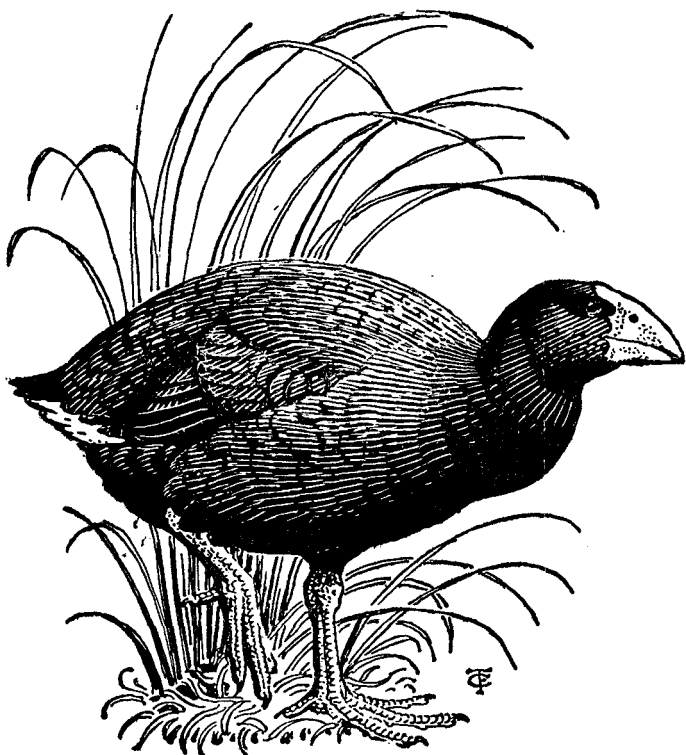


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RAROTONGAN BIRDS, WITH NOTES ON LAND BIRD STATUS

By E. G. TURBOTT

ABSTRACT

Observations made during visits to Rarotonga in July and August 1976 are detailed, with particular reference to land birds and petrels, a group not previously recorded. The outstanding feature of the land bird ecology is the apparent total restriction of the native species except Long-tailed Cuckoo to the central primitive forests and adjacent second growth. The native land bird fauna consists of only five species: Long-tailed Cuckoo, Pacific Pigeon, Rarotonga Fruit Dove, Rarotonga Flycatcher and the Rarotonga Starling, of which the last three are endemic. The Flycatcher and the Starling are now very rare. The settled parts of Rarotonga contain virtually a single species, the introduced Myna. Although its presence suggests a restriction on the spread of native birds into settled areas, similar conditions elsewhere might indicate that other factors may well have been responsible for such a habitat restriction. Early information on land birds and their status dating from Gill's missionary times of the 1840s-1860s is noted. Observations of sea birds, especially the Herald Petrel, a probable breeding species, are given.

INTRODUCTION

Since little has been published in recent years on the birds of Rarotonga, and nothing on the land birds [Holyoak's (1974) taxonomic descriptions of seven new forms from the Cook Islands refer to birds collected on Atiu, Mangaia, Mauke and Mitiaro in 1973], the following notes made during a seven-day stay are being placed on record, together with some comments on land bird status. Observations on petrels are of particular interest since there are no previous records of this group from Rarotonga.

The island (6719 hectares; 16,602 acres) has two remarkably clear-cut environmental zones: (a) the fertile coastal strip — long

inhabited — and (b) the uncultivated forested interior rising steeply at several points to prominent peaks (highest: Te Manga, 652 metres (2140 feet)). The fringing reef is comparatively close to the shore except at the south-west end of the island (Muri district) where four islets lie inside the reef. The principal road (21 miles) circles the island along the coast, while valley roads penetrate quite deeply into the interior along the cultivated valley bottoms.

Philipson (1971) has provided an up-to-date summary of the main vegetational features, noting that "the narrow belt of good soil between the coast and the hills has long been under cultivation. Fine specimens of many species of trees occur here, but they are either of coastal species or are species introduced for their usefulness or ornamental value. . . . A feature of this belt of cultivation is the abundant weed-flora. . . . The present extent of cultivation is evidently less than formerly. In all the valleys extensive traces of earlier cultivation were seen, often well beyond the present limits. These consisted of *taro* beds constructed from river boulders. There was some evidence that marginal parts of this land are being brought back into cultivation. . . . The old abandoned areas of cultivation are now covered with second growth forest, much of which consists of dense thickets of *Hibiscus tiliaceus* L. Some of these thickets are being burnt and cleared, and valley roads are being extended."

Referring to the forested interior, Philipson continued "... the vegetation of the central parts of the island has suffered remarkably little. The forest cover of the deep heads of the valleys and of the sharp ridges and peaks appears to be in a completely primitive condition. . . . Little change appears to have taken place in this central part of the island since the report of Cheeseman seventy years ago. Very few adventive plants have established themselves in the forest. . . . Citrus trees and pineapple plants . . . occur in the central forests, though rarely".

One additional type of modified area, especially prominent when the island is seen from the sea or by air, is that due to the burning which has in many places spread on to the lower ridges; of this Philipson said: "... burning has spread up the sides of the valleys so that hills near the sea mostly bear *Gleichenia* ["umbrella fern"] thickets or grassland".

LAND BIRDS

The outstanding feature of Rarotongan land bird ecology today is the apparently total restriction of the native land bird species — with the exception of the Long-tailed Cuckoo — to the central primitive forests and adjacent second growth. My observations were made from 23 to 29 July 1976, mainly in the coastal inhabited area, with several excursions into the central forested area which is readily entered along the valley roads, and by tracks several of which cross the island. I am most grateful to Mrs Beth Brown of Auckland, an

observer with much experience of Fijian as well as New Zealand birds, who made observations on the island between 16 July and 7 August 1976, and has kindly allowed me to include these in the present paper. In addition, both Mrs Brown and I were able to compare our observations and impressions with those of interested Rarotonga residents or visitors of long standing, and were thus able to confirm our impression of land bird status and distribution.

Rarotonga has a comparatively small total native land bird fauna, comprising only five species: Pacific Pigeon, *Ducula pacifica* (Gmelin); Rarotonga Fruit Dove, *Ptilinopus rarotongensis* Hartlaub & Finsch; Long-tailed Cuckoo, *Eudynamis taitensis* (Sparrman); Rarotonga Flycatcher, *Pomarea dimidiata* (Hartlaub & Finsch) and Rarotonga Starling, *Aplonis cinerascens* Hartlaub & Finsch. Three species (Fruit Dove*, Flycatcher and Starling) are endemic.

The sixth land bird species is the Common Myna, *Acridotheres tristis* (L.), introduced from New Zealand in the 1920s apparently in the hope of controlling agricultural insect pests (Syme, 1975).

The observations which Mrs Brown and I made, summarised below, indicated that both the Rarotonga Flycatcher and Rarotonga Starling are now to be regarded as very rare; both species are restricted to the central unmodified forests, but, although only in small numbers, they fortunately appear to be well established. The two species of pigeon were recorded both in the unmodified central forests and in fringing areas probably comprising mainly second growth; they may both tend to come into modified vegetation adjacent to the primitive forest edge, but so far as we could ascertain are never seen in the inhabited lowlands proper. The Long-tailed Cuckoo is, as mentioned above, regularly observed in both types of habitat.

In strong contrast to the above there is a single common land bird species in the lowland inhabited belt and along the cultivated valley bottoms — the introduced Myna; its ubiquity is perhaps most evident when a Long-tailed Cuckoo appears, its distinctive elongated, stream-lined shape providing contrast as it darts through the trees.

The limitation of the land bird fauna of the settled portions of Rarotonga to virtually a single species, the Myna — and a species suspected of affecting other birds through competition, including competition for nest sites, and even predation — inevitably tempts the observer to conclude that its presence restricts the spread into settled areas of native land birds. However, as may be seen under similar conditions elsewhere, some presumably more specialized forest species have been unable to adopt modified habitats, or at least not readily; it may well be that investigation of native Rarotongan land birds will

* A subspecies (*goodwini*) has been described recently from Atiu (Holyoak 1974).

ultimately show that factors other than the presence of the Myna have been responsible for the restriction of most Rarotongan land bird species to the remaining unmodified habitat.

OBSERVATIONS ON LAND BIRDS

PACIFIC PIGEON. One at forest edge, above the DSIR Research Station (Totokoitu) cropping area; one Takuvaine Valley in forest (EGT). Two, Avatiu Valley, in flight over forest (BB).

RAROTONGA FRUIT DOVE. One edge track in forest, Avatiu Valley (EGT). One at forest edge, Muri; Avatiu Valley, one seen and a number heard (BB).

LONG-TAILED CUCKOO. Lowlands (scattered); in forest by track, Avatiu Valley (EGT). Two, Muri area, and one, Ngatangia Village (both localities on coast); one in forest, Takuvaine Valley (BB).

RAROTONGA FLYCATCHER. No record by EGT. On 4 August 1976, BB at the Needle, at top of Avatiu Valley, saw a small dark bird fly from one tree to another in fairly heavy cover, presumably this species. (Part of white eggshell, approximately size of goldfinch's egg, on ground in this locality may have been Flycatcher's).

RAROTONGA STARLING. Avatiu Valley, three calling and in flight; others calling (EGT). Avatiu Valley, two seen low down in valley and others heard towards the Needle (BB). (Both observers noted that calls of this species include musical notes like those of the New Zealand Bellbird *Anthornis melanura*; BB also noted that the pattern of calls was like that of the Fijian Starling *Aplonis tabuensis vitiensis*, with a similar grouping of notes.)

MYNA. Throughout in cultivated areas and valley bottoms; also feeding on tidal flats, and in flocks on grass of airfield. In more open valley bottoms, but not observed actually inside unmodified forest. (EGT and BB).

EARLY INFORMATION ON RAROTONGAN LAND BIRDS AND THEIR STATUS

Rarotongan bird life appears to have been first described in the following paragraph in Gill's *Life in the Southern Isles*, an account of his missionary work in the Cooks in the 1840s - 1860s:

"The birds of this group are not numerous. Hervey's Island [i.e. Manuae] was once famous for yielding the red feathers sacred to the gods, consisting really of the two long feathers in the tail of the handsome Tropic bird. Tern, boobies, black and white herons, woodpeckers, kingfishers, pigeons, linnets and doves abound."

The main source of information subsequently, apart from the few specimens to reach European museums, is that of accounts of two collections written, respectively, by Hartlaub & Finsch (1871) and Ogilvie-Grant (1905). Unfortunately related field notes or comments

(except for colour of soft parts) are very limited, and it can only be surmised that the acquisition of the material described must have required some little time spent in the field.

Hartlaub and Finsch's collection was made in 1869-70 for the Museum Godeffroy, in Hamburg, by A. Garrett, evidently a collector at that time in the Pacific for various museums (Hartlaub & Finsch say: "Mr Andrew Garrett is an American, who has been collecting already several years for the Smithsonian Institution and for the Cambridge Museum, U.S.A."). The paper includes the original descriptions of three species: Rarotonga Flycatcher (6 specimens: 3 males, 3 females), Rarotonga Starling (5) and Rarotonga Dove (2: adult and immature). Four additional species were collected — Pacific Pigeon (1 immature), Wandering Tattler (1, winter plumage), Reef Heron (1, white phase, with a few slate-coloured feathers on the back), White Tern (1). As regards the land bird species, it seems clear from the number collected that two species, Flycatcher and Starling, must have been present in the 1860s in greater numbers than today.

The collection described by Ogilvie-Grant was obtained for the British Museum (Natural History) in March 1901, at the request of the Earl of Ranfurly (then Governor of New Zealand) by Lt.-Colonel W. E. Gudgeon. Colonel Gudgeon had been appointed British Resident to the Cook Islands in 1899, stationed at Rarotonga, and would accordingly have been familiar with the bird life and might have been expected to provide some indication of the status of the various species. Unfortunately, however, his comments were restricted to his remark that the Flycatcher was "rare." Nine species were collected: Rarotonga Dove (1 male), Pacific Pigeon (1 female), Common Noddy (1 male, 1 female), White Tern (1 female), Wandering Tattler (1 male, winter plumage), Reef Heron (1 male, dark phase), Long-tailed Cuckoo (1), Rarotonga Flycatcher (1 male, 1 female) ("a rare bird on the island"), and Rarotonga Starling (3 males). These numbers suggest roughly the kind of collection which could be expected if a similar attempt were made today. They certainly suggest that two species, Flycatcher and Starling, had undergone a reduction in numbers during the approximately 30 years since Hartlaub & Finsch's material was collected.

FRESHWATER AND SHORE BIRDS

The only species of waterfowl (Amadon 1943), the Grey Duck (*Anas superciliosa* Gmelin) was not recorded by Mrs Brown or myself.

Three species of wader have been recorded (Holyoak 1976): Lesser Golden Plover, *Pluvialis dominica* (Muller), Bristle-thighed Curlew, *Numenius tahitiensis* (Gmelin) and Wandering Tattler, *Tringa incana* (Gmelin). The Wandering Tattler was regularly observed by both Mrs Brown and myself.

The Reef Heron, *Egretta sacra* (Gmelin), is, with the Wandering Tattler, characteristic of Rarotongan reefs and tidal pools. Both white

and blue phases were observed, the latter appearing to predominate. In addition, Mrs Brown noted one coloured mainly white with dark mottling on the upper surface, near Arorangi village. Two seen in flight over the airfield had apparently been feeding in wet ground inland from the air strip (EGT).

SEA BIRDS

HERALD PETREL *Pterodroma arminjoniana heraldica* (Salvin)

On 27 July in the Takuvaine Valley, in clear fine weather, at 3.45 p.m., I watched a petrel overhead for several minutes; this was from the track between forested slopes leading up to Ikurangi and Te Manga peaks, the bird being at an elevation of perhaps 300 m. Flight was alternate sailing and flapping, with comparatively slow, deep wing-beats. The main characters noted were: size medium to large (i.e. length approximately that of Red-billed Gull: c. 370 mm); general shape that of a medium-sized *Pterodroma*, with broadly wedge-tipped tail; underparts dark with darker breast-band and pale throat; underwing with clearly marked narrow irregular white centre line down the whole length.

The bird was tentatively identified from King (1967) as of this form in the intermediate colour phase: I am indebted to Mr F. C. Kinsky, National Museum, for discussion following my return to New Zealand, and for confirming the identification (Mr Kinsky notes that the intermediate colour phases of the Herald Petrel and of the Kermadec Petrel *Pterodroma neglecta* are practically impossible to tell apart in the field; however, the distinctive underwing pattern of the Rarotongan bird points to *P. heraldica* rather than *P. neglecta*, the latter in most cases having white on the underwing only at the bases of the primaries and the outermost wing coverts — exceptionally this patch can extend in *P. neglecta* into a longer stripe, during the moult of the underwing coverts).

I discussed the bird seen with Mrs Brown, who mentioned that she had on 21 July seen a petrel coloured dark above and pale below at some distance flying inland from Muri. Mrs Brown subsequently watched carefully for petrels, and made the following additional records: on 31 July, 1 August and 6 August, one with the same general coloration seen flying inland (each time in the late afternoon, and at some distance); on 7 August, Muri, offshore beyond the reef, 12 recorded in 47 minutes, all having dark upperparts and pale underparts with some dark coloration on the breast; again on 7 August at 3.43 p.m. at Muri one was seen quite closely as it flew from the reef and directly overhead — the plumage was dark brown above, small white area on forehead, underparts white possibly with some dark coloration on the breast, underwing dark crossed almost diagonally by a white flash.

Our observations thus suggest that this Central and South Pacific form breeds in the inner forested zone on Rarotonga; further, Mr Kinsky has commented that this and other tropical petrels tend to fly over

their breeding grounds by day and especially in the afternoon, confirming the view that the birds seen were flying in to the breeding grounds.

UNIDENTIFIED PETRELS

Mrs Brown recorded a large, dark bird with typical shearwater flight at some distance away beyond the reef at Muri on 18 July, possibly either a Wedge-tailed Shearwater (*Puffinus pacificus*) or Christmas Shearwater (*Puffinus nativitatis*). King (1967) listed the Christmas Shearwater as a doubtful vagrant to the group.

In addition, calls which I heard at about 4.00 p.m. on 28 July from the forested slopes on the western side of the Avatiu Valley seem likely to have been those of a petrel, but have so far remained unidentified; the calls, loud and several times repeated, consisted of three to four harsh and rapidly repeated syllables, with some resemblance to the "pa-ka-ha" of the Fluttering Shearwater *Puffinus gavia*. The slopes from which the calls came were by this time of the afternoon in shadow.

