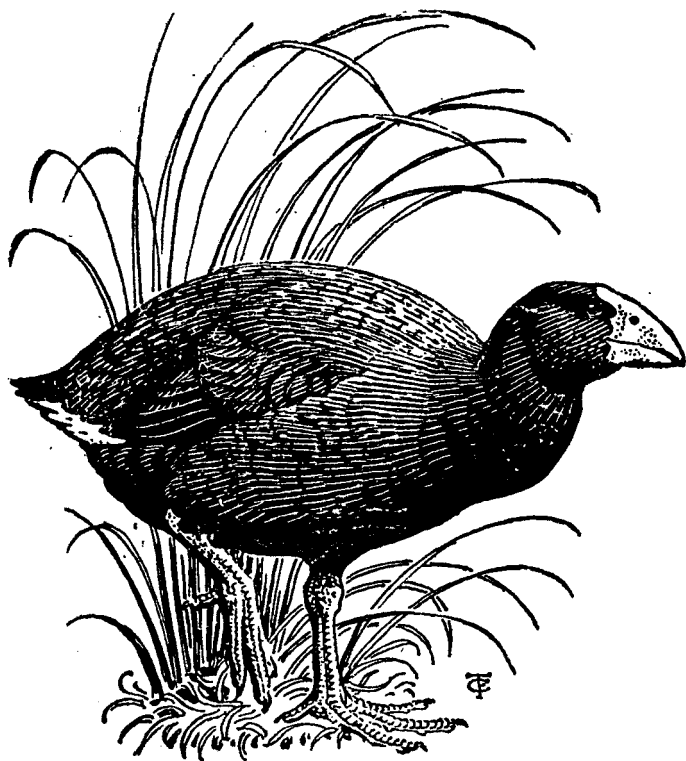


# NOTORNIS



QUARTERLY JOURNAL  
of the  
Ornithological Society of New Zealand



*Volume Eleven, Number Two, September, 1964*

# NOTORNIS

*In continuation of New Zealand Bird Notes*

Volume XI, No. 2

SEPTEMBER, 1964

---

JOURNAL OF THE ORNITHOLOGICAL SOCIETY OF NEW ZEALAND  
(Incorporated)

Registered with the G.P.O., Wellington, as a Magazine

Edited by B. D. HEATHER, 10 Jocelyn Crescent, Pinehaven,  
via Trentham Camp P.O.

Annual Subscription: Ordinary Member, £1; Endowment Member, 30/-  
Life Membership, £20 (for members over thirty years of age)

---

## OFFICERS 1964/65

President — Mr. A. BLACKBURN, 10 Score Road, Gisborne

North Island Vice-President — Dr. R. A. FALLA, Dominion Museum,  
Wellington

South Island Vice-President — Mr. G. R. WILLIAMS, Zoology Department,  
Lincoln College, Canterbury

Editor — Mr. B. D. HEATHER, 10 Jocelyn Crescent, Pinehaven,  
via Trentham Camp P.O.

Assistant Editor — Mr. A. BLACKBURN, 10 Score Road, Gisborne

Treasurer — Mr. H. R. MCKENZIE, P.O. Box 45, Clevedon

Assistant Treasurer — Mr. D. F. BOOTH, P.O. Box 2522, Auckland, C.1

Secretary — Mr. A. T. EDGAR, Inlet Road, Kerikeri

## *Members of Council:*

Mr. B. D. BELL, Wildlife Branch, Department of Internal Affairs,  
Private Bag, Wellington

Mr. F. C. KINSKY, Dominion Museum, Wellington

Mr. D. McGRATH, 14 Homewood Avenue, Karori, Wellington

Mr. N. B. MACKENZIE, Pakowhai, Napier, R.D. 3

Mr. R. B. SIBSON, Kings' College, Auckland, S.E. 7

Mr. E. G. TURBOTT, Auckland Institute and Museum, Private Bag,  
Auckland, C. 1

Organiser of Nest Records Scheme — Mr. J. C. R. CLARIDGE,  
82 Mungavin Avenue, Porirua

Organiser of Beach Patrol Scheme — Mr. B. W. BOESON, Box 30  
Carterton

Organiser of Recording Scheme — Mr. A. T. EDGAR, Inlet Rd., Kerikeri

Despatch of *Notornis* and Enquiries for Back Numbers —

Mrs. H. R. MCKENZIE, P.O. Box 45, Clevedon

Librarian — Miss ENID A. EVANS, Auckland Institute and Museum,  
Private Bag, Auckland C. 1

Convenor of Card Committee — Mr. B. W. CHAMBERS, Card Com-  
mittee, P.O. Box 3496, Auckland C. 1

*Contents of Vol. 11, No. 2: September, 1964*

The Kermadecs Expedition (A. Blackburn)	67
Birds of the Kermadec Islands (J. H. Sorensen)	69
Short Note — Gull and Octopus	81
An Account of the Establishment of the Australian Coot in the Rotorua District with Some Notes on its Nesting Habits (R. Jackson and H. Lyall)	82
Short Note — Cattle Egret Near Greymouth	86
Some Observations on Behaviour of the North Island Saddleback in August (A. Blackburn)	87
Feeding Stations and Food of North Island Saddleback in August (I. A. E. Atkinson)	93
Observations on the Song of the North Island Saddleback (J. L. Kendrick)	98
Short Note — A Little Whimbrel in Manukau Harbour	99
Reported First Sightings of Lesser Yellowlegs in New Zealand:	
I: Lesser Yellowlegs at Napier (Norman Mackenzie)	100
II: A Lesser Yellowlegs at Lake Ellesmere (G. A. Tunncliffe)	103
The Porirua Yellowlegs (R. A. Falla)	104
Short Note — Welcome Swallow in Southland	106
Australian Stragglers in New Zealand, With First Record of the Fan-tailed Cuckoo (E. G. Turbott and R. J. Scarlett)	107
Breeding Biology of the Southern Black-backed Gull —	
II: Incubation and the Chick Stage (R. A. Fordham)	110
Short Note — Two Forms of Redpoll in High Country	126
Heaphy Track Survey (David G. Dawson)	127
Short Note — Spur-winged Plover Breeding in Canterbury	129
Oriental Cuckoo ( <i>Cuculus Saturatus Horsfieldi</i> ) at Kaihinu, West Coast (P. Grant)	130
Short Notes — Marsh Sandpiper in South Taranaki; Greenfinch-like Sparrows; Little Egrets at Greymouth; Cattle Egret Near Masterton; Black-fronted Terns on the West Coast	133
Information Wanted	136

## THE KERMADECS EXPEDITION

By A. BLACKBURN

*Chairman of Expedition Committee*

Arrangements were not sufficiently advanced to enable a report to members to be published in the June issue, but most of the problems confronting the Expedition Committee, particularly the vexed one of personnel, have finally been resolved. May I say that this happy position is due in large measure to the unremitting efforts of our Honorary Secretary, who, since the A.G.M. in May, has obviously devoted nearly all his time to Expedition matters, and to other Society affairs. At this stage, may I once again stress the fact that the Expedition is being wholly sponsored and financed by the Society, and again request those members who intend to give their support as Sponsor Members to forward their contributions without delay.

### *Objectives of the Expedition.*

The Expedition Committee purposely withheld press publicity regarding the Expedition until 1st September, although some unauthorised statements were earlier given to Press and Radio. The objectives have perhaps been sufficiently publicised to members, but are again briefly summarised as (a) to mark in a worthy manner the twenty-fifth year of the Society's life; and (b) to increase our knowledge of the bird life, botany, and entomology of the Kermadecs. Elsewhere in this issue, J. H. Sorensen has produced a paper giving a complete summary of the recorded bird life of the Group; but much remains unknown, particularly of the out-lying islands such as Macauley and Curtis. The period 17/11/64 to 29/1/65 is designed to cover in part the breeding season of a number of the temperate zone sea-birds as well as that of some of the tropical gannets, terns and noddies, tropic birds, and petrels. The broad plan of work will be drawn up by the scientific leaders in consultation with Dr. Falla; details for its implementation can only be finally decided after arrival on Raoul.

### *Personnel*

Administrative Leader and Scribe: A. T. Edgar.

Scientific Leaders: F. C. Kinsky and G. R. Williams.

Stores and Transport: D. V. Merton.

Botanist: W. R. Sykes, Botany Division, D.S.I.R.

Entomologist: Owen R. Wilkes, nominated by the Bishop Museum, Hawaii.

Ornithological Members: D. E. Crockett (Wanganui), J. A. Peart (Palmerston North), both teachers of science; C. N. Challies (Lower Hutt), P. Child (Alexandra), D. G. Dawson (Christchurch), M. J. Hogg (Auckland), and A. Wright (Lighthouse Service).

### *Transport*

Through the valued co-operation of the Hon. Dean Eyre, Minister of Defence, H.M.N.Z.S. 'Lachlan' will transport personnel, perishable stores and equipment both to and from the Group. Without this help, the undertaking would have been beyond the resources of the Society. Bulk stores are being transported under C.A.A. arrangements on M.V. 'Holmburn,' leaving early in November, with D. V. Merton on board as an advance party.

*Inter-island Work*

The Committee has found it necessary to purchase a dinghy and outboard motor to work the Meier Group adjacent to Raoul, and of course these items will have a substantial resale value. The problem of providing transport for parties to the far outlying islands of Curtis and Macauley has not yet been solved, but we may possibly get assistance from yachts on summer cruising, to which end an article on the Expedition has been published in the August issue of the 'Pacific Islands Monthly,' a journal with a wide circulation amongst yachtsmen in countries bordering the Pacific Ocean. We have also reason to hope that for the final week transport of parties to these islands will be possible. A permanent camp will be established on Raoul Island, in the vicinity of the Meteorological Station, with satellite camps at Meier Island, Denham Bay, and other places where concentrations of breeding birds are found. The Officer in Charge at Raoul has offered valuable assistance to the Expedition in the way of vegetables, milk, fresh meat, and the use of certain facilities. Radio equipment for intercommunication between the camps is being acquired.

*Publication of Results*

It is intended that a book with popular appeal, after the style of Guy Mountfort's 'Portrait of a Wilderness,' be published on the activities of the Expedition. Such a book could have a wide sale overseas, and recoup for the Society some of its outlay on the undertaking. The scientific findings will be published in 'Notornis,' probably in a special issue, or issues. As is customary in such expeditions, members are required to sign an agreement not to publish any matter independently, without the sanction of the Committee.

*Sponsor Membership*

It was announced at the A.G.M. in May that Council had approved an invitation being given to members of the Society to become Sponsor Members of the Expedition by contributing the sum of Five Pounds. This would entitle them to a free copy of the book to be published, with their names listed as an appendix to the book. To date (20/9/64) the sum of £301 has been subscribed, and members still wishing to contribute are requested to do so now.

*Patronage of the Expedition*

His Excellency the Governor-General, Sir Bernard Fergusson, has been pleased to accept the office of Patron of the Expedition. Until this important announcement could be made, and for other good reasons, no earlier publicity has been given to the Expedition.

*General*

A mass of detailed planning has been completed by the Expedition Leader and approved by the Expedition Committee. All manner of essential equipment has been provided for, from tape recorders to climbing ropes, from collecting gear to camp ovens. Unexpected items of expense have arisen, such as, for example, the need to take out an insurance for some thousands of pounds to cover the possible cost of the emergency evacuation of a casualty. Adequate emergency medical arrangements are available on Raoul, and first-aid kits are being provided. The Committee is grateful for the ready and extensive co-operation offered by the Hon. Minister of Defence, Civil Air Administration, the Captain of 'Lachlan,' and the Officer in Charge at Raoul.

## BIRDS OF THE KERMADEC ISLANDS

By J. H. SORENSEN

---

In view of the proposal to celebrate the twenty-fifth anniversary of the O.S.N.Z. with an expedition to study the birds of the Kermadec Islands, I have prepared the following list of birds known or reported from this group. I give both verified and unverified reports and sightings, with brief notes culled from some of the sources to which I have had access, together with some of my own observations made in 1944. The classification follows the *Checklist of New Zealand Birds* 1953, excepting where the exact position of the species is unknown or the subspecific position requires determination.

### WANDERING ALBATROSS *Diomedea exulans exulans*

The inclusion of this albatross in the Kermadec lists rests mainly on sight records at sea adjacent to the islands. Cheeseman (1888) reported sighting a few individuals during a voyage to and from the islands and was informed by Mr. Bell that it bred on the Chanter Islets to the north-east of Raoul Island. As is generally known, these albatrosses breed on circumpolar subantarctic islands. The birds mentioned as breeding on Chanter Islets would almost certainly be Blue-faced Boobies (*Sula dactylatra*). Iredale (1910) reported that the only record he had of a Wandering Albatross was of one which had been washed ashore at Denham Bay previous to his arrival on Raoul Island in 1908. Oliver (1955) lists the Wandering Albatross as a "straggler to Raoul Island." He was in the same party as Iredale but does not mention this species in his 1930 edition of *New Zealand Birds*, where he records *Diomedea epomophora* as occurring "from the Kermadec Islands southwards to Campbell Island."

I sighted Wandering Albatrosses at sea between Auckland and Raoul Island in 1944 in latitude 34° 36' S. and longitude 177° 50' E. in which year Warner (1948) found a carcass on a beach about fifteen miles south-east of Noumea. Hindwood and Cunningham (1950) reported the finding of a dead Wandering Albatross at Lord Howe Island in 1935.

### ROYAL ALBATROSS *Diomedea epomophora*

From the foregoing notes it is doubtful if the Royal Albatross should be included in the Kermadec list. However, these birds are met with at sea off and to the north of Raoul Island. I sighted albatrosses between Auckland and Raoul Island in 1944 which I took to be Royals and not Wanderers; but I am not prepared to state which subspecies was present.

### BLACK-BROWED MOLLYMAWK *Diomedea melanophrys*

This is another species sighted at sea on the way to the Kermadec Islands and in their vicinity. Oliver (1930 and 1955) says that localities where it has been sighted include the Kermadec Islands, but Cheeseman (1890) again erred when he reported it breeding on Curtis Island. I did not sight this mollymawk closer to Raoul Island than the position in which I saw the Wandering Albatross. In 1944 Warner (1948) reported the finding of a Black-browed Mollymawk at New Caledonia.

### WHITE-CAPPED or SHY MOLLYMAWK *Diomedea cauta*

I include this species in the present list since I saw it farther north between Auckland and Raoul Island in 1944. In latitude

32° 36' S. and longitude 179° 15' E. one bird was seen but did not approach our vessel very closely.

**LIGHT-MANTLED SOOTY ALBATROSS** *Phoebastria palpebrata*

This is another albatross placed in the Kermadec list from sight records at sea. Cheeseman (1887 and 1890) states this species was noted at sea between Sunday (= Raoul) Island and Macauley Island. Oliver (1930 and 1955) says it has a range "from Kermadecs to Macquarie Island," and "sight records at the Kermadecs."

**GIANT PETREL** or **NELLY** *Macronectes giganteus*

I have been unable to find any recorded sighting of this bird in the Kermadec region. It is stated in the *Checklist of New Zealand Birds* (1953) as having a range "widely and abundantly in New Zealand seas and north rarely to 25° S." Hindwood and Cunningham (1950) recorded a Giant Petrel which was taken at Lord Howe Island in 1914. I did not sight the Giant Petrel in Kermadec waters in 1944, but its occurrence is probable.

**CAPE PIGEON** *Daption capensis*

Inclusion of the Cape Pigeon also rests on sightings at sea in the vicinity of the islands. Cheeseman (1887) reports this bird as plentiful at sea all around the group and, in 1890, as "plentiful at sea all around the group — in fact one of the commonest petrels at the time of my visit in August 1887." I did not see the Cape Pigeon north of Cuvier Island in 1944.

**PRION** or **WHALEBIRD** *Pachyptila desolata*

According to Oliver (1912) the skin on which the record for the island is based "... was taken from a specimen found by R. Bell cast up by the sea on Denham Bay beach on 29th July 1910." Oliver makes no further reference to this bird (1930 and 1955).

**NARROW-BILLED PRION** *Pachyptila belcheri*

In July 1944 I found a single specimen of this species cast ashore on the beach at Denham Bay.

**FAIRY PRION** *Pachyptila turtur*

My only reason for including this bird in the Kermadec list is a statement by Oliver (1930) — "...specimens can be found washed up on almost any part of the coast and it has been recorded from the Kermadecs ...". The *Checklist* (1953) states the species ranges commonly throughout the New Zealand region and straggles north to New Guinea. I did not record this bird in 1944.

**WEDGE-TAILED SHEARWATER** *Puffinus pacificus pacificus*

Known locally on Raoul Island as the Black Burrower, this large petrel breeds in large numbers on that island whence specimens were first forwarded to New Zealand by T. Bell in 1890. The birds arrive at Raoul Island in early October and burrowing commences almost at once, with egg-laying in early December.

**SHORT-TAILED SHEARWATER** *Puffinus tenuirostris*

The inclusion of this species in the Kermadec list is because of the statement by Oliver (1930) — "Specimens have been obtained at . . . Sunday Island," and in 1955 — "Specimens have been obtained at Raoul Island . . ." I have no further records and did not see or hear this petrel in 1944.

KERMADEC ALLIED SHEARWATER *Puffinus assimilis kermadecensis*

According to Cheeseman (1890) this species was collected at the Kermadec Islands first by McGillivray in 1854. Most subsequent visitors have found this petrel breeding on Meyer Island where it excavates short burrows from almost sea-level to high on the hillsides. I found this bird breeding on Meyer Island in August and September of 1944, the birds then having either well-incubated eggs or young chicks. Murphy (1927) described this subspecies from specimens taken from Herald Islets by R. H. Beck of the Whitney South Sea Expedition.



[J. H. Sorensen

**Fig. 1** — Allied Shearwater, Meyer Island, 6/8/44.GREY-FACED PETREL *Pterodroma macroptera gouldi*

Iredale (1912) states — "A specimen washed up on the beach on 7th August 1908 proved sufficient for identification. Another bird, too much damaged for preservation, had been noted on 25th July. However, it had already been added to the Kermadec avifaunal list by Ogilvie-Grant, whose specimen, which I have examined, also proves to be a washed-up bird."

SUNDAY ISLAND PETREL *Pterodroma externa cervicalis*

This bird is also known as the Black-capped Petrel. It breeds at higher levels on Raoul Island, the first recorded specimen being procured from the Kermadec group and described by Salvin in 1891. Oliver (1930) stated this bird appeared to be decreasing in numbers through the ravages of cats, only a few scattered colonies then being known. He also states (1930 and 1955) that the birds arrive at Raoul Island in October, burrow during November, with fresh eggs having been taken from December 26th to January 2nd. The young become fully fledged during May and leave the island in June.



PHOENIX PETREL *Pterodroma alba*

The inclusion of the Phoenix Petrel in the Kermadec list rests on a specimen collected by W. S. Bell on Raoul Island in 1913 and later described by Mathews and Iredale as *Aestrelata oliveri*; also, Oliver (1930 and 1955) records that four birds were seen on the ground in the forest in 7th March 1913. He presumed that the species probably bred on the island.



[J. H. Sorensen

**Fig. 2** — Kermadec Petrel, light phase, surface-breeding on Meyer Island, 6/8/44.

KERMADEC PETREL *Pterodroma neglecta*

The Kermadec Petrel was first collected by McGillivray, Naturalist to the "Herald," in 1854, but was not described until 1863. It is a common surface-breeding bird on both Raoul and Meyer Islands and, on account of the polymorphism exhibited and the varied breeding times, several names have been applied. On Raoul Island the birds appear in late August, fresh eggs being noted as early as 20th October and as late as 6th December. Most chicks are hatched by the end of January and the birds leave the island during May. On the other hand, on Meyer Island in August, 1944, I found fledglings ready to fly, downy chicks, and even one bird still incubating.

COOK'S PETREL *Pterodroma cookii*

According to Oliver (1930 and 1955) this petrel has a range of — "New Zealand seas, especially east of the main islands from the Kermadecs to the Bounty Islands." The *Checklist* (1953) gives a

somewhat similar range. I did not record this species in 1944 and can trace no definite records. It can be noted that Cheeseman (1890) recorded the next species (*P. hypoleuca nigripennis*) as Cook's Petrel.

**BLACK-WINGED PETREL** *Pterodroma hypoleuca nigripennis*

This petrel was recorded by Cheeseman from specimens collected by T. Bell. The birds were forwarded to Rothschild, who recognised its distinctness and described it in 1893. It is a breeding species and is described as more numerous on the outlying islands, especially Macauley and Curtis, than on Raoul. It is a summer breeder, being first heard in October, the eggs laid in December and early January, and the young birds leaving the islands towards the end of April.



[J. H. Sorensen

**Fig. 3** — Red-tailed Tropic Bird, Raoul Island. Fledgling just out of nest, 2/5/44.

**RED-TAILED TROPIC BIRD** *Phaethon rubricauda roseotincta*

This bird is a regular summer visitor to the Kermadec Islands, its southern boundary for breeding purposes. It is occasionally seen during the winter months, but the main arrival at Raoul Island is during October. Eggs are laid between mid-December and mid-January, occasionally later, and most birds leave the islands during April and May. Nesting takes place on ledges and in shallow holes in coastal cliffs.

**KERMADEC STORM PETREL** *Pelagodroma marina albiclunis*

Oliver (1955) writes — "Cheeseman, who visited the Kermadecs in 1887, records the 'Storm Petrel' as common at sea all around the

Kermadec Islands, and stated that Mr. T. Bell, who resided at Raoul Island, informed him it bred on Meyer Island and other out-lying rocks. This is no doubt correct, though during ten months' residence on Raoul Island in 1908 only two drift specimens were found . . . in September." Murphy and Irving (1951) described the Kermadec subspecies which is characterised by having the rump and upper tail coverts white instead of grey. The specimens were collected off Raoul and Meyer Islands by the Whitney South Sea Expedition in November 1925. The breeding status of this storm petrel is unknown and, although I excavated numerous small and fresh burrows on Meyer Island in late September 1944, all were untenanted. Some burrows did have a little fresh nesting material at the ends. All burrows excavated were three to four feet in length, almost double the length of Allied Shearwater burrows.

