F. Condon, Mahitahi; the area is under mixed silver beech-podocarp forest with a rich scrub understorey; the bird, seen when Mr Condon took shelter under a tree during a heavy shower, was dark, larger than a tui, with conspicuous markings on its face; when he tried to get closer it flew further into the bush (SCS).

BLACK BACKED MAGPIE *(Gymnorhina tibicen)*

Silverdale, Aug 76 (HAR). Numerous reports of black-backed and hybrids in Gisborne - East Cape area; a pair attacked and routed two cock pheasants (JCH). Manawatu, quite numerous throughout but tends to be more common away from the dunelands. This appears to be a relatively recent phenomenon, possibly a result of the influx in February-March 76. 3 seen in Southern Wairarapa 24/7/77 (HAR).

WHITE BACKED MAGPIE *(G. hypoleuca)*

Little Barrier, one appeared in May 77 (RCM). Mercury Bay Golf Course, 5/9/76, 8 attacking a harrier in the air (ABJ). Near Wanganui, May 77, occasionally attacking Cattle Egrets (DJ). Porirua, 25/6/75, chasing feeding gulls; Tawa, a drake mallard on an enclosed lawn was viciously pecked by magpies and forced down when it tried to take off; as I approached the magpies withdrew, the mallard recovered and flew, and the magpies resumed feeding (MT). Taramakau valley, Apr-June 77 (JRJ).

ROOK *(Corvus frugilegus)*

Waiuku, 1977, one; Miranda, 12/3/77, 13 circling high on a thermal over the sea towards Kairito (HRMcK) and a further 3 seen later, thermalling up out of sight; 29/3/77, 40, feeding (BB); Waitakururu, 4 on 31/5/77 (JCH). Maketu, 3/10/76, juvenile being chased by Black-backed Gulls, Caspian Tern and Stilts (AP). Tolaga Bay, 11/4/77, 15 feeding in a paddock; regrowth of colony almost exterminated some years ago; spreading in Gisborne area, frequent reports of 1-5 birds since July 76; odd birds at Wairoa, Nov 75 (JCH), and Mahia, July 75 (GF). Putorino, Sep 75, 60 plus (JCH); Tutira, Jan 77, 17 (RMW); Tangoio, Oct 75, 80, 37 nests in gum trees (JCH); 6/5/75, 4 eggs in a nest 15-20 m. up a Norfolk pine, Napier marine parade (CHL). Apiti, 25/4/77, 54 (JI). Eketahuna, 28/8/75, 6 (GF). Aug 77, 7 at Pirinoa (RNC), 12 at Kumanga (MLF). Ward, 11/5/77, one feeding in a paddock infested with grass grub (TJT). Little River, Banks Peninsula, 2/2/77, 3 (BB).

# SHORT NOTES

## SEEDS FROM A TUI

On 14 September 1976 a female Tui *(Prosthemadera novaeseelandiae novaeseelandiae)* was found dead in the grounds of the Forest Research Institute, Whakarewarewa, Rotorua. It had apparently hit a window of a building close to Silviculture House.

On 15 September, I dissected the Tui to ascertain what it had been eating. The digestive tract contained eleven totara seeds *(Podocarpus totara)*, two still attached to the receptacles, which appeared little altered except for colour. From the bright red of fresh totara receptacles they had turned to a bright yellow. There were also seven other receptacles in the gut. Little difference was apparent between the receptacles in the gizzard and those in the cloaca and all the seeds appeared unaltered.

The crop and oesophagus were damaged in the dissection.

Near the place where the Tui was found there is a totara tree approximately 11 metres high which was still bearing many seeds in September 1976. Some of the seed had undeveloped green receptacles but much of it had fully developed red receptacles.

When several of the seeds on red receptacles were cut in half they were found to contain no embryo.

The same tree had carried seed late in the previous year as well and although the seed was apparently inviable, tuis nevertheless made use of the fleshy receptacles available late in the season.

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## AN UNUSUAL PETREL NEAR THE CHATHAM ISLANDS, NEW ZEALAND

### INTRODUCTION

While trolling for tuna from f.r.v. *James Cook* 80 km west of the Chatham Islands on 8 March 1975, the vessel was accompanied by a peculiar petrel for about 15 minutes. Field observations supplemented with 35 mm colour slides taken with the aid of a 300 mm telescopic lens indicate that the bird was either a light-phase Kermadec Petrel, *Pterodroma neglecta* (Schlegel, 1863), or a light-phase Herald

Petrel, *P. arminjoniana heraldica* (Salvin, 1888). Colour notes follow the system proposed by Smithe (1975) and are based on the colour slides.

Without the initial stimulus of Mr M. J. Imber this note would not have been written. I thank him and W. R. P. Bourne, D. E. Crockett, Sir Robert Falla, F. C. Kinsky and W. King for examining and commenting upon the colour slides, and also J. A. Bartle for use of his *Naturalists' Colour Guide* and constructive criticism of the text.