Slater *et al.* (1970: 159) stated that the call of the Herald Petrel is — "A sequence of squeaky and sibilant notes 'hi-hi-hi . . .' up to a dozen or more times. Also a sharp monosyllabic 'hik'."

Species with calls very roughly of the type heard are the Wedge-tailed Shearwater and Kermadec Petrel. The Christmas Shearwater is likely to have a similar call although the voice of this species has so far as is known to me not been recorded. (Mr Kinsky has kindly mentioned (*in litt.*) that the Wedge-tailed Shearwater would not normally be on land in this region at this time of the year: eggs in late December, Niue; young leave in May, Fiji.)

WHITE-TAILED TROPIC BIRD *Phaethon lepturus* Daudin

It could perhaps have been expected that tropic birds of either common Pacific species would nest in Rarotonga's cliffy interior. However, the only previous published record seems to have been that of the botanist Wilder (1931) who said that "... high up on the rocky cliffs, the tropic bird builds its nest." On 28 July Mrs Brown heard high-pitched chattering notes high in the air over the Takuvaine Valley; nine birds were seen in display or courtship flights, chasing being observed within small groups; the birds were dipping out of sight behind trees on the ridges at over 300 m, and it seemed probable that they had nests or nest sites in the rocky faces. The long, white tail streamers were seen distinctly. (Mrs Brown discussed the birds with Rarotongans working in the adjacent taro gardens and was informed that the birds (known as *kawake*) nested on the high inland cliffs.)

On 4 August Mrs Brown again saw this species in the Avatiu Valley, where six were watched displaying in flight in the same manner. Shortly after her return from Rarotonga, Mrs Brown heard from Mr Bruce Hancock who, with Mr Hancock Snr, had accompanied her and watched the Tropic Birds over the Avatiu Valley on 4 August;

Bruce Hancock had climbed a rock chimney on the Needle and had seen a pair of White-tailed Tropic Birds hovering about a rock ledge. Although the ledge was not fully visible it seemed likely that this was a nest site.

GREATER FRIGATE BIRD *Fregata minor* (Gmelin)

Two Frigate Birds seen by Mrs Brown over the reef at Muri on 17 July were probably of this species. One bird — evidently a female in view of the considerable amount of white on the underparts, including the breast — was joined shortly afterwards by a second, and both then chased a flock of Sooty (?) Terns and a Noddy (see notes on these species below).

There is no previous published record of the species from the island.

CRESTED TERN *Sterna bergii* (Lichtenstein)

Mrs Brown on 19 July saw two large terns, almost certainly of this species with which she was familiar in Fiji, offshore beyond the reef on the south coast; on 5 August in the Muri area she saw one flying over one of the lagoon islets, and another was seen in the same area on 7 August. The species, the common large tern of the tropical Pacific, has not previously been recorded from the Cook group.

SOOTY TERN *Sterna fuscata* (L.)

On 17 July Mrs Brown, as mentioned above, watched a Frigate Bird chasing four terns which she believed were of this species (white below, dark wings).

COMMON NODDY *Anous stolidus* (L.)

Recorded by Mrs Brown over the reef at Muri on 17 and 18 July (one on each occasion).

WHITE TERN *Gygis alba* (Sparrman)

My first observation was of three adults performing display or courtship flights low over trees on the coast at Arorangi; later a larger group (7 or more) were seen flying well up towards the high forested slopes on this (western) side of the island. Mrs Brown on 21 July recorded c. 20 inland over the Takuvaine Valley (a flock of 12, and the others in two's and three's); smaller numbers were seen on 4 August over the Avatiu Valley. Breeding is probably at various points in the forest; further field work is now needed on this species to discover the nesting sites.

LITERATURE CITED

- AMADON, D. 1943. Birds collected during the Whitney South Sea Expedition. 52. Notes on some non-passerine genera. Amer. Mus. Novit. 1237: 1-22.
 DU PONT, J. E. 1976. South Pacific Birds. Delaware Museum of Natural History Monog. Ser. 3: xii + 1-218, pls 1-31.
 GILL, W. W. 1876. Life in the Southern Isles. London: Religious Tract Society.
 HARTLAUB, G.; FINSCH, O. 1871. On a collection of birds from Savai and Rarotonga Islands in the Pacific. Proc. Zool. Soc. Lond. 1871: 21-32.
 HOLYOAK, D. T. 1974. Undescribed land birds from the Cook Islands, Pacific Ocean. Bull. Br. Orn. Cl. 94: 145-150.

- HOLYOAK, D. T. 1976. Records of waders in the Cook Islands. *Notornis* 23: 1-3.
- KING, W. B. 1967. Preliminary Smithsonian Identification Manual: Seabirds of the Tropical Pacific Ocean. Washington, D.C.: Smithsonian Institution.
- OGILVIE-GRANT, 1905. On the birds procured by the Earl of Ranfurly in New Zealand and the adjacent islands. *Ibis* (8) 5: 543-602.
- PHILIPSON, W. R. 1971. Floristics of Rarotonga. Pp. 49-54 in: FRASER, R. (comp.) Cook Bicentenary Expedition in the South-west Pacific. *Bull. Roy. Soc. N.Z.* 8: 1-141.
- SLATER, P. et al. 1970. A field guide to Australian birds. Non-Passerines. Pp. xxxii + 1-428, illus. Adelaide &c.: Rigby Limited.
- SYME, R. 1975. Isles of the Frigate Bird. Pp. 1-234, illus. London: Michael Joseph.
- WILDER, G. P. 1931. Flora of Rarotonga. *Bernice P. Bishop Mus. Bull.* 86: 1-113.

APPENDIX

I am indebted to Captain J. A. F. Jenkins for extracting the following records of the Herald Petrel from his observations of petrels at sea over the past two years, to the north-west, west and south-west of the Tongan group: 5 March 1975, 20°10' S, 17°05' W (one light phase); 11 May 1975, 19°57' S, 175°01' W (five, one light phase); 12 May 1975, 22°04' S, 176°09' W (one); 25 May 1975, 18°31' S, 174°28' W (three light phase); 25 May 1975, 19°20' S, 174°50' W (one); 25 May 1975, 19°59' S, 175°00' W (five); 13 July 1975, 20°21' S, 175°12' W (two); 14 July 1975, 21°13' S, 175°29' W (two light, two dark phase); 25 April 1976, 20°03' S, 175°03' W (six); 6 July 1976, 15°37' S, 173°07' W (one); 8 July 1976, 19°58' S, 175°01' W (three, one doubtful); 9 July 1976, 25°43' S, 178°31' W (one, doubtful); 26 July 1976, 19°06' S, 174°39' W (one); 27 July 1976, entrance to Nukualofa Harbour (one); 27 July 1976, 20°59' S, 175°19' W (one dark, one light phase); 27 July 1976, 21°08' S, 175°29' W (two light phase); 8 September 1976, 20°50' S, 175°14' W (eight, six light phase). Captain Jenkins notes that while he has been in Tongan waters during all other months, no records were made in the summer months. Although Murphy & Pennoyer (*Amer. Mus. Novit.* 1580: 1-43; 1952) considered it likely that the breeding season of the Herald petrel is "prolonged or nearly continuous, at least in lower latitudes of the range", the above observations by Captain Jenkins would suggest that in Tonga at least it is a winter breeder; young were found in the nest in the Tongan group during the Whitney Expedition on 24 July 1925 (Murphy & Pennoyer 1952).

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A DIURNAL RHYTHM OF ACTIVITY BY THE ADELIE PENGUIN

By C. D. PAULIN and P. M. SAGAR

ABSTRACT

A diurnal rhythm of the numbers of Adelie Penguins (*Pygoscelis adeliae*) leaving from the rookery was observed at Cape Bird, Ross Island, Antarctica. No diurnal rhythm in numbers of birds returning to the rookery was observed.

INTRODUCTION

Diurnal rhythms of activity in the Adelie Penguin (*Pygoscelis adeliae*) in continuous light conditions has been noted by Wilson (1907), Muller-Schwarze (1966, 1968), and Spurr (1972). Most of these studies dealt with activities of chicks or adult birds at the nest site, rather than with the movement of large numbers of birds. In the present study counts were made of the numbers of penguins leaving from and returning to the rookery area, at Cape Bird, Ross Island, Antarctica (77°13' S, 166°27' E).

METHODS

Between 15 and 21 December 1973, ten minute counts were made on the hour, every hour, of the number of Adelie Penguins leaving for and returning from the Ross Sea fishing grounds. Birds were counted, from near the laboratory site using 8 x 30 binoculars, on the rookery beach, between two meltwater streams approximately 1 km apart where the birds gathered for ice-free access to open water. The status of the birds could easily be determined by the condition of plumage and direction of travel. Stationary birds were not included in the totals. Concurrent observations were made of light and temperature.

RESULTS

Birds left the rookery in large groups of 30 to 100 individuals, numbers reaching a maximum at 2400 hrs, and a minimum at 1200 hrs (Fig. 1A). Returning birds were in small groups of up to ten and numbers showing no apparent rhythm (Fig. 1B). The total number of birds, leaving the rookery, per hour, increased over the observation period: at 2400 hrs on 15 and 16 December a mean of 180 birds per hour was observed, increasing to a mean of 300 birds per hour on 20 and 21 December. Cycles of light intensity and temperature reached a minimum at 2400 hrs and a maximum at 1200 hrs.

were easily recognisable from the shore by their black backs; the white bellies of those returning are hard to distinguish in the fissured sea ice . . .”

At Cape Bird observations were made during the latter part of the chick hatching period. The increasing number of chicks, and hence increasing demand for food, and shorter period of attendance at the nest site by the adults, is reflected in the gradual increase in the total numbers of adults leaving for the Ross Sea.

From the graphs (Fig. 1) there is apparently a greater number of birds leaving the rookery than returning. This difference could be attributed to the behaviour of the birds. Birds leaving gathered in large groups which progressed across the beach, few birds moving across the beach individually. Hence, each count included one or two groups on an otherwise deserted beach. Returning birds, however, travelled in small groups and on reaching the shore proceeded to their respective nest sites. Accordingly, there was a continual stream of returning birds throughout the day.

Although the maximum number of birds leaving the rookery was observed at 2400 hrs, high numbers were also observed later in the morning. These later birds were from the rear of the rookery. Groups of birds were observed moving through the rookery from 2400 hrs onwards but did not reach the beach where counts were made until 0200 hrs onwards.

A count should be made of the total number of returning birds, rather than the number present at one time. This would show numbers equal to those leaving and whether or not there is, in fact, a diurnal rhythm of numbers of birds returning.

ACKNOWLEDGEMENTS

This research was carried out while we were members of the 1973-74 University of Canterbury Antarctic Research Unit.

We would like to thank Mr F. C. Kinsky, former Ornithologist of the National Museum of N.Z., for his comments on the manuscript.

LITERATURE CITED

- MULLER-SCHWARZE, D. 1966. Daily pattern of activity of the Adelie Penguin during the polar day in Antarctica. *Umschau* 66 (18): 603-604.
MULLER-SCHWARZE, D. 1968. Circadian rhythms of activity in the Adelie Penguin (*Pygoscelis adeliae*) during the austral summer. *Antarctic Research Series* 12: 133-149.
SPURR, E. B. 1972. Social organisation of the Adelie Penguin (*Pygoscelis adeliae*). Unpublished Ph.D. thesis, University of Canterbury.
WILSON, E. A. 1907. Aves. *British National Antarctic Expedition Report 1901-1904*. *Natural History* 4: 1-42.
YEATES, G. W. 1971. Diurnal Activity in the Adelie Penguin (*Pygoscelis adeliae*) at Cape Royds, Antarctica. *Journal of Natural History* 5: 103-112.

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FOREST BIRDS OF THE HOPE CATCHMENT, LAKE SUMNER STATE FOREST PARK, NORTH CANTERBURY

By G. B. WILKINSON and R. GUEST

ABSTRACT

Twenty-four bird species were recorded in the beech forests of the Hope catchment during a survey of vegetation and associated animals. Vegetation descriptions were classified into associations, and some variation in bird frequency and species was observed between associations and at different altitudes.

INTRODUCTION

In November-December 1975, the New Zealand Forest Service surveyed the forests within the Hope River catchment of the Lake Sumner State Forest Park, North Canterbury. The main purposes were to describe the composition, structure, and habitat of the forests and to establish permanent reference plots to monitor future trends in forest health. However, additional data were collected which enabled the forest bird populations to be described. The catchment covers over 19 000 hectares. Beech forest covers over half the area (Guest & Wilkinson 1977), with the upper bush edge occurring at about 1 300 metres.

A total of 137 non-areal reconnaissance plots were located at 200 m intervals along 26 randomly chosen altitudinal transects running from valley floor to tree line. A description of the vegetation was made at each plot, listing all vascular plants within the following five tiers: main canopy; 5-12 m; 2-5 m; 0.3-2 m; less than 0.3 m. The dominant species and the density of the canopy were recorded, together with the altitude, aspect, terrain, and the mean top height of trees.

At each plot, a 5-minute bird count was carried out using the methods outlined by Dawson & Bull (1975), recording all birds seen or heard within the set period. Birds flying overhead or heard at a distance of about 100 m or more were not recorded. Weather conditions, the time of observation, and the presence of running water, high wind, or other factors making aural observations difficult, were also noted.

THE FORESTS

The forest canopy of the catchment is composed almost entirely of red (*Nothofagus fusca*), silver (*N. menziesii*), and mountain beech (*N. solandri* var. *cliffortioides*).

Using a group average cluster analysis similar to that described by Wardle *et al.* (1971), the forest was defined into five associations. These associations and the habitat which they occupy are briefly described below. The mean altitude of each association is shown in Fig. 1.

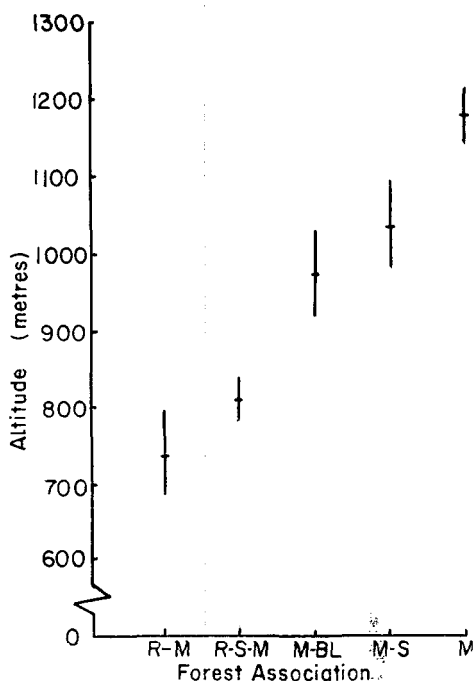


FIGURE 1 — Mean altitude of forest associations with 95% confidence limits.

1. *Red Beech - Mountain Beech Forest (coded R-M in table and figures)*

This association is found on lower slopes and terraces and is dominated by large red and mountain beech. Broadleaf (*Griselinia littoralis*) and *Coprosma pseudocuneata* are the other major species present.

2. *Mixed Beech Forest (coded R-S-M)*

The canopy of this association contains red and mountain beech, with a sub-canopy of silver beech and many other species in the lower tiers, including broadleaf, *Coprosma foetidissima*, *C. parviflora*, and *Polystichum vestitum*. It is most often found on terraces and lower slopes, but also at higher altitudes near the head of the valley.

3. *Mountain Beech - Broadleaf Forest (coded M-BL)*

On some steep dry sites, broadleaf is dominant beneath a mountain beech canopy. *Coprosma linariifolia* is often present, whilst *C. pseudocuneata* and *Polystichum vestitum* usually dominate the lower tiers.

4. Mountain Beech - Silver Beech Forest (coded M-S)

Mountain beech is much more common than silver beech in the canopy of this forest type which usually occurs on steep upper slopes near the main divide. A shrub layer containing broadleaf, *Olearia lacunosa* and *Pseudopanax simplex* is usual, and the ground cover is quite diverse.

5. Mountain Beech Forest (coded M)

This forest type generally has few associated species, the most common being *Coprosma pseudocuneata* and *Polystichum vestitum*. It is of simple structure compared with the other associations, and forms the tree line in most places.