#### AUSTRALIAN GANNET *Sula bassana serrator*

Cheeseman (1890) admitted this bird to his list of Kermadec birds on the authority of Mr. T. Bell, who stated it was identical with the New Zealand Gannet and not infrequently visited Raoul Island. Iredale (1912) considered this bird should be omitted from the Kermadecs list until skins were actually forthcoming from the group. I did not record the Gannet during 1944.

#### MASKED or BLUE-FACED BOOBY *Sula dactylatra personata*

This species breeds in the Kermadec area on outlying islands but not on Raoul Island itself. In 1944 Meyer Island was the only outlier on which I managed to land. On 24th September I found two birds with nests, one with one egg, the other with two, all eggs



[J. H. Sorensen

Fig. 4 — Masked or Blue-faced Booby, Meyer Island, 24/9/44.

being heavily incubated. Other sitting birds could be seen on less accessible parts of Meyer Island. Other visitors have recorded this Booby on both Macauley and Curtis Islands. Apparently eggs are found from late August to November.

**BROWN BOOBY** *Sula leucogaster plotus*

This species does straggle south and has occurred several times in New Zealand. Oliver (1930 and 1955) included this Booby among the Kermadec birds on information received from Roy Bell. I did not record it during 1944.

**LITTLE BLACK SHAG** *Phalacrocorax sulcirostris*

The inclusion of this species in a Kermadec list rests upon a personal communication from R. S. Bell to the late Dr. W. R. B. Oliver that — "... a small number once took up their abode on Raoul Island and remained for a few years." A sighting by R. Bell cannot be ignored, but no other resident or visitor has reported sightings at the Kermadecs.

**FRIGATE BIRDS** *Fregata* spp.

There are a number of sight records of Frigate Birds at Raoul Island but no reliable information exists as to whether *F. minor* or *F. ariel*, or both, visit the Kermadecs. Both have occurred in New Zealand proper as stragglers. Cheeseman (1888 and 1890) says that Mr. Bell informed him that Frigate Birds visited the island (Raoul) every spring and summer but were not permanent residents. I have one sight record in November 1944 which was undoubtedly of a Frigate Bird at Raoul Island.

**REEF HERON** *Egretta sacra sacra*

Cheeseman (1890) admitted this species on the authority of Mr. Bell, who informed him it was seen occasionally in the group. No other sightings seem to have been made and it is therefore very indefinite as to whether Reef Herons have occurred or, if they have, which species they were. In October 1944 I was informed of two birds seen in flight from Low Flat on Raoul Island, my informant calling them "Blue Cranes." I saw no sign of these birds on subsequent searches.

**GREY DUCK** *Anas superciliosa superciliosa*

The Grey Duck, too, was admitted to the Kermadec list by Cheeseman on the information of Mr. Bell. Cheeseman did not see this duck but later observers have. Oliver (1912) states nests were found in the crater of Raoul Island in October 1910, one containing six eggs, the other seven. In 1944, apart from odd sightings of single birds elsewhere on Raoul Island, I found Green Lake in the crater mainly used by Grey Duck, 31 being sighted there on 7th May. On 5th September 12 were seen on Blue Lake.

**HARRIER HAWK** *Circus approximans*

Almost all visitors to the Kermadec Islands have reported sighting Harrier Hawks but I have no record of a specimen having been taken. Thus the exact subspecific status of the birds which occur there remains in doubt. According to Bell, as reported by Cheeseman (1890), the Harrier is not a permanent resident but disappears each year in September; returning the following January. According to Bell the hawk is driven from the islands by the Sooty Terns and he was confident that they migrated to New Zealand. If this is the case then the

subspecies will be *gouldi*; otherwise, and this is possible, the birds will be Fiji Harriers (*C. a. approximans*). I saw hawks on Raoul Island as late as 26th October 1944 and left the island shortly afterwards.

#### MOUND BIRD *Megapodius* spp.

The inclusion of a species of *Megapodius* in a Kermadec list rests entirely on hearsay evidence. Cheeseman (1890) says — "The same Mr. Johnson states that when he lived on Sunday Island, which was prior to the eruption of 1876, a bird inhabited the floor of the large crater which made mounds of sand and decayed leaves 2ft. to 3ft. high, laying its eggs in the mound. He was in the habit of visiting the mounds for the sake of the eggs and young birds and has frequently taken four or six from the same nest at one time. The eruption of 1876 covered the floor of the crater with a deposit of mud very similar to that thrown out by the eruption of Tarawera and apparently killed out the species for it has not been seen since." If, indeed, a Megapode did inhabit Raoul Island, it is long extinct there.

#### BANDED RAIL *Rallus philippensis*

Cheeseman (1890) wrote — "Striped Rail (*Rallus philippensis* L.) Sunday Island, vicinity of lagoon in Denham Bay, but by no means common." Iredale (1912) writes — "Cheeseman notes it as 'by no means common' at Denham Bay lagoon. Although we camped at this spot for ten months, it was neither heard nor seen. It is possible that stragglers may occur, and it would be delightfully interesting to know which subspecies straggles to this out of the way place." Mayr (1949), in his "Notes on the Birds of Northern Melanesia," has this to say of *Rallus philippensis* — "The Banded Rail is one of the most successful colonists of the islands of the Pacific. The range extends from Cocos Keeling and the Philippines in the west to Tasmania and New Zealand in the south and Samoa in the east . . ." No other resident or visitor to the Kermadecs has listed the Banded Rail and I saw no sign of it in 1944.

#### SPOTLESS CRAKE *Porzana tabuensis plumbea*

Whereas the position in respect of the Banded Rail must remain doubtful there is no doubt that the Spotless Crake can be included in the Kermadecs list. It was found breeding at Denham Bay by R. S. Bell in 1909 and this was recorded by Oliver (1912). I failed to find this bird in 1944 but one doubtful sighting was made on Meyer Island that year. Lindsay (1929) recorded seeing one bird on Meyer Island.

#### PUKEKO or SWAMP HEN *Porphyrio porphyrio melanotus*

The presence of one or more Pukeko on Raoul Island has been recorded by observers from 1887 to the present day although I did not see one in 1944. One was shot by King Bell in 1909 and Oliver (1912) records that the skin is in the Auckland Museum. However the subspecific status of the Kermadec birds seems not to have been resolved.

#### PACIFIC GOLDEN PLOVER *Charadrius dominicus fulvus*

Almost all visitors to Raoul Island have recorded this Plover, which appears from September to December annually. Iredale (1912) reported a flock of 13 on Macauley Island in November. The biggest flock I sighted on Raoul Island was 15 on 2nd November 1944.

**BANDED DOTTEREL** *Charadrius bicinctus*

Oliver (1930) records this species as "accidental at Sunday Island" and, (1955), as "accidental at Raoul Island, one occurrence, September 1913, male." The *Checklist* (1953) lists this species as "partially migratory . . . considerable numbers reach Australia; occasional at Norfolk, Lord Howe, and New Hebrides Islands." It is therefore a migrant wader one would expect to see occasionally at the Kermadec Islands. None was seen in 1944.

**ORIENTAL DOTTEREL** *Charadrius asiaticus veredus*

The admission of this bird to the Kermadec list exists because one specimen was taken by Oliver on 22nd April 1908 at Denham Bay, Raoul Island. It does not seem to have been recorded since.

**ASIATIC WHIMBREL** *Numenius phaeopus variegatus*

This is another Kermadec record made by Oliver in 1908 when one of a pair sighted on 26th September was obtained. A few days later three similar birds were seen. It has not been recorded since.

**EASTERN BAR-TAILED GODWIT** *Limosa lapponica baueri*

This Godwit seems to be a fairly common visitor to Raoul Island as a passage migrant, although Iredale (1912) states the bird was not met with during the stay of his party in 1908. Most other visitors to Raoul Island have recorded the Godwit usually for the months of October and November. Three birds was the greatest number I noted at any one time in November 1944. It was much commoner on grassy flats than along the coastline.

**WANDERING TATTLER** *Heteroscelus incanus incanus*

The Kermadec record for this species is a specimen in summer plumage shot on Raoul Island by W. S. Bell in 1913 and recorded by Oliver (1930 and 1955). I can trace no further records.

**KNOT** *Calidris canutus rogersi*

Oliver (1912) recorded a specimen taken at Denham Bay on 29th July 1910. Iredale (1912) recounts his efforts to obtain a bird thought to be this species and associated with a small flock of Golden Plover in the same locality in September 1908. I have not traced other records.

**SHARP-TAILED SANDPIPER** *Calidris acuminata*

Oliver (1912) first recorded this species with a bird he obtained in 1908 at Raoul Island. A further skin was obtained from a bird shot by R. Bell on 29th October 1910, and is stated to be in the Auckland Museum. I have no other records.

**CURLEW SANDPIPER** *Calidris ferruginea*

Oliver (1930 and 1955) gives the Kermadec Islands as one of the places from which this bird has been recorded. I cannot trace any definite recordings or sightings and did not see it in 1944.

**SOUTHERN BLACK-BACKED GULL** *Larus dominicanus*

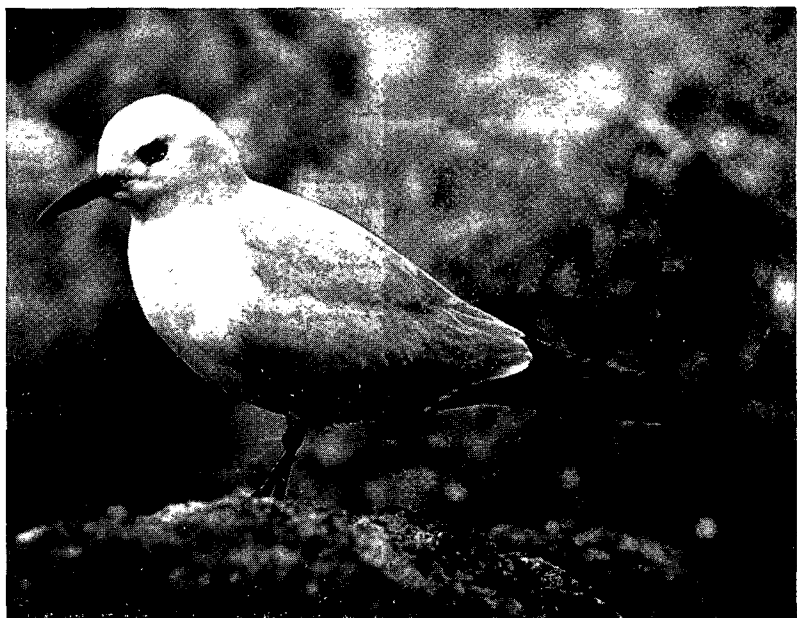
Oliver (1930 and 1955) includes "Kermadec Islands, accidental" in his distribution of this species. I know of no undoubted record of its occurrence at the Kermadec Islands. Hindwood and Cunningham (1950) record a solitary bird at Lord Howe Island on 21st August 1949 and record a further bird which frequented Botany Bay near Sydney in early 1943.

**RED-BILLED GULL** *Larus novaehollandiae*

My reason for including this species in the present list is because of one or more gulls in the Otago Museum collections bearing a label "Kermadec Islands," the specimens being named *Bruchigavia jamesonii*. Mr. L. Gurr, who drew my attention to the skins in a personal communication, says that both measurements and wing pattern suggest the birds are *Larus gunni* of Tasmania. No other information is available at the moment and I include these skins under the above name very tentatively.

**GREY TERNLET** *Procelsterna cerulea albirostris*

This bird breeds on all islands of the Kermadec Group, laying its single egg on cliff ledges in late September or early October. The birds are exceptionally tame and allow approach to within a few feet. Breeding takes place on Meyer Island but they are less commonly met with ashore on Raoul Island. They have bred sparingly at each end of Denham Bay.



[J. H. Sorensen

**Fig. 5** — Grey Ternlet, Meyer Island, 24/9/44.

**CASPIAN TERN** *Hydroprogne caspia*

Cheeseman (1890) placed this species on the Kermadecs list on the authority of Mr. Bell, stating that he, personally, had seen no specimens from the group. The record is therefore of doubtful validity and no subsequent record has been made.

**CRESTED TERN** *Sterna bergii cristata*

The inclusion of this species in this list is because of a young male bird shot by K. Bell on 1st April 1910, the bird having been

noted first in Denham Bay the previous day. This skin is in the Auckland Museum collection. No further sightings seem to have been made.

**SOOTY TERN** or **WIDEAWAKE** *Sterna fuscata*

All visitors to Raoul Island have recorded this tern, which visits the island annually to breed, principally on the back beach at Denham Bay. The birds arrive in late August and laying starts in early November. By February some of the chicks are able to fly and nearly all birds leave the Island in April.

**WHITE-CAPPED NODDY** *Anous tenuirostris minutus*

This species breeds on Meyer Island but not, so far as is known, on Raoul Island itself. Nests are constructed in trees and the single egg laid in October. In September of 1944 the birds were present when I visited Meyer Island but nesting had not started.

**WHITE TERN** *Gygis alba royana*

This is another tree-nesting species at the Kermadec Islands, *Metrosideros villosa* being mainly if not solely used. The birds arrive in September and the laying season is an extended one, eggs appearing from October to early January. In 1944 I located many pairs in the forest at the back of Denham Bay late in October.

**NEW ZEALAND PIGEON** *Hemiphaga novaeseelandiae*

The only reason for including this species in a Kermadec list is because of early information that a large fruit-pigeon was found by early settlers on Raoul Island, but its numbers were thinned out and finally it was exterminated. The position of this pigeon is therefore of doubtful validity.

**KERMADEC PARAKEET** *Cyanoramphus novaezelandiae cyanurus*

The presence of 'paroquets' was noted at the Kermadec Islands as far back as 1788 when the first islands, Curtis and Macauley, were discovered. It was later claimed by Mr. T. Bell that the species formerly bred on Raoul Island but was exterminated by wild cats. To-day parakeets are present on Meyer Island, where I saw very tame birds in 1944.

**SHINING CUCKOO** *Chalcites lucidus lucidus*

The presence of the Shining Cuckoo on the Kermadecs list is because of statements made to Cheeseman (1887 and 1890) by Mr. T. Bell. Iredale (1912) did not list it as seen by his 1908 party, and stated the record by Cheeseman needed verification if only to determine its subspecific status. It follows that, since the bird seems not to be reported since, the statements by Oliver (1930 and 1955) and in the *Checklist of New Zealand Birds* (1953) as "straggling to the Kermadecs" also need verification.

**LONG-TAILED CUCKOO** *Eudynamis taitensis*

Initially this species was recorded for the Kermadecs on information given to Cheeseman by Bell, but this was later supported by the production of the tail of one bird. According to Bell the cuckoo was a permanent resident, although by no means common. Iredale (1912) records that the bird was more commonly heard than seen, but was noted in every month his party was on the island, being most plentiful in October. In 1944 I sighted this cuckoo in most of the winter months and obtained specimens in June.



**KINGFISHER** *Halcyon sancta*

This is a common resident breeding species on Raoul Island, rarely if ever seen near water, and has been noted by all who have visited the Island. The systematic position, however, requires attention, it being my opinion that the Kermadec bird is more closely allied with Pacific forms than with the New Zealand bird.

**SKYLARK** *Alauda arvensis*

This lark is a new record for the Kermadec group and based on a bird I collected on Raoul Island in June 1944. It was one of two birds seen together. I saw two more on 28th July.

**SONG THRUSH** *Turdus ericetorum*

Oliver first recorded the Song Thrush from the Kermadec Group in his 1930 edition of *New Zealand Birds*. In a personal communication to me at a later date he stated he found this bird nesting on Raoul Island in September 1908. Iredale (1910), writing of the birds of the Kermadecs, says — "It is interesting to record that the birds acclimatized in New Zealand have reached the island and firmly established themselves. These are the European Song Thrush, Blackbird, and Starling . . ." I found thrushes moderately plentiful on Raoul Island in 1944. This species has also been noted on Curtis Island.

**BLACKBIRD** *Turdus merula*

The position with the Blackbird at Raoul Island is almost exactly comparable with the Song Thrush but it is more commonly met with. I noted this species on both Raoul and Meyer Islands in 1944 and it has been recorded from Curtis Island.

**PIPIT** *Anthus novaeseelandiae*

The Pipit was recorded by Cheeseman (1888) thus — "... Two or three specimens noted on Macauley Island." Cheeseman (1890) reported not seeing the Pipit on Raoul Island, but that he was informed by Mr. Bell it was occasionally seen, usually in pairs. Lindsay (1929) records observing Pipits on Curtis Island that year, whilst Oliver, in a personal communication, informed me that three Pipits were seen at Low Flat, Raoul Island, in August 1908, a further bird being seen in the crater on 2nd October. In 1944 I recorded the Pipit only once, on 8th June, at Wilson Point, Raoul Island.

**TUI** *Prothemadera novaeseelandiae*

The Tui was early reported as plentiful and breeding at Raoul Island. A most remarkable statement, however, was made by Iredale (1912) that this bird had lost its voice. This observation is quite contrary to fact and the first bird I heard in song when I landed on Raoul Island in 1944 was a Tui. Despite the ravages of wild cats the Tui is still common on Raoul Island. Nesting starts in September with fully fledged young being noted in early November.

**WHITE-EYE or SILVER-EYE** *Zosterops lateralis*

This bird was recorded by Cheeseman (1888 and 1890) who saw the White-eyes on several occasions in the forest on Raoul Island and on Macauley Island. Mr. Bell told Cheeseman that it was only an occasional visitor and that he had never known it to breed on the island. No later visitor seems to have noted the White-eye and I did not see it in 1944.

**GOLDFINCH** *Carduelis carduelis britannica*

This species was recorded by S. Percy Smith in 1887 and occasional sight records have been made since that time. The late Dr. Oliver, in a personal communication, told me that one was shot on 17th May 1909 by R. S. Bell on Raoul Island. Three birds were reported in 1940 but I saw none in 1944.

**LESSER REDPOLL** *Carduelis flammea cabaret*

Small finches were apparently common on Raoul Island in 1909 and Roy Bell made sightings which were undoubtedly of Redpolls. His diary entry for 4th May 1910 says — "King shot another finch, a little fellow like a goldfinch but with a pink breast." On 29th May 1944 I saw a flock of small finches on a grassy flat in the crater on Raoul Island. This flock seemed to be entirely composed of Redpolls.

**YELLOW HAMMER** *Emberiza citrinella citrinella*

This bird is a new record for Raoul Island I made in 1944, when several specimens were obtained. This species was moderately plentiful and seen regularly between May and November. No nesting was noted.

**STARLING** *Sturnus vulgaris*

As with the Blackbird and Song Thrush, this species apparently reached Raoul Island just prior to 1908. In 1944 I found Starlings particularly common in the vicinity of the Hostel on Raoul Island, common all around that island, and on Meyer Island. In early October mating was noted and pairs seen at nesting holes along coastal cliffs and roadside cuttings. Young birds were seen in numbers in mid-November.

**SELECTED REFERENCES**

- Bell, R.S.: Diary (unpublished), Dominion Museum.  
 Cheeseman, T. F.: Trans. N.Z. Inst., Vol. 20, 1887.  
 ———— Trans. N.Z. Inst., Vol. 21, 1888.  
 ———— Trans. N.Z. Inst., Vol. 23, 1890.  
 Fleming, C. A. (et al): "Checklist of New Zealand Birds," 1953.  
 Hindwood, K. A., and Cunningham, J. M.: Emu, Vol. 50, 1950.  
 Iredale, T.: Emu, Vol. 10, 1910.  
 ———— Trans. N.Z. Inst., Vol. 45, 1912.  
 Lindsay, C. J.: Dominion Museum Report (unpublished), 1929.  
 Mayr, Ernst: Amer. Mus. Novit., No. 1417, 1949.  
 Murphy, R. C.: Amer. Mus. Novit., No. 276, 1927.  
 ———— "Oceanic Birds of South America," 1936.  
 ———— and Irving, S.: Amer. Mus. Novit., No. 1506, 1951.  
 Oliver, W. R. B.: Trans. N.Z. Inst., Vol. 45, 1912.  
 ———— "New Zealand Birds," 1930.  
 ———— "New Zealand Birds," 2nd ed., 1955.  
 Warner, D. W.: Emu, Vol. 47, 1948.

— ★ —

## SHORT NOTE

**GULL AND OCTOPUS**

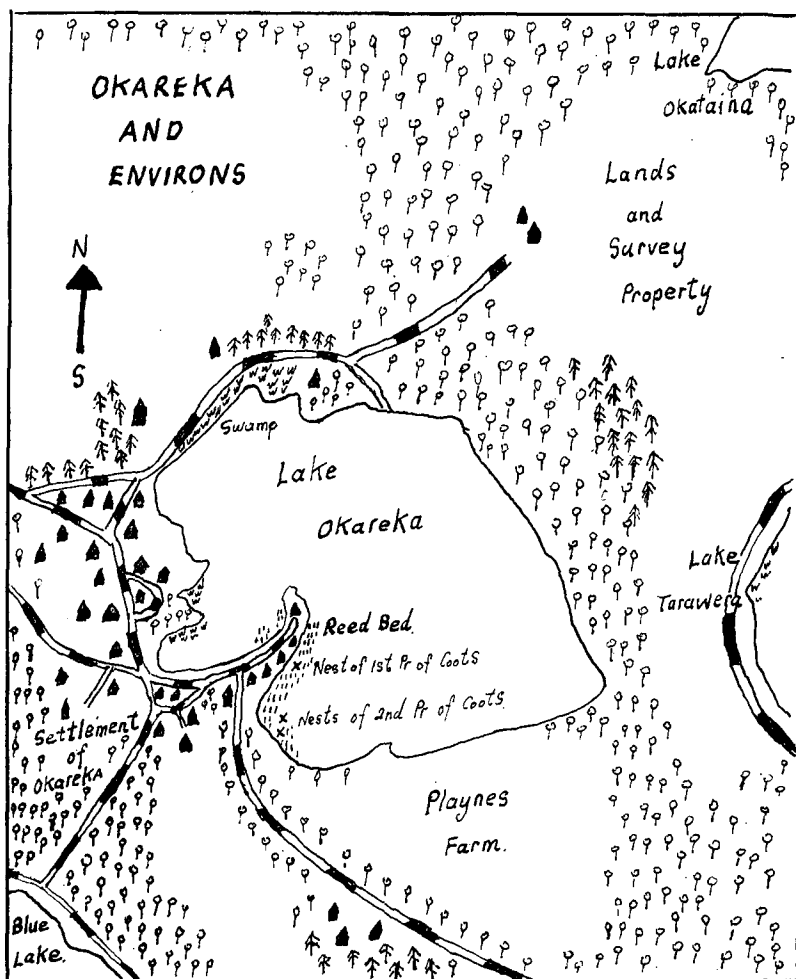
On 13/1/64 at Half-moon Bay, Stewart Island, I saw a flock of Red-billed Gulls apparently mobbing another gull. But they all flew up, leaving the victim struggling in the water and apparently diving deliberately half under. I then noticed a disturbance beyond it and, moving along the embankment, saw that an octopus was holding the gull with about two-foot arms. The gull, which was apparently diving under at the octopus, after half a dozen dives rose free suddenly and flew away. The octopus then sneaked away quietly.