## OBSERVATIONS

The bird was about the same size as a Grey-faced Petrel *P. macroptera* (Smith, 1840). The bill was black. The head was generally a pale neutral grey (colour 86 of Smithe 1975) with some blackish neutral grey feathers behind and above the bill. A small patch of dark neutral grey formed a mottled eye ring. There was a dark greyish brown or blackish neutral grey chest collar separating head from pure white underparts. Undertail coverts were white mottled with brown, while the undertail was probably dark greyish brown or fuscous. The underwing was fuscous in the axillary and underwing covert regions, with an extensive subterminal white primary patch. At the base of the primaries there was a series of alternating burnt umber, white and tawny areas, giving a rather mixed colour pattern (Fig. 1). There appeared to be less white under the left wing compared with the right although this difference may have resulted from poor light conditions. The upper body behind the neck, and the upperwing were uniformly dark greyish brown to fuscous in colour.

In flight the short squarish tail was a prominent feature. The flight pattern consisted of a long, low glide followed by a sharp banking flight to 10-15 m above the sea. In wind speeds of force 6 (Beaufort Scale, 40-50 km hr) the bird was not seen to beat its wings during the observation period.

The petrel was seen between 1750 and 1805 hrs (NZST), 8 March 1975, at 43° 40′ S, 178° 00′ W. Sea-surface temperature was 16.8°C and sea-surface salinity 35.05‰. The sky was overcast, wind NW at force 6, and with rough seas.

## DISCUSSION

The " relatively short and squarish tail . . . and an underwing pattern which includes a highly conspicuous, elongate subterminal patch formed by the white . . . inner webs of the primary quills " (Murphy & Pennoyer 1952: 26) distinguish the Kermadec Petrel from all allied species except light-phase Herald Petrels. The Kermadec Petrel *(Pterodroma neglecta)* has a widespread breeding distribution throughout the subtropical Pacific (OSNZ 1970). It is rarely reported at sea in the New Zealand region away from the northern breeding

FIGURE 1 — View of underbody of the ? Kermadec Petrel observed near Chatham Islands. *Note:* the extensive subterminal underwing patches, distinct collar separating breast from belly and dark undertail coverts.

Photo: P. E. Roberts

grounds (Jenkins 1967, 1970 and pers. comm.) and even more rarely elsewhere (e.g. Nakamura & Tanaka 1976). Only 2 specimens have been recorded as beach-wrecked (Oliver 1955) since regular beach patrolling began in New Zealand.

Other ornithologists to whom the series of 35 mm colour slides have been shown have suggested that the petrel did not look like Kermadec Petrels seen by them. The specimen photographed was

" very dark and brown for *neglecta,* with a darker head and upper breast, and trace of a paler chin " (W. R. P. Bourne, pers. comm.). Also the primary patches in the underwing look too extensive to other observers who have seen the bird at the breeding colonies. · Kermadec Petrels usually have a single small patch, although one study skin at the National Museum, Wellington, does have patches similar to those shown in the colour slides. The Kermadec Petrel is extremely variable in colour with dark-and-light-phase birds " linked by a series of intermediates representing nearly every possible blend " (Murphy & Pennoyer 1952: 25).

The closely related Herald Petrel *(Pterodroma arminjoniana heraldica* Salvin, 1888) can only be distinguished from *P. neglecta* " in having dark shafts on the wing quills " (Murphy & Pennoyer 1952: 38). This latter species also has a wide breeding distribution across the South Pacific Ocean between 8°S and 27°S latitudes and has never been reported at sea in the New Zealand region. The closest known breeding ground to New Zealand is in the Tongan Islands (Murphy & Pennoyer 1952). The field notes and colour slides taken do not allow positive identification.

An alternative suggestion, made by M. J. Imber (Wildlife Service, Department of Internal Affairs, Wellington), that the bird was a Chatham Island Taiko (*P. magentae* (Giglioli & Salvadori, 1868 *fide* OSNZ 1970) was also considered. Despite several trips to the Chatham Islands to search for Taiko over the last few years, no definite sightings have been made. Single " head-less " (i.e. dark-headed and white-bellied) birds were observed by spot-lighting in 1974 on two occasions (D. E. Crockett, pers. comm.). However, this species was described as having a white belly and dark head (Bourne 1964), whereas no mention was made of white underwing patches. Recently, a petrel thought to have been a Taiko was seen north of Chatham Islands — but in this specimen the underwing was " completely dusky except for a very pale central stripe " (Bourne & Dixon 1975: 69). Hence, it is unlikely that the petrel seen by me was a Taiko, while the identification as a Kermadec (or Herald) Petrel seems more acceptable.

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# A FURTHER NOTE ON THE NOMENCLATURE OF NEW ZEALAND SPUR-WINGED PLOVERS

Brathwaite & Van Tets (1975) have suggested that the name *Vanellus miles* (Boddaert, 1783) should be used for the Spur-winged Plover of New Zealand. During a study of *V. miles* in Southern Victoria, egg dimensions of this population were compared with data in the literature on populations from New Zealand, Tasmania and New South Wales. The results are presented here.