TABLE 1. PERCENT FREQUENCY OF BIRD SPECIES IN

THE FIVE FOREST ASSOCIATIONS AND FOR

THE FOREST AS A WHOLE

Species	Total Forest	Forest Associations					CHI-Square Value
		R-M	R-S-M	M-BL	M-S	M	
	No. of Plots						
	137	16	55	20	15	31	
	PERCENT FREQUENCY						
Yellow-crowned Parakeet	11	19	18	6	7	3	6.11 not significant
S.I. Rifleman	77	81	96	67	87	48	29.20 significant at .005 confidence level
Brown Creeper	28	0	29	33	27	39	5.65 not significant
Grey Warbler	34	31	65	56	53	45	7.20 not significant
Yellow-breasted Tit	62	50	56	72	60	84	8.72 significant at .100 confidence level
S.I. Robin	16	19	31	0	13	3	15.50 significant at .005 confidence level
Blackbird	21	37	24	0	27	16	6.05 not significant
Bellbird	59	75	65	61	40	45	7.33 not significant
Chaffinch	70	81	84	78	46	48	17.24 significant at .005 level

THE BIRDS

1. Bird distribution and relationship with forest composition

Twenty-four bird species (listed in Appendix 1) were recorded within the forest area sampled. Nine of these species occurred in more than 10% of the plots. The percentage of these nine in each forest association, and for the forests as a whole, is shown in Table 1.

The frequency of four species was significantly different between forest associations, and there is a tendency for birds to be less frequent in associations at higher altitude. The Yellow-breasted Tit, however, shows an apparent reversal of this trend, with more observed at higher altitudes. Whether this fact is explained by increasing altitude or a preference for pure mountain beech by this tit is not clear. The mean numbers of birds and bird species recorded in each forest association are shown in Figs 2 and 3.

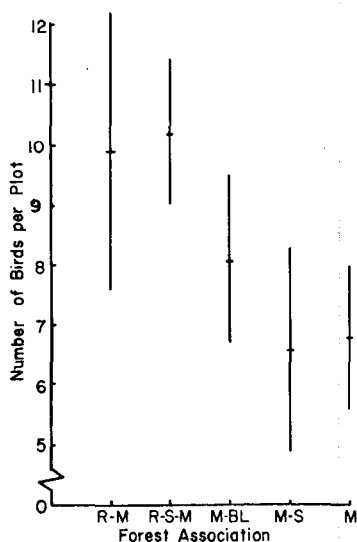


FIGURE 2 — Bird density for each forest association, mean and 95% confidence limits.

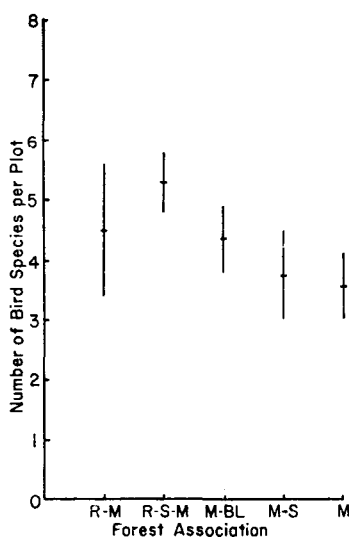


FIGURE 3 — Number of bird species, mean and 95% confidence limits, for each association.

With the associations arranged in increasing altitudinal sequence there is a trend for both numbers of individuals and number of species to decrease. An analysis of variance between associations was carried out. Significant differences existed in the mean number of birds per association ($F = 4.32$, 4,132 df; $P = 0.010$), and in the mean number of bird species per association ($F = 4.39$, 4,132 df; $P = 0.010$).

2. Bird distribution and relationship with forest structure

MacArthur & MacArthur (1961) reported work in the United States and suggested that bird species diversity could be best predicted

in terms of the height profile of the vegetation. The vegetation profile was determined by measuring the density of foliage at a series of heights above the ground and expressed as the foliage height diversity (FHD). They also commented that a knowledge of plant species diversity did not enable an improved prediction of bird species diversity. Similarly, Recher (1969) and Cody (1970) both demonstrated that bird species diversity was strongly correlated with foliage height diversity. In respect of the forest areas of the Hope catchment, foliage densities per tier were not available. However, it was possible to calculate a foliage species diversity for each tier (five tiers in all) and thus express the habitat diversity in terms of both species complexity and, to some extent, density. The density component was not an absolute value per tier, but an expression of the vertical distribution of density through the presence or absence of any or all the tiers recognised. This measurement of habitat diversity was found to be strongly correlated with altitude ($r = 0.7122$ 136 df; $P = 0.010$), and with bird populations present, i.e. number of bird species ($r = 0.4874$ 136 df; $P = 0.010$) and number of individuals ($r = 0.4510$ 136 df; $P = 0.010$).

3. *Bird distribution and relationship with altitude*

The only clear relationship established between habitat and bird populations was that expressed by altitude. Highly significant correlations existed between altitude and the number of birds ($r = 0.6393$ 136 df; $P = 0.010$), and altitude and numbers of bird species ($r = 0.6313$ 136 df; $P = 0.010$). However, altitude is closely associated with forest structure and composition.

4. *Bird species diversity*

A bird species diversity value was calculated for the forests of the whole catchment, using the Shannon Information Index (H). (MacArthur 1965). This index of 2.24 for the Hope forests is generally a high value when compared with information summarised by McClay (1975) for *Nothofagus*, podocarp, and modified forests in Southland and on the West Coast. It is difficult to be certain that the data used by McClay (largely he used data published by Kikkawa (1966)) are entirely comparable with data from the Hope; furthermore it is not possible to determine whether the Hope bird species diversity of 2.24 is significantly higher statistically than values from other areas. However, from information and data available it would appear that the predominantly *Nothofagus* forests of the Hope catchment are comparatively rich in both introduced and native bird species.

CONCLUSIONS

The interaction of factors which affect the distribution of bird populations is complex. Altitude, vegetation type (its structure and composition), and season all probably influence bird distribution. Further, environmental factors are probably so closely associated, that

to measure one is largely a surrogate value for another. These problems are compounded by other variables such as weather, time of day, and observer bias.

It seems likely that the criteria affecting bird distribution will not be identified from such broad base surveys such as this, but from repeated census work and autecological work in relatively small areas. Ordination techniques such as Principal Component Analysis could have relevance in considering the effect of environmental gradients on bird distribution.

ACKNOWLEDGEMENTS

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LITERATURE CITED

- CODY, M. 1970. Chilean Bird Distribution. *Ecology* 51: 455-64.
 DAWSON, D. G.; BULL, P. C. 1975. Counting Birds in New Zealand Forests. *Notornis* 22: 101-9.
 GUEST, R.; WILKINSON, G. B. 1977. Forests and Animals of the Hope Catchment. (in press).
 KIKKAWA, J. 1966. Population Distribution of Land Birds in Temperate Rainforest of Southern New Zealand. *Transactions of the Royal Society of New Zealand, Zoology* 7 (17): 215-77, 14 figs, 4 pls.
 MacARTHUR, R.; MacARTHUR, J. 1961. On Bird Species Diversity *Ecology* 42: 594-8.
 MacARTHUR, R. 1965. Patterns of Species Diversity. *Biological Reviews* 40: 510-33.
 McCCLAY, C. L. 1974. The Species Diversity of NZ Forest Birds. *NZ Journal of Zoology* 1 (2): 179-96.
 RECHER, H. F. 1971. Bird Species Diversity: A Review of the Relation between Species Number and Environment, in "Quantifying Ecology." *Proceedings of the Ecological Soc. of Australia* 6: 135-52.
 WARDLE, J.; HAYWARD, J.; HERBERT, J. 1971. Forests and Scrublands of Northern Fiordland. *N.Z. Journal of Forestry Science* 1: 80-115.
 WARDLE, J.; GUEST, R. 1976. Forests of the Waitaki and Lake Hawea Catchments. (in press.)

APPENDIX 1

BIRD SPECIES RECORDED

Paradise Duck (*Tadorna variegata*), New Zealand Falcon (*Falco novaeseelandiae*), New Zealand Pigeon (*Hemiphaga novaeseelandiae*), South Island Kaka (*Nestor meridionalis*), Kea (*Nestor notabilis*), Yellow-crowned Parakeet (*Cyanoramphus auriceps*), Shining Cuckoo (*Chalcites lucidus*), Long-tailed Cuckoo (*Eudynamis taitensis*), South Island Rifleman (*Acanthisitta chloris*), Brown Creeper (*Finschia novaeseelandiae*), Grey Warbler (*Gerygone igata*), South Island Fantail (*Rhipidura fuliginosa*), Yellow-breasted Tit (*Petroica macrocephala*), South Island Robin (*Petroica australis*), Song Thrush (*Turdus philomelos*), Blackbird (*Turdus merula*), Silveryeye (*Zosterops lateralis*), Bellbird (*Anthornis melanura*), Tui (*Prothemadera novaeseelandiae*), Yellow Hammer (*Emberiza citrinella*), Chaffinch (*Fringilla coelebs*), Redpoll (*Acanthis flammea*), Starling (*Sturnus vulgaris*), White-backed Magpie (*Gymnorhina tibicen*).

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HISTORY OF DISCOVERY OF THE CRESTED GREBE, *Podiceps cristatus*, IN NEW ZEALAND

By K. E. WESTERSKOV

ABSTRACT

In 1865 Buller named a 'hitherto undescribed' Crested Grebe *Podiceps Hectori* after its collector. Several other records and observations precede Buller's description: Heaphy saw 'Grebes,' possibly Crested Grebes, on Lake Rotoroa, Nelson, in 1846; Grey presented a specimen of '*P. cristatus*' from New Zealand to the British Museum (Natural History) in 1847; Potts 'first made its acquaintance' on Lake Selfe, Canterbury, in 1856 but did not publish this till 1869; Haast in 1861 published a definite record of 'crested grebe (*Podiceps cristatus*?)' on Lake Rotoroa, Nelson; Hector's diaries indicate that he collected and identified the bird on which Buller based his *Podiceps Hectori* at Lake Wakatipu in April 1863 (Hector listed 'Crested Grebe, *Podiceps Cristatus*' in his note-book for May-June 1863).

INTRODUCTION

It is just over one hundred years since the twenty-seven years old Walter Buller was awarded the Commissioner's silver medal for his *Essay on the ornithology of New Zealand* in the essay competition of the New Zealand Exhibition held in Dunedin in 1865 (first published as a pamphlet 1865, re-published 1868).

In this pioneer work on the New Zealand avifauna, Buller described 'a large crested grebe, hitherto undescribed' and inhabiting the lakes of the South Island. He mentioned that 'Dr Hector obtained several specimens of this bird during his explorations of the Otago Province, and they are now deposited in the Provincial Museum.' He gave a detailed description of the species, leaving no doubt that he, in fact, described a southern form of Crested Grebe, *Podiceps cristatus*; he called it, however, *Podiceps Hectori* Buller, naming it in honour of its discoverer.

This description has generally been accepted as the first published record of the Crested Grebe in New Zealand, so much more so as Buller himself stated that this species was 'hitherto undescribed.'

This, however, is not so. Several years before Buller's essay appeared at least five other persons had either obtained a specimen (Grey), published records of what can reasonably be interpreted as observed Crested Grebes (Heaphy, and Haast), or subsequent publication or records have shown that Crested Grebes were observed or collected (Potts, and Hector).

HEAPHY SEES 'GREBES' ON LAKE ROTOROA, NELSON, 1846

Charles Heaphy arrived in New Zealand in 1839; he came with Wakefield in the *Tory* and had been engaged by the New Zealand Company as official artist and draughtsman. In 1841 he returned temporarily to England to report to the Company's directors, and while in England he wrote and published (1842) a *Narrative of a Residence in Various Parts of New Zealand*. In this informative although somewhat rosy account of life and opportunities in the new colony, he mentioned among other waterfowl, 'divers' being present on the rivers. This inadequate mention hardly justifies acceptance of Crested Grebe being seen although Heaphy did spend two months in the Nelson area. (Gould who in 1848 published the first illustration of the Southern Crested Grebe (cf. Fig. 1) — in colour and natural size — mentioned that the species is called 'diver' by the colonists in Australia, and even in recent years I have met anglers and other people in the New Zealand back-country referring to this bird as diver). After his return to New Zealand Heaphy settled in Nelson early in 1843. With Thomas Brunner, William Fox (who later won knighthood, premiership and riches) and the Maori Kahu, Heaphy set out in 1846 on a trip to Lake Rotoroa. In his account of this trip, published in

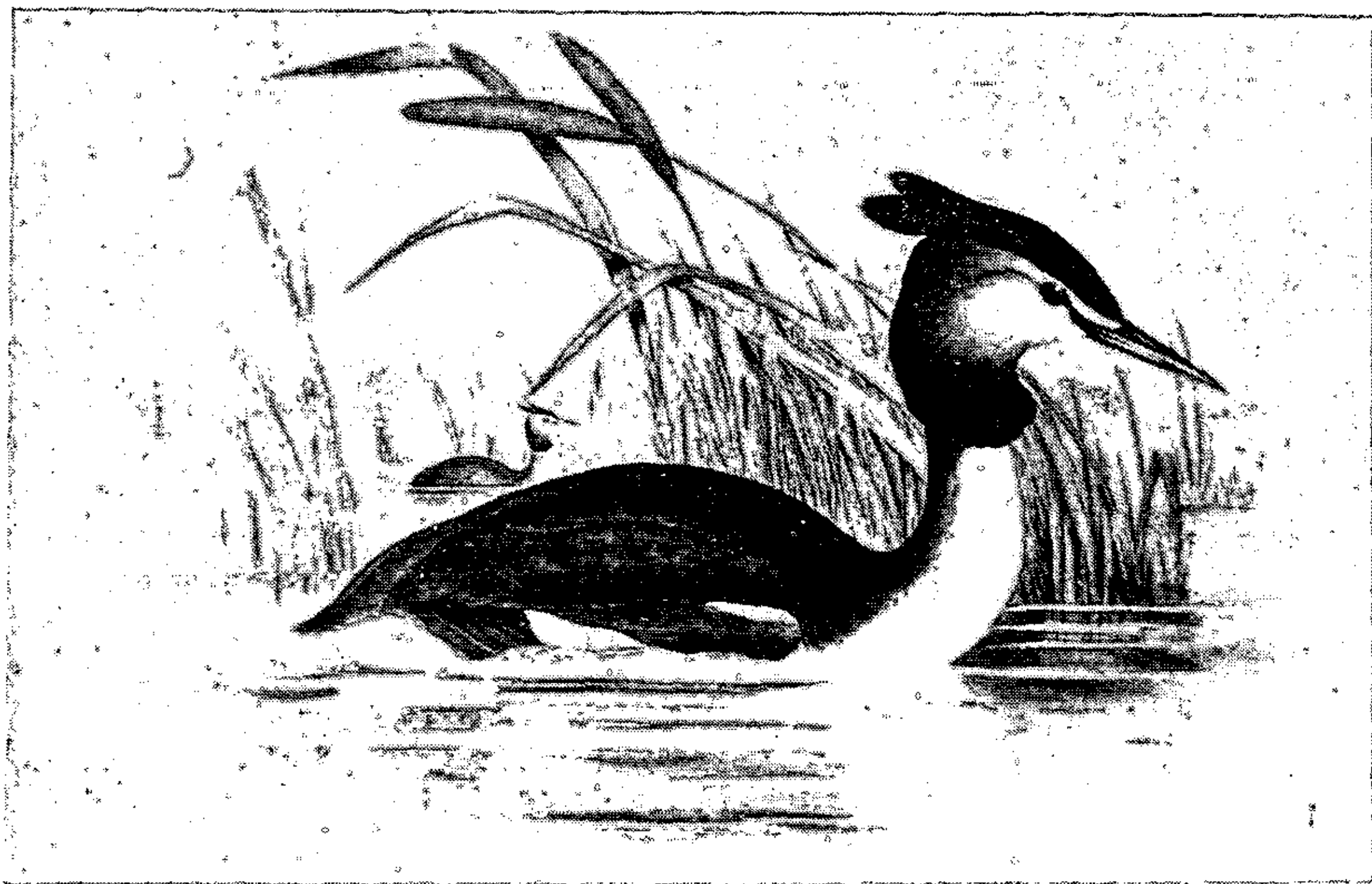


FIGURE 1 — The first published illustration of the Southern Crested Grebe (in colour and natural size) was plate 80 in volume 7 of J. Gould's *The Birds of Australia* (1848). Unfortunately it is incorrect and appears to have been at least partly drawn from a European specimen (*P. c. cristatus*): in the illustration the bird has a clear white loreal stripe continuing over the eye. In *P. c. australis* the lores are not white but fulvous, and there is no unbroken white eye-stripe.

the *Nelson Examiner* for 4 and 14 March 1846, he mentioned from his visit to Lake Rotoroa on 11 February that: 'Grebes and divers with other water-birds, were floating about on the surface, nor did the instability of our shalop deter us from getting a shot at them.' Kehu snared four Wekas and shot six New Zealand Pigeons and four Blue Ducks, but grebes were not mentioned as being shot. While not satisfactory, this description indicates that Heaphy probably observed Crested Grebes on Lake Rotoroa in 1846, a lake where Crested Grebes were soon to be seen by others.