— W. T. POPPELWELL

# AN ACCOUNT OF THE ESTABLISHMENT OF THE AUSTRALIAN COOT IN THE ROTORUA DISTRICT WITH SOME NOTES ON ITS NESTING HABITS

By R. JACKSON and H. LYALL

The Australian Coot (*Fulica atra australis*) made its first appearance in the Rotorua District on Lake Okareka, in the early spring of 1962, with the arrival of one bird on the southern side of the main peninsula. This bird remained by itself for about 4 weeks, keeping company with the Scaup (*Aythya novaeseelandiae*) and the Pukekos



(*Porphyrio p. melanotus*). It was then joined by another bird, presumably female (but in external appearance both sexes look alike). The pair soon adapted themselves to living in a bed of rushes (*Eleocharis sphacelata*) of about 4 or 5 acres in extent, and by the end of that year brought out a brood of seven young (not 2 broods as originally supposed). Soon after hatching one was lost, but the other six survived to reach maturity and stayed with the parent birds until the beginning of September, 1963, when they were driven off. Four of them stayed in the vicinity out of reach of the old birds, while two of them crossed to the other side of the peninsula, but failed to establish themselves there.

Towards the end of September 1963, this pair nested again, for in the third week of October they were seen with another brood of seven; again one went missing, but up to the present (January 1964) the rest have survived. During December 1963, they must have set to work once more for, unexpectedly on the morning of the 6th January 1964, two newly hatched young were noticed. Finally, on the 8th they came out on to the open water with a complete brood of seven. The young of the previous brood had moved away to the eastern end of the peninsula and joined up with two others belonging to the brood of the year before.

Meanwhile on the 17th November 1963, at the southern end of the same bed of rushes a nest with only three eggs was found, belonging to two members of the first original brood. These eggs had hatched by the 1st December, when the parents were seen with two young, which they lost a few days later. No further attempt was made at nesting by the same pair until the 23rd December, when a nest of six eggs was reported not far from where their first nest had been discovered. For a fortnight the number of eggs in the nest remained at six, but when visited on the 9th January 1964, only five could be found. By the 12th January the number had fallen to three, but a young bird was in the water close by. Another young bird was seen in the nest on the 14th January, as well as one egg. However, on the 16th January, the nest was deserted altogether, and one of the adult birds was seen moving through the rushes followed by two young.

So, during the period of approximately 14 months that the Coots have been breeding at Okareka, 25 young have been hatched and four lost, a loss of roughly 16%. This loss may be caused by the fact that when the young first take to the water, the parents have considerable trouble keeping them together, and odd ones become cut off from the main brood and are lost among the rushes, thereby falling easy prey to such predators as the Harrier Hawk (*Circus approximans gouldi*) and the Black-backed Gull (*Larus dominicanus*). In the last nest under observation the unaccountable disappearance of the eggs could be attributed to Pukekos, as on two occasions they have been noticed in the nests of the Black Swan (*Cygnus atratus*) feeding on eggs which have failed to hatch.

At present these Coots have not moved to any of the other lakes in the Rotorua district, with the exception of one pair which was reported on the northern side of the peninsula and has since vanished without trace. From what we have so far observed, their spread may be limited by two factors.

Firstly, they may be restricted by a preference for beds of rushes



[R. W. Jackson

Fig. — Australian Coot (*Fulica atra australis*) settling on nest. Lake Okareka, 5/1/64.

(*Eleocharis sphacelata*) in this district. They are very aquatic in habits and obtain most of their food from the lake bed. They seem rather ungainly on dry land and seldom come ashore; when pressed too closely they prefer to swim for shelter amongst the dense rushes rather than take to flight. Therefore, this extensive bed of rushes at Okareka provides an ideal habitat. These rushes seem to grow best in sheltered backwaters which have a muddy or stony bottom and are deep enough not to dry out during the summer months. The maximum depth at which they will grow ranges from 8 to 10 feet. In places where there are large expanses of silt and sand, or where streams and swamps flow out into lakes, either they do not exist or their place is taken by raupo (*Typha angustifolia*), of which there are considerable areas on most lakes. Therefore, if the Coots confine themselves to these beds of rushes, their range in this area may be restricted through lack of preferred habitat. But, on the other hand, if the younger birds wish to breed many will have to leave Okareka for, when nesting, Coots take up well defined territories from which other members of their species are strictly excluded. Whether or not they will become as adept as the Pukeko in clambering about amongst the dense growth of raupo remains to be seen.

Secondly, their feeding habits are very similar to those of the N.Z. Scaup, which is present in large numbers on all the lakes about Rotorua. Both birds obtain their food from the bed of the lake by

diving, at which the Coot seems to be the more proficient, as it stays submerged for a longer period and can get its food in deeper water. The Coot seems to spend a good portion of the daylight hours feeding, whereas the Scaup feeds mainly in the evening and spends most of the day resting on the surface of the water. Certainly the Coots behave aggressively towards the Scaup and frequently attack isolated individuals. But during the winter months when the Scaup gather in large flocks, the rise of the lake level is bound to cause a shortage of food for both species. Then, whether the Coot will be able to hold its own against the Scaup, or will succumb to weight of numbers, is something which must yet be found out. At Okareka it has been noticed that if there are too many Scaup on the water, the Coots prefer to move back into the rushes and leave them to it, though at most other places they seem indifferent to their presence. The ecology of the Dabchick (*Podiceps rufopectus*) also is similar, but the Dabchick is not present in large enough numbers for it to be a serious rival of the Coot.

We were fortunate enough to be able to study two nests of these Coots, both of which belonged to the same pair. The first nest was built in a rather exposed situation, about 10 yards from the shore in a very open patch of stunted rushes; it was on the verge of disintegration when we found it. The site for the second nest, however, was much better chosen. It was placed about the same distance from the shore but, being about 6 yards in from the edge of a dense stand of rushes, was better protected from rough weather. Both nests were poorly constructed, being small, untidy heaps, built by pulling down the surrounding rushes and bending them round to form a platform, with little trouble taken to build up the structure with loose material. Nevertheless, built in this way, they were securely anchored to the lake bed, and were capable of withstanding a certain amount of wave action in stormy weather, though a rise in the water level would probably be disastrous.

The eggs appear to be identical in size and shape to those of the Pukeko; they are dull white in colour, but on closer examination show a brownish pink tinge. They are also marked all over with black spots.

During the incubation period the Coots seldom move far from the nest. On each of our visits one bird was on the nest while the other stood guard on the open water outside. Whenever we went up close, the bird that was sitting would withdraw and crouch at the side of the nest hissing with wings spread and neck outstretched as though prepared to attack; the other bird would leap up and down on the surface of the water in an effort to attract our attention. Once they got used to our presence they would quieten down, and the bird that was on the nest would settle on the eggs again. As soon as the eggs start hatching they seem to lose interest in the nest, their attention being given to the young that are on the water. The young evidently leave the nest very soon after they are hatched, as it was only on one occasion that a young bird was caught actually in the nest.

In appearance the young bear no resemblance to the adult birds. When first hatched they are almost a brilliant scarlet colour about the sides of the head, the bristles down the back of the neck and around the face are tipped with yellow, and the rest of the body is covered

with black down. After about three or four weeks this bright colouring fades and is replaced by a patch of dull greyish-white down the front of the neck and breast. They are almost full grown before they show black on the neck and the frontal shield begins to appear.

In conclusion, our thanks must be given to many of the local residents who took a keen interest in the proceedings and were able to give us much useful information; above all, our thanks must go to Mr. E. Housby of Lake Okareka, who originally found the two nests and who was always able to provide us with a boat when we wanted one. We are also extremely grateful to Mr. M. J. S. Black, of Rotorua, but for whose encouragement a good deal less might have been done.



## SHORT NOTE

### CATTLE EGRET NEAR GREYMOUTH

On 28th April, 1964, Mr. R. H. Jones of 92 Ward St., Cobden, told me that he had seen a strange small white heron near the roadside in the Coal Creek area. He said that he was familiar with the ordinary White Herons, Royal Spoonbills and White-faced Herons, but did not know this bird. The bird was white in colour; bill yellowy orange but shorter than a White Heron's bill; head and neck appeared thicker in proportion than on a White Heron; the legs were very dark; the wings in flight rounded and blunt. On the ground the bird had a sawn-off appearance, tail short and well off the ground, stance upright. When the bird was disturbed it flew to some grazing cattle, landed by the head of one, skipped sideways with half-raised wings when the cow butted at it, then moved around behind the cow. The bird was still following the cattle some four hours later. There were no other birds to be seen in the area. From the general description and behaviour the bird was clearly a Cattle Egret, *Ardeola ibis*.

I was not successful in seeing the bird on the ground but probably saw it in flight over Greymouth on 30th April, 1964. The relatively short and rounded wing compared with White Herons, *Egretta alba modesta*, and Little Egrets, *Egretta garzetta*, was very apparent. The bill appeared orangey and the legs very dark. The wingbeat was noticeably faster than that of White Herons or Little Egrets. However, I had only a brief glimpse in good light from below the bird while I was driving a vehicle.

On 3rd May, 1964, Mr. T. Hartley-Smith reported that he had followed a White Heron-like bird near Totara Flat. Unfortunately the fog was very thick and a good view was not obtained. The bird had a short, rounded wing, very dark legs, quick wingbeat — about twice as fast as the wingbeat of White-faced Herons, *Notophox novae-hollandiae*, it was with; bill appeared dark. Smaller than the White-faced Herons.

Whether or not the same bird was seen at Greymouth and Totara Flat is problematical, but the Greymouth bird was not reported after 30th April and it could easily have moved some twenty miles up the Grey River by 3rd May. It is very likely that the Totara Flat bird was in fact a Cattle Egret.

— P. GRANT

## SOME OBSERVATIONS ON BEHAVIOUR OF THE NORTH ISLAND SADDLEBACK IN AUGUST

By A. BLACKBURN

### INTRODUCTION

Little is recorded of the behaviour of the North Island Saddleback, *Philesturnus carunculatus rufusater*, whilst it was still present in some numbers on the mainland; nor has any serious work on behaviour been published since the species became confined to Hen Island. Perhaps Reischek (1886) goes into greater detail than any other writer when, on a visit to Hen Island in December, 1883, he found the birds feeding mainly on the nectar of flax, *Phormium tenax*. He records the excited behaviour of the bird when it observes anything unusual, its great activity in climbing and hopping from branch to branch, and picking in decayed wood and crevices in bark. He goes on to say "they feed on berries and honey. During all this time they keep up a continuous whistling."

The observations recorded in this paper were chiefly made from 23/8/63 to 3/9/63 by members of the party named in Atkinson's paper in this issue. However, a party led by Mr. D. V. Merton of Wildlife Division was on Hen Island for some weeks in January 1964, trapping birds for liberation on Middle Chicken, in which work they were wholly successful. Mr. Merton and some members of his party have kindly supplied notes on behaviour to supplement the August observations; and also some interesting comment on breeding success, or clutch size, which suggests that the Saddleback population on the island may be at saturation point. Mrs. Moncrieff (1929) records a family party of two adults and three young; and Reischek (1886) tells of watching two parent birds, the female feeding three young, naively adding "I shot the parents first." But Merton found family parties of two adults and one fledged young most common, although several with two young were suspected; but on no occasion was a parent bird seen to feed two young.

The sexes are quite distinct in the field, although no difference is stated by Oliver (1955). The wattles of the male are much larger, almost double the size of those of the female, and in most pairs a brighter orange red (not orange). In some pairs the female appears to be slightly smaller than the male. Under excitement, the wattles of the male curve outwards most noticeably; and viewed sideways, when the male's bill is wide open, such as when he is giving the territory call, the wattles hang well forward of the gape. The edging along the top of the chestnut saddle, which distinguishes the two races, is given by Oliver (1955) as pale brown, but is distinctly yellow in the field, being seen to advantage during aggression display.

### TERRITORIAL BEHAVIOUR

Most pairs appeared to be strictly on territory, although several parties of three, four, six, and one of eight, were observed. Territory calling by male birds was frequent in all areas traversed. Both sexes give the territory call, but the female infrequently; and it may be given from any situation, in the foliage, on lower branches, or when feeding amongst ground litter. Territories appear to be well defined, e.g. a territory call by a male of a pair was not answered by a male



30 yards distant. Of three birds in one area, the pair fed together, the third bird keeping its distance. Again, both of a pair gave the aggression call against a strange male in their territory, followed by the male of the pair giving the territory call. This was answered by the intruding male, the female meanwhile continuing to give the aggression call. This "aggression call" is not referred to by Kendrick in his paper, and where the term is used in this paper, it merely implies a more emphatic or aggressive rendering of the normal territorial call. On another occasion, a female called, and almost immediately two males appeared, one of which flew to the female, touched her bill, and gave a call of three notes. He then flew to the other male, and both faced each other, began to bow and fan their tails, and stretching out head and neck, gave Tui-like calls of two notes. The dominant or resident male then gave the territory call, at which the other appeared to be cowed. Both then flew to a higher branch, displayed again, and the dominant male flew to the female and preened her back feathers. She then flew off with the male following.

A pair at the camp site at Dragon's Mouth Cove appeared to have a territory of about 80 yards diameter, and Atkinson estimated that in the valleys and on the ridges east of Baldy, where conditions were perhaps not so favourable, an average territory would be 180 yards across.

The January party used a mounted adult male skin and a tape recording in their trapping work, and the invariable response by the male, or both birds, when the specimen was placed within their territory, and the territory call played, was aggression display and the whispering "flute call." Merton has described this display in his notes as follows: "During the usual bowing display, the largest possible area of brown is on view to the intruding bird. The body being tilted forward and the head bowed low, the entire saddle, yellow band, and brown rump are on view. The wattles, too, are extended and obvious, so that the bird is a fearsome sight from in front. The display is always directed front-on to an intruder, or to a female."

Many instances of bowing display in different situations are recorded. For example:

1. A male seen to flick leaves aside as he displayed on the ground 6ft. away from the mounted specimen (J. Kendrick).

2. A male observed to display and give the flute-call to specimen. He then flew to the ground and began to toss leaves aside, calling continuously (N. Ledgerd).

3. Display and displacement feeding seen to take place in branches 20ft. up, to the specimen 4ft. from the ground (N.L.).

In almost all cases, birds would approach the mounted specimen from above, displaying and flute-calling several times, beginning at about 20ft. distant. If left alone, they would approach to within inches of the specimen, and on one occasion a pair actually attacked it, knocking it 6ft. to the ground (D.M.).

Pairs still feeding fledged young were most aggressive, whereas those with apparently no dependent young were barely interested in the tape recordings played within their territories. Merton further records that two adult pairs were trapped from one territory within four days, indicating a rapid movement into unoccupied areas. Juveniles were frequently taken in areas from which pairs had recently been

removed, a movement which was particularly noticeable near the camp site. But the playing of tape recordings often had the effect of causing juvenile birds to abandon their newly acquired territories. Many roving juveniles were encountered.

### FEEDING BEHAVIOUR

Much of the August feeding is by probing under bark, into forks and knot-holes, under lichens, and into the broken ends of decayed twigs and branches. Normally the point of the bill is used, and the bill then opened; but sometimes the wide-opened bill is used, and in one observation the upper mandible only was inserted into a small knot-hole. Dead wood is attacked with a Woodpecker-like action, the tapping being audible some distance away.

On the ground, mostly the bill is used for tossing aside dead leaves and turning over pieces of rotting wood, but occasionally scratching in the litter was noted. Quite large pieces of wood are turned over, one such being 10 ins. long, and weighing 40 gms.

The male appears to spend more time on the ground than the female, and during some observations he called to the female with a Tui-like warbling note, and she then joined him on the ground.

There is much intensive searching of hanging clusters of dead leaves, and on occasion the stem of a large dead leaf, such as of whau, is grasped by a foot to be held firmly against a branch, while the leaf is thoroughly searched. In nikau palms, the dead leaves are prised apart with the bill, and the base of each leaf is usually probed into. When feeding round the base of cabbage-tree crowns, either the trunk or pendent leaves are grasped, and a complete circuit of the crown made in every case. From one observation on clematis, *C. indivisa*, nectar is taken from flowers in the manner of all birds with honey-eater tongues.

An almost exaggerated tossing movement of the head is made when swallowing insects, whether the bird is feeding on the ground or elsewhere. An instance was noted of a bird taking a 3 in. caterpillar and tossing its head until the insect was in a suitable position for swallowing, which it did without maceration. In other cases, maceration was effected by wiping the bill on a branch, and again by flicking the head and thus seeming to get rid of distasteful juices.

The extreme nervous energy of the Saddleback in its continuous search for food is its most notable behavioural characteristic, and in this there is a resemblance to the now extinct Huia, *Heteralocha acutirostris*. It seems probable that the life history and habits of the two related species were closely alike. Buller (1882) records of the Huia that "they never seem to tire of probing and chiselling with their beaks," and Phillipps (1963) suggests that a high rate of metabolism is the cause of the restless habits of the family.

The lack of permanent water on Middle Chicken Island, where liberations have now been made, is a matter for concern. It has been suggested that the Saddleback as an insect-eater may not require drinking water, for it appears that the genus *Malurus* and other Australian genera which are wholly insectivorous, have never been observed to drink. But further observations on Hen Island will undoubtedly show that at certain seasons berries, flower-buds, and nectar in particular, form a large part of the Saddleback's diet. Moreover, in January, birds were observed to drink at the waterhole at Dragon's Mouth Cove, and Merton noted one drinking raindrops from the undersides of coprosma

leaves. It would seem that provision of an artificial water supply on Middle Chicken during the summer months may be necessary. However, a recent survey of the island has revealed a sufficient growth of collospermums to provide some necessary water. J. Kendrick states (*pers. comm.*) that in January he saw a Red-crowned Parakeet, *Cyanoramphus novaeseelandiae*, taking water from the base of a collospermum clump, and that he knows from experience that these plants, and possibly astelias, hold water for long periods.

### FLIGHT

Movement is generally restricted to within the bush canopy, and on one occasion only was a bird observed in very brief flight above a stand of kanuka. Short flights of up to 30 yards are frequent; but the usual progression in a tree or on the ground is by a series of hops, with wings closed, or by running along a branch. Buller (1888) describes the flight as very laboured, though rapid, and always confined to short distances. The general impression of intense activity seems to make the words "very laboured" somewhat inappropriate.

### SEXUAL DISPLAY AND ACTIVITY

Feeding of the female by the male was frequently seen, and records at other periods will probably show that this behaviour continues throughout the year, to indicate that, like the Huia, the birds remain paired and on territory for life. In this activity, the bills are held in alignment, with the tips touching, and either one choice insect or grub offered and accepted, or two or more small insects fed in succession. Normally the male calls the female to be fed, but on occasions the female approaches the male. In one observation the female waited by the male for about 20 seconds, opening her bill two or three times, without response.

Sometimes display accompanying feeding of the female was seen. For example, before and after feeding, a pair held their bills about an inch apart, at the same time warbling and bowing to each other. Three males and one female were observed in pohutukawas on the cliff face near the camp site at 1730 hrs. Two males offered the female food, which was refused, and one was seen to drop the food, a green nightshade berry. The males were continuously giving short "pipe organ" calls, without display.

Again in January, feeding of the female was a common activity, frequently accompanied by flute-like whisper calls and bowing display by the male. With some pairs, the young had already become independent; where there were dependent young, the female would pass on the food thus provided.

Mutual preening was not often seen, one August record being noted above under territory behaviour; and G. Moon in January recorded a female preening the tail feathers of its mate.

### NESTING

Although rather outside the scope of this paper, a record of nests found by the January party is of interest. Oliver (1955) describes the varied positions and construction of most of the nests recorded on Hen Island, which demonstrate that the Saddleback is not restricted in its nest building to any particular type of situation or material. G. Moon discovered three nests as follows:

1. In the hollow centre of a mahoe, 8 ft. from the ground. Built of kowhai leaf axils and roots.

2. In a niche 15 ft. up the bole of a pohutukawa. Composed of roots and rootlets, and lined with kowhai leaf stalks.

3. Under a rock overhang 6 ft. from the ground. Lined with well-dried blade bases of *Xeronema callistemon*. This nest (20/1/64) contained one apparently fresh egg.

The only August observation was of a female, high in a karaka tree, watched for several minutes collecting bark. The male also stripped bark from a dead twig, and then displayed by running along a branch to the female, and fanning his wings.

### CALLING

Elsewhere in this issue, Kendrick has described the song and calls, and the circumstances under which they are given so far as could be defined from our observations. The territory and other calls are certainly highly developed, and Armstrong (1955) gives the probable reason for this when he says "Territorial birds with domains sufficiently large and endowed with cover in which they spend most of their time out of sight of rivals tend . . . to have highly developed songs or calls."