The increase in egg width with latitude in the Australian populations conforms to the trend predicted by Bergmann's rule. Bergmann's rule states that " races of warm blooded vertebrates from cooler climates tend to be larger than races, of the same species from warmer climates " (Mayr 1956). Egg width is a less variable parameter than egg length and can be considered a correlate of body size. In the Song Thrush *(Turdus philomelos)*, egg length is correlated with habitat and age while egg width remains constant in a population (Gromadski 1966). Although the ranges overlap, the differences between the means of the egg width of the Australian populations are statistically significant (t-test, $p < 0.001$; N.S.W./Vic. $p < 0.1$). However, the difference between the New Zealand sample and the New South Wales sample is not significant.

EGG SIZE VARIATION OF *Vanellus miles* WITH LATITUDE

| Locality and Latitude | (mm) | Range | Mean | S.D. | Source |
|---|---|---|---|---|---|
| Invercargill, N.Z. (46° 24') | Length<br>Width<br>(n=60) | 45.7 - 54.8<br>33.0 - 37.6 | 49.4<br>35.3 | ±2.0<br>±1.0 | Barlow *et al.* (1972) |
| Hobart, Tasmania (42° 55') | Length<br>Width<br>(n=171) | 42 - 59<br>32 - 38 | 51.33<br>37.44 | ±2.25<br>±1.24 | Thomas (1969) |
| Phillip Island, Vic. (38° 30') | Length<br>Width<br>(n=82) | 45.2 - 54.2<br>32.5 - 37.3 | 48.78<br>35.78 | ±1.93<br>±0.90 | Present study |
| Lake Bathurst, N.S.W. (35° 01') | Length<br>Width<br>(n=16) | | 49.0<br>35.4 | | Thomas (1969) |

The discontinuity in the expected trend of an increase in egg size with latitude created by the inclusion of the New Zealand birds, is due to the relatively recent establishment of this population from an Australian source. It is thought that the New Zealand population arose from a single pair of Australian birds in 1932 (Barlow 1972). The locality from which the birds came is unknown, but judging by egg size, the New Zealand population appears to show an affinity with a more northern Australian population than is adequately represented by the data available. This evidence indicates that the relatively small

eggs at a high latitude in New Zealand may be due to the parental stock being from N.S.W. or further north, as suggested by Van Tets & Brathwaite (1975), based on plumage characteristics. I wish to thank Drs A. A. Martin and G. F. Van Tets for their valuable criticisms in the preparation of this note.

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## FIRST RECORD OF THE CHRISTMAS ISLAND SHEARWATER IN NEW ZEALAND

A specimen of the Christmas Island Shearwater *(Puffinus nativitatis)* was found on the Dargaville West Coast by members of the Northland Branch of the Ornithological Society of New Zealand during a routine beach patrol on 29 February 1976.

The Christmas Island Shearwater is a little known seabird of the Central Pacific Ocean. King (1967 *Seabirds of the Tropical Pacific Ocean,* U.S. Natn. Mus., Washington, D.C.) summarised its present distribution:—

> " Breeds on the Hawaiian, Line, Phoenix, Henderson, Ducie, Tuamotu and Austral Islands. Although this species breeds at many localities its total population is not large. It is observed most frequently offshore of its breeding islands. No post breeding migration is known to occur, although it is known to be absent from its subtropical breeding areas during the contra-nuptial season. It may be present all year near its Tropical breeding islands."

This is apparently the first record for the Australasian Region and its presence on Dargaville Beach is no doubt a case of long distance vagrancy as elaborated by Bourne (1967 *Ibis* 109 (2): 141-167) rather than evidence of migration.

On 22 January 1972 a tropical storm formed in the Northern New Hebrides, the centre passing New Caledonia on 24 January and Norfolk on the 26th, before moving into the South Tasman Sea and losing intensity. During the following day a westerly airstream developed and winds from this quarter continued for several days. The above conditions would be consistent with the finding of a well-dried corpse

on the beach at Dargaville on 29 February 1976. Murphy (1936; *Oceanic Birds of the South America.* New York: Macmillan) describes similar cases. The *Annotated Checklist of the Birds of New Zealand* (OSNZ 1970) lists Blackfooted Albatrosses *(Diomedea nigripes),* Leach's Storm Petrel *(Oceanodroma leucorhoa)* and Hawaiian Wedge-tailed Shearwater *(Puffinus pacificus cuneatus)* as other examples of tropical or North Pacific species which have occurred as stragglers to New Zealand.

The Christmas Island Shearwater, which has a sooty brown plumage, shiny black beak and dark brown legs, was recognised from other dark shearwaters by the following characters:

1. The Sooty Shearwater *(Puffinus griseus)* and Fleshy-footed Shearwater *(Puffinus carneipes)* by its smaller size.
2. The dark phase Wedge-tailed Shearwater *(Puffinus pacificus)* by its short round tail.
3. The Short-tailed Shearwater *(Puffinus tenuirostris)* by its slender body, shorter, less pointed wings, and a stouter shiny black beak.