CAPTAIN G. GREY'S '*P. cristatus*. 41.1.8.6' FROM 1847

As attempts to locate any of Hector's original grebe specimens in New Zealand museums had failed, I wrote to Dr D. W. Snow, Curator of Birds, British Museum (Natural History), Tring, England, enquiring whether any of the specimens might have ended up there on exchange, as purchase or gift in colonial days. This had indeed been the case (as reported below), but Dr Snow further advised me that another Crested Grebe specimen had come into the collection a good deal earlier. An unsexed adult specimen had been among a small collection of bird skins from New Zealand presented to the British Museum (Natural History) by Captain G. Grey in 1847. The only information on the label is "*P. australis*. New Zealand. Grey. 47.1.8.6.", the last being the Registered Number.

As and when opportunity permits I shall wish to examine this specimen and the circumstances of its receipt (dispatch, possible place of origin), but, in the meantime, the facts of its receipt and its label must suffice. This collected specimen pre-dates the Hector/Buller *Podiceps Hectori* with some 17 years.

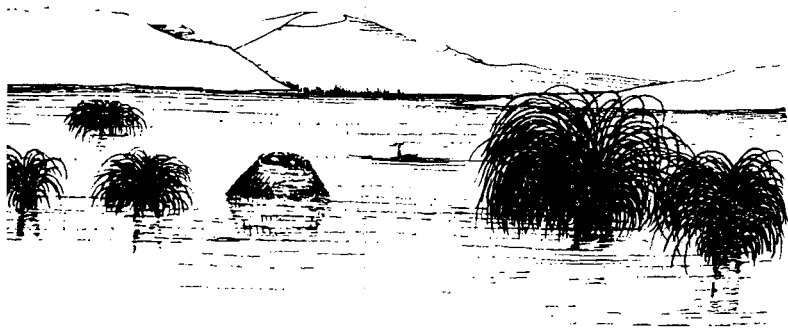
Sandhurst-trained and after soldiering with the 83rd Regiment of Foot in Ireland, Captain George Grey made two expeditions to north-west Australia 1837-1839 and was appointed Governor of South Australia in 1840. He had early shown interest in natural history: 'Like many another boy, he loved to visit the British Museum of Natural History at South Kensington, which in after-years he supplied with specimens of animals he had shot in the course of his travels' (Rutherford 1961: 4). During his stays in Australia 1837-1845, Grey sent large collections of birds to the British Museum: in 1843 a donation of 375 specimens arrived for which the Secretary of the Board acknowledged: "Your contributions are some of the most interesting which we can boast in the department of zoology" (Rees & Rees 1892: 72). In 1843 three more collections arrived, including a large number of bird skins; the last gift of specimens from South Australia was acknowledged on 18 March 1847, after Grey had gone to New Zealand.

Grey was appointed Lieutenant Governor of New Zealand on 13 June 1845 and arrived at Auckland on 14 November 1845. His first couple of years in this country — during which the Crested Grebe

specimen was collected and dispatched — saw him take charge of the campaigns against the Maori rebels in the Bay of Islands area, later transferring his activities to the Wellington and Taranaki districts where order was also restored. It is not possible with the information available to discover where, when and how Grey obtained (shot or purchased?) the Crested Grebe specimen; as far as I can ascertain, Grey did not during 1845-1846 or early 1847 travel in the South Island (where most of the Crested Grebes are and were) or to Waikaremoana or Waikare-iti in the North Island (where there were grebes then). The possible solution to the problem of the origin of Grey's '*P. cristatus* New Zealand' will have to be left to future work.

POTTS NOTES 'CRESTED GREBE' ON LAKE SELFE,
CANTERBURY, 1856

Chronologically, the next recorded observation of Crested Grebe — and possibly the first definite field determination — was made by T. H. Potts but unfortunately not published till later. Potts (1869), in his discussion of the Crested Grebe, said: 'In April, 1856, we first made its acquaintance, on a small lake, now called Lake Selfe' (cf. Fig. 2). Potts who had come to New Zealand from England in 1853 was one of Haast's closest personal friends and collaborators, and he travelled widely in the South Island in pursuit of his ornithological, botanical and Maori studies.



Nest of
PODICEPS HECTORI
Grebe

T.H. Potts del. J.B. 1869

FIGURE 2 — The first illustration of a Crested Grebe and its nest in New Zealand, drawn by T. H. Potts, probably at Lake Selfe, and published in 1869 (plate 4 in Potts, 1869). Buller never published an illustration of this species in any of his editions of *A History of the Birds of New Zealand*.

HAAST RECORDS '*PODICEPS CRISTATUS* ?'
ON LAKE ROTOROA, NELSON, 1861

The first definite record published of Crested Grebe in New Zealand was by Haast (later Sir Julius von Haast) in 1861. Haast had come to New Zealand in 1858 from his native Germany. His home town was Bonn where he had attended the university, and he travelled widely in Germany; after leaving university he spent some years in France and Belgium and made extensive journeys to Austria, Italy and Russia. With his undoubted interest in birds — as later work and papers showed — and having spent the first 35 years of his life in Europe, in parts where Crested Grebes are common, there can be no doubt that Haast knew this species. His first official assignment in New Zealand was geological and topographical surveys in Nelson. This expedition took place from January to June 1860 in the course of which in January he visited Lakes Rotoiti and Rotoroa; it was here Haast observed and correctly identified this bird (Haast 1861): 'On the lakes, besides the several inhabitants before enumerated, we found the crested grebe (*Podiceps cristatus* ?), of which only very little is known.' The section on bird observations in this report was in 1862 reprinted as a separate paper — and thus made more easily accessible to ornithologists — in *Ibis*, and it was this paper which was seen by the German authority, Dr Otto Finsch who wrote a critique of Buller's essay (1868 and 1869). It was, however, strange that Buller did not see or acknowledge Haast's Crested Grebe observation, either in its 1861 original or in the 1862 *Ibis* reprint.

ELLMAN AND GRAY ON CRESTED GREBE, 1861 AND 1862

In the same year that Haast's grebe observation was published, J. B. Ellman (1861) published his hitherto almost completely overlooked review and species list of New Zealand birds which as a check-list is only preceded by Gray (1843 and 1845). Whereas Gray had no reference to Crested Grebes, Ellman had this entry: 'Crested Grebe? Found on lagoons in the middle island. Unknown to me.' The middle island is, of course, the early name for the South Island. Ellman's manuscript is dated 8 March 1861, and as Haast's *Report* was completed and forwarded to the Superintendent, Nelson, on 27 November 1860, Haast's published record of Crested Grebe must stand as the first although his and Ellman's papers both appeared in 1861.

In 1862 Gray published a new list of New Zealand birds, incorporating 'the additional species recorded by modern authors.' Gray included only one species of grebe, *Podiceps rufpectus*, the New Zealand Dabchick, which he strangely enough had obtained from Taieri, Otago, from where it has completely disappeared many years ago. He then added a foot-note: 'What is the Crested Grebe, Ellman, Zool. 1861, p. 7472?' Gray has no mention of Haast's Crested Grebe observation in 1861 or of the 1862 *Ibis* reprint preceding his own paper; but Gray could not have seen this before he communicated his own

manuscript, and he could not reasonably be expected to have had access to Haast's *Report* in 1861.

HECTOR COLLECTS '*Podiceps Hectori*' AT LAKE WAKATIPU, OTAGO, 1863

The last pre-Buller observation and, in fact, the first collection of Crested Grebe specimens in New Zealand known through publication was due to the efforts of James Hector. After a medical degree from the University of Edinburgh and four years in Canada, the twenty-eight years old Hector arrived in Dunedin in April 1862 where he had been appointed as Provincial Geologist for a three-year period. During 1862 and 1863 he explored widely in Otago Province, publishing many of his findings in 1863. In this the only major report published by Hector about his explorations in Otago, he mentioned a number of birds seen and collected during his travels, but there is no mention of the Crested Grebes which — as subsequently shown — he had collected.

In his *Essay* (1865), Buller mentioned that 'several specimens' were obtained by Hector in Otago; as they are the first specimens collected, and identified, their exact origin is of course of considerable interest. But as with so many other facets of the history of early New Zealand exploration, this enterprise has proved time-consuming and yielding but little information.

At the New Zealand Exhibition in Dunedin, opening on 12 January 1865, Hector had among a great variety of other items, a display: *Birds of Otago*. In the *Official Catalogue of the New Zealand Exhibition*, 1865 is found a list of Hector's birds; the list was prepared by Walter Buller, Esq., F.L.S., and contained a list of 78 species including:

58. *Podiceps Hectori*. — (New species) named by Buller, Rufous Crested Grebe (five specimens; four adults, one chick and two eggs).

As Buller in his *Essay* stated that the specimens 'are now deposited in the Provincial Museum,' I have, with Dr R. R. Forster, Director of Otago Museum, and its Zoologist, Mr J. T. Darby, examined all possibilities (skins, display specimens, entry books); no trace of Hector's specimens could be found, unless some of the unlabelled specimens (labels lost?) may be his type specimens. The possibility existed that such specimens might have been loaned or transferred (in his second edition of *A History of the Birds of New Zealand*, 1888, Buller said that his descriptions of adult and young Crested Grebes are based on specimens 'in the Colonial Museum') to the National Museum, Wellington. An examination of Crested Grebe material held in the national collection was kindly made for me by Mr F. C. Kinsky, then Curator of Birds, but no specimens appear to be Hector's early skins; two specimens are labelled Otago but have no date or collector's name. Nor are these specimens to be found in the Auckland Institute

and Museum (E. G. Turbott, Director) or in Canterbury Museum which, incidentally, has the best collection of Crested Grebe material in New Zealand with one specimen from Buller's collection, but none from Otago; I have personally examined all of these specimens.

As there was no trace of Hector's Crested Grebes from Otago in any New Zealand collections, I contacted — as mentioned above — Dr D. W. Snow, Curator of Birds, British Museum (Natural History), Tring. To my pleasure Dr Snow advised that one Crested Grebe specimen from New Zealand is in the collection, an unsexed adult; the label reads: "*Podiceps cristatus* Crested Grebe/Colonial Museum, Wellington. Dr. Hector, Director." This specimen was registered in 1875, registration number 75.7.2.57, and was one of a collection of 81 specimens received in exchange from Hector who was then Director of the Colonial Museum. This is, undoubtedly, one of Hector's Crested Grebes obtained in Otago of which Buller (1865) said: "they are now deposited in the Provincial Museum" (i.e. Otago Museum). Sometime between 1865 and 1875 these (or some of these) specimens must have been transferred (by Hector?) to the Colonial Museum. Hector became the first Director of the Museum, established in 1865.

Unfortunately this apparently only surviving specimen of Hector's original collection bears no date or place of collection.

In an attempt to find exactly where and when these specimens were collected, a study was made of various Hector and Buller material, including Hector's original note-books from his Otago explorations and now kept in Hocken Library, Dunedin. In note-book B96 for May-June 1863 (Hector's large West Coast expedition in the *Matilda Hayes* took place from 19 May 1863 to 6 January 1864) there is a list of bird specimens collected (so far?), including among others: 13 Kakapo, 13 Little Spotted Kiwi, 4 *Crested Grebe*, and a great number of other species, totalling 27 species and 82 specimens. On another page of the note-book is a list of scientific names of birds, including '*Crested Grebe, Podiceps Cristatus*.'

The note-books do not fully solve the problem. Buller (1873: 354) mentioned that Dr Hector: 'found it on the Whakatipu Lake, accompanied by young . . . while in brackish lakes by the coast where old and young birds, as well as eggs, were obtained . . .'. If we review Hector's movements during his three years in Otago (and for this purpose I had much help from Mr R. I. M. Burnett's unpublished M.A. Honours thesis: *The Life and Work of Sir James Hector*, University of Otago, 1936, copy in Hocken Library), it appears that he visited Lake Wakatipu on four occasions:

- (1) briefly in November 1862 when he skirted the southern end of the lake on his way elsewhere. It is unlikely the grebe specimens were collected then:
- (2) in April 1863 before setting out on his major expedition, Hector journeyed to Lake Wakatipu where he got in touch with a local

runholder, Mr N. von Tunzelman, with whom he crossed the lake to its western shore to what is now known as Whites Bay: from here they tramped up the Von riverbed, up the Mararoa and almost to the head of the Greenstone River, returning the same way. It is possible that Hector collected adult Crested Grebe specimens at Lake Wakatipu on this trip, either crossing or re-crossing the lake or staying at it:

- (3) the chick and eggs collected and listed in the *Catalogue of the New Zealand Exhibition*, were according to Buller obtained 'in brackish lakes by the coast'; this is inconsistent with Buller (1873: 354) where he also stated that Hector 'found it on the Wakatipu Lake, accompanied by young.' A review of Hector's 1863-64 expedition to Fiordland in the *Matilda Hayes* shows stops in *Chalky Sound* (where Hector penetrated Edwardson Sound) and reached Lake Cadman which had brackish water and is a potential Crested Grebe lake (no recent records available) from Cliff Cove at the top end of Cunaris Sound Hector walked across to Last Cove in Long Sound; *Preservation Inlet* (where Hector via Narrow Bend reached the top end of Long Sound, a brackish to almost freshwater 'lake' where: 'owing to the quantity of fresh water poured into the head of the Sound, the influence of the flood is hardly felt'; in Long Sound: 'there were plenty of ducks of various kinds'; Hector was in Chalky and Preservation Inlets from 17 June to 22 July); *Thompson's Sound* (Deas Cove, past Secretary Island to Doubtful Sound, Crooked Arm inlet where there were: 'plenty of ducks and other water fowl'; in this inlet there was a layer of fresh water (which froze) above the 6 fathoms of sea water below of a temperature of 9°C); *Milford Sound* (early August, camped at Freshwater Basin at top end of Sound, Cleddau River Valley); *Martins Bay* (Hector sailed up the Hollyford River and arrived in Lake McKerrow, which he called Kakapo Lake, on 28 August; Hector named the Hollyford, the Kaduku River; the lake is brackish, with increasing amount of fresh water towards its head). On 23 September he left the *Matilda Hayes* in Wart Cove and tramped up the Hollyford River Valley; near the pass (now known as Key Summit) he found two lakes, Lake Howden and Lake McKellar and via the Greenstone Valley and his former track reached Lake Wakatipu and eventually Queenstown on 4 October. From Queenstown Hector journeyed to Dunedin where he wrote his report, returning to:
- (4) Queenstown on 27 October, returning to the base camp at Lake McKerrow the way he had come. In his absence John Falconer, the Skipper, had examined Lake Alabaster. Because of bad weather their departure was delayed a fortnight.

On the return journey by sea Hector visited Milford, Bligh and George Sounds. He spent three weeks in Dusky Sound, New Year's Eve at Chalky Inlet, and returned to Dunedin, arriving at Port Chalmers, on 6 January 1864, with a large collection of geological, botanical and zoological specimens. The *Otago Daily Times* featured the return of the *Matilda Hayes* in its issue for 7 January. In the report was mentioned that: 'The Doctor has succeeded in capturing Kiwis

(Apteryx) of two species, and also some Kakapos, or ground parrots; one of the latter has been brought alive to town.' There is no mention of Crested Grebes. The final sentence reads: 'A full account of the expedition will be made public as soon as possible' but no general report was ever published. Hector was shortly after his return appointed one of the Commissioners of the New Zealand Exhibition, opening in Dunedin in January 1865, a year after his return. He was busy arranging his collections for public display, and also his bird collection was temporarily removed and displayed at the exhibition.

It should further be pointed out that the four adult Crested Grebe specimens, the chick and the two eggs displayed by Hector in 1865 and originating from his explorations in Otago, might not necessarily have been collected (all or part) on his major expedition in 1863-64. From his report (1863) and note-books it is clear that he during 1862-63 visited a number of lakes where Crested Grebes now occur occasionally and undoubtedly occurred in his day, including Lake Wakatipu, Lake McKerrow and Lake Wanaka. It is unfortunate that the type specimen of Buller's *Podiceps Hectori*, whatever its subsequent fate, is unknown and that likewise the first locality of a verified Crested Grebe is unknown and may remain unknown forever.

All we can safely conclude is that Hector's collected Crested Grebe specimens (adults, chick and eggs) provided the first scientific record of verified occurrence in New Zealand. The adult specimen, on which Buller's *Podiceps Hectori* = *Podiceps cristatus australis* was based, was most likely collected in Lake Wakatipu in April 1863; it could be this specimen which is now in the British Museum (Natural History), Tring, forwarded by Hector in 1875.