The territory call is always given with the head up and the bill held well above the horizontal. In the Tui-like "warble" note, frequently given from the ground, the head and neck are well extended. At times the notes appear to be forced out in a manner similar to the whisper song of the Tui, *Prosthemadera novaeseelandiae*. The two note "pipe organ" call is always accompanied by a fanning of the tail.

Song is much reduced from about 1300 to 1500 hours. The earliest song recorded was at 0630 hrs. on 30/8/63, and the latest was at 1738 hrs. the same day; although some 4 minutes later a male was seen progressing by long hops among the pohutukawas near the camp site.

Certain types of calling are referred to in this paper, which are not specifically mentioned by Kendrick, but come under his general reference to "low amplitude calls of soft and organ-like quality."

### SADDLEBACK - FANTAIL ASSOCIATION

A search of the literature fails to reveal any mention of a feeding association between the Saddleback and the Fantail, *Rhipidura fuliginosa placabilis*, which is so apparent on Hen Island to-day. It is an association which may have developed only with the vast changes in our fauna which began in the middle of last century; for some early records refer to a close feeding association between the Saddleback and flocks of Whitehead, *Mohoua ochrocephala albigilla*. Smith (1910) comments on early observations of Saddlebacks following flights of Whiteheads to feed on insects disturbed by them. He says that about the middle of last century, the Whitehead was the commonest bird of the Taranaki bush, and flocks of 30 to 40 were invariably accompanied by a pair of Saddlebacks. Such feeding associations are not unusual. For example, Lack (1948) records the English Robin keeping close to the Pheasant in hard weather, and feeding where the Pheasant had broken through the frost layer. But the Whitehead-Saddleback association was unusual in that the Saddleback is much the larger bird. Lister (1962) states "such associations are more usual between birds of different sizes than of equal size, the smaller taking advantage of the disturbance of insects by the larger."

In the August period, there were in all some 21 observations of Fantails, sometimes a pair, feeding in close association with feeding

Saddlebacks. The association was not as general as that found by Bell and Blackburn (unpublished notes) in July, 1958, when a high wind had stripped the foliage from much of the under-storey on the lower southern slopes, and insect food was probably scarce. Almost every Saddleback on these slopes had one or a pair of Fantails in attendance.

In the foliage, the Fantail usually hovers a foot or so above the Saddleback to catch flying insects disturbed by it; when the Saddleback is feeding under bark, the Fantail perches about 18 ins. below, and intently watches the Saddleback's movements. During the removal of an 18 in. strip of bark referred to by Atkinson, a Fantail watched and waited continuously for the 6 minutes of the process, and was rewarded by several falling insects.

An interesting record was that of a Bellbird, *Anthornis m. melanura*, which followed a pair of Saddlebacks from a puriri to a rock, and from the rock to a collospermum. This went on for about 3 mins., when the Saddleback briefly attacked the Bellbird. Aggression towards the Fantail was rarely shown, and then consisted only of a seeming brief display of impatience.

The January party supplied a further 11 instances of this association, including one of 20 mins. duration, when a Fantail was in continuous attendance on a pair feeding in the ground litter (L. Shailer). G. Moon recorded a Fantail following a pair for 150 yds.; and R. Sibson, Jr., reported seeing a Fantail make a deliberate attack and dart within inches of a feeding Saddleback, which retreated. But this observation is treated with reserve, as being capable of a different interpretation.

#### GENERAL

Birds could at most times be closely observed, and showed no reaction to a careful observer at distances down to 6 ft. A noisy or careless approach usually evoked what we regarded as an aggression call.

Reaction of 3 birds to a Morepork, *Ninox novaeseelandiae*, was extreme agitation, with a continuous chorus of alarm and territory calls. This went on for 12 mins., Bellbirds and a Blackbird, *Turdus merulus*, joining in to swell the din.

A brief historical note will perhaps not be out of place in closing this paper. Reischek (1886) records the Saddleback as very rare on the mainland of the North Island in 1883. Buller (1888) says that in 1863 it was very common on Little Barrier, and formerly comparatively plentiful on the mainland; but in 1888 extremely scarce, and on Little Barrier nearly exterminated by the cats.

#### ACKNOWLEDGEMENTS

Thanks are expressed to Mr. D. V. Merton for making available his notes on observations in January, 1964, and to the members of the party in August, 1963, whose observations contributed so much to this paper.

#### REFERENCES

- Armstrong, E. A., 1955: *The Wren* 44.  
 Buller, W. L., 1882: *Birds of N.Z.* 30, 31.  
 ———, 1888: *A History of the Birds of N.Z.* 2, 18-19.  
 Lack, D., 1948: *Ecology of the Robin*, *Ibis* 252-79, 267.  
 Lister, 1962: *A Bird and its Bush* 85.  
 Moncrieff, P., 1927: *N.Z. Jour. Sci. Tech.* 10, 338.  
 Oliver, W. R. B., 1955: *N.Z. Birds* 513.  
 Phillipps, W. J., 1963: *The Book of the Huia* 13.  
 Reischek, 1886: *Trans. N.Z. Inst.* 19, 188-189.  
 Smith, W., 1910: *Trans. N.Z. Inst.* 43, 165-168.

## FEEDING STATIONS AND FOOD OF NORTH ISLAND SADDLEBACK IN AUGUST

By I. A. E. ATKINSON

Botany Division, Department of Scientific and Industrial Research,  
Lower Hutt

### INTRODUCTION

Since Fleming (1941) recorded a pair of North Island Saddlebacks (*Philesturnus carunculatus rufusater*) in the Raukumara Range during February 1935, none has been definitely recorded save on Hen Island. The danger of losing the Hen Island population through cats, disease or fire is ever present, so it is desirable to establish the bird on other islands as soon as practicable. Detailed knowledge of diet may prevent wasted effort in transferring birds to islands where they cannot survive and, considered with other characteristics, can define the ecological niche of this bird.

This paper records observations on feeding stations and foods of the Saddleback made by a combined Wildlife Branch - O.S.N.Z. - D.S.I.R. expedition to Hen Island from 23rd August to 3rd September, 1963. The party consisted of Mr. D. V. Merton (leader), Misses L. J. Bishop and M. Johnston, Messrs. J. S. Adams, A. Blackburn, D. J. Campbell, M. J. Hogg, J. L. Kendrick, N. J. Ledger, P. D. G. Skegg and the writer, all of whom contributed observations. I wish to emphasise that the basic data of this paper are entirely the result of a team effort. We are indebted to Dr. J. A. Gibb for helpful criticism of the manuscript.

### DISTRIBUTION RELATED TO VEGETATION

In mapping the island's vegetation, the writer tentatively delimited the following types:—

- (i) Kanuka scrub on slopes at the western end of the island.
- (ii) Kanuka and kanuka-puriri forests on the strongly rolling northern slopes.
- (iii) Pohutukawa forest on slopes within 200 ft. of sea-level.
- (iv) Puriri-pohutukawa forest in valleys near the sea.
- (v) Puriri-taraire forest on the southern slopes.
- (vi) Taraire-tawa forest on the southern slopes.
- (vii) Cliff vegetation.

During our visit Saddlebacks were seen feeding in almost all these communities, from the pohutukawa near sea-level on both northern and southern coasts, to the kanuka forest of the upper ridges at 900 to 1,000 ft.; but they were not noticed in the kanuka scrub at the western end of the island. An attempt was made to find out whether Saddlebacks were feeding more in one type of vegetation than another but this was unsuccessful because of an inadequate number of observations.

### FEEDING STATIONS

Prompted by Gibb's (1961) analysis of the feeding stations of birds in Kaingaroa pine forest, the possible feeding stations of the Saddleback on Hen Island were listed. The party's observations, made mainly on the southern slopes, were recorded daily and the results are

summarised in Table 1. Each observation is that of one bird feeding in one place. If a bird moved to another station then this was treated as a separate observation.

TABLE 1: FEEDING STATIONS OF THE SADDLEBACK ON  
HEN ISLAND: AUGUST, 1963

Feeding Stations	No. of observations	% of total
Aerial feeding more than 3ft. above ground	0	0
Aerial feeding within 3ft. of the ground	3	2
Canopy foliage (excluding tufted crowns)	19	9
Understorey foliage	13	6
Foliage of cabbage tree, nikau, collospermum and flax	21	10
Dead foliage	15	8
Bark of upper branches and twigs	59	29
Dead branches	9	4
Boles	23	11
Ground	43	21
<i>Total</i>	<u>205</u>	<u>100</u>

A large proportion (44%) of the feeding observations was of birds feeding along branches or on boles. Characteristically a bird would work along the branches, either ascending or descending, ripping or chipping off pieces of bark, probing into knots and holes, tapping on the bole like a woodpecker, and sometimes using the upper mandible alone as a skewer. Once a strip of kanuka bark, 18 in. long, was torn off the trunk from the bottom upwards, beginning 6ft. above the ground (A.B.).

The tree species on which a bird was seen feeding was identified whenever possible but no particular preferences emerged. Trees with relatively smooth bark figured just as prominently as those with flakey bark, such as kanuka.

When feeding on the ground the beak was used to turn leaves and twigs and occasionally to toss them aside. A piece of rotten wood weighing nearly 40 gm. was turned over (A.B.). Probing actions were also seen and D.V.M. watched a bird spend a minute or two digging a hole nearly two inches deep and an inch in diameter. Crevices in rocks were sometimes examined and J.L.K. observed birds pecking at spider webs.

Aerial feeding was observed when a bird made a short flight from the ground to catch a flying insect disturbed while the bird was feeding amongst the litter (A.B.).

The percentages of Table 1 are open to the criticism that some observations were made shortly after the bird had been disturbed by the observer. Thus the birds could be spending more time feeding on the ground than is indicated. A number of timed observations were made in which recording of the bird's feeding station was begun only after it appeared to be taking little notice of the observer (Table 2).

TABLE 2 — TIMES SPENT BY SADDLEBACKS IN THREE GROUPS OF FEEDING STATIONS ON HEN ISLAND:  
AUGUST, 1963

Feeding Stations	No. of birds observed	Total time of observations (min.)	Percentage of Total
On branches and boles ----	15	145	43
Among foliage ----	6	80	24
On ground ----	14	109	33
<i>Totals</i>	35	334	100

The longest timed observation was made by N.J.L., who followed one bird for 63 minutes, some 25 of which were spent on or within 2 ft. of the ground.

The association of Fantails with feeding Saddlebacks is discussed elsewhere in this issue by Blackburn.

#### FOODS

Twenty-six observations were made in which the food taken was identified (Table 3).

TABLE 3 — FOODS OF SADDLEBACK ON HEN ISLAND:  
AUGUST, 1963

Food	No. of observations
Caterpillars, beetle larvae, spiders and centipedes ----	16
Beetles and moths ----	4
Apical buds of matipo ( <i>Myrsine australis</i> ) ----	2
Flower buds of fivefinger ( <i>Neopanax arboreum</i> ) ----	2
Berries of nightshade ( <i>Solanum nodiflorum</i> ) ----	1
Nectar of <i>Clematis paniculata</i> ----	1 (?)
<i>Total</i>	26

A.B. observed one bird pick off a case moth cocoon and, grasping it with one foot, pick a hole at one end through which the caterpillar was extracted.

With matipo, the birds pecked off and swallowed the apical buds (P.D.G.S.; L.J.B.). J.L.K. saw a male bird fly on to a large rock, grasp the stem of a nightshade with one foot and then pick and eat a cluster of green berries.

On fivefinger, the birds fed selectively among fruits, flower buds and flowers in the upper canopy (D.J.C. and A.B.). The size of the parts taken indicated that they were flower buds. Sibson (1949) observed Saddlebacks eating ripening berries of fivefinger during early January.

The bird feeding from clematis flowers plunged its bill right into the centre of the flower and moved its tongue backwards and forwards, apparently sucking nectar. Immediately afterwards a Bellbird went through the same motions on another flower 18 in. away (D.V.M.).



Kowhai, puriri and *Rhabdothamnus solandri* were also in full flower but there was nothing to suggest that they were being visited by Saddlebacks.

Near the camp-site at Dragon's Mouth Cove, Saddlebacks were often seen searching for food under the flakey bark of kanuka. D.J.C. examined the invertebrates under the bark of two trees each 25 ft. high and 8-10 in. diameter at breast height. The most abundant potential food available on the foliage and fine stems of the canopy were egg masses of scale insects. In the upper branches scale insects themselves were abundant, especially in the axils of small branches where it was damp. Juvenile cockroaches and cockroach egg masses were also common here. Below 15 ft., cockroaches were still present, and centipedes and spiders increasingly common towards the ground; centipedes were the dominant invertebrate under bark within 3 ft. of the ground. Isopodes were also present below 15 ft., particularly in damp places. Thysanurans were present at all levels.

Three Saddleback droppings collected in kanuka forest near the camp have been examined by Dr. K. E. Lee. He reported that most of the material contained in them was so macerated and digested that it was quite unrecognisable. Material that was recognised is shown in Table 4.

TABLE 4 — ANALYSES OF SADDLEBACK DROPPINGS  
(Dr. K. E. LEE)

From all 3 droppings	From 2 out of 3	From 1 out of 3
Egg cases of cockroaches	Fragments of elytra, legs; also mandibles, head capsule of Tenebrionid beetle ( <i>Chrysopeplus expolitus</i> )*	Fragments of legs and body segments of adult cockroach.
	Small fragments of legs, body segments, wing covers of large green insect (probably a mantid). Seeds ( <i>Ranunculus?</i> and one other plant).	Small fragment of skin of insect larva (could be from Elaterid larva).

\*Determined by E. S. Gourley

### DISCUSSION

These observations establish that during late August Saddlebacks feed primarily on insects and other invertebrates living in bark or in litter. The fact that Saddlebacks can be observed spending one third of their feeding time on the ground, even in the presence of man, demonstrates how vulnerable this bird may be to cats or stoats. It also suggests that an undisturbed forest litter could be an essential source of food that probably could not be maintained in the presence of goats or pigs.

The analysis has not revealed that the birds are dependent on any particular food, lack of which could limit numbers on other islands.

On the contrary it appears that in late August a wide variety of invertebrates is taken from a wide range of stations. Feeding behaviour, further details of which are given in this issue by Blackburn, also suggests that the Saddleback is versatile in collecting food. It is clear that many more feeding studies are required at other times of the year, especially during the nesting period. It would be interesting to ascertain whether there is any overlap in foods with other insectivorous birds. Sampling of the invertebrates of tree bark and litter is also necessary to establish what foods are available at different times of the year.

Dr. K. E. Lee (*pers. comm.*) has made a preliminary examination of stomach contents of Kiore (*Rattus exulans*) collected from Hen Island during August. In spite of the extremely macerated condition of these contents some fragments of centipede were definitely identified and probably also cockroach and cicada larvae. These, together with other insect fragments, indicate that invertebrates are an important component of kiore diet. It is possible that there is competition for food between Saddlebacks and Kiore since both forage for food on the forest floor.

Buller (1888), writing when Saddlebacks were still present on the mainland, stated "At the present time it is more plentiful on the Hen than anywhere else": he attributed this to the absence of cats. Since the abundance of Saddlebacks on Hen Island is of such long standing, the island must be particularly favourable to them. The vegetation is rather unusual in having a high proportion of old kanuka stands intermixed with taller forest containing well developed litters. There is no proof from this study that kanuka bark and deep litters are either or both essential to maintain Saddleback numbers, but this could be examined.

There are few other islands where North Island Saddlebacks could be successfully established. Big Chicken Island has been tried unsuccessfully but reasons for the failure are not known. Middle Chicken Island, though smaller, may be a more suitable habitat. Cuvier Island, where Saddlebacks were formerly present (Oliver, 1955), is an obvious choice when cats have been completely exterminated. Aorangi of the Poor Knights Islands may be worth considering although it does not look ideal.

Originally the Saddleback may have occupied a closely parallel ecological niche to that of the Huia although in a different type of forest. Oliver (1963) points out a close similarity of the Huia to the Saddleback in skull structure. Further intensive work on the Saddleback may allow other comparisons and will certainly be necessary in order to preserve this fascinating bird as a member of our fauna.

#### REFERENCES

- Buller, W. L., 1888: *A History of the Birds of New Zealand*. Second Edition. Vol. 1. London.  
Fleming, C. A., 1941: Saddleback In Summarised Reports. *Ann. Rep. Orn. Soc. N.Z.* 1939-40. No. 1, p. 18.  
Gibb, J. A., 1961: Ecology of the Birds of the Kaingaroa Forest. *Proc. N.Z. Ecol. Soc.* 8: 29-38.  
Oliver, W. R. B., 1955: *New Zealand Birds*. Second Edition. A. H. and A. W. Reed. Wellington.  
Oliver, W. R. B., 1963: The Skull of the Huia. Appendix in Phillipps, W. J., 1963: *The Book of the Huia*. Whitcombe and Tombs. 159 pp.  
Sibson, R. B., 1949: A Visit to Hen Island. *N.Z. Bird Notes* 3 (7): 183-88.

## OBSERVATIONS ON THE SONG OF THE NORTH ISLAND SADDLEBACK

By J. L. KENDRICK

---

### METHODS

Since sound recordings can be of great assistance in the study of the Saddleback, a tape recorder with portable power supply and parabola was taken to Hen Island on the August-September visit. This recorder was heavy so some mobility was sacrificed but even so recordings of notes from different birds were made within a half-mile radius of the base camp.

For the visit during January 1964, a transistorized recorder was used, giving complete mobility and further opportunities for recording and attracting the birds. Territorial birds, such as the Saddleback, respond readily to playback of certain calls, and this fact can be of great assistance in the close study of the species.

As a result of these two visits a representative selection of the various types of call of the Saddleback is now available as tape recordings for further analysis.

### TYPES OF CALL

A tentative classification of the more usual calls may be associated with various activities of the birds.

#### *Territorial Call*

The Saddleback uses this challenging and penetrating call in making known its territory to neighbouring birds. Andersen (1926) gives a good phonetic representation by describing the notes as "Chee-per-per Chee-per-per" repeated a number of times with accent on the first syllable. However it was noted that this section was often, though not always preceded by a note which can be described as "Chink." The call from the female is lower in pitch and less incisive in those examples studied.

N. J. Ledgard recorded that when a pigeon flew low overhead, a male bird stopped feeding, gave its territorial call and then resumed feeding. It has been noted that the note is often given from the ground, and this territorial call appears to be the type heard most frequently from the birds throughout the year.

#### *Alarm Call*

This sound is produced as a series of quick agitated notes, similar in form to the alarm cry of the Bellbird or Blackbird. Recordings of the alarm call were made while the birds were vigorously reacting to the presence of Moreporks during August-September 1963 and January 1964. In a recording where all three birds are harassing a Morepork the notes of the Saddleback may be easily distinguished by the higher pitch and more incisive quality.

#### *Courtship, Feeding and Communicating Calls*

Many observations of courtship display by the male were noted during the first visit in August-September — that is, the period preceding their breeding season. These included feeding of the female, and caressing actions with display of wings and tail, often accompanied by low amplitude calls of soft and organ-like quality. When tapes containing these calls are played, the birds show a strong reaction and

approach within a few feet of the observer. These calls appear to be more in evidence in the spring than in January when the breeding season has concluded.

A variety of soft "whistles" and "pips" is often given when a pair is feeding some distance apart, apparently as a means of maintaining contact. A resemblance between these notes and those of another wattle bird — the Kokako — is apparent.

#### *Flute Calls*

The low amplitude notes mentioned above have great beauty but the loud melodious flute calls are more easily heard and probably constitute the usual "song" of the Saddleback given more or less at any time throughout the year. Although these notes have not yet been associated with a particular type of activity, more were heard in January than in the August-September period.

### DISCUSSION

By playing back the various types of call it was found that the agitated notes produced during harrying of Moreporks were the most reliable in attracting Saddlebacks from some distance. The territorial call was also found useful for attraction in spring.

The Saddleback must surely be one of our most interesting species to study for quality and variety of call notes. The sharply penetrating and energetic territorial call leaves one in no doubt as to the identity of the bird, even if it is unseen, and once heard it is not easily forgotten. In contrast there are the soft, organ-like "warblings" and "pips," given when the birds are close to one another or when the male is displaying to the female in courtship. It is not yet known whether all the calls recorded are made by both sexes. An interesting field for future work lies in observing similarities or differences of song and associated behaviour between the North and South Island subspecies of Saddleback.

### REFERENCE

Andersen, J. C., 1926: *Bird-Song and New Zealand Song Birds*. Whitcombe and Tombs. 215 pp.



## SHORT NOTE

### A LITTLE WHIMBREL IN MANUKAU HARBOUR

On 28/3/64 we were watching at Karaka a loose flock of waders being driven towards us by the rising tide. A small party of godwit was feeding as it came in. We noticed a smaller, dark brown bird being chivvied occasionally by the godwit. Suddenly it would turn and viciously pursue one of the larger birds, then resume feeding. J.U. was first to get her glasses on to it and notice its down-turned bill. It was 180 yards away so I used my 30 X telescope and noted some light pattern somewhere on its head but only for an instant and not clearly. Some dogs then put up the whole party of birds which flew towards us and then wheeled away, backs fully exposed. We had plenty of time to train our binoculars on to the smaller bird and to see that it showed no light on the upper surface. Size, colour and bill left no doubt as to its being a Little Whimbrel, *Numenius minutus*.

— (Mrs.) JULIET URQUHART, H. R. MCKENZIE

## REPORTED FIRST SIGHTINGS OF LESSER YELLOWLEGS IN NEW ZEALAND

### I: LESSER YELLOWLEGS AT NAPIER

By NORMAN MACKENZIE

On the morning of the 3rd November 1963, I was one of a small party of O.S.N.Z. members and friends visiting the Ahuriri Lagoon, Napier. The time was 0600 hours with a clear bright sky and excellent visibility.

On our arrival at the Domain pond it was decided to investigate a flock of Godwits on the western shore. The water in the pond, which is brackish and tideless, was very low and many birds were to be seen on the extensive mudflats to the south of the causeway.