Measurements of the Dargaville specimen (in mm) are as follows: Bill 31.4, Wing 243, Tarsus 45.5, Toe 46.8, Tail 84.5. These relate closely to measurements recorded by Ashmole & Ashmole (1967, *Bull. Peabody Mus. Nat. Hist,* 24).

The specimen was forwarded to the National Museum of New Zealand and is now included in its collection.

I would like to thank the members of the Beach Patrol on 29 February 1976 for their effort and co-operation, the staff at the N.Z. Meteorological Service, Wellington, for details of weather in the Tasman Sea during January and February 1976, Mr F. C. Kinsky for his assistance and confirmation of identification and Mr A. T. Edgar for reading this paper and making helpful comments.

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## THE RELATIONSHIP OF SPRING MORTALITY PATTERNS IN THE SHORT-TAILED AND SOOTY SHEARWATERS

Imber & Crockett (1970, *Notornis* 17 (3): 223-230) described a much greater than usual mortality of the Short-tailed Shearwater *(Puffinus tenuirostris)* in New Zealand in the spring of 1968. This was accompanied by a large mortality of prions (*Pachyptila* spp.). The mortality of Sooty Shearwaters *(Puffinus griseus)* was considered to be less than usual.

These observations were mainly attributed to the weather, for there was an unusually protracted period of strong westerly winds from mid-September to late November. A food shortage was considered but dismissed on the assumption that *P. tenuirostris* and *P. griseus* take very similar foods. Their explanation was that as *P. tenuirostris* is an Australian breeding species and *P. griseus* mainly a New Zealand species,

*P. tenuirostris* were blown onto the New Zealand coast but *P. griseus* were blown away from it to the east. This hypothesis is attractive but probably only partly explains the situation. I maintain that the importance of a probable food difference between these species has not been appreciated.

The observations in Table 1 contribute to the solution of this problem. The data for 1968 and 1969 are my own. The remainder were collected by members of the New South Wales Field Ornithologists Club, to which I was an important contributor in 1970, 1974 and 1975. The data for 1970 to 1975 have been published; references are available in Holmes (1977, *Australas. Seabd. Gp. Newsl.* 8: 20-35).

TABLE 1 — MORTALITY OF *Puffinus griseus* RELATIVE TO *P. tenuirostris* IN NEW SOUTH WALES, 1968-1975

| | 1968 | 1969 | 1970 | 1971 | 1972 | 1973 | 1974 | 1975 |
|---|---|---|---|---|---|---|---|---|
| *P. tenuirostris* | 4373 | 2574 | 1068 | 593 | 3769 | 1473 | 6928 | 2353 |
| *P. griseus* | 14 | 27 | 20 | 4 | 21 | 15 | 27 | 49 |
| *P. griseus* (%) | 0.32 | 1.05 | 1.87 | 0.67 | 0.56 | 1.02 | 0.39 | 2.08 |

If *P. tenuirostris* and *P. griseus* take the same food their mortality patterns should be closely correlated. In the table the mortality of *P. griseus* is expressed as a percentage of the total mortality of both species. This gives the mortality of *P. griseus* relative to *P. tenuirostris*. The four years of greatest mortality in *P. griseus* were 1975, 1970, 1969 and 1973. The two years of greatest mortality in *P. tenuirostris* were without doubt 1968 and 1974. The relationship of mortality in these two species is therefore frequently inverse. This is difficult to explain unless they have a difference in food. It is significant that the 1968 mortality of *P. tenuirostris* in New Zealand corresponded to a similar mortality in NSW, where westerly winds would be expected to drift dead birds away from the coast. Clearly some widespread factor was operating. This is most likely to be food shortage. The greatest mortality of *P. griseus* in New Zealand for the period 1961-75 occurred in 1975 (Veitch 1977, *Notornis* 24 (1): 41-49). This mortality was also observed in N.S.W. (see Table 1), so a widespread food shortage is again indicated. Apparently *P. tenuirostris* was not particularly affected at this time.

On the basis of these observations I suggest that *P. tenuirostris* occupies a lower trophic level than *P. griseus*, being much more dependent on plankton. Its smaller size and great abundance both support this probability. Furthermore the large prion mortality in New Zealand in 1968 at the time of the *P. tenuirostris* mortality indicates a shortage of plankton, for they are the most specialised plankton feeders.

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# SIR CHARLES FLEMING

By Several of His Friends

## 1. SOME TRIBUTES

Members of this Society will have been delighted at the recent honour bestowed on one of its founding members by the Sovereign's own hand on 28 February this year. This last distinction is one of many which Sir Charles has earned, so far, during his scientific career of approximately 40 years. As he is, among many other things, a Fellow of the Royal Society of London, Charles Fleming is probably our Society's most distinguished member. His knighthood was conferred on him because of his contribution to conservation; but like many other Fellows of the Royal Society, he has extraordinarily wide interests which include art and music, as well as science.

Sir Charles was President of the Society from 1948 to 1949, but has played an influential part in its history throughout the whole of his and its career. He published his first paper in the Society's journal, then *New Zealand Bird Notes,* in 1946, but by that time he had already published 15 other papers including, as his first three, the definitive paper of the birds of the Chatham Islands.