THE FATES OF ROTHSCHILD'S BULLER-SPECIMENS

Finally, it needs to be mentioned that tracing the fates of grebe specimens from Buller's collection to the New World was as unsuccessful as other attempts to locate his *Hectori* type specimen.

Rothschild's much lamented sale of his bird collection to the American Museum of Natural History included four Crested Grebe specimens from New Zealand. Three of these were labelled Buller Collection but only one specimen had further identification (A.M.N.H. No. 526627): it was from Rotoiti Lake, South Island, and dated November 1892 (F. Vuilleumier, pers. comm.).

The fourth Rothschild specimen (A.M.N.H. No. 526625) was of particular interest. The original label showed that it came from A. von Hugel's collection, was a female, from Lake Wakatipu, December 1874. Rothschild's label showed that the specimens from von Hugel had gone to G. M. Mathews, Australia's avid bird collector, and later to Rothschild. It is not quite clear who A. von Hugel was, whether (and most likely) the Austrian Baron Karl Alexander von Hugel who was interested in natural history, in particular plants, and a great

collector (he provided the museums of Vienna with 32 000 biological specimens!) and who visited New Zealand from 9-31 March 1834 (Marshall 1836, Dolezal 1972), or his son A. (for Anatole) who in 1883 became Director of the Ethnographical-Archaeological Museum of Cambridge University. If the date (1874) is correct, it is of less interest in connection with the problem raised in this paper as it is somewhat later than grebe observations and the Hector specimens. If the older von Hugel (later to be known as Charles von Hugel; he settled in England and married an Englishwoman) had obtained the specimen in 1834 or subsequently from contacts made, the matter would be of appreciable interest as such a grebe specimen could precede Hector's first collection by up to 31 years. A closer study of the travels, collections, letters and publications of the two von Hugels in Vienna and elsewhere may be profitable.

In addition to the four grebe specimens from the Rothschild collection, two Crested Grebes, a male and a female, from Buller's collection are in the Carnegie Museum of Natural History, Pittsburgh. They are both labelled "Marlborough 1892" (K. C. Parkes, pers. comm.).

In both collections the Crested Grebe specimens of New Zealand origin are either too late (1874 and 1892) or undated so they have no direct bearing on the establishment of the identity of Buller's type specimen.

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LITERATURE CITED

- BULLER, W. 1865. An essay on the ornithology of New Zealand. Pp. 1-26. Dunedin: Fergusson & Mitchell.
- BULLER, W. 1868. An essay on the ornithology of New Zealand. Transaction and Proceedings of the New Zealand Institute 1 (Supplement): 1-20.
- BULLER, W. L. 1873. A History of the Birds of New Zealand. Pp. xxiii + 1-384, col. pls 1-35 and 1 monochrome. London: Van Voorst.
- BULLER, W. L. 1888. A History of the Birds of New Zealand. 2nd ed. Vol. II. Pp. xv + 1-359, col. pls. 25-50, text illus. London: Published by the author.
- BURNETT, R. I. M. 1936. The Life and Work of Sir James Hector. Unpubl. M.A. thesis, University of Otago, Dunedin. Pp. 1-173 + lxxxvii.
- DOLEZAL, H. 1972. Karl Alexander Freiherrn von Hugel. Pp. 731-732 in: F. Wagner et al. (eds.). Neue deutsche Biographie. Vol. 9. Pp. xvi + 784. Berlin: Duncker & Humblot.
- ELLMAN, J. B. 1861. Brief notes on the birds of New Zealand. Zoologist 19: 7464-7473.
- FINSCH, O. 1868. Notes on Mr Walter Buller's "Essay on the Ornithology of New Zealand." Transactions and Proceeding of the New Zealand Institute 1: 112-125.
- FINSCH, O. 1869. Remarks on some species of birds from New Zealand. Transactions and Proceedings of the New Zealand Institute 2: 389-390.

- GOULD, J. 1848. The Birds of Australia. Vol. VIII. Pp. 1-85, 85 col. pls. London: Published by the author.
- GRAY, G. R. 1843. List of the birds hitherto recorded as found in New Zealand, Chatham, and Auckland Islands, with their synonyma. Pp. 186-201 in: DIEFFENBACH, E. (ed.). Travels in New Zealand. Vol. II. Pp. iv + 1-396. London: John Murray.
- GRAY, G. R. 1845. Birds of New Zealand. Pp. 1-20 in: RICHARDSON, J. & GRAY, J. E. (ed.). The Zoology of the Voyage of H.M.S. Erebus & Terror under the Command of Captain Sir James Clark Ross, During the Years 1839-1843. Vol. I. Pp. 1-39, 37 col. pls. London: Janson.
- GRAY, G. R. 1862. A list of the birds of New Zealand and the adjacent islands. Ibis 4: 214-252.
- HAAST, J. 1851. Report of a Topographical and Geological Exploration of the Western Districts of the Nelson Province, New Zealand. Pp. 1-150. Nelson: C. & J. Elliott.
- HAAST, J. 1862. Observations on the birds of the Western Districts of the Province of Nelson, New Zealand. Ibis 4: 100-106.
- HEAPHY, C. 1842. Narrative of a Residence in Various Parts of New Zealand. Pp. viii + 1-142. London: Smith, Elder & Co.
- HEAPHY, C. 1846. Account of an exploratory expedition to the S.W. of Nelson. Nelson Examiner 5 (209): 3, (210): 5-6.
- HECTOR, J. 1863. Geological expedition to the West Coast of Otago, New Zealand. Otago Provincial Government Gazette VI (274): 434-468.
- MARSHALL, W. B. 1835. A Personal Narrative of two Visits to New Zealand in His Majesty's Ship Alligator A.D. 1834. Pp. xvi + 353. London: J. Nisbet & Company.
- POTTS, T. H. 1869. On the birds of New Zealand. Transactions and Proceedings of the New Zealand Institute 2: 40-78.
- REES, W. L.; REES, L. 1892. The Life and Times of Sir George Grey, K.C.B. Pp. 1-496, illus. Auckland: H. Brett.
- RUTHERFORD, J. 1961. Sir George Grey, K.C.B., 1812-1898. Pp. xvii + 1-709, illus. London: Cassell & Company Ltd.

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BIRDS OF THE WESTERN CHAIN SNARES ISLANDS, NEW ZEALAND*

By P. M. SAGAR

ABSTRACT

Birds observed during a visit to Rima Islet of the Snares Western Chain on 21 November 1976 were counted. The results of previous landings on the five main islets of the Western Chain are discussed and a distribution of the four breeding species (Snares Crested Penguin, Salvin's Mollmawk, Snares Cape Pigeon and Fulmar Prion) is proposed. Their breeding cycles are discussed.

INTRODUCTION

The subantarctic Snares Islands (48°02'S, 166°36'E) lie 100 km south of the southern tip of Stewart Island, New Zealand. These islands support a large seabird population and three endemic landbird subspecies. Despite the short distance between the Western Chain and the main Snares group (Figure 1A) there are major avifaunal differences. Salvin's Mollmawks (*Diomedea cauta salvini*) and Fulmar Prions (*Pachyptila crassirostris*) breed on the Western Chain but not on Main Island, and the breeding cycle of the Snares Crested Penguin (*Eudyptes robustus*) is later on the Western Chain than elsewhere.

On 21 November 1976 the five members of the University of Canterbury 1976-1977 Expedition, based on Main Island, landed on Wha and Rima Islets of the Western Chain. These landings completed the initial exploration of the five main islets (Figure 1B), which were described and named by Fleming & Baker (1973). An updated list of birds is now presented. Wha and Rima are the southernmost islets of the chain, each rising steeply out of deep water to a height of 80 m. The geology and petrography of the Western Chain were described by Fleming (1953) and Watters & Fleming (1975).

HISTORICAL

The Snares were discovered in 1791 by Captain Vancouver (McNab 1907) and were probably visited by sealers during the nineteenth century. The first published account of a landing on the Western Chain was that of Falla on Rima Islet in 1947 (Fleming 1948; Stead 1948). Large numbers of Cape Pigeons (*Daption capense australe*) and "populous" Snares Crested Penguin colonies were recorded breeding, with White-capped Mollmawks (*Diomedea cauta*) breeding on adjacent islets. The next recorded landing was on Tahī,

* University of Canterbury Snares Islands Expeditions Papers No. 30.

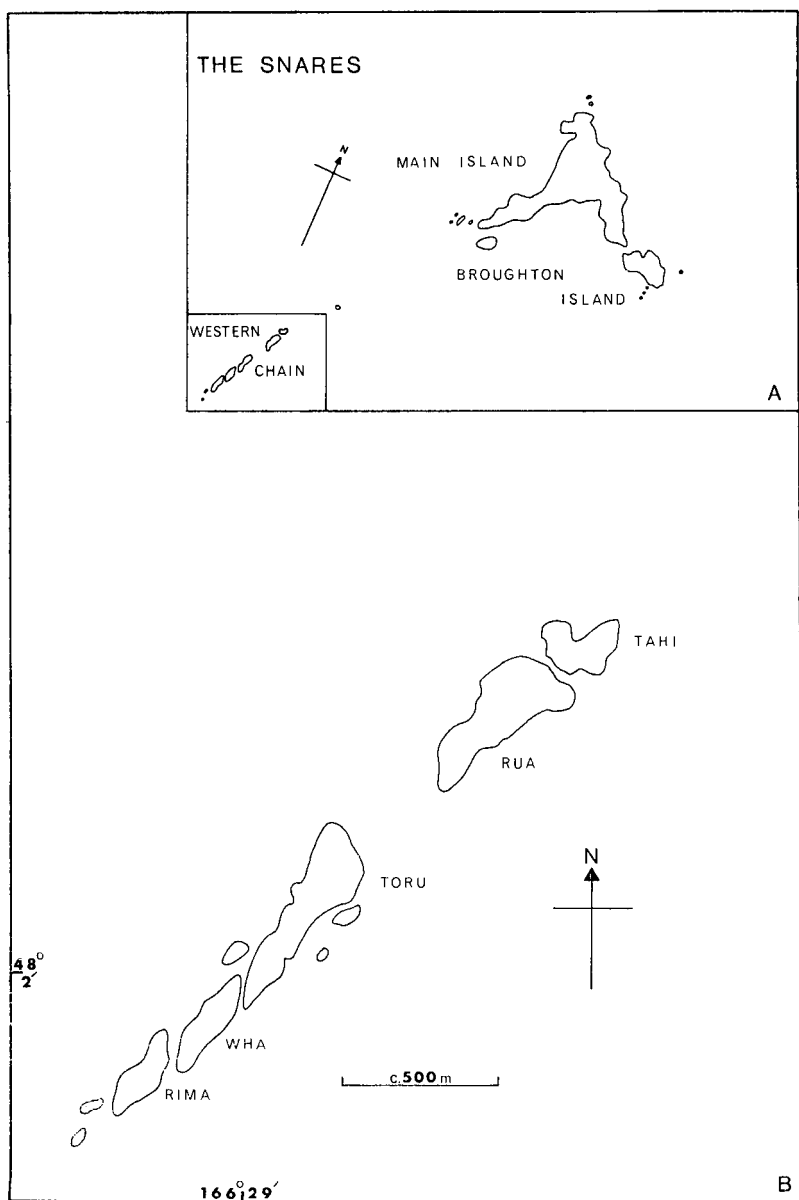


FIGURE 1 — The Snares Islands, New Zealand.
A. The Snares Islands, inset = Western Chain.
B. The Western Chain.

by Dawson and Singleton in 1964 (Dawson 1964), who confirmed the breeding of Cape Pigeons on this islet. Fleming & Baker (1973), after their landing on Toru in 1972, summarised the species breeding in the islets as follows: Snares Crested Penguins on Toru but not Tahī and Rua; Salvin's Mollymawks on Toru, Wha and Rima but not Tahī and Rua; Cape Pigeons on Toru, but not Tahī and Rua. They confirmed the breeding of the Fulmar Prion on Toru, originally proposed and queried by Mathews & Iredale (1913).

On 21 November 1976 the five members of the 1976-1977 University of Canterbury Snares Islands expedition (J. W. Early, G. D. Fenwick, D. S. Horning, P. M. Sagar and J. L. Woods) spent eight hours on Rima Islet. Observations made by Dr D. S. Horning on Wha Islet also on this date are included in this paper.

RESULTS AND DISCUSSION

SNARES CRESTED PENGUIN:

Adults and occupied nests were counted. However, because of the difficulty in locating nests this number is probably an underestimate. This species nested solitarily in caverns under large boulders, which were inaccessible to Salvin's Mollymawks and sheltered from prevailing winds. Nests were frequently found by sighting an unoccupied bird standing on a rock above the nest-site. Nests were formed from small quantities of granite chips (10-20 mm diameter) and granite dust.

The contents of occupied nests were examined by causing the sitting bird to rise. Sixty birds were incubating eggs, while 14 were on empty nests. Fleming & Baker (1973), on 2 December 1972, found incubating birds. Their observations represented a breeding season delay of at least 26 days over those birds breeding on the Snares Main Island (Warham 1974). My observations represent a breeding season delay of at least 15 days and, therefore, do not support the alternative explanation suggested by Warham (1974), that inclement weather before 2 December 1972 destroyed the eggs and/or chicks and that the remaining birds were sitting on infertile eggs. Warham also noted differences in chick development between Main Island colonies that he suggested could arise through different laying dates and/or the effects of varying degrees of exposure.

No breeding Snares Crested Penguins were seen on Wha Islet.

SALVIN'S MOLLYMAWK:

On Rima I counted 706 adults, 122 live chicks, 13 dead chicks and 9 eggs. Adults not at nests congregated in the more sheltered areas while nests tended to be in the most sheltered areas such as under rock overhangs and in crevices. Nest materials were weathered granite and guano. Two live adults were found caught between rocks by the wing or tarsus. Both were freed but were in such a weak state that they probably did not survive. How the birds became trapped

is not known. However, this situation probably represents a minor mortality factor in this species.

Chicks were estimated to be from 3 to 45 days old; all were in slate-grey down and being guarded by an adult. Five eggs were being incubated. This agrees well with the known breeding cycle of the same subspecies on the Bounty Islands (47°43'S, 179°05'E). Oliver (1955) reported that Falla's expedition to the Bounty Islands found pipped eggs and newly hatched young on 10 November 1950.

Eight eggs were measured on Rima and ranged from 96.1-109.0 x 65.2-68.6 mm with a mean of 102.6 ± 4.10 x 66.5 ± 1.00 mm.

A dead chick was collected and 837 ticks (*Ixodes ?uriae*) taken from it. Johnstone, Milledge & Dorward (1975) recorded heavy infestations of *Ixodes auritulus* on White-capped Mollymawk (*Diomedea cauta cauta*) chicks at Albatross Island (40°22'S, 144°40'E) and considered these to be a factor affecting chick mortality. These data support their consideration.

Salvin's Mollymawks were not found breeding on Wha.

The excess number of adults (706) over number of occupied nests (144 including those with dead chicks) indicates that a large proportion of the population had either failed to breed or were non-breeders. Fleming & Baker (1973) estimated that over 1000 pairs nest on the Western Chain. They saw "some hundreds on the SE side of Toru" and "200 were visible on an air photo of Rima and the total population must exceed a thousand nests." No estimate was given for the number of birds they saw on Wha. However, Dr Horning's observations suggest that they would not have been breeding.

Taking egg and chick losses into account, not more than 200 pairs nest on Rima Islet. A careful count of the occupied nests on Toru is required before the total population is known accurately.

SNARES CAPE PIGEONS:

The numbers of this species breeding on Rima were too great to be counted in the time available. Nests, in crevices and under rock overhangs, were made of weathered granite and granite chips. Birds were continually visiting and leaving nest-sites while large flocks fed inshore.

Twenty eggs were measured and ranged from 57.5-66.5 x 40.4-44.6 mm with a mean of 60.6 ± 2.14 x 42.5 ± 1.08 mm.

Large concentrations were breeding on Wha.

FULMAR PRION:

On Rima nests were found in the NW and NE areas of the islet. Here large rocks formed a jumble over the solid rock foundations. Nests were deep under these rocks in an area inaccessible to both

Snares Crested Penguins and Salvin's Mollymawks. Nests were shallow scrapes in granite debris, occasionally lined with penguin feathers. Unoccupied birds were seen sitting on the rocks above the nest sites in both areas. Large flocks were feeding close inshore and there was movement from the flocks to the breeding areas.

Thirteen eggs were measured and ranged from 44.2-48.6 x 30.7-34.0 mm with a mean of 46.1 ± 1.14 x 32.9 ± 1.04 mm. This subspecies is recorded as breeding on Bounty Island (Oliver 1955).

No Fulmar Prions were observed on Wha.