While the rest of the party, Messrs. B. D. Hankins, L. S. Shailer, T. H. Davies and Roderick Mackenzie, stayed behind to watch this group, K. W. Varney and I moved further south towards another concentration of birds. As we came within 100 yards or so of this group my attention was quickly drawn to an unusual wader that was feeding on the distant outskirts of the flock. At this part of the pond the muddy margin narrowed considerably, because of a point of land projecting into the water. There was plenty of cover nearby and it took only a short time to get within 30 yards of the strange bird.

It was busily feeding in shallow water in association with a small flock of Curlew Sandpipers (*C. ferruginea*) on the outskirts of a flock of Bar-tailed Godwits and a scattering of Pied Stilts.

The following description was compiled by B.D.H., K.W.V., and myself over the next three days.

First seen at 0600 hours 3/11/63 and watched intermittently all morning in clear bright sunlight and on 4/11/63 seen again from 1700 hours to 1800 hours with the light behind us. On 5/11/63 seen at 1100 hours in high wind and clear light when the bird took shelter behind some salicornia. Seen on the first day at 30 yds. range with binoculars and 20 x 50 telescope and on the other two days at varying distances.

**SIZE:** A little larger than Curlew Sandpiper, but smaller than Pied Stilt.

**HEAD:** Small, with slight striations or feather margins on dark fawn crown. A white superciliary stripe above and slightly beyond the eye appearing to join in front above the bill. Cheek and side of face paler in colour than the crown, toning off in density of colour to the upper breast.

**BILL:** Long and slightly tapered. Black generally with horn colour near base.

**EYE:** Dark.

**BREAST AND SHOULDERS:** Pale fawn.

**UNDERPARTS:** White but not as white as Curlew Sandpiper.

**NAPE AND FORWARD PART OF BACK:** Dark uniform fawn.

**WINGS:** Primaries: brown/grey.

Secondaries and Coverts: Lighter in colour, coverts with slight white margins; no white wing bar shown.

**UNDERWING PATTERN:** Darker on primaries, lighter on secondaries and axillaries.

**RUMP AND TAIL:** Not visible when standing. Very white in flight and noticeable to the naked eye.

**LEGS:** Very long and slim, at first sight light yellow but as the light varied, deepened to a deep orange; frequently appeared to be slightly bent.

**TOES:** An elevated hind toe.

**GENERAL:** While it appeared only a little larger in the body than the Curlew Sandpipers, its unusually long legs made it tower above them. The Curlew Sandpiper is generally considered to be about  $8\frac{1}{2}$  inches long and we agreed without difficulty that the stranger must be a good 10 inches and at first were inclined to say still larger. The head appeared small and when the bird was actively feeding the neck appeared elongated and thin.

**CALL:** Too many Godwits, Curlew Sandpipers and Pied Stilts to catch any notes.

**FLIGHT:** Fairly swift and erratic. Seen to fly on many occasions, mostly short distances and often back to the starting point. The white tail was very noticeable.

**HABITS:** During the three days this bird was seen at Ahuriri it was nearly always in the same place and at the most not more than 400 yards away. Nearly always seen standing in the water and feeding actively on or near the surface, and occasionally on the muddy bottom. Often waded up to its belly. Carried its bill almost vertically over the water while feeding and occasionally buried its head under the surface. Fed by quick darting and jabbing and did not at any time deliberately probe like a Godwit. When active its neck appeared long and thin. Bobbed occasionally. It preened while in the water and now and again scratched itself. In general it conveyed an impression of elegance and activeness.

#### DISCUSSION

There is a number of birds which more or less fit this description and the following were considered:

Wilson's Phalarope, Stilt Sandpiper, Greater and Lesser Yellowlegs, Marsh Sandpiper, Wood Sandpiper.

Most of these can be ruled out either by size as in the case of the Greater Yellowlegs and Wood Sandpiper, colour in Wilson's Phalarope, or the shape of the bill in the case of the Stilt Sandpiper. This leaves two: The Marsh Sandpiper (*Tringa stagnatilis*) and the Lesser Yellowlegs (*Tringa flavipes*).

The Marsh Sandpiper (9 inches) an accidental visitor to this country from its breeding grounds in Eastern Europe and Asia has as its principal diagnostic features, long legs generally considered to be a greenish olive-yellow; a long, fine, straight bill; white cheeks and face; a white tail and rump and a white wedge running up the back between the wings.

Although the literature available to me states that the legs are always a colour varying from green to dusky olive, it has been reported (*pers. comm.* R. B. Sibson, H. R. McKenzie) that a Marsh Sandpiper seen in the Firth of Thames recently had legs which at times appeared

yellow; so this is evidently an unreliable character. The Ahuriri bird had a long, straight bill but had a pale fawn cheek and side of face and a uniform dark fawn-brown colour on the back down to the area of the rump or upper tail-coverts, that is to an approximate line between the trailing edges of the extended wings. The illustration of the Marsh Sandpiper in the *Handbook of British Birds* Vol. IV, plate 119, shows a bird with a great deal of white on the face and a white throat, while the white on the lower back is most conspicuous.

The Lesser Yellowlegs ( $9\frac{1}{2}$ -11 inches) has not as yet been recorded in New Zealand. Its breeding grounds extend from north western Alaska to Ungava Bay and south to Manitoba and Quebec, while its normal migration route lies to the East along the Atlantic seaboard as far south as Chile and Patagonia. On the return trip it tends to travel inland up the Mississippi valley region but is seldom seen west of the Rockies. It has been recorded a number of times in Great Britain and Europe.

It is generally agreed that in appearance there is little to distinguish the two species of Yellowlegs except size and that the differing points are too minute and perhaps are too variable to be always useful in the field. The photograph of the Greater Yellowlegs at Porirua (*Notornis* X, plate XXVa, I. G. Andrew) shows a bird with rather conspicuous speckling on the wings and coverts, a feature which was not quite so noticeable in the Ahuriri bird. We were fortunate to get such a good comparison in size with the Curlew Sandpipers and can dismiss the larger species with some confidence.

The Lesser Yellowlegs shares the general conformation of the Marsh Sandpiper but is slightly larger and more robustly built. Its legs are invariably yellow, the amount of colour evidently being subject to slight variation, as various artists portray it in varying intensities. The face and breast are an ashy brown and the back entirely lacks white as far down as the rump or tail coverts. The *Handbook* Vol. IV, p. 317, states that the tail has transverse brown bars and in flight appears white.

This is a description that fits the Ahuriri wader well, particularly the general darker colouration about the head, the always brightly-coloured legs and the lack of white on the lower back. The Ahuriri bird flew frequently and we had many fine opportunities for a good look into this point.

During the previous season a Tattler (*H. i. brevipes*) (*Notornis* 10: 237) was seen in this area and in my initial efforts to identify it I had made myself familiar with the diagnostic features of both the birds now under discussion. The amount of white on the lower back is perhaps the most important single feature distinguishing the two species and I watched for it with great care.

Some little time later I was interested to hear that John Kendrick of Hamilton had photographed the Firth of Thames Marsh Sandpiper on 8 m.m. colour film and Mr. Kendrick obligingly ran the film through for me several times. It is of course difficult at a later date to evaluate comparative sizes but when the opening sequence showed the Marsh Sandpiper between two Pied Stilts it appeared to look slightly smaller than the Ahuriri bird. However, any lingering doubts I may have had about my tentative identification of the Ahuriri bird as a Lesser Yellowlegs soon disappeared when I saw firstly the much whiter head and

secondly the very extensive amount of white on the back of the Marsh Sandpiper while it was in flight.

We feel that the description of the Ahuriri wader and consideration of the various points mentioned above lead to the conclusion that this wader is most likely to be the Lesser Yellowlegs, *Tringa flavipes* (Gm.) and that, if so, it will be the first recorded in New Zealand.

#### REFERENCES

- Condon and McGill: Field Guide to the Waders, 2nd Ed. 1930.  
Fleming: *Notornis* 10, 258-262, plate XXVa.  
National Geographic Society: The Book of Birds.  
Peterson and others: A Field Guide to the Birds of Britain and Europe.  
Wilson: American Ornithology.  
Witherby and others: The Handbook of British Birds, Vol. IV.



## II: A LESSER YELLOWLEGS AT LAKE ELLESMERE

By G. A. TUNNICLIFFE

A wader, which was later identified as a Lesser Yellowlegs (*Tringa flavipes*), was first seen on 20/1/64, roosting with a flock of Pied Stilts (*Himantopus h. leucocephalus*) and Banded Dotterels (*Charadrius bicinctus*) near the Lower Selwyn Huts on the western edge of Lake Ellesmere, Canterbury. This is of interest because this species has not been recorded previously in New Zealand,\* though Fleming (1963) has recently published a record of a bird tentatively identified as a Greater Yellowlegs (*T. melanoleuca*).†

On my first examination, through 8 x 30 binoculars at about 30 yds. distance, I recorded the following details: the beak was black, straight, narrow, and about half the length of a stilt's; face, pale brown with white eyebrow stripe; posterior to the eyebrow stripe was a small dark grey patch; back, dark grey; underparts, white; breast, dark grey; wing coverts, faintly barred; and the leading edge of the folded wing was dark brown. In flight, a pattern of white rump and a uniformly dark brown tail showed clearly. The legs were yellow and projected like a stilt's in flight. It had a body shape slimmer than a stilt's, and it stood half the height of a stilt. The bird was identified provisionally as a Lesser Yellowlegs.

Six days later, 25/1/64, I was joined by Messrs. D. H. Brathwaite, D. Dawson, and J. Hilton, and saw the bird in the same area. With the aid of D.H.B.'s powerful telescope, further points were noted. The face was mottled, and D.D. and D.H.B. observed that the white eyebrow stripes converged above the base of the beak. Mottling occurred along the lower edge of the dark grey area on the breast, and on the flanks (D.H.B.). The legs were yellow, with a tinge of orange.

The bird fed on organisms in shallow water more actively than a stilt, and the action consisted mostly of probing, as well as frequent snatching from the water surface. Regurgitation of material occurred twice (D.H.B.). On two occasions a Pied Stilt chased the bird when the latter approached too closely.

When on the ground, a short monosyllabic call was given, with irregular intervals between calls. In flight, a disyllabic call was given twice, and then repeated once more but after a considerable interval.

\* But see Mackenzie in preceding paper of this issue.—Ed.

† But see Falla in following paper of this issue.—Ed.



D.H.B. described the ground call as 'ti,' and the flight call as 'ti tu' (—). This is similar to the 'kit to' (—) described by Saunders (1951) for the call of Lesser Yellowlegs.

Thus the characters which distinguished this bird as a Lesser Yellowlegs, and not a Greater Yellowlegs, were based on field observations of its general body size, the relative length and definite straightness of its bill, and the nature of its call.

The Lesser Yellowlegs breeds in Canada, from North Quebec to Manitoba and Alaska. It migrates throughout east North America, and winters in South America. The Greater Yellowlegs breeds in areas from Labrador and Hudson Bay South to the Gulf of St. Lawrence and South Manitoba. It migrates throughout the United States and winters along the Atlantic and Gulf Coasts north to the Carolinas — occasionally further.

I wish to thank Dr. Stonehouse, Mr. E. G. Turbott, and Mr. D. H. Brathwaite for their help and the considerable interest they have shown.

#### REFERENCES

- FLEMING, C. A., 1963: *Notornis* X, 6: pp. 258-262.  
SAUNDERS, 1951: A Guide to Bird Songs.



## THE PORIRUA YELLOWLEGS

By R. A. FALLA

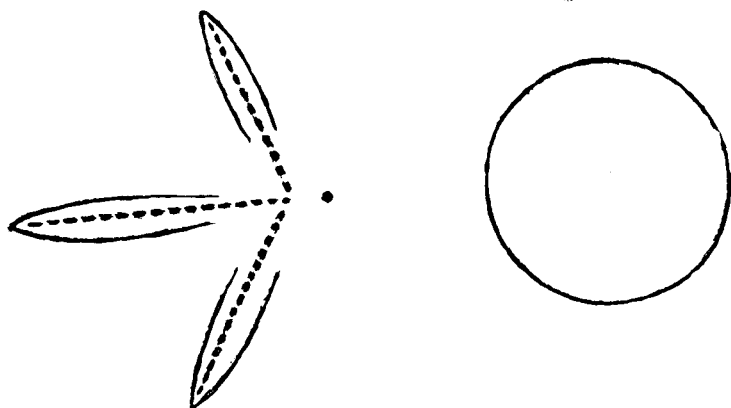
As one of the many observers of the vagrant wader near Porirua in November 1962, I have studied with interest the paper by C. A. Fleming (1963) in which are advanced the reasons that led to a conclusion that it was a Greater Yellowlegs, *Totanus melanoleuca*. It would not be helpful to consider any further the subjective evidence. The bird was apparently always alone and my own impression was that, apart from the length of leg, it was little bigger than a tattler or a knot. This opinion has about the same chance of being wrong as that of those who thought it was larger.

Furthermore the ingenious device of estimating the length of the bill by comparison with a measured stick which the bird walked over must be regarded as liable to some margin of error.

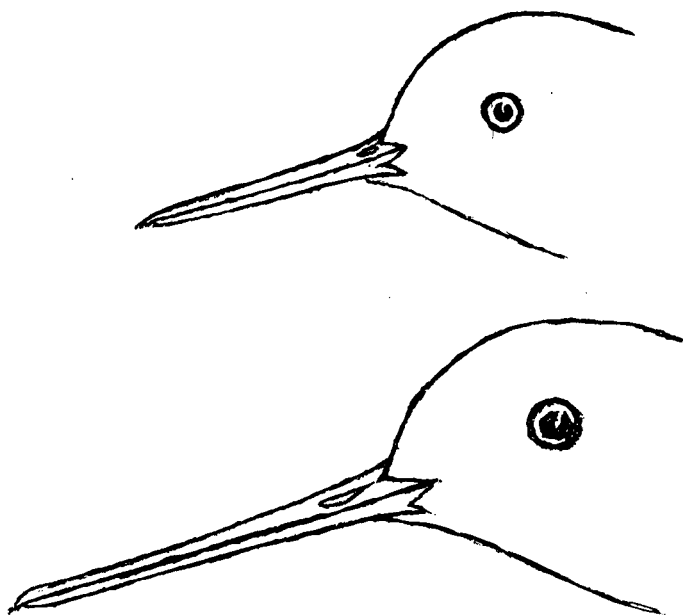
The main purpose of this questioning note is to comment on the objective evidence — the photograph of a footprint in soft mud (Fleming 1963, pl. XXVI b), and the skin of a female Lesser Yellowlegs, *Totanus flavipes*, sent to the Dominion Museum at Dr. Fleming's request by the American Museum of Natural History. The soft mud has clearly depressed into a V-shaped groove totally unlike the impression made by a dried foot in plasticine. The grooves in the mud are much wider than the toes and could be slightly longer, so that an estimated mid-toe length of 41 millimetres may be excessive. In the dried skin of *T. flavipes*, collected in 1899, the normal shrinkage of up to 1 mm. at each of the five joints of the middle toe must be reckoned with. Its present length of 33 mm. is consistent with an original flesh length of 35mm. or more. The span between the tips of the spread outer toes is 50 mm. even in the dried foot, and this is the actual extent of span in the photographed footprint.

In the accompanying diagram, which is natural size, the dotted lines are the dimensions of the dried toes of the specimen of *T. flavipes*

the groove shapes are assumed, and the circle represents the half-crown for comparison with the published photograph. The impression of a live foot of the same bird could well have been larger.



Another fact that arises from a comparison of the only two available skins, one of *T. melanoleuca* (Nebraska, 3 October) and one of *T. flavipes* (New York, 18 September) is that the latter is appreciably paler under the wing, the coverts nearly white and the axillaries entirely so except for an imperceptible smudge at the tips of the longest.



Yellowlegs Heads (actual size)

Upper: *T. flavipes*, female

Lower: *T. melanoleuca*, male.

By contrast *T. melanoleuca* is darker, with perceptible chevron bars and vermiculation on the axillaries. The published photographs in the paper under review (Plates XXV and XXVI) are most consistent in this respect with the specimen of *T. flavipes*. It must be remembered, too, that *T. melanoleuca* has a relatively as well as absolutely longer bill than *T. flavipes*. In the former the linear distance from the back of the eye to the base of the culmen is less than half the length of the bill; in the latter it is fully half or more than half. This can be tested in any side-on photograph, such as XXVa in the paper cited.

These further speculations cannot be claimed to be conclusive, but they do prompt the reflection that:—

- (a) Subjective speculation can be a stimulating exercise up to a point.
- (b) When the available recorded data in the literature are, as in the case of the two Yellowlegs, rather meagre for such common birds, are sometimes defective, and occasionally contradictory, the field observer can be left speculating.
- (c) In default of a fresh specimen even a fifty-year old skin with full data can help the interpretation of photographs considerably.

If the submissions advanced above are accepted as valid the Porirua bird could have been a Lesser Yellowlegs.

#### REFERENCE

FLEMING, 1963: *Notornis* 10: 258-262.



## SHORT NOTE

### WELCOME SWALLOW IN SOUTHLAND

A bird observed at Otatara, near Invercargill, intermittently from November 1963 to early March 1964 can be described as follows:

About the size of a pipit but in flight and habits unlike any bird I have seen. The flight was fast — fluttering — weaving, somewhat bat-like. The bird was in association with sparrows, greenfinch and chaffinch around the farm, close to the buildings at times. Invariably separated from the other birds when they took flight. It landed very seldom — would soar quite high on its own till lost to view and then next moment would be seen flying fast very close to the ground, closely following contours. It would persist in this for ten minutes or so over a wide area, frequently coming into sight again, and then would disappear. It was observed perching only once in rather a bad light. From the front view the bird was very dark all over, either dark grey or brownish, with a small patch of diffused buffy yellow at the throat. The colour in flight was a rich velvety brownish-black (almost lambent) with a small patch of creamy yellow on the upper tail coverts or very low on the rump, seen from behind. The beak appeared to be dark and short, the neck short and the eye dark. The tail was relatively long but no other feature about the tail was obvious.

The flight was so fast and erratic that although I kept the field glasses handy I never succeeded in viewing it through them.

— L. E. HENDERSON

[This account and an accompanying sketch answer the description of a juvenile Welcome Swallow.—Ed.]

## AUSTRALIAN STRAGGLERS IN NEW ZEALAND, WITH FIRST RECORD OF THE FAN-TAILED CUCKOO

By E. G. TURBOTT, *Canterbury Museum*, and  
R. J. SCARLETT, *Canterbury Museum*

---

The following notes include the re-identification as an Indian Waterhen (*Gallinula chloropus indica*) of a specimen in Canterbury Museum believed to be of New Zealand origin (formerly identified as an Australian Black-tailed Waterhen, *Tribonyx ventralis*), together with new records based on specimens sent in to the Museum of the Fan-tailed Cuckoo (*Cacomantis pyrrhophanus*) (first New Zealand record) and Fork-tailed Swift (*Apus pacificus*).

INDIAN WATERHEN. *Gallinula chloropus indica* Blyth, 1842.

A specimen (Canterbury Museum AV. 2437) included in the collection purchased by the Museum in 1942 from the late Mr. A. C. O'Connor and identified as *Tribonyx ventralis* (Gould, 1837) (Otago, ex Smyth Collection) now proves to be of this species. It is recorded under *T. ventralis* in the *Checklist* (Fleming *et al.* 1953) as "'Otago' without date"; Oliver (1955) mentions "specimens without data in museums" presumably including this specimen.

Unfortunately some small doubt must remain as to whether the bird was collected in New Zealand, as the above data had been recorded in Mr. O'Connor's catalogue only and no collector's label was attached to the specimen. It originated from the collection made by the taxidermist, W. Smyth, who worked in Dunedin in the period approximately 1895-1910, much of whose material was derived from the Dunedin area. After W. Smyth's death, his bird skins passed to Bills and Rowley. The skin in question was purchased by C. A. Fleming in January, 1940, and given to A. C. O'Connor.

The material available in New Zealand collections proved insufficient to enable the specimen to be identified down to subspecies. We have accordingly submitted it to Dr. Alexander Wetmore, Research Associate at the Smithsonian Institution, Washington, D.C., and we are grateful to Dr. Wetmore for the following report (*in litt.*): "The gallinule . . . is an interesting specimen. After careful comparison I have identified it as *Gallinula chloropus indica*, an immature individual with the frontal plate not yet fully developed. I have made a thorough study to be certain that it was not the typical race of this species that might have been carried rather casually by some traveller to New Zealand. The two races concerned are fairly similar in size, but *indica* differs in this stage in being darker brown on the back and wings, and also in having a wash of this same darker colour on the head and hindneck."

Commenting also on the possibility that the specimen provides a New Zealand record, Dr. Wetmore says: "Range [of *indica*] . . . differs somewhat from some of the earlier statements, particularly in that birds from Arabia and Iraq are now placed with typical *chloropus* . . . Breeds from Kashmir, southern Tibet, Assam, southern and eastern China and Japan south to southern India, Ceylon, central and southern Burma (locally), Cambodia, the Riu Kiu Islands, Formosa, and Botal

Tabaga. Migrant in the north, a few remaining through the winter months in southern Japan; common at that season in northern Siam and throughout Burma; reported casually from Korea and Sakhalin.

"There is no question but that this bird is migratory in the northern section of the breeding range. I have found no definite records for the East Indies or the Philippines but believe that eventually *indica* will be recorded there as a winter visitor though to date it does not seem to have been distinguished from the resident forms of these areas.

"Under these circumstances it would seem reasonable to accept the casual occurrence of *indica* in New Zealand."

Our thanks are due to Mr. A. Lendon, of Adelaide, who pointed out during a visit to the Museum that the specimen had been misidentified.

**EASTERN AUSTRALIAN FAN-TAILED CUCKOO.** *Cacomantis pyrrhophanus prionurus* (Lichtenstein, 1823)

On 15th June, 1960, a specimen (AV. 19616) was sent in by Mrs. M. R. Page, of Governor's Bay (Lyttelton Harbour, distant eight miles from Christchurch). It had been killed that day by a cat, but was quite undamaged. Colours of soft parts: iris pale brown, eyelids lemon ochre, skin round gape orange; female.