*Photo:* The Evening Post, Wellington, 31 December 1976: 4

In just less than 40 years, Sir Charles has published just under 400 papers of various kinds which means an average of about 10 a year, which sets a standard that could probably stand for a long time in any local equivalent of the Guinness Book of Records.

Many ornithologists will remember having been generously encouraged by Charles Fleming in their younger days and all of us would wish to congratulate him on his most recent distinction and a continuing long and productive career during his official retirement.

G. R. W.

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It is a pleasure to record that Dr Charles Fleming, a foundation member of this Society, has been knighted by Her Majesty the Queen, " for services to Science and to Conservation." Sir Charles has given distinguished service in many fields: as a war-time coast-watcher in the lonely Auckland Islands, as an outstanding research scientist in both geology and zoology, as a very progressive president of the Royal Society of New Zealand, as a distinguished representative of New Zealand in science congresses around the world and, last but not least, as a tireless fighter for the conservation of New Zealand's endemic animals and plants.

His ornithological publications include the standard work on Chatham Island birds, the life history of Silver-eyes (a pioneer study involving the first major use in New Zealand of colour bands on wild birds), the phylogeny and taxonomy of petrels (especially prions, *Puffinus assimilis* and the Subgenus *Cookilaria*), a very detailed study of all the New Zealand tits and robins and, with Dr K. Wodzicki, a census of the Gannet (another pioneering work in which aerial photography was used to permit actual counting of breeding adults). These are only some of the highlights in a long series of important ornithological papers which, for Sir Charles, were but a spare time labour of love (as also is his important work on New Zealand cicadas).

His professional career has been in geology and, more particularly, but by no means exclusively, in palaeontology. This, however, is not the place to review his geological contributions except to say that they are wide-ranging and numerous, and that their quality has earned him the rare distinction of being made a Fellow of the Royal Society of London, the American Philosophical Society, and the Royal Society of New Zealand.

His mastery of both geology and zoology (and of other sciences, and of arts as well) permits Sir Charles to cross the conventional boundaries of scientific disciplines as, for instance, in his stimulating reviews of the geological history of New Zealand with reference to the origin and history of the fauna and flora. He has not only a rare

ability to synthesize data from many different fields, but also the courage to publish his current interpretations despite incomplete data; by such means does science progress.

The discovery and interpretation of new facts is obviously a joy for Sir Charles; no less evident is his appreciation of the beauty and uniqueness of the animals and plants he studies and of the communities in which they live. To appreciate such things is to wish that they be preserved for future generations to enjoy; Sir Charles has not merely wished this, but has generously devoted his time, energy and money to the cause. In the interests of conservation he crosses departmental frontiers as easily as he does the man-made boundaries between branches of science. Credit and help are freely given where deserved, but woe betied those who, through greed or incompetence, threaten the survival of New Zealand's endemic fauna and flora.

All will agree that Sir Charles has given exceptional service to science and to conservation, but he has not done it alone. Lady Fleming, herself a contributor to the early pages of this journal, has been an indispensable supporter, field companion, secretary, adviser, and home baker as well as serving the community in her own independent spheres of interest.

P. C. B.

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I am indebted to the Editor of **The Evening Post**, Wellington, for permission to reproduce the photograph of Sir Charles and Lady Fleming taken at Waikanae on 31 December 1976. As the **Post's** caption stated, "His T-shirt tells all."

E. W. D.

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## A G M 1977: A LATER REPORT

## RARE BIRDS COMMITTEE

The Rare Birds Committee has given further consideration to the reported breeding of the White-winged Black Tern in New Zealand by R. J. Pierce (*Notornis* 21 (2): 129-134; 1974). This report was originally considered while the Convener of the Committee was overseas. On his return, and after studying the photograph of the chick (not originally available to the Committee), he expressed the opinion that it was not the chick of any tern known to breed in New Zealand.

More recently the photograph was submitted to the British Museum (Natural History). Authorities there considered that the chick appeared to be that of a White-winged Black Tern.

Because of this the Committee considers that the record can be accepted as a positive breeding attempt producing a chick, although it appears that this did not survive to the flying stage.

F. C. KINSKY, Convener,
Rare Birds Committee

# REVIEWS

Wace, N. M. & Holdgate, M. W. 1976: Man and Nature in the Tristan da Cunha Islands. IUCN *Monograph* No. 6. International Union for Conservation of Nature and Natural Resources, Morges, Switzerland, 1976. 114 pp., 14 figs.

To New Zealand naturalists, subantarctic islands have an irresistible attraction, and because seabird distributions (as emphasised by R. C. Murphy) tend to be circumpolar, following the zones of surface water, the islands of the Atlantic and Indian Oceans have almost as much interest as our own. Wace (now at the Research School of Pacific Studies, Australian National University) and Holdgate (formerly of the Nature Conservancy, now Director of the Institute of Terrestial Ecology, Natural Environment Research Council, London) are well equipped to write a multidisciplinary account of Tristan, Inaccessible, Nightingale, and Gough Island in the south Atlantic, having both taken part in expeditions to the group in 1955-6 and in 1968.