OTHER SPECIES:

Five other species were recorded on, or flying over, the Western Chain. The skull of a Broad-billed Prion (*Pachyptila vittata*) was found on Rima; its condition indicated it had been preyed upon. Four Black Shags (*Phalacrocorax carbo*) were flushed from Rima at our approach. They flew NE along the Western Chain. A Southern Skua (*Catharacta lonnbergi*) was seen feeding on a carcass on Wha. It is surprising that more of this species were not recorded as Fulmar Prions would appear to be a readily accessible prey. Two Red-billed Gulls (*Larus novaehollandiae*) were seen on a rock platform just above mean high water on Rima. Finally, an Antarctic Tern (*Sterna vittata*) was seen flying over Rima.

CONCLUSIONS

The combined observations of Fleming & Baker (1973) plus those of this paper indicate that Snares Crested Penguins breed on Rua, Toru and Rima Islets; Salvin's Mollymawks breed on Toru and Rima Islets; Cape Pigeons breed on Tah, Rua, Toru, Wha and Rima Islets and Fulmar Prions breed on Toru and Rima Islets.

; The precise delay in breeding of Snares Crested Penguins on the Western Chain over those on the Snares Main Island has yet to be determined. The total population of breeding Salvin's Mollymawks on the Western Chain has yet to be determined accurately.

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LITERATURE CITED

- DAWSON, E. W. 1964. Antarctic oceanography, 1963-64. *Antarctic* 3 (10): 430-432.
FLEMING, C. A. 1948. The Snares Islands Expedition, 1947. *New Zealand Bird Notes* 2 (8): 181-184.
———. 1953. The geology of the Snares Islands, Part 1: General Geology. *Scientific Results of the New Zealand Sub-Antarctic Expedition, 1941-45. Cape Expedition Series Bulletin* No. 13: 9-27, figs 1-15.

- FLEMING, C. A.; BAKER, A. N. 1973. The Snares Western Chain. *Notornis* 20 (1): 37-45.
- JOHNSTONE, G. W.; MILLEDGE, D.; DORWARD, D. F. 1975. The White-capped Albatross of Albatross Island: Numbers and breeding behaviour. *Emu* 75 (1): 1-11.
- McNAB, R. 1907. Murihiku and the Southern Islands. Invercargill: W. Smith, 377 p.
- MATHEWS, G. M.; IREDALE, T. 1913. A reference list of the birds of New Zealand. Part I. *Ibis* 1: 201-263.
- OLIVER, W. R. B. 1955. New Zealand Birds. 2nd ed. Wellington: A. H. & A. W. Reed, 661 p.
- STEAD, E. F. 1948. Birdlife on the Snares. *New Zealand Bird Notes* 3 (3): 70-79.
- WARHAM, J. 1974. The breeding biology and behaviour of the Snares Crested Penguin. *Journal of the Royal Society of New Zealand* 4 (1): 63-108.
- WATTERS, W. A.; FLEMING, C. A. 1975. Petrography of rocks from the Western Chain of the Snares Islands. *New Zealand Journal of Geology and Geophysics* 18 (3): 491-498.

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CORRIGENDUM

Due to a proof-reading lapse, a "fun" title for the review on page 144 of *Notornis* 24 (2), June 1977, appears as the true title of the volume reported on. "Wishbones for Wetmore" would be a librarian's nightmare! We regret any confusion.

ANNUAL GENERAL MEETING 1977

The Society's 38th Annual General Meeting was held on Saturday, 21 May, at the Auckland Museum and was attended by 90 members and friends. The President, Mr B. D. Bell, presented his report on the ornithological year. Australian vagrants continue to be reported, the more interesting being a Yellow-billed Spoonbill, Plumed Egret, Australian Pelican, Red-kneed Dotterel and a Pallid Cuckoo. Hoary-headed Grebes have again bred in Southland and the Australian Little Grebe has bred for the first time. Three prominent advancements of the Society were outlined. A study course for Junior Members has been held on Farewell Spit, the publication of OSNZ News was a new venture that had appeal to most members and provided a vital means of communication and the Mapping Scheme was at a stage where plans for final publication were being made. It is hoped to publish an atlas of distribution maps within the year. Council has agreed to cease further reprinting of back-numbers of *Notornis*; as stocks decrease they will become available to libraries only. The reports of Scheme Organisers were summarised and the Financial Report discussed; these are printed here in full. Over the last year projects assistance has been provided to: subsidise Junior Members attending the Farewell Spit Course, purchase a telescope currently on loan to the Manawatu Region for their study of an estuary and to assist the long-standing research on N.Z. Dotterel. Confirmation was given of the Study Course being held in the Bay of Plenty during January 1978.

Mr Bell believes the Society has a promising future with many enthusiastic members. However, the problem of rising travel costs is affecting us all and members will need to co-operate with others when pursuing their field activities.

A meeting of Regional Representatives was held on the Saturday morning, where after discussing local problems and achievements, Dr P. C. Bull presented each with a draft atlas of distribution maps. During the afternoon conference Dr C. Watt, Entomology Division, DSIR, spoke on the nest fauna of New Zealand birds. He made a request for further nests, sealed in a cloth or paper bag, to be sent to him in Auckland. Mr R. B. Sibson gave an informal address on a range of subjects, mainly concerned with active speciation occurring in our avifauna; which was particularly stimulating to those who may have felt that — 'all the work has been done.' The AGM was then preceded by an excellent dinner catered for by the Auckland Herbal Society.

On the Sunday morning about 40 members were escorted by Dr R. Lockley around Tahuna-Torea, a bird reserve on the shore of the Tamaki Basin. The day was wet and the birds were few but members were impressed with how the land had been managed for birds and birdwatchers. Acquaintances were identified beneath parka hoods and the conviviality of the weekend continued.

P. D. GAZE
Hon. Secretary

TREASURER'S REPORT

For Year Ended 31 December, 1976



The membership at the end of the year was 1174, an increase of 13 for the twelve months. New members admitted totalled 128; 64 left by resignation and 51 were struck off unfinancial. The classes of members are 1 honorary life, 78 life, 739 ordinary, 57 junior, 9 family, 116 corporate bodies, 87 husband and wife, counting as two, total 1174.

The income for the year was \$13540, an increase of \$2096. Subscriptions increased by \$471 mainly due to the increased subscriptions now being charged to libraries, universities and other institutions. The profit on the sale of Christmas cards, \$4391, is almost double last year's record amount of \$2266. Interest is about the same as last year but it should be noted that the interest earned on the Projects Assistance Reserve Fund investments amounting to \$441 has been credited direct to that Fund.

Expenses totalled \$9825, an increase of \$94. The cost of printing and distribution of *Notornis*, including the cost of the December *OSNZ News*, was \$7502, \$733 more than last year. The cost of having back numbers of *Notornis* reprinted was \$967 which is \$713 less than the previous year.

The profit from the sale of Christmas cards \$4391 was mainly responsible for making the surplus on the year's working \$3715, which has been transferred to the Accumulated Fund.

The Projects Assistance Reserve Fund was credited with \$1249, royalties on the revised *Field Guide* received during the year. A grant of \$1000 was made from the Fund to the Miranda Naturalists' Trust for assistance with the building of a bird observatory.

During the year investments of \$5000 with The Perpetual Trustees Co. Ltd. matured and were reinvested in the Development Finance Corporation of N.Z. secured debenture stock \$3000 at 9½% interest maturing on 30/6/79 and \$2000 at 9¾% interest maturing on 30/9/81. \$3000 was invested in Christchurch Drainage Board debenture stock at 9½% interest maturing on 1/8/82. These investments are authorised trustee investments.

H. W. M. HOGG, *Hon. Treasurer*

THE ORNITHOLOGICAL SOCIETY OF N.Z. (INC)STATEMENT OF ACCOUNTS FOR THE YEARENDED 31 DECEMBER 1976

<u>1975</u>	<u>INCOME WAS EARNED FROM</u>	
6325	Subscriptions	6796
199	Transfer from Life Members	225 (Note 1)
59	Donations	120
2266	Profit from Christmas Cards	4391
602	Sale Back Numbers	323
109	Surplus Summer School	-
20	Surplus Annual General Meeting	-
46	Sale Car Stickers	16
25	Biology of Birds	38
<u>9651</u>	<u>TOTAL ORDINARY INCOME</u>	<u>11909</u>
	<u>PLUS INVESTMENT AND OTHER INCOME</u>	
1615	Interest	1601 (Note 11)
31	Royalties	30 (Note 111)
5	Booksellers Margin on direct Checklist Sales	-
102	Legacy Late W.J. Burns	-
40	Sale of Tent	-
<u>1793</u>	<u>TOTAL INVESTMENT & OTHER INCOME</u>	<u>1631</u>
<u>11444</u>	<u>TOTAL INCOME</u>	<u>13540</u>
	<u>LESS EXPENSES</u>	
6769	<u>'Notornis' and 'OSNZ News' Printing and Distribution</u>	7502
-	Annual General Meeting	23
50	Audit Fee	85
76	Beach Patrol Scheme	-
168	Car Stickers	-
-	Donations	20
215	General Expenses	152
124	Kermadec Reprints	-
50	Library Expenses	134
-	Nest Record Scheme	36
137	Postages	190
211	Printing and Stationery	222
40	Royal Society Affiliation	20
211	Travelling Expenses	474
<u>1680</u>	<u>'Notornis' Reprinting</u>	<u>967</u>
<u>9731</u>	<u>TOTAL EXPENSES</u>	<u>9825</u>
1713	SURPLUS FOR YEAR TRANSFERRED TO ACCUMULATED FUND	3715
=====		=====

THE ORNITHOLOGICAL SOCIETY OF N.Z. (INC)BALANCE SHEET AS AT 31 DECEMBER 1976

<u>1975</u>	<u>CURRENT ASSETS</u>		
4588	Cash at Bank of New Zealand	3572	
-	Amount owing to Society	373	
799	Bank of New Zealand Savings A/c	28	
1500	Term Deposits Bank of New Zealand	5500	
<u>100</u>	Stock of <u>Notornis</u>	<u>100</u>	(Note IV)
6987	<u>TOTAL CURRENT ASSETS</u>		9573
	<u>INVESTMENTS</u>		
-	Local Body Stocks	3000	
	The Perpetual Trustees Co Ltd		
12000	Group Trustee Investments	7000	
	B.N.Z. Finance Co Ltd		
5528	First Ranking Debenture Stock	5889	
	Development Finance Corp of N.Z.		
<u>-</u>	Secured Debenture Stock	<u>5000</u>	
17528	<u>TOTAL INVESTMENTS</u>		20889
<u>1000</u>	Library at Valuation		<u>1000</u>
25515	<u>TOTAL ASSETS</u>		31462
	<u>LESS LIABILITIES</u>		
1735	Amounts Owed by Society	3023	
631	Subscriptions in Advance	656	
	<u>Reserve Funds</u>		
4650	Projects Assistance Reserve	5340	(Note V)
1799	Life Subscriptions	2028	
<u>1000</u>	Publications	<u>1000</u>	
<u>9815</u>	<u>TOTAL LIABILITIES</u>		<u>12047</u>
15700	<u>VALUE OF ACCUMULATED FUNDS AS BELOW</u>		19415
	<u>ACCUMULATED FUNDS</u>		
14037	Balance at 31/12/75	15700	
<u>1713</u>	Surplus for Year	<u>3715</u>	
15750		19415	
	Transfer to Projects Assistance		
<u>50</u>	Reserve Fund	<u>-</u>	
15700	<u>BALANCE AT 31/12/76</u>	.	19415
=====			=====

We report, that in our opinion, the foregoing accounts and notes attached of THE ORNITHOLOGICAL SOCIETY OF N.Z. (INC.) for the year ended 31 December 1976 are in agreement with the books and reports of the Society and give a true and fair view of the Society's position at that date and the results of its transactions for the year. The Society has kept proper books and supplied all the information required.

DUNEDIN: 10 MARCH 1977

THOMPSON & LANG

*Chartered Accountants
Auditors*



NOTES TO ACCOUNTS

NOTE I	Life members transfer: 10% of Balance at 31/12/76.		
NOTE II	The interest earned on the Projects Assistance Reserve Fund investments has been credited direct to the Fund.		
NOTE III	Royalties from Sales of <i>Checklist</i> .		
NOTE IV	Stocks of <i>Notornis</i> and Valuation of Library are at Standard Values. No attempt has been made to accurately value these assets.		
NOTE V	Projects Assistance Reserve.		
	Movements in this Reserve Fund during the year are:		
	Balance as at 1/1/76	.....	\$4650
	Plus Royalty on Revised <i>Field Guide</i>	.....	1249
	Interest earned by Fund	.....	441
			<hr/>
			\$6340
	Less Cash payment		
	Miranda Naturalists' Trust	.....	1000
			<hr/>
	Balance as at 31/12/76	.....	\$5340



DONATIONS 1976

The following donations of \$1.00 or more were received during the year.

Dr C. J. Ralph \$2.75; W. M. Burrows \$2; C. J. Foreman \$4; L. S. Rickard \$4; R. G. Mueller \$14; Rev. R. Burt \$4; D. M. Cunningham \$4; J. S. Thomson \$2 and \$6; Miss N. D. Tanner \$4; Miss B. Bird \$4; M. N. Sim \$1.50; Mrs L. Collingwood \$4; Mr & Mrs A. B. Cochrane \$1; J. F. Castle \$4; G. I. Hunt \$4; R. Jackson \$4; I. E. Cooksley \$2; P. Warren \$2; S. R. Emmens \$4; R. E. Satherly \$4; R. Cometti \$6; D. Saril \$1; Mrs N. Dyson \$2; Mrs E. M. Hannah \$4; A. H. Grootegoed \$4; G. Wightman \$2; Dr G. I. Nicholson \$2; Mrs H. F. Drake \$1; M. G. Turner \$4; Sir Charles Fleming \$10.

LIBRARY REPORT

It has been good to see more use made of the library this year, and thanks are due to the editor of *OSNZ News* for publicity and for publishing reviews.

Details are: 153 items borrowed, 30 on interloan, 31 by Auckland University and 92 by other members. An exchange has been arranged with the New Guinea Bird Society and we should soon be receiving a journal again from the Ornithological Society of Bavaria.

The year's allowance for replacement of missing back numbers has been spent on copies of *Wilson Bulletin* and Supplements to *Ostrich*, and we have also been able to replace Oliver's *New Zealand Birds*, 2nd Edition. A new list of books and periodicals has been printed but cataloguing of the remainder of Dr Deignan's collection of reprints is still to be done. In addition, 14 volumes of *Notornis* have been bound.

Sincere thanks to those who donated 29 items to the library this year — Messrs M. Ross, T. C. O'Callaghan, H. R. McKenzie, E. G. Turbott, C. R. Veitch, Mrs A. Prickett, Dr Michael Taylor and Dr Denis Hanna; also to Sylvia Reed for advice and help, including duplicating the new catalogue.

Once again we are indebted to the Director and Council of the Auckland Museum and Institute for providing space for the library and for the use of their Gestetner machine and to the Museum Librarian and his staff for so much willing help.

A. J. GOODWIN, *Hon. Librarian*



REPORT OF THE NEST RECORD SCHEME

For the Year Ended 30 April, 1977

There are now 11,684 nest record cards covering 146 species within the scheme. During the year ending 30 April 1977 334 nest record cards were received from 37 contributors. Observations were made for 54 species. New species for the scheme are Hoary-headed Grebe, Snares Island Snipe, Black Tit and Snares Fernbird.

Chris Lusk, working mainly in the Wairarapa, contributed 78 cards covering 28 species, a notable effort for a Junior member.

35 Colonial cards were received covering the following species: Gannet, Pied Shag, Little Shag, Pied Stilt, Black-backed Gull, Red-billed Gull, Black-billed Gull, Caspian Tern and White-fronted Tern.

Cards for 12 species were on loan during the year.

My sincere thanks to those who have contributed to the scheme.

Thanks go to my wife, Ruth, whose assistance with the Nest Record Scheme has been most valuable.

DAVID E. CROCKETT, *Convener*

LIST OF CONTRIBUTORS

W. J. Campbell (20), C. N. Challies (8), D. H. Brathwaite (2), M. Clarbrough (39), M. Conway, (2), R. S. Cowan (7), Tony C. Crocker (11), T. Curran (2), M. S. Field (1), K. Fletcher & R. V. McIntock (4), R. A. Froggatt (2), R. Genet (13), Bruce Goffin (2), R. Guest (4), Mathew Hastie (1), M. Heine (15), M. Irwin (1), I. G. McLean (35), C. H. Lusk (78), Neil Mair (16), Pat Miller (4), G. H. Moon (2), I. A. Nicholson (4), R. Odgers (1), Colin O'Donnell (4), Julie Paice (1), S. M. Reed (14), C. H. B. Robinson (2), W. A. Rodgers (4), P. M. Sagar (24), Jean F. Skinner (2), R. R. Sutton (4), Alison Taylor (1), M. Turner (1), Marion E. Wallis (2), K. Wright (1).