The species ranges from New Guinea through the Solomons and New Hebrides to Australia, New Caledonia and Fiji. Mr. K. A. Hindwood, Honorary Ornithologist, Australian Museum, who kindly examined the specimen considered it to be a typical example of the above subspecies. He states (*in litt*): "The species has been recorded throughout the year from near Sydney where it is considered nomadic in its movements during the autumn and winter months . . . A tendency to wander is indicated by the fact that there are two records of the occurrence of the species on Lord Howe Island, some 300 miles east of New South Wales. One of these specimens is still in existence and I have compared it with material from New South Wales and also with the New Zealand specimen, and it agrees with such birds." (Cf. Hindwood, 1940.)

Mr. Hindwood gives the following additional notes on his examination of the specimen: "From the very fine, scarcely noticeable, flecking on the underparts of the New Zealand bird it would seem that it is not quite fully adult, a fact also indicated by the brownish colour of the secondary wing feathers, which in fully adult birds are the same colour as the primary wing feathers."

**FORK-TAILED SWIFT.** *Apus pacificus pacificus* (Latham, 1801)

The following are records of two specimens in the Museum's collection:

(a) (AV. 15170.) This specimen, mummified but with plumage little damaged, was rescued from a kitten by Mr. A. L. Adamson, at Manakiaiaua, South Westland, on 31st May, 1957.

(b) (AV. 19739.) This bird, an adult male, was sent to Mr. B. D. Heather from Waianiwa, Southland, by Mr. D. N. Price, who found it on his farm on 20th November, 1960. Mr. Heather forwarded it to the Museum. The accompanying photograph of the dead swift was taken before it was despatched and appeared in the *Weekly News* of 1st March, 1961.

Our specimens have not been critically determined to subspecies, but are presumably of this form, which is present in Australia as a summer migrant.

#### REFERENCES

- Fleming, C.A. et al., 1953: *Checklist of New Zealand Birds*, Wellington.  
Hindwood, K. A., 1940: The Birds of Lord Howe Island. *Emu* 40: 1-86.  
Oliver, W. R. B., 1955: (2nd. ed.). *New Zealand Birds*, Wellington.



## BREEDING BIOLOGY OF THE SOUTHERN BLACK-BACKED GULL

### II: INCUBATION AND THE CHICK STAGE

By R. A. FORDHAM

Zoology Department, Victoria University of Wellington

#### ABSTRACT

The study was made on Somes Island in Wellington Harbour during the 1961-62 breeding season. Incubation behaviour, development of the incubation drive and methods of nest relief are discussed. The average incubation period is 27 days, with extremes of 23 and 30 days. The average breaking period of the eggs is three days, with extremes of one and six days. Two-egg clutches hatch in one to five days, three-egg clutches in two to six days. In most two- and three-egg clutches incubation becomes effective on arrival of the second egg. Of all the eggs from first clutches, 66.1% hatched successfully. Half of those failing to hatch were adured or contained dead embryos. Three-egg clutches had a higher hatching percentage than two-egg clutches, which were in turn more successful than one-egg clutches. Egg losses are correlated with nesting density; greatest losses occurring in areas of highest density.

Brooding and defensive behaviour are outlined, and the feeding of chicks discussed. A wide variety of foods is offered the chicks, but in general they are fed whatever happens to be handy and available in quantity. Chicks leave the nest two to three days after hatching, are able to swim at five to six days of age, and fly at about seven weeks. The egg tooth is lost on the eighth or ninth day, the yolk-sac scar disappears by the end of the third week, and the beak becomes wholly black after five weeks. Young birds leave the colony within a month of fledging.

Minimum chick mortality to the flying stage was 19.8% — heaviest losses being sustained in the first week after hatching. The minimum overall mortality of eggs and chicks to the flying stage was 45.9%, and a mean of 1.3 chicks per breeding pair reached the flying stage. The majority of breeding adults found dead were males, most of which died from wounds inflicted by other gulls. A few immature birds in the colony showed incomplete breeding behaviour.

This paper concludes a description of the breeding of the Southern Black-backed Gull, *Larus dominicanus*, as recorded on Somes Island, Wellington Harbour, New Zealand, during the 1961-62 season. An earlier paper (Fordham, 1964) gave an account of the pre-egg and egg stages, and the present paper continues with descriptions of incubation, chick growth and behaviour, the breeding success of the colony, mortality of breeding adults, and the behaviour of non-breeding immature birds. Calls and postures mentioned have been described previously by Fordham (1963).

#### INCUBATION AND HATCHING

##### *Incubation Behaviour*

Before completing the clutch, the birds attend the nest but rarely incubate. Displacement preening is occasionally seen both in and out of the nest. Serious incubation, to which the following notes refer, begins after the last egg is laid. On settling, the incubating bird shuffles the eggs into place against the brood patches and then usually adjusts the nest material. This is achieved by shifting material about the nest with the beak and may be followed by foot-patting. Foot-patting is a nest-building activity (described by Fordham, 1964) which occurs with decreasing frequency as incubation progresses until after about 10 days it is rarely seen. Reduction in foot-patting is probably an expression of the waning of the nest-building drive, for a little nest-building often occurs in nests with new eggs. To turn the eggs the bird lowers its head and pulls them toward itself with the underside of the beak. Sitting birds make small "trampling movements" (Beer, 1961) with the feet, which tilt the body from side to side and eventually move the feet close to the eggs. By approaching incubating birds with a torch at night, and gentle handling, it was established that in fact the feet

usually are partly under the eggs. This helps to explain how eggs and small chicks are sometimes flicked out of nests when the parent departs abruptly.

While on the nest a bird spends much of the time sleeping, preening, simply sitting still, or on hot days gasping. Other activities include joining in contagious cries such as long calls or alarm calls, and there may be a little choking on occasions. Nests remain free of faeces or dirt until the eggs hatch, but in one nest a regurgitated casting of shellfish remains was found after a fortnight's incubation. Tinbergen (1953) concluded that incubation inhibits defecation. In bad weather the birds flushed as readily as during fine weather, but tended to return more promptly to the nest. Similarly for the Black-headed Gull, *L. ridibundus*, Baerends (1959) and Beer (1961) found that cold weather increased the tie to the eggs.

After a spell of incubation, parents usually fly off to feed and bathe. On return to the territory they occupy an area which is usually adjacent to the nearest neighbouring nest where they spend their time in preening, sleeping, stretching and, when necessary, in defence of the territory.

During laying and incubation there is a gradual intensification of brooding, difficult to detect from day to day, but recognisable over a longer interval by the birds' increasing reluctance to leave the nest and increasing use of defence measures. Following a disturbance in the early stages of incubation the parents usually circle overhead giving alarm and anxiety calls; later in incubation they begin to hover above the intruder and, as hatching draws near, may dive down giving the charge call. Diving attacks on intruders become more common when the chicks hatch, and occur with greatest frequency while the chicks are unfledged.

Incubation is shared between the male and female; each taking more or less regular turns on the nest and remaining there for anything from 20 minutes to seven hours. Pairs under observation showed variation in the amount of time spent on the nest by either bird, and records of time spent in incubation as well as observations of general behaviour did not suggest any consistent difference in the attitude of male or female towards brooding. Males and females alike were often frustrated in attempts to relieve their mates, especially after a short interval. Tinbergen (1953) considered the female Herring Gull, *L. argentatus*, is on the average a slightly more "devoted brooder" than the male, and Baerends (1959) found in the same species that the incubation instinct is possibly not activated so readily in the males as in the females. There is evidence in the Black-headed Gull that perhaps males spend slightly more total time sitting than females (Ytreberg, 1956; Beer, 1961).

Parents changed places on the nest at any time of day, although more attempts to relieve sitting birds were seen in the afternoon than at other times. This was probably an expression of the general increase of activity witnessed in the late afternoon. The methods by which one bird seeks to relieve the other are varied, ranging from voluntary departure from the nest by the sitting bird, to forcible ejection by the partner. The most common method was for the partner to approach the nest mewing, then start choking beside the sitting bird. Another common method is to carry nest material and occasionally food to the



sitting bird. Both these methods may be unsuccessful at first, but after two or three attempts the sitting bird may stand, step from the nest and either begin preening or fly away. Sometimes the brooding bird simply stands and walks out of the nest without any prior display, and similarly on other occasions the non-sitting bird may relieve its mate without any display or call being given. Repeated frustration of attempts to relieve the sitting bird usually leads to a forcible take-over by the partner. In these cases the bird steps on to the side of the nest, gradually edges its feet down between the nest wall and its partners, and then burrows its head under the chest of its mate so that the other is pushed up and out of the nest. Forcible nest relief usually follows vigorous choking by the non-sitting bird, which passes into "muffled" choking while the change-over is affected.

### *Length of Incubation*

The incubation period extends from the laying of the last egg to the hatching of the last young (Nice, 1937). The effect of this definition is that records can be used only from nests in which the last egg hatches. On *Somes Is.* the mean incubation period in 172 clutches of one to three eggs was 27 days (range 23-30 days), and 161 of the clutches (93.6%) hatched in 26-28 days. Two clutches each containing two eggs were incubated steadily for 58 and 69 days respectively before being deserted.

The hatching of an egg usually takes several days and faint tapping and cheeping can be heard even the day before the first crack or pip appears. The length of time between the appearance of the first cracks in the shell and the moment when the chick emerges has been called the breaking period of the egg by Paludan (1951). Of 124 eggs recorded in the present study, 116 (93.5%) broke in two to four days, and the average length of time was three days; extreme records were one and six days. There are no significant differences between the breaking periods of first, second or third eggs; in each case three days is the most common length of time taken. Essentially similar findings were made by Paludan (1951) for Herring and Lesser Black-backed Gulls.

### *Hatching Sequence*

The eggs of a clutch are laid over a period of days, and because some incubation usually occurs during the laying period, hatching is also spread. The order and time intervals at which the eggs hatch can be called the hatching sequence, and does not necessarily correspond to the intervals at which they were laid. The same phenomenon in the Lesser Black-back and Herring Gull was called the "hatching pattern" by Paludan (1951), who considered that from such patterns some evidence of incubation during the laying period could be gathered. When all the eggs in a clutch hatch on the same day it may be assumed that incubation began at or after the laying of the last egg, but when the eggs hatch on different days incubation must have begun some time between the laying of the first and last eggs. In the Southern Black-backed Gull two-egg clutches hatched in one to five days, and only 8.5% of the 60 clutches recorded took longer than three days to hatch. The hatching of three-egg clutches ranged from two to six days, and 17.7% of the 57 clutches recorded took longer than four days. It was clear from the hatching sequences recorded that in most

clutches of two or more eggs incubation becomes effective at about the stage of arrival of the second egg. In only one (two-egg) clutch did the second egg definitely hatch before the first, but in two further nests (one two-egg, and one three-egg), it appeared likely that the second egg may have hatched before the first. After intensive studies with Black-headed Gulls, Beer (1962) found that increase in effective incubation during the laying period accounts for the differences between laying and hatching intervals.

#### *Hatching Success*

Of 310 marked clutches, 125 (40.3%) remained intact up to hatching. Brief gales of two or three days' duration experienced periodically were responsible for destroying several nests either before or after the eggs had hatched. It is clear that only good fortune prevents more beach nests being damaged by high tides, since after the breeding season several nests were destroyed in this way. Of 741 eggs of first clutches, 490 (66.1%) hatched, and of the 251 (33.9%) that failed to hatch, 15 started to hatch but the chicks failed to emerge. The fates of the eggs that did not hatch are shown in Table 1.

TABLE 1 — FATES OF UNSUCCESSFUL EGGS

	<i>Number</i>	<i>Percentage</i>
Eggs that addled, or in which the embryo died	127	50.6
Eggs destroyed and/or eaten by gulls*	54	21.5
Eggs that disappeared	47	18.7
Eggs that began to hatch, but perished	15	6.0
Eggs lost when nest collapsed or was destroyed	4	1.6
Eggs that perished when the nest was abandoned	4	1.6
	<u>251</u>	<u>100.0</u>

\* Two of the eggs listed as destroyed were broken by the observer.

Three-egg clutches showed a slightly higher (but statistically insignificant) hatching percentage than two-egg clutches, while the success of one-egg clutches was much lower than either two- or three-egg clutches (Table 2). Paynter (1949) found that the hatching success of two- and three-egg clutches of Herring Gulls did differ significantly.

TABLE 2 — CLUTCH SIZE AND HATCHING SUCCESS  
(FIRST CLUTCHES ONLY)

<i>Clutch Size</i>	<i>No. of Nests</i>	<i>Total No. of Eggs</i>	<i>Hatched</i>	<i>Percentage</i>
3	149	447	312	69.8
2	133	266	172	64.7
1	28	28	6	21.4
<i>Total</i>	<u>310</u>	<u>741</u>	<u>490</u>	<u>66.1 (Aver.)</u>

Of the 15 eggs that began to hatch, but from which the chicks failed to emerge, most were found to be in a slightly squashed condition. The sequence of events was usually as follows: one or two days after beginning to pip, the shell would become very cracked and broken in the general area of the original pipping. Finally the egg would become slightly flattened about the cracked area of the shell

often with the beak of the now dead chick protruding. Eggs that became cracked or dented during incubation rarely hatched, and even small injuries in the early stages of incubation were apparently sufficient to cause addling. Only in the last stages of incubation did cracks and dents have no effect on the developing chick.

Egg losses have a positive correlation with nesting density, since the lowest and highest percentage of egg losses were found in the areas of lowest and highest nesting density respectively. Losses are caused largely by the predation of neighbouring gulls whose effect is accentuated when the nests are close together. The correlation of egg losses with nesting density is shown in Table 3 where the marked areas are listed in order of increasing nesting density.

TABLE 3 — EGG LOSSES AND NESTING DENSITY

<i>Area</i>	<i>Nests/Acre</i>	<i>No. of Eggs</i>	<i>No. not Hatched</i>	<i>Percentage</i>
F	65	120	29	24.1
A	80	85	22	25.9
B	86	112	34	30.4
G	88	86	32	37.2
D	109	261	108	41.3

In order to determine whether the presence of an observer affected egg losses in the marked areas, 320 nests in other parts of the colony were inspected. Nearly 20% of the nests contained broken or addled eggs. Although no statistical test was made, taking into account eggs lost without trace, embryos dead in apparently whole eggs, etc., it is considered that egg losses in the marked areas would probably not have differed significantly from those in other parts of the colony.

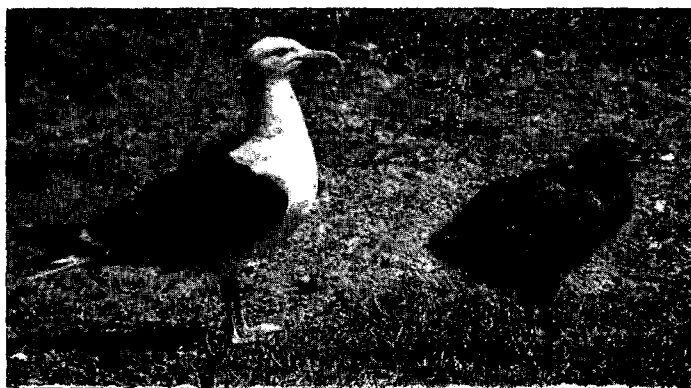
## THE CHICKS

### *Parental Behaviour*

The chicks are brooded by both parents, which seek to relieve each other in the same ways described for nest-relief during incubation, i.e. by mewing, choking, etc., but mewing is the commonest method. While the chicks are being brooded, food is often brought to them by the non-sitting bird. The nest itself is ignored by both parents. As the chicks hatch the posture of the incubating bird changes; it sits more lightly on the nest, wings drooped and held very slightly away from the body, and the wings and body are frequently lifted to accommodate the movements of the chicks. Apart from this posture there are no signs that the eggs are actually hatching; shortly after a chick hatches however, the parents usually take the egg shells from the nest and drop them a few feet away. Egg shell removal is thought by Tinbergen *et.al* (1962) to be of survival value in that eggs are more subject to predation than are cryptically-coloured chicks, and thus removal of egg shells reduces the likelihood of predation by neighbouring gulls.

On the first day chicks may struggle out from beneath the parent, and even when unable to stand may push their way around inside the nest bowl. They may also aim feeble darts at the beak of the parent, but this food begging is usually unsuccessful. If a small chick has difficulty finding its way back under the brooding bird, the parent will stand, bend its head forward, and apparently move the chick to a position under one wing. Chicks are brooded fairly constantly for

three to four days, after which they leave the nest for increasingly long intervals; the parents cover them only sporadically, and to all intents the nest is abandoned. Chicks 10 to 12 days and older are commonly buffeted by strong cold winds and have to find their own way to shelter in the surrounding vegetation while their parents remain apparently oblivious of their efforts. No matter how hot or wet the weather, only the smallest chicks are sheltered by the parents. A long period of rain leaves the older chicks so bedraggled that their wings droop, which causes the birds to flick them continually in order to lift them back into position. At night only the smallest chicks are sheltered by the parents, older chicks finding their own shelter beside or close to the nest, and there is no doubt that lack of shelter at certain times causes the death of some chicks. No "creche" system was found to operate in any part of the colony, and although a few chicks were associated in one or two clear spaces, family groups were not seen to mix.



I—Chick approximately 5 weeks old with parent on guard.

Until the chicks can fly there is nearly always at least one parent in the neighbourhood (Plate I). Later their attachment to the chicks rapidly weakens, so that, while most young birds accompany and beg food from their parents for some time after they are able to fly, their demands are rarely satisfied.

Wandering chicks are attacked by adults, and defended by their own parents. Many chicks are killed during the breeding season by these attacks, and some are eaten. R. M. Lockley (*pers. comm.*) informed me that wandering chicks of the Great Black-backed Gull (*L. marinus*) may be killed and eaten by neighbours, and the parents themselves may eat the dead chicks. Herring and Lesser Black-backed Gulls may also kill and devour young of their kind (Paludan, 1951).

Chicks often choose to hide in the same place each time they are frightened, even though it may appear to lend scant protection; a two-day old chick was even seen pushing an empty egg shell round and round the nest while attempting to clamber into it. When the chicks are hiding they sometimes curb activities, such as gasping on hot days, if the predator approaches close to where they are concealed. The only parental calls to which they pay any attention are the alarm call which

sends them into hiding, and the mew call which is often used to bring them out of hiding. Alarm may often spread through small sections of the colony for no reason apparent to the hidden observer, so that chicks may rush into hiding when no predator is near. While chicks are travelling to and from their hiding places, following a disturbance in the colony, they encounter most attacks from neighbouring adults. Minor disturbances often result when foreign gulls, probably on the look-out for unprotected eggs or chicks, land in the midst of a group of incubating and brooding birds. Parents will drive other species of birds away from the vicinity of the chicks, and if the chicks are attacked will fly rapidly to defend them. The attackers are driven off with wing blows and pecking, the parents emitting vigorous long calls in the process.

Chicks commonly take to the water when alarmed and usually bunch together to a certain extent, especially when they are attacked by older gulls; yet banding showed that at such times older chicks sometimes exhibit aggression towards younger chicks of different clutches. Once the parents have warded off an attack on their chicks they shepherd them to safety, and on only one occasion was a young chick seen to be deserted by its parents during this stage. The chick which was attacked on the water by many birds was defended by its parents for a while, but they later departed, and it was almost killed before it managed to reach dry land.

#### *Food and Feeding of the Chicks*

Both parents feed the chicks. Food may be offered to the chick on the day it hatches, but may not be accepted, if only because the chick is too weak to make the appropriate responses with its beak. Feeding is usually sporadic for the first two days but becomes more frequent after that. One chick, watched for five hours the day it hatched, and for six hours the following day was offered food once only. It aimed feeble darts at the beaks of its parents, and gave small squeaky cries, but these food-begging movements remained unanswered. On hatching, chicks possess a certain amount of residual yolk in the abdomen, and these remains do not disappear for from five to seven days. It is likely that delayed feeding of the chicks in the first day or two is related to the presence of the yolk remains.

When a chick begs food it gives piping cries accompanied by vertical movements of the head and neck, and aims pecks at the beak of its parent. The parent then begins walking about, regurgitating with effort at intervals. Regurgitations are slow and controlled and, at least while the chicks are still small, the parent does not resist their begging to any extent. When the chicks are older a parent may run several yards pursued by its offspring before it is able to vomit in relative peace. Food is held loosely in the beak near the gonys while the chicks peck at it. There is no dispute between chicks over food. In the early stages food that drops to the ground is ignored but later, parents draw the chicks' attention to this food, and after five or six weeks chicks eat most of their food from the ground. Though it is usual for a parent to give the mew call before offering food, it is not always given, and a chick may miss a feed because it is out of sight of the parent as the other members of the brood are fed. If several feeds are missed by one chick, it could become weakened.

At one or two weeks of age chicks are fed on an average once

an hour, while at three weeks it may be about every two hours, and in general they are fed with decreasing frequency as they grow. There is a tendency for older chicks at least to be fed more often on cold days than very hot days, and some feeding almost certainly occurs on moonlit nights, though not on very dark nights.

Parents seem to have no concept of the size of food that small chicks are able to deal with. Often they regurgitate whole fish, earth-worms, etc., which the chicks are not able to swallow. Sometimes the parents tug at the food, possibly attempting to break it up, but usually it is swallowed again by the parent, or left on the ground. Though items of any size may be offered chicks of any age, in general well fragmented food is given to very small chicks.

Chicks may accompany their parents for several months after they are able to feed themselves (i.e. shortly after they can fly) and juveniles up to at least six months old are often seen food-begging, but always unsuccessfully. Wilkinson (1952) records that parents stop feeding their chicks at about 12 weeks.

### *The Food*

Stomach contents of chicks; regurgitated pellets from parents and chicks; other food remains in or by nests were examined, and a list of items identified is given below.

### LIST OF IDENTIFIED FOOD ITEMS

#### *Chordata.*

*Mammalia:* Norwegian rat *Rattus norvegicus* (beheaded bodies regurgitated). Hedgehog *Erinaceus europaeus* (legs and jaws).