The present publication describes the scientific interest of the islands, summarises current knowledge, outlines the history of human occupation and use, analyses man's impact on the biota, and makes proposals for management and conservation. It ranks as part of the United Kingdom contribution to Project 7 of the UNESCO *Man and the Biosphere Programme,* on the ecology and rational use of island ecosystems. I found it fascinating reading, not only for the ornithology (which Holdgate described in earlier papers, 1960 and 1965) but for the history of occupation and exploitation, the varying fortunes of the islanders, the varying fates of endemic land birds and introduced mammals, some of which, surprisingly, were well established (goats, pigs) but later became extinct.

Tristan, like the Chatham Islands, lies close to the Subtropical Convergence, has a few tropical and many subantarctic seabirds, and its crayfish (or rock lobsters) now provide the most reliable source of income for the islanders. Uninhabited Gough Island 350 km to the SSE, has a high-latitude subantarctic avifauna, with *Pterodroma mollis, P. lugens, P. incerta* and *Adamastor* as well as convergence species like *Pachyptila vittata* and *Pterodroma macroptera.*

Among the guidelines set out for environmental management are proposals that meteorological recording at Tristan might be coupled with environmental monitoring for pollutants, and accommodation provided for visiting scientists. New Zealand may need comparable reports on her own outlying islands if the United Nations insist that the islands must be occupied before they can be used as a basis for drawing the boundary of a 200 mile economic zone. If New Zealand has to occupy Antipodes and reoccupy the Auckland Islands, there would be much merit in the occupiers combining the functions of fishery protection, wildlife ranging, environmental monitoring, meteorological observation and other scientific research.

C. A. F.

*The Birds of Paradise and Bower Birds* by William T. Cooper and Joseph M. Forshaw (with a foreword by Rt Hon. M. T. Somare, Prime Minister of Papua New Guinea). 1977. Sydney: Collins. 304 pp., maps, b. & w. field sketches, col. pls. 62 including 1 on dust cover, 415 x 290 mm. $125.00.

Having so recently written a review (*Notornis* 24 (2): 146) of an article on " The World's Glamour Birds " by W. S. Peckover, with two paintings by Bill Cooper, I did not expect to be so fortunate to see a book containing 62 paintings by the same artist. W. T. Cooper (of fame for his illustrations in *A Portfolio of Australian Birds* with K. A. Hindwood in 1968, and *Parrots of the World* with J. M. Forshaw 1973) is a talented Australian artist, and the publishers are to be congratulated in producing the present sumptuous volume.

When an ornithologist thinks of Birds of Paradise the names of John Gould (*Birds of New Guinea,* 1888), Tom Iredale (*Birds of Paradise and Bower Birds,* ill. Lilian Medland, 1950) and Tom Gilliard (*Birds of Paradise and Bowerbirds,* 1969) immediately come to mind. Their books are now hard to get (although a small volume of Gould's plates with a text by A. Rutgers was published in 1970) and the present volume is, therefore, doubly welcome. Readers who wish to compare the styles of the artists should also examine the paintings by Walter A. Weber in Dillon Ripley: " Strange Courtship of the Birds of Paradise " (*National Geographic* Feb. 1950: 247).

Comparisons may be invidious particularly by one who once thought Lilian Medland's paintings unsurpassable, but it cannot be denied that Cooper has a style combining graphical accuracy with the highest qualities of artistic merit. The plumage of many of the birds does, of course, give vast scope to the artist's ability — if also making for difficulties — but Cooper has portrayed the fine feathering to perfection. In some plates, those, for example, of the Blue Bird of Paradise, and the Raggiana Bird of Paradise on the dust cover, the tail feathers seem literally to shimmer as the birds vibrate in their ecstatic courtship displays. It is a pity, therefore, that the single disappointing plate, that of the King Bird of Paradise, appears to have been reproduced to make the male look like a plastic toy. Other plates of this species give the same impression, however, so perhaps the bird is difficult to portray or it really does look artificial !

Forshaw is an accomplished writer and compiler of information, and his bibliography must be particularly valuable to a student of these birds' distribution and habits. He has included material published since Gilliard's work but has not attempted to duplicate it except " to complete lucid accounts of various species." The present book was indeed " planned as a companion volume to Gilliard."

This is a book for ornithologists to read and re-read, and for bird lovers to treasure and hand down as valued family possessions for generations to come.

J. M. C.

Feduccia, A. 1976: A Model for the Evolution of Perching Birds. *Systematic Zoology* 26: 19-31.

The Passeriformes and related perching birds have been difficult to classify but Feduccia has discovered new evidence, in the morphology of the stapes (columella or stirrup-bone) of the inner ear, to resolve phylogenetic relationships. The primitive condition, found in their reptilian ancestors, is shared in the majority of living birds, but derived conditions distinguish other groups including hoopoes and wood-hoopoes (with an "anvil" stapes), bee-eaters, motmots, kingfishers, todies and trogons (now grouped together as "Alcediniformes") and some (but not all) of the groups hitherto known as "suboscines."