LIST OF ACCESSIONS TO THE NEST RECORDING SCHEME

Yellow-eyed Penguin 1; N.Z. Dabchick 1; Hoary-headed Grebe 1; Gannet 1; Black Shag 5; Pied Shag 1; Little Shag 6; Bittern 1; Canada Goose 1; Black Swan 4; Grey Duck 1; Mallard 5; Chukor 1; Banded Rail 1; Pukeko 7; Australian Coot 4; South Island Pied Oystercatcher 5; Variable Oystercatcher 3; Spur-winged Plover 4; Banded Dotterel 8; N.Z. Dotterel 13; Black-fronted Dotterel 1; Snares I. Snipe 1; Pied Stilt 33; Southern Skua 3; Black-backed Gull 45; Red-billed Gull 2; Black-billed Gull 1; Black-fronted Tern 9; Caspian Tern 11; White-fronted Tern 6; N.Z. Pigeon 2; Rock Pigeon 1; Kea 1; Little Owl 1; Kingfisher 2; S.I. Rifleman 4; Skylark 7; Welcome Swallow 14; N.I. Fantail 36; Black Tit 4; Snares Fernbird 6; Brown Creeper 1; Song Thrush 14; Blackbird 17; Hedge Sparrow 2; Tui 2; White-eye 7; Goldfinch 6; Redpoll 1; Chaffinch 3; House Sparrow 6; Starling 8; White-backed Magpie 3.



BEACH PATROL - INTERIM REPORT

During 1976, 140 people walked 3 041 kilometres on 480 beach patrols on all sections of coast except Fiordland. They found 5570 dead seabirds at an average rate of 2.13 per kilometre of beach covered monthly. Totals for each section of coast are:—

<i>Coast</i>	<i>Km</i>	<i>Birds</i>
Auckland West	1308	3871
Taranaki	157	79
Wellington West	100	274
Westland	8	2
Auckland East	535	509
Bay of Plenty	64	51
East Coast North Island	6	12
Wairarapa	22	14
Canterbury North	31	35
Canterbury South	39	142
Otago	21	27
Southland	86	206
Wellington South	152	211
North Coast South Island	10	101
Outlying Islands	76	36

After the large wrecks of 1974 and 1975 this is a pleasing return, for the birds at least, to more normal conditions.

My thanks are due to all who took part in the Beach Patrol Scheme during 1976.

C. R. VEITCH, *Scheme Organiser*



BIRD DISTRIBUTION MAPPING SCHEME

Annual Report for 1976

The computer office has at last provided draft maps showing the distribution of all but the rarest of New Zealand's land and fresh-water birds (the inadvertent omission of a map for Little Black Shag will be rectified later), and also for several shore birds, especially those that come up rivers or breed inland; maps have not been printed for arctic waders, nor for species that are mainly pelagic.

Enough copies have been made of each map to supply a set on loan to each member of Council and to each Regional Representative. Although some copies are of rather indifferent quality, they should assist council members to decide on the form in which the maps should be published, and also permit Regional Representatives to use their local knowledge in searching for possible errors (while there is still time for corrections) and to obtain the views of local members on the future of the mapping scheme. Members who wish to see the draft maps, or to assist in checking their accuracy, should contact their Regional Representative or nearest member of Council.

It is a pleasure to acknowledge the continued practical support of the Directors of Ecology Division (DSIR) and Wildlife Service (Department of Internal Affairs); copies of the draft atlas could not have been produced without this support. The Photographic Section of the Geological Survey helped with the problem of fitting coastlines to the computer maps. Finally, members should know that the significant progress achieved during the past year results mainly from the hard work, perseverance and enthusiasm of P. D. Gaze and C. J. R. Robertson.

P. C. BULL, *Scheme Organiser*



RARE BIRDS COMMITTEE

Annual Report for the Period

June 1976 - May 1977

Members: F. C. Kinsky (Convener)

B. D. Bell

D. H. Brathwaite

Sir Robert Falla

During the period June 1976 to May 1977 the Rare Birds Committee received four submissions, which were considered by the Committee, as set out below:

- A) The sighting of a Red-kneed Dotterel (*Charadrius cinctus*), Manawatu River estuary, 14th March 1976.

- The Committee confirmed the identification by majority vote.
- B) The sightings of a Yellow-billed Spoonbill (*Platalea flavipes*) in Northland in 1976. A photograph was submitted with the report.
The identification of this bird was confirmed by the Committee on a unanimous vote.
- C) The alleged sighting of five Stilt Sandpipers (*Micropalama himantopus*) at the Manawatu River estuary on 13th October 1976.
This submission was rejected unanimously by the Committee.
- D) Sighting of a Baird's Sandpiper (*Calidris bairdii*) at the Manawatu River estuary on 10th, 11th and 25th October 1976.
This submission was accepted and the identification was confirmed by the Committee, although only three out of the four committee members commented.

F. C. KINSKY, *Convener*



SHORT NOTE

THE FIRST OCCURRENCE OF THE YELLOW-BILLED SPOONBILL (*Platalea flavipes*) IN NEW ZEALAND

On 23 August 1976, I sighted a group of four waders at Rangaunu Harbour, Kaitaia. I was immediately able to identify three of the birds as a White Ibis (*Threskiornis molucca*) and two Royal Spoonbills (*Platalea leucorodia*), but the fourth, though obviously a Spoonbill, was larger and had distinctive yellow legs, feet and bill. The Spoonbills were feeding vigorously in the shallows on the mud-flats, sometimes venturing out into water 45-50 cm in depth. On occasion these three birds would form into a line and work along the shoreline with typical sideways movements of their bills.

After consultation with a colleague, and reference to Frith 1969 (*Birds in the Australian high country*. Reed) and Slater 1970 (*A field guide to Australian birds*. Rigby), I realised that the unusual Spoonbill was, in fact, a Yellow-billed Spoonbill (*Platalea flavipes*).

In its native Australia, the species ranges throughout most of the continent, with the exception of the south-west and Tasmania, frequenting swamps, shallow lakes, rivers and dams.

This, however, would appear to be the first record of a Yellow-billed Spoonbill in New Zealand and outside of continental Australia (Conden 1975, *Checklist of the birds of Australia*. RAOU).

A. E. BILLING, *C/o Wildlife Service, Department of Internal Affairs, Private Bag, Wellington.*

[A photograph, unfortunately not reproducible here, together with the text, was submitted to the Rare Birds Committee which confirmed the identification on a unanimous vote — see Annual Report 1976/77. — Ed.]

SHORT NOTES

UNUSUAL FEEDING OF STARLING

An unusual feeding technique of the Starling (*Sturnus vulgaris*) was witnessed on 18 April 1977 during a visit to the Masterton Borough Sewage Ponds. On one pond, particularly, several lots in twos were seen flying low over the water and gliding down with feet partially extended to pick up food from the water's surface, in the manner of a swallow. Later, a party of ten birds in a fairly compact assemblage was doing likewise. Small flocks of Starlings were feeding also along the concrete verge of the pond. There is no mention in *The Handbook of British Birds* (Witherby *et al.*) of Starlings feeding from the surface of water.

R. H. D. STIDOLPH, 120 Cole St, Masterton

★

RED-KNEED DOTTEREL (*Charadrius cinctus*) — FIRST RECORD FOR NEW ZEALAND

On 14 March 1976 at 0900 hours, just after high tide, the authors and Sybil Quin were watching a mixed flock of waders as part of the monthly census at the Manawatu Estuary. Separate from the main group, which included Knot (50), Wrybill (18) and Terek Sandpiper (2), feeding along the tidal edge was a strange dotterel. At first glance the bird resembled a Black-fronted Dotterel (*Charadrius melanops*), with which we were all familiar, but its markings were soon seen to be quite different. We moved closer and, using 8x40 binoculars, watched it for thirty minutes at distances varying between twenty and thirty-five metres. The morning light, although not ideal, was bright and viewing conditions were good.

While under observation the bird was extremely active, running along the tidal edge, feeding rapidly, picking at the surface and on occasions entering the water. It flew only once, wheeling with the mob, its flight noted as being rapid, quite unlike the undulating action of the Black-fronted Dotterel.

Most distinctive was the white bar along the leading edge of the closed wing, and, when the bird was watched in flight, the broad white trailing edge of the wing (formed by the white secondaries) contrasted with the darker remainder. A broad black breast band narrowing slightly at centre-front tapered to a narrow collar around the neck and onto the hind-neck. Throat, chin and side of the neck were white, creating a clear-cut triangular patch contrasting with the black collar and uniform grey head. Underparts and underwing were

white. On these features alone we (and the Rare Birds Committee; see Annual Report 1976/77) were in no doubt that the bird was, in fact, an adult Red-kneed Dotterel (*Charadrius cinctus*).

Although named the Red-kneed Dotterel the red knees, or more correctly as Mr R. B. Sibson (pers. comm.) notes "red ankles," are not readily distinguishable in the field due to the active behaviour of the species. Another possible ambiguity which we have noted is that the scientific name *Charadrius cinctus* = banded dotterel, and we suggest the local Banded Dotterel (*Charadrius bicinctus*) might be more correctly called the Double-banded Dotterel as it is in Australia where both species occur.

Although the Red-kneed Dotterel was certainly the highlight of the year, comprehensive counts by Manawatu members produced an unusually high number of rarities. Royal Spoonbill (*Platalea leucorodia regia*) numbers reached a record peak of 52 in March 1976 and, interestingly, a small group stayed over summer. In early December a single White Ibis (*Threskiornis molucca*) joined them and remained till February 1977. Other notable records included: 14 Spur-winged Plover (*Lobibyx novaehollandiae*), 31 Golden Plover (*Pluvialis dominica fulva*), one juvenile N.Z. Dotterel (*Charadrius obscurus*), 3 Long-billed Curlew (*Numenius madagascariensis*), 3 Terek Sandpiper (*Xenus cinereus*), 17 Sharp-tailed Sandpiper (*Calidris acuminata*), 3 Pectoral Sandpiper (*Calidris melanotos*), 7 Curlew Sandpiper (*C. ferruginea*) and a possible Baird's Sandpiper (*C. bairdi*) [see Annual Report, Rare Birds Committee, 1976/77]. These results perhaps show that regular watching at an estuary can pay dividends.

H. A. ROBERTSON, No. 1 R.D., Ackautere Drive, Palmerston North,
and M. D. DENNISON, 129 Renall Street, Masterton



THE ENERGY VALUE OF THE YOLK RESERVE IN A NORTH ISLAND BROWN KIWI CHICK (*Apteryx australis mantelli*)

Reid 1971 (*Notornis* 18 (4): 250-252) found that the yolk of a fresh kiwi egg contained 43.3% water and 56.7% solids; and Calder & Rowe 1977 (*Notornis* 24 (2): 129-135) found that the yolk of another egg had an energy value of 18.16 kilojoules (or 4.34 Kcal.) per gram wet weight.

An egg laid at the Mt Bruce Reserve measuring 126.9 x 78.3 mm and having a calculated fresh weight of 435-440g produced a chick which immediately following hatching and while wet weighed 351.3g. This chick died 37 hours after emerging from the shell and at the time of death its weight had decreased by 60.8g to 290.5g. Surface moisture on newly hatched chicks is thought to weigh about 15-25g so the actual

decrease in body weight during the time the chick was alive was about 35 to 45g, or about 1g/hour. Post-mortem examination revealed a yolk-sac containing 86.5g yolk and analysis showed this yolk to contain 43.55% water and 56.45% solids; and to have an energy value of 18.34 kilojoules (4.38 Kcal.) per gram wet or 32.49 kilojoules (7.76 Kcal.) per gram dry weight.

The very close agreement between the proportions of solids and between the relative energy values of yolk in kiwi eggs and in a kiwi chick would indicate that the composition of the yolk, at least in so far as these criteria are concerned, probably changes very little during embryonic development.

Another chick that died between the ages of 12 and 15 hours had then a yolk reserve weighing 111.9g (Reid 1972; *Notornis* 19 (3): 261-266). This second chick, therefore, lived for about 24 hours less and carried about 25g more yolk in its sac than the chick mentioned above. Data from both chicks would indicate that young kiwis lose weight at a rate of approximately 1g/hour during their first 24-36 hours following hatching and this, in turn, implies that both of these chicks emerged from their shells carrying a yolk reserve considerably greater than shown by the dissections i.e. about 120-125g yolk with an energy value of approximately 2235 kilojoules (535 Kcal.) in the case of the first (351.3g) chick.

The data given by Calder & Rowe show that a fresh egg having the same dimensions as the egg from which this chick hatched would have an energy content of about 5140 kilojoules (1225 Kcal.). Hence, it seems that the prolonged developmental process within the kiwi egg utilizes only 56 or 57% of the stored energy — and the disproportionately large surplus (when compared with that available to chicks of other species) is available to nourish the young kiwi during its first week, or more, of life.

I am indebted to Trevor Daly, Chemistry Division, DSIR, for calorimetric analysis of the yolk sac, and to Tony Caley and Colin Roderick for weights of chicks hatched at Mt. Bruce.

BRIAN REID, *Wildlife Service, Department of Internal Affairs, Private Bag, Wellington*



NEW ZEALAND FALCON EATING CARRION

On 17 January 1977, at Jackson Bay, south of Haast, I observed a New Zealand Falcon flying low over the wharf. It landed on the boulder beach and began eating a fish head. This is unusual in that they are usually stated not to be carrion eaters. I was able to approach

to within 10 m of the bird and watched it for several minutes before it flew off into the bush.

KEVIN TAYLOR, *Ainola, Goat Island Road, Leigh, R.D. 1*



STATUS CHANGES IN GARDEN BIRDS

Daily records of birds observed in my garden in Masterton in a 12-month period — May 1942 to April 1943 inclusive — compared with a similar record in the 12 months — May 1971 to April 1972 — indicate the changes that have taken place in the intervening 29 years. The trees and shrubs in the garden have remained basically the same, with the minimum alteration in the environment in the garden or in its immediate neighbourhood.

Four species have maintained their numbers: Blackbird (*Turdus merula*), House Sparrow (*Passer domesticus*), Starling (*Sturnus vulgaris*) and Silvereye (*Zosterops lateralis*) being recorded on every day of observation.

Two species showed a slight decrease, the first figures in each instance giving the days recorded in 1942-1943, the second those in 1971-1972: North Island Fantail (*Rhipidura fuliginosa placabilis*), 166-144; Tui (*Prosthemadera n. novaeseelandiae*) 98-78.

Greater decreases in varying degrees were shown by eight species: Chaffinch (*Fringilla coelebs*) 229-126; Goldfinch (*Carduelis carduelis*) 184-74; Greenfinch (*Carduelis chloris*) 62-10; Hedge Sparrow (*Prunella modularis*) 276-173; N.Z. Kingfisher (*Halcyon sancta vagans*) 19-1; Song Thrush (*Turdus philomelos*) 365-174; Shining Cuckoo (*Chalcites l. lucidus*) 13-3; Grey Warbler (*Gerygone i. igata*) 257-37. As the Kingfisher is of erratic occurrence in built-up areas and has remained widely distributed in the district generally and actually increased in numbers in the past 30 years, the above garden record is of no significance. The decrease in records of the Shining Cuckoo possibly bears some relation to the substantial drop in the numbers of the Grey Warbler. The other introduced species listed above have shared in the general decrease of birdlife apparent throughout the Wairarapa.

Eight species recorded in 1942-43 were not seen in 1971-72: Californian Quail (*Lophortyx californica brunnescens*) 8-0; Morepork (*Ninox n. novaeseelandiae*) 18-0; N.Z. Pipit (*Anthus n. novaeseelandiae*) 5-0; Pukeko (*Porphyrio porphyrio melanotus*) 3-0; Indian Myna (*Acridotheres tristis*) 4-0; Redpoll (*Acanthis flammea*) 96-0; Skylark (*Alauda arvensis*) 25-0; Yellowhammer (*Emberiza citrinella*) 10-0.

Except for occasional birds brought to the district, mostly from Hawkes Bay, the Myna no longer inhabits the Wairarapa. The Pipit,

Skylark, Pukeko and Yellowhammer lost their habitat when a large area of open land a short distance up the street was developed for housing; the Pukeko and Skylark formerly bred in the area. The Californian Quail, Morepork, Redpoll and Yellowhammer have all declined district-wide. The Redpoll was formerly recorded during the breeding season and bred in the garden and vicinity.