*Aves:* Starling *Sturnus vulgaris*, House Sparrow *Passer domesticus*; whole bodies regurgitated. Other remains of small birds (e.g. Dunnock *Prunella modularis*, Silvereye *Zosterops lateralis*).

*Amphibia:* *Hyla aurea* (Tadpoles).

*Pisces:* Short-finned Eel *Anguilla australis schmidtii* ca. 15 cm., and *Anguilla* sp., ca 50 cm. and one lb. wt. regurgitated.

Cockabully *Tripterygion* sp.

Spotty *Pseudolabrus celidotus*.

Yellow-eye Mullet

*Aldrichetta forsteri*.

Long-snouted Pipefish

*Stigmatophora longirostris*.

Snapper *Chrysophrys auratus* (?)

} Whole  
regurgitated  
bodies

#### *Echinodermata.*

*Asteroidea:* *Patiriella regularis*.

*Echinoidea:* Sea egg *Evechinus choloroticus*.

#### *Arthropoda.*

*Insecta:* *Coleoptera:* Green chafer *Chlorochiton suturalis*.

Grass grub, *Costelytra zealandica*.

Manuka beetle *Pyronota festiva*.

Eucalyptus tortoise beetle *Paropsis dilatata*.

*Diptera:* *Syrphidae* (Hoverflies): Larvae of *Eristalis* sp.

*Calliphoridae:* Blowfly *Calliophora quadrimaculata*.

*Tipulidae* (Crane flies): adults.

<i>Lepidoptera</i> :	Hepialidae: Puriri Moth pupa <i>Hepialis virescens</i> . Noctuidae: Remains of adults and pupae.
<i>Hemiptera</i> :	Cicadidae: <i>Melampsalta cingulata</i> and other spp. Pentatomidae: Green vegetable bug <i>Nezara viridula</i> .
<i>Crustacea</i> .	
<i>Natantia</i> :	Crangonidae (remains of shrimps).
<i>Decapoda</i> :	Crab remains.
<i>Annelida</i> .	
<i>Oligochaeta</i> :	Lumbricidae: <i>Lumbricus rubellus</i> and other species. Megascolecidae: Remains of specimens ca. 25 cm.
<i>Mollusca</i> .	
<i>Amphineura</i> :	Chitons e.g. <i>Eudoxochiton</i> and <i>Amaurochiton</i> .
<i>Gastropoda</i> :	<i>Lunella smaragda</i> . <i>Paua Haliotis</i> sp. <i>Cominella</i> spp. <i>Nerita melanotragus</i> .
<i>Pelecypoda</i> :	<i>Chione stutchburyi</i> . <i>Perna</i> spp. <i>Amphidesma</i> spp.
<i>Cephalopoda</i> :	<i>Octopus</i> .

This list is not exhaustive, and additional to it would be grass and grit, major items such as offal, remains from rubbish tips, gull chicks, and possibly skinks, which are common on the island. Most of the animals were probably caught alive, or washed up on beaches, and illustrate the various habitats exploited by the parents. The rats' bodies probably came from a tip, but Burden (1949) saw a gull kill a rat in 10 minutes, and succeed in swallowing the corpse after half an hour. The habit of stealing eggs or young of other species such as terns, gulls and Gannets is well documented (Stead, 1932; Murphy, 1936; Taylor & Wodzicki, 1958; Williams, 1963) and Dr. R. A. Falla (*pers. comm.*) told me that Southern Black-backs often cruise low over open bush, looking for young birds in exposed nests. In practice the chicks are fed whatever is handy and available in quantity, so that earthworms are common food during wet weather, and shrimp, beetle or grass grub remains at numerous nests indicate the general abundance of those items at certain times. Thus Bell (1960) mentions that chicks in the Wairau River colony, Marlborough, were fed mainly on "army worms" *Persectania ewingi* (Noctuidae: Lepidoptera) and McMillan (1961) states that smelt *Retropinna anisodon* forms the bulk of the food of Southern Black-backs nesting in the Rangitata River, Canterbury.

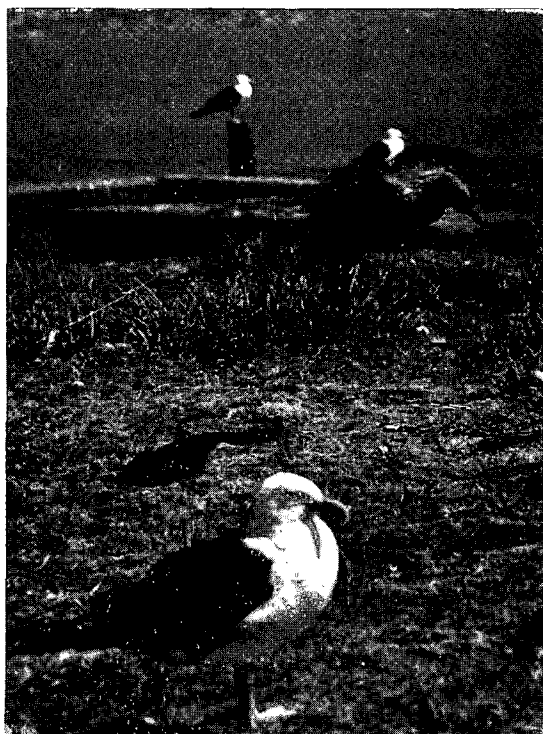
#### BEHAVIOUR AND AGE OF ACCOMPLISHMENTS

Although most chicks are unable to stand on the day they hatch, and may walk unsteadily for a week, a few chicks may struggle out of the nest if they are disturbed before their down is completely fluffed. Most chicks can move about outside the nest after two or three days, and in a week spend gradually less time under the parents, but they do not stray far from the nest.

Some chicks appear to wander less than others in their own nest areas; e.g. two chicks from one nest were seen every day for about six weeks on the same rock on which their nest was built, although they were quite capable of leaving it. Some parents and chicks abandon

the nest after a day or two and "shift camp" a few feet distant; thus the original nest is left comparatively clean and the chicks are brooded in a new place. Soon after hatching, when their down is dry, chicks begin food-begging, but the parents appear to take no notice for the first day at least. Gradually as the days pass the vibrating, reedy food call becomes a major activity for the chick. If given when the colony happens to be quiet, the call usually sets off a bout of long calling from all the neighbouring adults. The same call may accompany other activities such as jumping, wing-flapping, and retreat from predators, and will similarly cause contagious long calling. Preening and stretching begin at an early age (one chick two to three days old was seen to preen for a few seconds) and after a week are common activities.

At about a fortnight chicks voluntarily enter the sea and wash, without actually going right under the water. But from the time they are five to six days old chicks will enter the water if menaced by a predator, and are well able to swim after about 10 days. Their stay in the water is as brief as possible however, for their feathers very soon become water-logged, even when feathering of the body is largely completed. Chicks from beach nests are the first to enter the water.



II — Chick approximately 7 weeks old, jumping and flapping its wings in attempts at sustained flight.



Long before flight, chicks jump up and down, flapping wings and giving shrill cries. (Plate II.) The age of flying appears to vary slightly, but no birds were seen to fly properly before seven weeks. Wilkinson (1952) wrote that chicks fly at six weeks, but no doubt this refers to the fact that before true flight some chicks can flutter weakly in a downwards direction if pursued. When the first true flight occurs some down may still be present at the chin and pelvis, and the tenth primary may still be shorter than

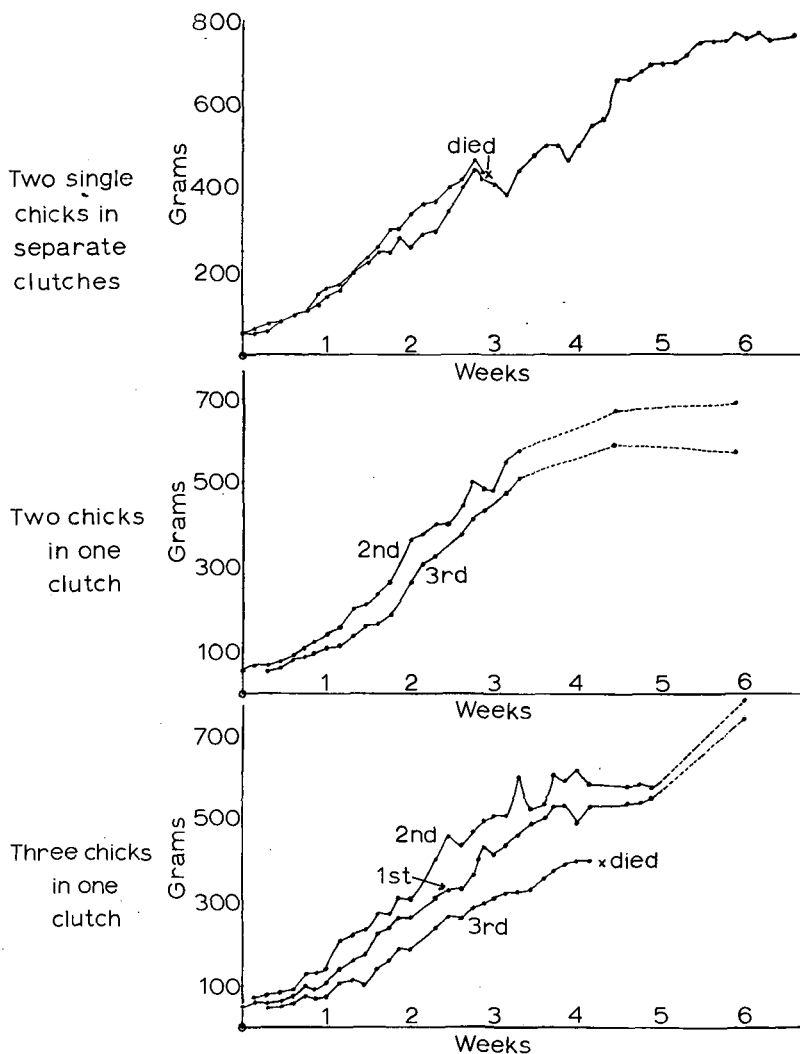


Fig. 1 — Growth rates of four broods of chicks.

the ninth. Chicks from cliff edges or upper slopes can fly as soon as those from beaches or lower slopes, but are reluctant. A tendency towards retarded flight has survival value for chicks from cliff edges for whom a return flight to the nest would be strenuous. During practice flights chicks often land yards away from their nests and are too weak to fly back. They are often attacked and occasionally killed by neighbouring adults as they move back to their own nests.

Fear of predators develops gradually, but there is some individual variation. Chicks up to three days old have squealed at me from their nests, but in a few seconds have gaped at a red pen in a feeding response. After a few days chicks will run from an observer, except those from cliff-edge nests. Having nowhere to run, such chicks usually show displacement activities such as preening, stretching and looking at their feet. At three weeks a chick may squeal at and defy an attacking adult gull.

### GROWTH RATES

*Weight.* Five nests were each surrounded at a distance by low wire-netting fences, so that capture of the chicks for weighing was made easier. Two single chicks, a brood of two, and two broods of three chicks were weighed daily in a cloth bag until they died, disappeared, or managed to flutter over the low barricades. The growth rates of these broods (except those of one of the broods of three) are shown in Fig. 1. Bearing in mind the small size of the sample, chicks

TABLE 4 — GROWTH OF SOME BODY CHARACTERS

	Beak Colour	Yolk-sac Scar	Egg Tooth	Juvenal Plumage
1 day	black with white band from tip to $\frac{1}{2}$ way between tip and nares			natal down completely fluffy after one day.
1 week			begins to lift	
8-10th day			falls off	remiges, rectrices & scapulars appear. 2ry. remiges a day later than 1ry. remiges.
10-12th day				natal down reaches maximum thickness.
2 weeks	band is now grey to dark grey.	the abdominal opening of this sac remains as a scab or lump to 18-19 days.		
3 weeks		all signs of scab or lump disappear completely.		remiges ca. 3.5 cm. & may protrude 5-6mm from sheaths. Coverts of 11th 1ry. present. Rectrices not 1 cm, but clear of sheaths. Scapulars well
		clear of sheaths & wing & scapular coverts formed. (Greater wing coverts are first of wing series to appear, but are slower than scapular coverts.) Contour feathers appear.		
3½ weeks		11th. 1ry. visible, & main tail coverts appears. Upper wing coverts well formed, but only greater coverts present under wing.		
5 weeks	whole beak is black with tiny horn-coloured tip.			
5½-6 weeks		Under wing coverts grown. Remiges & rectrices not fully grown.		
7 weeks		Plumage complete and flight achieved. 10th. 1ry. may still be shorter than 9th., but soon surpasses it.		

from all broods grew at approximately the same rate, although the heaviest chicks from the two- and three-chick broods grew slightly faster than the single chicks. This may have been the result of greater stimulation of the parents by the presence of more than one chick which led to more frequent feeding of all the chicks. The brood of three not shown in Fig. 1 all died in a starved condition at about four weeks of age. In both broods of three the second chick (hatching from the second egg laid) had a slightly faster rate of growth than the first chick. This can perhaps be explained in one brood where the second egg was heavier than the first, but there may also have been minor set-backs suffered by both the first chicks.

*Juvenal Plumage.* Development of the juvenal plumage has been tabulated (Table 4) together with some other body characters so that growth can be more readily correlated with age.

#### DEPARTURE FROM THE COLONY

Soon after flight is achieved the young birds are absent from the colony at least during the day. Initially however, they may travel about the island, and single birds are seen swimming off-shore or standing in empty paddocks. The departure of chicks is a little hard to detect, because the island is a night roost as well as a breeding colony, but banding on the island as well as in other colonies which are not important night roosts has shown that young birds leave at least within the first month of flight. It is not known whether flying chicks return to their nest areas at night in the early days of flight, but at the end

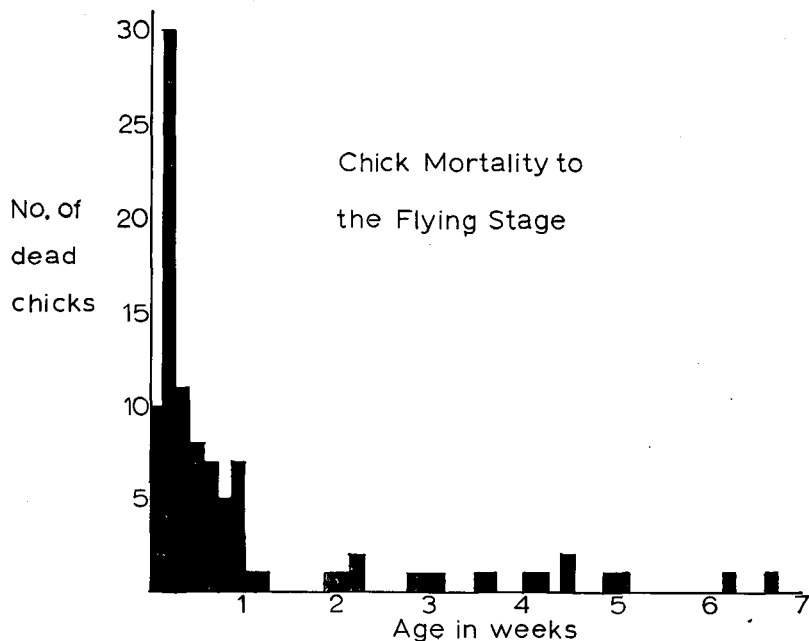


Fig. 2 — Mortality of chicks up to the flying stage

of the breeding season, i.e. January and February, there appear to be loose associations of adults and young throughout the colony at night, and these are without reference to individual nest areas.

By the end of February the main roosting flocks of adult (and immature) birds begin to form on the island, and chicks of the season are present in small numbers. By May and June nearly all the first year birds have joined the main roosting flocks, though small groups are occasionally found roosting or foraging together, apart from the main adult flocks.

### BREEDING SUCCESS

#### *Chick Mortality to the Flying Stage*

Of 741 eggs comprising first clutches, 490 (66.1%) hatched. Daily observations and banding showed that at least 97 of the 490 chicks died before flying age, giving a minimum chick mortality of 19.8%. Most losses occurred in the first week, following which time the number of deaths dropped steadily till flight was achieved at a little over seven weeks. The age dispersal of the deaths is shown in Fig. 2. A similar pattern of loss was found in the Herring Gull by Paynter (1949). "Last sight" records of many other chicks ranged from the second day after hatching to just before flying age, but no estimates can be made of the numbers of these chicks that actually died.

Since chicks hatched from marked eggs it was often possible to distinguish for a time the first, second and third chicks of the brood. Considering broods of one, two and three chicks, almost equal numbers of first, second and third chicks died, but in broods of three, 26 (78.7%) out of the 33 that died were third chicks. Paynter (1949) found no significant differences in the survival of Herring Gull chicks from broods of one, two or three. The fates of the dead chicks are listed below:

Dead in nest	---	---	---	---	---	29
Disappeared on hatching or on following day	---	---	---	---	---	25
Uninjured outside nest	---	---	---	---	---	23
Killed by adult gulls	---	---	---	---	---	12
Fell out of nest	---	---	---	---	---	4
Exposure	---	---	---	---	---	3
Accidentally killed by author	---	---	---	---	---	1
						<hr/> 97

Chicks dead in their nests were generally only a few days old. Those killed by adult gulls were pecked heavily about the head and body, bone-damage often resulting especially in the head region. The chicks thought to have died of exposure were found during or following cold wet weather. The only animal other than gulls which may have killed some chicks was a Harrier *Circus approximans*. One was seen occasionally in flight, but was always driven off by adults, so was probably unsuccessful most, if not all, of the time. As far as could be determined, there was no correlation between chick mortality and nesting density similar to that between egg mortality and nesting density.

#### *Overall Losses*

Of 741 eggs, 251 (33.9%) were lost or failed to hatch. Of the remaining 490 eggs that hatched, at least 97 (19.8%) chicks died before

reaching the flying stage. This gives a total loss of 348 eggs and chicks from first clutches, providing a minimum overall mortality of 46.9% to the flying stage. As these figures are based on records from 310 nests, the mean number of chicks to reach the flying stage is 1.3 per breeding pair.

### BREEDING ADULT MORTALITY

Twenty-two adults were found dead during the breeding season, including two, both females, from marked nests. Thirteen of the 22 deaths could be attributed to injuries received during fighting; these and other causes are listed in Table 5.

TABLE 5 — ADULT MORTALITY

Signs or Causes of Death	Male	Female	Totals
Extensive scalp, neck & body wounds caused by gulls	9	4	13
No visible injuries	3	2	5
Diseased (T.B. or Aspergillosus)	1	1	2
Heavy tick infestation on the head	1	—	1
Minor injuries seemingly insufficient to cause death	1	—	1
	15	7	22

More males than females were killed by other gulls, but this is not surprising since most fighting is done by males. It is not known if all the dead birds were actually breeding; the gonads of the diseased specimens were small and undeveloped. A heavy infestation of large ticks belonging to the Ixodoidea (J. R. H. Andrews, *pers. comm.*) on the head of one bird may have been a contributing cause of its death. Thirteen of the deaths were in the last week of November and the first week of December. No dead adults were found during the peak laying period in early November and the first was found shortly after the earliest clutches hatched. This is significant because gulls are most aggressive towards predators from just before till just after the chicks hatch, and when chicks begin wandering about their nest areas predatory gulls become more active so that opportunities for fighting occur more frequently. Maximum adult mortality corresponds with peak hatching and the two are probably correlated.

### THE NON-BREEDING BIRDS

Throughout the breeding season first and second year birds were occasionally seen flying about the colony during the day, and at night small numbers of these birds were present in the main roosting flocks. During the rest of the day only solitary immature birds were seen in the group of non-breeders which made up the club. The club often formed by the lighthouse in one of the main roosting areas and was usually present the whole day. In daytime immature birds were attacked (in two cases killed) almost straight away by breeding birds, but often one would manage to land in a nesting area, though usually displaying the utmost caution and departing rapidly at the first signs of hostility. A few foreign birds would, however, while keeping a safe distance from incubating birds, walk about inspecting nests and incubating birds carefully. As mentioned before, such birds were undoubtedly searching for exposed eggs or small chicks. Disturbances in the colony caused breeding birds to give alarm cries repeatedly, but it was noticeable that any immature birds circling in the air with

the breeding birds at such times never gave cries of alarm. Although failing to give cries of alarm, a few instances were observed of immature birds displaying breeding behaviour at the end of December and in early January, i.e. late in the season. The displays, which were marked by brevity and incompleteness were all from birds at the end of their second year or beginning of their third year; none were seen from birds at the end of their first year or start of their second year. The displays seen were as follows:

1. A second year bird (male?) was seen collecting grass (for nest material?) in a rather haphazard manner.
2. A second year male emitted a long call, after which an adult female walked around him a few feet distant in the mewing posture, but giving no sound.
3. A second year male was seen mewing and choking vigorously with an adult (female?) but was driven away by a neighbour.
4. In January an adult was seen in company with another bird just starting its third year (clearly identifiable by the plumage). The adult mewed, and led the way to a nest which did not belong to it. The third-year bird followed but made no display or noise, and eventually flew away.

These observations show that birds at the end of their second year may display for the first time at least some of the calls and postures associated with breeding, even though they are probably not actually breeding, or even mated. The gonads of 30 first and second year birds examined in summer were considerably smaller than those of breeding adults, suggesting that it may not have been possible for them to breed.

#### ACKNOWLEDGEMENTS

During the two-year study towards an M.Sc. degree I was fortunate to receive advice, encouragement and practical assistance from numerous people, some of whom have been mentioned in the first paper arising from the study (Fordham, 1963). I would like, however, to restate my appreciation to Dr. R. W. Balham and Prof. L. R. Richardson, Zoology Dept., V.U.W., for valued guidance; Mr. F. C. Kinsky and Dr. R. A. Falla, Dominion Museum, for useful discussions; and Dr. B. Stonehouse, from whose constructive criticism this paper has benefited. I am also indebted to the Dept. of Agriculture for permission to visit Somes Island; to Mr. and Mrs. R. Mander, Dept. of Agriculture, and family, of Somes Island, for their willing help at all times; and to various members of the Zoology and Botany departments of V.U.W. for ready assistance, especially with banding and equipment.