Within the suboscines some families (including the Lyrebirds and New Zealand Wrens) retain the primitive condition of the stapes as do the structurally advanced oscines, whereas Old World pittas, broadbills, the Philepittidae of Madagascar and the tyrant flycatchers and other suboscines of the New World have a stapes of derived type. According to Feduccia, "the oscines and suboscines could not have shared a common ancestor," a statement that might make *Archaeopteryx* turn in its grave (or at least in its graving stone!). He means, however, that the Passeriformes, as previously conceived, are not monophyletic, the true "suboscines" being more closely related to the Alcediniformes (as defined above) than to the "oscines," which must include the Lyrebirds and New Zealand Wrens.

As knowledge of Tertiary birds increases, new patterns are emerging. The structurally primitive Piciformes (woodpecker allies) were "Apparently the predominant and perhaps the only perching birds of the early Tertiary of North America" the first passeriform being Upper Oligocene and doubtful. In both Europe and America, the Oligocene was a period of importance, even dominance, of Alcediniformes, and the early records of Passeriformes need checking.

The classification proposed uses some names chosen because of common usage and euphony rather than priority, as permissable for orders, which are not subject to the Code of Zoological Nomenclature. The Orders Piciformes, Coraciiformes, Upupiformes, and Bucerotiformes have the usual content. The Order Alcediniformes contains the superfamilies Meropoidea (bee-eaters) Alcedinoidea (Kingfishers, motmots, todies, each a family) and Trogonoidea (trogons). The Order Tyranniformes includes the several families of suboscinine birds and the Order Passeriformes has its normal content plus the two groups rejected from the suboscines.

For New Zealand ornithologists this paper reclassifies the Xenicidae: they can no longer be considered diminutive relatives of the Pittas but their affinity within the Passeriformes has not been established. Moreover, if the radiation of the Old World oscines was post-Eocene, the endemic New Zealand passerine families may not be as old as has sometimes been suggested.

C. A. F.

# LETTERS

The Editor,
Sir,

## HISTORY OF DISCOVERY OF CRESTED GREBE

I have just read Dr Westerskov's interesting paper (*Notornis* 24 (3): 167-177) on the history of the discovery of the Crested Grebe in New Zealand and wish to make a few comments primarily in the interests of historical accuracy.

Quoting Potts (1869, *Trans. Proc. N.Z. Inst.* 2: 40-78; 1870) Dr Westerskov wrote (p. 170) that possibly the first definite field determination of Crested Grebes was made by him at Lake Selfe in April 1856. It is, however, clear from other writing by Potts (which admittedly is not well known) that he not only definitely saw Crested Grebe at Lake Selfe in April 1856 but that he also definitely saw the species at Lake Coleridge shortly before. In the *Canterbury Times* for 3, 10, 17 and 24 December 1886, Potts, writing under a pseudonym, described an expedition which he and two others made in April 1856 to the upper reaches of the Rakaia River. Although written 30 years after the events described, the article is nevertheless a very detailed one and clearly was based on a contemporaneous written record kept by Potts, perhaps on his diary part of which apparently still survives (Acland, *The Early Canterbury Runs,* 1975, p. 296). In the *Canterbury Times* report Potts recalled that at Lake Coleridge on 15 April 1856 " Waterfowl were abundant. Amongst the numerous flocks of ducks were some loons or grebe, swimming with an easy buoyant gracefulness, without the least apparent exertion, carrying their crested heads loftily." He further recalled that at Lake Selfe on 20 April 1856 " hundreds of waterfowl were swimming or disporting. Lanky (one of his companions) most unreasonably took a very long shot at a magnificent crested grebe (Podiceps cristatus)." It is also of interest that at Lake Selfe Potts saw " a few pairs of the red-breasted grebe (P. rufipectus)," the Dabchick.

Dr Westerskov reproduced as Figure 2 the illustration by Potts of a Crested Grebe and its nest which appeared in Potts (1869), saying that this was drawn probably at Lake Selfe. However, in the above quoted account Potts did not mention seeing nesting grebes at Lake Selfe and it seems extremely unlikely that eggs (which are clearly visible in the illustration as originally reproduced) would be present as late as April. It is much more likely that this illustration of nesting grebes with eggs is of the nesting grebes which Potts observed at Lake Coleridge in the spring of 1868 and which he refers to in the same 1869 article (p. 74) with which the illustration was originally reproduced.