Recorded in 1942-1943, substantially increased in 1971-1972: White-backed Magpie (*Gymnorhina tibicen hypoleuca*) 9-127. This species has increased throughout the district.

Not present in 1942-1943, recorded in 1971-1972: Barbary Dove, feral, (*Streptopelia risoria*) 0-365; N.Z. Falcon (*Falco novaeseelandiae*) 0-4.

Since it became established in a feral state in 1971 the Barbary Dove has been a constant inhabitant of the garden and other areas in the neighbourhood. The Falcon is widely distributed throughout the district and is frequently observed flying overhead from the garden.

R. H. D. STIDOLPH, 120 Cole Street, Masterton



REACTIONS OF FEEDING WADERS TO BROWN RATS

On 23 March 1975, *Union South Pacific* was at the wharf at Nuku'alofa, Tonga. Since it was Sunday there were no cargo operations in progress and the wharf area was quiet. From the ship it was possible to see over the wharf shed onto a reclaimed area where, after recent heavy rain, there were some large shallow pools. Throughout the day, waders were seen at these pools, three species being noted: Pacific Golden Plover (*P. dominica*), Turnstone (*A. interpres*) and Tattler, probably *T. incana*. The highest numbers seen together were six Golden Plover, four Turnstones and three Tattlers.

The whole area was alive with rats, up to 15 being counted in sight at once. It was interesting to observe the reactions of different species of birds to the rats. Many times a rat was seen to run at the birds as if to attack, and each time the specific reaction was the same. The Golden Plovers and the Turnstones just lifted clear of the rat, drifted a few feet, and landed again, remaining quiet throughout. The Tattlers, however, jumped up, calling loudly and flew rapidly clear of the reclamation altogether.

JOHN JENKINS, 14 Lechiel Road, Remuera, Auckland

TWO LESSER YELLOWLEGS IN NEW ZEALAND IN SUMMER 1973/74

A Lesser Yellowlegs (*Tringa flavipes*) found at Karaka, in the Manukau Harbour, on 28 October 1973 by Mrs Joan Trollope and the writer was confirmed by R. B. Sibson next day. The bird remained in the vicinity of the shellbanks and was seen by at least fourteen members during the first six weeks. Toward the end of this period it was absent at times and was seen to fly in from the west with Turnstones (*Arenaria interpres*) and Bar-tailed Godwits (*Limosa lapponica*). It was last seen on 9 March 1974.

Preliminary identification was made on the following points: It was an obvious "shank," in some ways reminiscent of a Marsh Sandpiper (*Tringa stagnatilis*) seen in the Firth of Thames in 1963; long necked, slim of body, but a much browner bird with long bright yellow legs; body length that of a Turnstone; in flight, an eye-catching white patch on rump and upper tail and long legs trailing well beyond the tail; straight bill, less needle-like than that of *T. stagnatilis*, wing coverts conspicuously spotted with white.

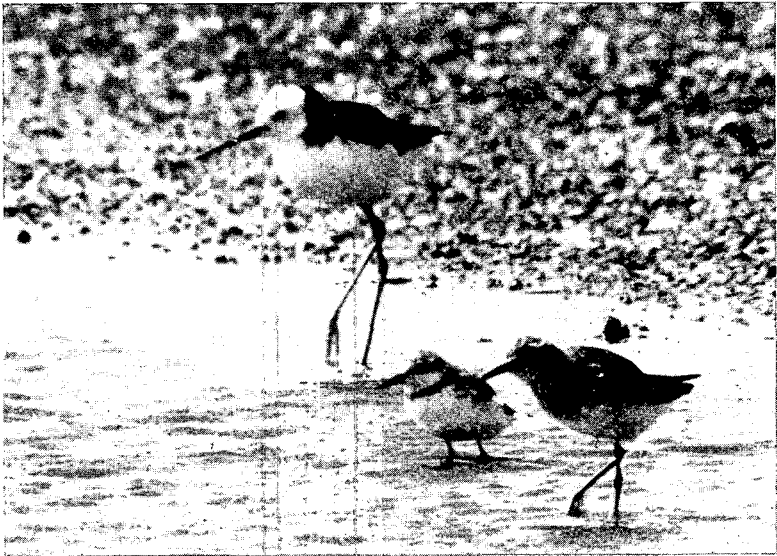


FIGURE 1 — Pied Stilt and Wrybill with Lesser Yellowlegs, Karaka, November 1973.
Photo: J. A. Brown

When first seen the bird was seemingly still in breeding plumage. Colour and monochrome photographs, taken by J. A. Brown in the first week of November, show it in a partially faded stage with other waders, Pied Stilt (*Himantopus leucocephalus*), Red-necked Stint

(*Calidris ruficollis*) and Wrybill (*Anarhynchus frontalis*) giving useful size comparisons (Fig. 1). Its almost ceaseless activity made it an extremely difficult camera subject.

Crown: medium grey-brown with paler streaking.

Cheek, throat, side of neck, nape and hind-neck: pale grey-brown.

Chin: whitish.

Ear coverts: dark.

Superciliary: light line from above eyes to bill. A dark line through eye.

Eye: large, dark.

Bill: black, straight, comparable in length with tibia.

Breast: pale grey-brown overlaid with vertical brown striations forming a barely defined "bib," less obvious in the field than in photographs, and a whiter area forward of scapulars.

Sides and flanks: some fine dark spotting showed below the folded wing.

Belly and undertail: whitish.

Mantle: medium grey-brown with darker centres to feathers.

Scapulars: similar to mantle, but a little darker.

Wing coverts: warm brown with pale centres to feathers giving a strikingly spangled effect. This faded but was still discernable five weeks later.

Primaries: blackish brown.

Primary coverts and secondaries: dark brown.

Back: medium grey-brown.

Rump: a large white area whose forward edge curved upward while the sides were level with the scapulars.

Tail coverts: white.

Tail: brown tipped, with lighter brown appearing as fine barring when viewed laterally.

Underwing: primaries dark, coverts light fawn and axillaries white.

Legs: bright yellow, showing an orange cast in some lights, long and slender with an elevated hind toe.

Flight: fast and erratic, at times difficult to follow. Often led other birds in flight i.e. Turnstones and Stilts. When alarmed it would take off, jink erratically over a wide area before settling into a long smooth descent to alight near its take-off point.

Voice: mainly silent, not heard until 2 December 1973 when it uttered a soft two-syllabled call three times as it flew. There

was a longer interval between the second and third, than the first two parts of the call.

Size: when first seen at 30 to 40m the head was turned away and my first thought was that it was a Terek Sandpiper (*Tringa cinerea*). Total length would be two-thirds that of a Stilt, about 10 inches (254 mm), with bill length about 1½ inches (38.1 mm). Once, as it slept on a shellbank between two Turnstones, all with heads turned back, only the long legs revealed its identity.

It was an extremely active bird which fed avidly over the mud or waded, at times up to the belly in water, usually picking on or just under the surface, although on more than one occasion the entire face was submerged. It fed with quick "dabs" stepping sideways on the small pebbles at the edge of a stream, or sometimes crouched and reached well forward. Once or twice the bill was dabbled with a chewing action and it took small shellfish and probably a snail. On the first day it was very wary but soon became a little more settled, feeding more continuously and frequently than any of the other waders with which it formed a loose association. It was often chivvied by stilts and would bob nervously or fly off a few feet. Its height, as it fed slightly crouched among these, was slightly less than the stilts' leg length. The leg joints seemed to protrude sideways giving it an oddly gawky appearance. On the larger tides it roosted in a field with other waders.

Preening occurred frequently with much scratching of the face. The bill was dipped into water and the sides were preened repeatedly, revealing the white chin. As the weeks passed the plumage faded, although it remained brownish rather than grey, while the spotting faded until it was faintly visible only at close range. The last sighting was made by Mrs Juliette Urquhart on 9 March 1974, when a large tide held mixed waders on the grassy flats. Notes made on this day describe the pattern on the back as "very clearly defined, scaly rather than spotted, in brown with lighter colour intermingling."

On the same day J. A. Brown, Mrs Sylvia Reed and I identified a strange wader at Farewell Spit as a Lesser Yellowlegs. All of us had spent considerable time watching the Karaka bird. This bird had been found on the previous day by R. M. Weston. There was some hesitation over the identification because the bird had a scaly, rather than spotted pattern on the wing coverts, but otherwise resembled the Karaka bird on the last occasion on which we had seen it.

Mrs BETH BROWN, 39 Red Hill Road, Papakura

[Other photographs submitted were not reproducible but usefully show a Red-necked Stint with the Yellowlegs, a side view of a Yellowlegs and a group of Stilts with a Yellowlegs. Readers wishing to examine the interesting detail of these photographs should contact Mrs. Brown. — Ed.]

LETTERS

The Editor,
Sir,

A MATTER OF SPELLING

According to an old tenet of journalism, most people are concerned less with what may be said about them than with whether their names are spelled correctly. Allow me, therefore, to register a complaint on behalf of two of my American colleagues, one of whom can no longer protest for himself and the other of whom may have by now resigned himself to misspellings of his admittedly uncommon middle name.

In the review by K.W. in the March 1977 number of *Notornis*, the name of the late Josselyn Van Tyne is twice spelled "Jocelyn" and that of George Miksch Sutton three times as "Mikesh." The multiple occurrences suggest that these misspellings were not simply overlooked printer's errors, but were in the original manuscript. My own family name being one that is frequently misspelled, I am perhaps more than usually sensitive on this point.

KENNETH C. PARKES

*Curator of Birds,
Carnegie Museum of Natural History,
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16 May 1977*

['Do you spell it with a "V" or a "W" ? ' inquired the judge.
'That depends upon the taste and fancy of the speller, my Lord,'
replied Sam.

Editorially, we are not subscribers to such flights of Dickensian fancy, and we regret very much errors in *Notornis* despite their origin in the typescript submitted to us as Dr Parkes has suggested. Dr Robert W. Storer, Museum of Zoology, University of Michigan, Ann Arbor, has also written pointing out the error of our ways but softening the blow by sending his good wishes for the "continued success of *Notornis*" remarking — "I always enjoy receiving my copy of *Notornis*, in part because of the contents and in part because it reminds me of the very pleasant time I had in New Zealand several years ago and the friends which I have there." Thank you, Dr Storer, for your welcome support. — Ed.]



The Editor,
Sir,

ON "THE RELATIONSHIPS OF *FINSCHIA* AND *MOHOUA*"

I was interested to read Dr A. Keast's paper (*Notornis* 24 (1): 50-52, March 1977) in which he takes some two pages to tell us that

he doesn't know what the affinities of *Finschia* and *Mohoua* are; that, at least, is my assessment from his conclusions that they are "members of an old Australian pachycephaline-warbler-flycatcher lineage" and that "they are apparently derived from an earlier generalized, forest-dwelling proto-pachycephaline stock." I further suggest Dr Keast may have been misled by the occurrence of "multiple adults."

JOHN L. MCKEAN

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27 May 1977*



ABOUT OUR AUTHORS

GRAHAM TURBOTT is Director of the Auckland War Memorial Museum with which he has a long association, being appointed to the staff in 1937 and working there until 1957 when he became Assistant Director and Keeper of Zoology at the Canterbury Museum. He returned to Auckland in 1964. Co-author of the much-appreciated *Field Guide to the Birds of New Zealand*, Mr Turbott is a Past President of the OSNZ (1949-52), the Art Galleries and Museums Association of NZ (of which he is a Fellow), the Auckland Zoological Society, the Auckland Branch of the Antarctic Society, and the Canterbury Branch of the Royal Society of New Zealand (1963-4). He edited the third edition of Buller's *Birds of New Zealand*. A member of a number of Government committees and commissions, he was appointed to the Fauna Protection Advisory Council in 1949. Mr Turbott was also a member of the Auckland Island coastwatching party during the wartime "Cape Expedition."

GEORGE B. WILKINSON graduated in forestry in 1955 at the University College of North Wales. He joined the New Zealand Forest Service in 1963 and has worked in Southland, Otago and Canterbury. In 1972 he was awarded a State Services post-graduate fellowship and completed an M.Sc. at the Joint Centre of Environmental Studies at Canterbury. Recently he completed an assignment as joint co-ordinator of the inter-departmental land use study of South Westland. He has a keen interest in ornithology and forest ecology, and enjoys fishing and shooting in his leisure time.

ROB GUEST was introduced to readers in a previous issue, *Notornis* 22 (1), 1975.

CHRIS PAULIN has been interested in ornithology since secondary school in North Taranaki. He is a graduate of the University of Canterbury and was fortunate to join the University of Canterbury Antarctic Research Unit for two seasons, in 1973 and 1974, studying aspects of the feeding of the Adelie Penguins. At present he is employed at the National Museum in Wellington mainly involved with fishes. Although interested in birds generally, his particular interest is in the sub-fossil avifauna of New Zealand.

REVIEW



The Cormorant: Bulletin of the Southern African Seabird Group, No. 1, November 1976. Address: C/o FitzPatrick Institute of African Ornithology, University of Cape Town, South Africa.

This first issue promises well. It contains 20 pages (size approx. 15 x 21 cm.) of notes and information compactly printed in clear small type, ideal for the bookshelf (which the large heavy foolscap size bulletins of other Seabird Groups are not!). It is intended to cover all seabirds on the southern African list, and the oceanic islands of Prince Edward, Marion and Tristan de Cunha. Waders are not considered to be seabirds, with the exception of phalaropes, but inland-breeding gulls and terns are.

The population dynamics of the abundant Hartlaubs Gull (*Larus hartlaubii*), a city scavenger, are a continuing project. Already over 47,000 birds have been examined, of which 1680 had colour rings (a new colour for each year) and 1559 had steel (numbered) rings only. Vast numbers of northern hemisphere terns winter along the coast in the South African summer. E. L. Roberts has counted at least 100,000 resting on sandbanks at Kleinrivierslei (34°26'S, 19°18'E), "virtually all Common/Arctic terns *Sterna hirundo* and *S. macrura*, with a light sprinkling of Sandwich Terns *S. sandvicensis*." One hopes research by this seabird group may help to confirm the circumnavigation of the Antarctic continent, postulated by F. Salomonson (*Biol. Meddr. Dan. Viv. Selsk* 24: 1 (1967), by a proportion of Arctic terns.

There are many other interesting observations, such as the flocking of seabirds to fish stunned or killed by underwater explosions; and some results of studies of the two *Phoebastria* albatrosses which co-exist on Marion Island, nesting on similar sites and about the same time. As it is against the rules for allied (or any) species to co-exist except in ecological or geographical isolation, the author, A. Berruti, infers that the differences between the ecologies of the two lie in the pelagic stages.

As one who has watched the considerable migration of seabirds along South African coasts, and also witnessed the vast assemblies of pelicans, gannets and cormorants on the artificial (wooden) platforms planted in the surf-battered coasts of Namibia (for the collection of guano) I believe there is great scope for sea-bird research as well as conservation studies, and echo the sentiments of the editor, J. Cooper, who considers that "Research cannot be conducted without an object of study, and so we need to be *involved* in conservation."

R. M. L.

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FAR NORTH: D. E. Crockett, 21 McMillan Ave., Kamo, Whangarei
 NORTHLAND: Mrs. S. Reed, 4 Mamaku Street, Auckland 5
 SOUTH AUCKLAND: Mrs. Beth Brown, 39 Red Hill Rd., Papakura
 WAIKATO: Mrs B. Seddon, 11 Grey Street, Cambridge
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 VOLCANIC PLATEAU: R. W. Jackson, 9 Kenrick Road, Rotorua
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LITERATURE AVAILABLE

From all bookshops:

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

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

A biology of birds, by B. D. Heather.	\$1.33
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From B. A. Ellis, 44 Braithwaite Street, Wellington 5:

Field guide to the waders, by H. T. Condon & A. R. McGill.	Post Free \$1.20
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The following are available from Mrs H. Hagen, 53 Minnehaha Street, Titirangi, Auckland 7:

Back numbers of 'Notornis': Parts of Vol. 1, 30c each; Vols. 2-13, \$1.00 per part; Vols. 14-21, \$1.50 per part; Vols. 22-, \$2.00 per part.	
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Reports and bulletins (1939-1942)	\$2.00
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OSNZ Library catalogue (1976 ed) 17 pp.	\$0.50
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Banding reports, Nos 8-14, 50c each.

(Nos 1-7 are incorporated in early issues of 'Notornis').

Kermadec Expedition, 1964, by A. T. Edgar.	45c
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Guide to Identification of Shearwaters and Petrels in New Zealand waters (Auckland Museum), J. P. Croxall	\$0.50
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All above, plus 10% of order to cover postage.