Although Buller wrote in 1873 (*History of the Birds of New Zealand*, p. 354) and again in 1888 (Vol. 2, p. 284) that the specimen on which he founded his original description of *Podiceps hectori* was

in an imperfect condition, it is clear from the original 1865 description that he had more than one specimen before him at that time. According to Buller these specimens had been collected by Hector and were then in the Provincial Museum. Because he could find no trace of Hector's specimens in the Otago Museum, and because Buller in 1888 had said that his description of adult and young Crested Grebes was based on specimens in the Colonial Museum, Dr Westerskov explored (p. 172) the possibility of Hector's specimens being loaned or transferred to the National Museum. In fact Buller as early as 1869 (*Trans. Proc. N.Z. Inst.* 2: 388; 1870) had referred to specimens in the Colonial Museum as he did again in 1873 (p. 354). But there is nothing I can find in Buller's writings to indicate that any of Hector's Provincial Museum grebe specimens ever found their way to the Colonial Museum. However Dr Westerskov asserted (p. 173) that sometime between 1865 and 1875 Hector's grebe specimens or some of them must have been transferred from the Provincial Museum to the Colonial Museum. The only evidence adduced by Dr Westerskov in this regard is the fact that British Museum (Natural History) specimen No. 75.7.2.57 has a label which reads "*Podiceps cristatus* Crested Grebe/Colonial Museum, Wellington, Dr. Hector, Director." On the basis of this label Dr Westerskov stated that the specimen is "undoubtedly" one of Hector's Crested Grebes obtained in Otago but mentions in the very next paragraph that the specimen bears no date or place of collection. Furthermore the reference to "Dr. Hector, Director" on the label does not in fact prove that Hector himself collected the specimen. On the evidence given by Dr Westerskov all that can safely be said about the specimen is that it is an adult Crested Grebe which was in a collection of 81 specimens received by the British Museum (Natural History) from Dr Hector, Director of the Colonial Museum. It is my opinion that such evidence as is adduced by Dr Westerskov falls a long way short of satisfactorily establishing that the specimen in question was one of Hector's Otago specimens, let alone that it is or could be a type specimen. For all we know Hector's specimens (including the type/s) may still be among the unlabelled specimens which Dr Westerskov mentioned are in the Otago Museum.

It is surprising that Dr Westerskov was not able (p. 175) to more definitely identify A. von Hugel and the origin of American Museum no. 526625 attributed to him and said to have come from Lake Wakatipu in December 1874. Sir Robert Falla, who was acknowledged by Dr Westerskov as having critically read his manuscript and made helpful suggestions, himself referred to this von Hugel and some of his activities in New Zealand in his 1967 paper on the Auckland Islands Rail (*Notornis* XIV: 107-113). Sir Robert there pointed out that von Hugel had arrived in Invercargill on 19 December 1874 and quoted a passage from von Hugel's letter to R. Bowdler Sharpe which was written from Christchurch on 11 February 1875 and published in *Ibis* 1875: 389-394. From this letter we learn among other things that von Hugel, shortly after his arrival in New Zealand, undertook an expedition to Lake Te Anau where he collected a number of Kakapo specimens, some at least of which are now in the Rothschild collection in the American Museum of Natural History (Williams, *Rec. Dom. Mus.* 3 (3): 224; 1960). It seems certain, therefore, that the von Hugel

grebe specimen in question was collected by him in the course of his Te Anau expedition. That von Hugel was an avid bird collector is evident from the contents of his letter and from his statement (p. 393) that he had at the date he wrote already obtained some 300 New Zealand specimens.

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*8 October 1977*

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[The diary of T. H. Potts referred to above and quoted in Acland's *The Early Canterbury Runs* is in the possession of Mr David McMillan, F.R.C.S., of Christchurch (pers. comm.). Only the sections 6 April 1855 - 1 April 1858 and 1 January 1865 - 2 December 1865 are known to have survived according to an article by the owner (Memoir Thomas Henry Potts (1824-88) *History and Bibliography* No. 2: 160-172; August 1948) in which he gave ornithological extracts later used by Dawson & Cresswell in 1949, (" Bird life at Governor's Bay, Banks Peninsula. *N.Z. Bird Notes* 3 (6): 141-146). A manuscript record of nests found 1855-1882 also still exists. The article on Potts stated (p. 164) that in his diary for July 1856 he " . . . noted a pair or two of the great crested grebe on one of the lakes near Lake Coleridge." A bibliographic history of Acland's book was also given (pp. 156-157).

— Ed.]

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The Editor,
Sir,

## HISTORY OF THE DISCOVERY OF THE CRESTED GREBE

In his article on the history of the discovery of the Crested Grebe in New Zealand (*Notornis* 24 (3); 167-177; Sept. 1977), Dr K. E. Westerskov devoted a paragraph to speculation on the identity of the collector of a Rothschild specimen credited to A. von Hugel, December 1874, collected at Lake Wakatipu. The suggestion in the article is that A. von Hugel may have obtained the specimen from his father Baron Carl von Hugel who visited New Zealand in 1834.

The 1874 date on the label is correct. Anatole von Hugel (1856-1928) arrived in Invercargill from Melbourne on 19 December 1874, and purchased a number of natural history specimens from a dealer (probably James Morton of Tay Street) before travelling north, as recounted in his letter to Bowdler Sharpe published in *Ibis* 1875.

As Dr Westerskov makes generous acknowledgment of my critical reading of his manuscript, I must offer him an apology for regrettable lack of attention at the end of the exercise.

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