#### LITERATURE CITED

- Baerends, G. P., 1959: The ethological analysis of incubation behaviour. *Ibis* 101: pp. 357-68, 1 fig.
- Beer, C. G., 1961: Incubation and nest building behaviour of Black-headed Gulls. I: Incubation behaviour in the incubation period. *Behaviour* XVIII: 1-2, pp. 62-106, 2 figs., 9 tabs.
- , 1962: Incubation and nest building behaviour of Black-headed Gulls. II: Incubation behaviour in the laying period. *Behaviour* XIX: 4, pp. 283-304.
- Bell, B. D., 1960: Some food of young gulls and terns. *Notornis* IX: 3, p. 111.
- Burden, P. M., 1949: (*Notornis* III: 4, Classified Summarised Notes.)
- Fordham, R. A., 1963: Individual and social behaviour of the Southern Black-backed Gull. *Notornis* X: 5, pp. 206-22, pls. XXI-XXIV, 1 fig.
- , 1964: Breeding biology of the Southern Black-backed Gull I: Pre-egg and egg stage. *Notornis* XI: 1, pp. 3-34.
- Murphy, R. C., 1936: *Oceanic birds of South America*. Macmillan Co., Am. Mus. Nat. Hist. N.Y. II, pp. 641-1245.

- McMillan, H. M., 1961: An addition to the knowledge of the fish *Retropinna anisodon* Stokell (Retropinnidae). *Trans. Roy. Soc. N.Z. Zoology*, 1: 10, pp. 139-44, 2 figs., 1 tab.
- Nice, M. M., 1937: Studies in the life history of the Song Sparrow. I. *Trans. Linn. Soc. N.Y.*, IV. 247 pp., 33 tabs., 18 charts, 14 maps.
- Paludan, K., 1951: Contributions to the breeding biology of *Larus argentatus* and *Larus fuscus*. *Vidensk. Medd. fra Dansk. Naturh. Foren., Kbh.* 114, pp. 1-128, 7 pls., 30 figs., 30 tabs.
- Paynter, R. A., Jr., 1949: Clutch size and the egg and chick mortality of Kent Island Herring Gulls. *Ecology*, 30, pp. 146-66, 5 figs., 7 tabs.
- Stead, E. F., 1932: *The life histories of New Zealand birds*. Search Pub. Co. Ltd., Lond., 161 pp.
- Taylor, R. H., & Wodzicki, K., 1958: Black-backed Gull — a Gannet predator. *Notornis* VIII: 1, pp. 22-3, 1 fig.
- Tinbergen, N., 1953: *The Herring Gulls World*. Collins, Lond. 255 pp.
- et al., 1962: Egg shell removal by the Black-headed Gull, *Larus ridibundus* L.; a behaviour component of camouflage. *Behaviour* XIX: 1 & 2, pp. 74-117, 11 figs., 30 tabs.
- Wilkinson, A. S. & A., 1952: *Kapiti bird sanctuary*. Masterton Print, Co. N.Z., 190 pp.
- Williams, M. J., 1963: Predatory habits of the Black-backed Gull. *Notornis* X: 5, pp. 239-40.
- Ytreberg, N., 1956: Contribution to the breeding biology of the Black-headed Gull (*Larus ridibundus*) in Norway. *Nytt Magazin for Zoologi* 4, pp. 5-105.



## SHORT NOTE

### TWO FORMS OF REDPOLL IN HIGH COUNTRY

At a Field Study Course held at Rotorua last Labour Week-end (1963), it was brought to my notice that the status of the Redpoll in this country was under review. I was informed that besides the Lesser Redpoll (*Carduelis flammea cabaret*) the nominate race the Mealy Redpoll (*Carduelis f. flammea*) was also thought to be present. I have some information of my own which I would like to add in support of this opinion.

Before I moved to Rotorua I lived on a sheep station between the upper reaches of the Rangitikei and the Ngaruroro on the Napier-Taihape road. Here Redpolls were very common; each year in the early spring large flocks of them would be seen about the homestead feeding on the willow trees that had just come into leaf. They would stay for about three months until December, when they dispersed for breeding.

I used to keep them under close observation, and was after a while struck by the fact that among all the smaller Redpolls there were certain birds that looked definitely larger and more conspicuous. These larger birds were never common, one or two only being present in a flock of twenty birds. They were more shy and tended to keep apart from the smaller redpolls, and were usually observed sitting out on a branch by themselves. In appearance not only did they look larger, but the rosy colouring on the breast was spread over a wider area, with the white on the lower abdomen more conspicuous than in the smaller Redpolls. I had no opportunity to observe them from the rear, nor was I able to distinguish any female birds that matched them in size.

I at first took them to be Linnets (*C. cannabina*) as according to the reference books I had at that time, Linnets were still considered to be present in New Zealand. However, as the description of the Linnet did not appear to fit these birds, I was forced to the conclusion that the larger birds were older, and that the smaller ones had yet to reach maturity. I consequently thought no more of the matter until I was told just recently that there might be two subspecies of redpoll in New Zealand.

— HAMISH LYALL

# HEAPHY TRACK SURVEY

By DAVID G. DAWSON

A party consisting of Sally E. Symes, Pamela D. Symes, Jenny A. McPherson, Lois J. Bishop, Brian D. Bell (leader), and the author walked the Heaphy track in the period Jan. 7th 1964 - Jan. 14th. Notes were kept of all birds seen and also several counts were made. Most of the following notes are from the observations of the latter three members (all members of O.S.N.Z.). Weather conditions were poor: mainly variable S.W. winds with showers or heavy rain on every day except the 14th. This paper presents the results of the counts. A list of all birds seen with notes on their status in the area has been sent to the Recording Scheme.

Williams (1960) describes the Goulard Downs and its birds in detail. The status of birds on the downs seems little changed, except that the Harrier and N.Z. Pigeon were added to the list of recently recorded birds. The Pigeon, which was seen in all bush on the downs except the beech, was perhaps most common in the varied bush near

TABLE 1

	Total	Oystercatcher	Unidentified	Hedge Sparrow	Tit	Fantail	Blackbird	Silvereye	Thrush	Bellbird	No. of Stops	Observer
1:	46	0	0	0	0	2	6	32	1	5	5	B.D.B.
2:	30	0	0	0	0	5	6	12	2	5	5	L.J.B.
3:	46	2	2	2	5	0	5	14	7	9	5	D.G.D.
	122	2	2	2	5	7	17	58	10	19		Total
	100	1.6	1.6	1.6	4.1	5.7	14	48	8.2	16		% of Total
	8	.13	.13	.13	.33	.45	1.1	3.9	.67	1.3		Av. per count

TABLE 2

	Total	Pigeon	Tui	Chaffinch	Tit	Fantail	Blackbird	Silvereye	Grey Warbler	Bellbird	No. of Stops	Observer
5:	46	1	3	5	4	4	3	12	7	7	4	D.G.D.
6:	40	1	8	1	5	4	0	14	0	7	4	L.J.B.
7:	7	0	0	2	0	1	0	0	2	2	1	B.D.B.
	93	2	11	8	9	9	3	26	9	16		Total
	100	2.2	12	8.6	10	10	3.2	28	10	17		% of Total
	10.3	.2	1.2	.9	1	1	.33	2.9	1	1.8		Av. per count



the Lewis hut. Harriers were seen along the coast, and a lone bird on the downs.

The counts were carried out in the manner outlined by H.R.McK. (i.e. the "bush bird census" of Turbott and Bull) with three minutes' wait and five minutes' counting at each stop. Tables 1 to 4 summarise the results of these counts. Table 1 is of a count made up low ridges immediately east of the Heaphy hut: the weather was overcast and warm, with one shower. The counts were conducted between 1530 and 1645 hrs. The bush was rain forest with Rata (*Metrosideros robusta* and *M. umbellata*) dominant: subdominants Mahoe (*Melictytus ramiflorus*)

TABLE 3

Observer	---	---	D.G.D.	D.G.D.	Total	% of Total	Av. per count
No. of Stops	---	3	6				
Thrush	---	2	3	5	7.2	.55	
Grey Warbler	---	4	1	5	7.2	.55	
Silveryeye	---	1	7	8	12	.9	
Blackbird	---	3	3	6	8.7	.67	
Fantail	---	2	0	2	2.9	.22	
Tit	---	1	4	5	7.2	.55	
Hedge Sparrow	---	3	0	3	4.3	.33	
Chaffinch	---	2	7	9	13	1	
Bellbird	---	1	0	1	1.4	.11	
Rifleman	---	6	15	21	30	2.3	
L.T. Cuckoo	---	1	0	1	1.4	.11	
Redpoll	---	0	2	2	2.9	.22	
Unidentified	---	0	1	1	1.4	.11	
Total	---	26	43	69	100	7.7	

8: 9:

TABLE 4

Observer	---	---	D.G.D.	D.G.D.	Total	% of Total	Av. per count
No. of Stops	---	13	8				
Kea	---	0	1	1	1.4	.05	
Unidentified	---	2	2	4	5.8	.19	
Tit	---	1	1	2	2.9	.10	
Redpoll	---	3	4	7	10	.33	
Skylark	---	6	4	10	15	.48	
Pipit	---	7	5	12	18	.57	
Fernbird	---	4	4	8	12	.38	
Bellbird	---	4	1	5	7.2	.24	
Chaffinch	---	4	3	7	10	.33	
Thrush	---	1	0	1	1.4	.05	
Grey Warbler	---	2	5	7	10	.33	
Hedge Sparrow	---	1	3	4	5.8	.19	
Weka	---	1	0	1	1.4	.05	
Total	---	36	33	69	100	3.3	

10: 11:

and Kamahi (*Weinmannia racemosa*), with Kiekie (*Freycinetia banksii*) forming a shrub layer. 8/1/64.

Table 2 is of a count made up the ridge upon which the Lewis hut is situated. The weather was overcast with steady rain, but warm. The three counts were all conducted between 1000 and 1050 hrs. The bush was rain forest with Quintinia (*Quintinia acutifolia*) and Kamahi as dominants and emergent Rimu (*Dacrydium cupressinum*), with less Kiekie as a shrub layer. 10/1/64.

Table 3 is of a count made along the Heaphy track in the patch of bush immediately west of the Downs hut. Count 8 was made on 13/1/64 and 9 on 12/1/64: on both days the weather was cool with few showers. Between them the counts cover the period 1350 - 1715 hrs. The bush was mountain beech (*Nothofagus solandri cliffortioides*), surrounded by divaricating scrub which would be in hearing about half the time.

Table 4 is of a count made along the Heaphy track immediately through the patch of bush of table 3. Count 10 was made on 12/1/64 and 11 on 13/1/64, with the same weather as for 8 and 9. Both counts fall within the period 1415 - 1630 hrs. The vegetation was Red Tussock (*Chionochloa rigida*) with subdominant divaricating shrubs.

For each bird species at each counting area the average number recorded at each stop has been calculated: this is the best index of population density for comparison with other areas. It is hoped the counts will provide a basis for comparison in future years and also give a more quantitative idea of numbers than is usual.

However, it must be remembered that weather, time of day, and (most important) time of year produce significant differences in the index for the same population. A general result is that the three bush areas had essentially similar bird indices: 8, 10.3, and 7.7 birds per stop respectively, while the tussock area had the smaller index of 3.3 when its birds are on the whole more conspicuous.



## SHORT NOTE

### SPUR-WINGED PLOVER BREEDING IN CANTERBURY

On 17th November, 1963, Mr. R. Novis, ranger to the North Canterbury Acclimatisation Society, reported to Canterbury Museum the presence of a pair of strange birds which were evidently nesting on the tussock flats of Lake Station at the head (N.W. end) of Lake Taylor (Hawarden district, North Canterbury). Mr. Novis noted that the birds were performing distraction display but the nest could not be found. They were readily identified from his description as Spur-winged Plovers. In early December E.K.S.R. examined the area without finding the nest, but it was found shortly after this by a lad, Ken Allingham, on a visit to the area. Ken Allingham reported his find to E.K.S.R. and had noted that the nest contained a newly-hatched chick and one egg.

On about 20th April, 1964, three adults were seen flying together in the same locality by Mr. D. Maindonald (N. Canterbury Acclimatisation Society ranger), presumably the parents and grown chick.

A further record was sent in to the Museum by Mr. W. J. Harris who, on 7th November, 1963, saw a pair on the Clarence River bed to the north of Jack's Pass (N. of Hanmer): it was not known whether these were breeding.

— E. K. S. ROWE & E. G. TURBOTT

## ORIENTAL CUCKOO (*CUCULUS SATURATUS HORSFIELDI*) AT KAIHINU, WEST COAST

By P. GRANT

---

This bird was first noticed by Master Russell Cook about 12th January, 1964, and was reported in the *Greymouth Evening Star* on 25th January, 1964, after it had been identified by Russell's father, Mr. G. S. Cook. Messrs. E. W. Crack, P. Grant, A. B. Munden and D. Panckhurst joined in observations which were made until the bird disappeared about 3rd February, 1964. These notes are made up from combined observations of all these persons. The bird was photographed successfully in both colour and monochrome.

Mr. Cook's farm is at Kaihinu, three miles north-east of Hokitika, Westland. The homestead is about twelve chains from the coast line and has a number of macrocarpa trees of moderate height, as well as several lower bushes. The surrounding country is fairly open, with grass paddocks. The Hokitika-Greymouth railway line runs between the homestead and the main road, and the passing railway traffic at times scared the bird to another homestead about three hundred yards away.

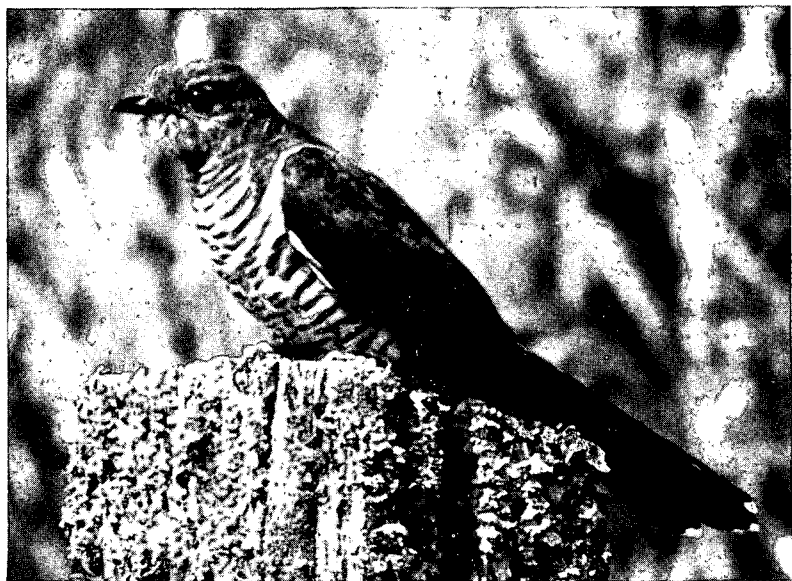
Some difficulty was caused by the fact that the bird was moulting, evidently changing from immature to mature plumage. Description as follows:— Upper mandible dark slate-grey until near the grey-green base; lower mandible grey-green; cutting edge orange; gape orange. Bill slightly down curved, shortish; nostrils prominent, black. Eyelids yellow; iris light brown; pupil dark. Lores greyish, flecked white; chin and upper throat covered by prominent greyish white beard which was faintly tinged brown when viewed from the front; malar region grey-brown; ear coverts light brown flecked white over blue grey; eyebrow bluish white (actually new feathers replacing previously brown feathers contrasting with brown feathers which had not yet moulted); side neck faintly barred brown-white over blue-grey. Forehead centre brownish, sides blue grey; nape and hind neck brownish-grey, mostly white flecked (light-brown barred faintly white, tips of feathers white, moulting to blue-grey). Mantle blue-grey, overtones barred brown, moulting; back blue-grey, overtones light brown; rump blue-grey, overtone light brown in a few places; upper tail coverts brownish flecked white; tail — centre tail feather slate-black, seven white spots longitudinally, three basal ones paired, faintly margined white, stitched effect; tail feathers white tips. Other tail feathers white spotted near base, very faintly white stitched on margins; under tail spotted white (large spots) roughly barred effect. Apparently eight spots when tail closed. Outer tail feathers more brownish in colour. Breast, foreneck and lower throat white barred brown, thin bars, which sometimes appeared slate-black; belly barred in same fashion; then short area of white before under tail coverts which were white with brown bars wide apart. Flank white, barred brown; legs and feet orange; claws light brown. Scapulars blue grey and brown feathers; lesser, median, and greater wing coverts blue-grey and brown mixed, with tendency to barred effect; primary coverts light brown; primaries brown with white spots on leading edges of several outer feathers; secondaries brown, second and third outers



I (a)



I (b)



I (c)

[P. Grant]

I — Oriental Cuckoo, (a) and (c) showing variation in stance, (b) showing pattern of under-surface.

white spots on leading edge; under wing white barred brown, carpal joint area white, with white edge sometimes showing above carpal joint when wing in closed position. Wing length with wing closed — wing tip reached just beyond mid length of tail; overall length of bird about twelve and one half inches. More briefly, an apparently plumpish bird coloured brown on upper surfaces, barred brown on white on under surfaces and around neck, tail blackish with white spots, tipped white.

One of the features of the bird was the variety of positions it adopted. On pointed posts it would droop until it appeared to be the top of the post (Plate 1a). On flat-topped posts if it landed on the near edge it would take up an almost vertical position. If it landed on the flat top of a post it would take up a much flatter stance (Plate 1c), and at times would raise its tail above the horizontal. Viewed from different angles very widely different impressions as to shape could be obtained, and frontal views could give the impression that the bird was much shorter in length than it really was. Also, the impression was gained at times that the wings were too large and ungainly for the bird and that they were just drooping around. The carpal joint was frequently hidden under the breast feathers.

As the bird was moulting it could be expected to sit around quite a bit, and this it did. It did not like wet or rough weather and apparently took shelter, coming out immediately when the weather cleared. Its favourite spot was on sheltered fence posts about four feet high, and here it would sit for relatively long periods then half glide and fly to the ground. When alighting into longer grass it kept its wings outspread and propped on the grass, reaching down to pick up its food. The return flight to fence posts was direct, with a final upward glide. Generally, the bird flew in a leisurely fashion, but on one occasion when caught in smoke from a train took off at terrific speed — it could fly very fast if it wanted to. The feeding habits may be likened to those of a kingfisher on dry land. Frequently it caught a green cicada which it would take back to a post top, and Russell, who saw the bird very clearly from close range at times, said he never saw it with a brown cicada, both green and brown being common at the time. Worms were taken also, and the bird was watched from close range as it rolled up a worm into a ball in its bill before swallowing it. A moth may have been taken, and spider web on the bird may have indicated that the bird was catching spiders but it could have passed through a web inadvertently.

The bird was completely silent. No call or whistle was heard at any time.

Our first impression was that we had observed an immature Oriental Cuckoo which was in the process of moulting, and regarded it as the rufous phase as recorded in Oliver's *New Zealand Birds*, 2nd ed., p. 537, because of the barred neck. The description there did not seem to make it clear whether the rufous phase was an immature phase or not. Correspondence with Mr. K. A. Hindwood of Australia brought the information that all immature Oriental Cuckoos are barred right up the neck, and that the so-called rufous phase was apparently an immature phase.\* This appears to be borne out by the fact that the bird's head was generally changing from brown to blue-grey and if the bird had stayed longer we may have been fortunate enough to

witness the blue-grey plumage. Mr. Cook, who saw the bird for the longest period, said that he thought that the bird was changing from brown to blue-grey in colour.

The question arises as to why the bird should be seen in New Zealand as previous sightings have been very few. A reason may be worked out with the help of the following brief reports. Another bird, apparently similar to the Kaihinu bird in habits, was seen at the same time in a district perhaps some twenty miles away but this report has not yet been followed up. At Greymouth, a smaller cuckoo (possibly a Fan-tailed Cuckoo) was seen on 30th December, 1963. From Jacobs River area comes the report of a strange cuckoo-like bird seen in January, 1964, and from Manakauaia (a little north of Jacobs River) the report of an Australian Tree Martin seen in December, 1963, and still there in mid-January, 1964. It is apparent that a number of birds from the Australian area were brought to this country by the succession of strong westerly winds which blew over the West Coast in December, 1963. It is unlikely that they were in sufficient numbers to breed here.

\* The question of rufous phases was discussed with Mr. E. G. Turbott, who said that the rufous phase is finally an adult plumage. This means that the bird mentioned was not in rufous phase plumage but was a normal immature bird changing into adult plumage. Mr. K. A. Hindwood apparently linked the Rufous Phase mentioned in Oliver, second edition, p. 537, with immaturity because of the barred throat. He stated that he had written without going into literature regarding the matter and apparently had forgotten or was unaware of the adult Rufous Phase cuckoos. This clearly explains the difference in the two opinions.



## SHORT NOTES

### MARSH SANDPIPER IN SOUTH TARANAKI

On 1st November, 1963, while I was visiting a freshwater pond on the coastal side of Hawera in the company of F. Finer, M. Bysouth and G. Macdonald, an unusual bird was noticed on the coastal end of the pool. It appeared to be resting while standing in the shallows, and while F.F., M.B. and G.M. kept binoculars trained on it, I was able to approach to at least 30ft. before the bird showed signs of annoyance. From here, I secured three colour transparencies of the bird, using a telephoto lens. These have enabled it to be identified as a Marsh Sandpiper (*Tringa stagnatilis*) by R. B. Sibson and H. R. McKenzie, both of whom made observations of the other two New Zealand records of Marsh Sandpiper, in the Auckland area, in 1959 and 1963 (*Notornis* VIII, 125-126, and X, 235-236).

The bird had a slim, streamlined appearance in keeping with the diagrams in Witherby's 'Handbook of British Birds,' and Bannerman's 'Birds of the British Isles,' Vol. X, Plate 10. It was generally white except for grey upper surface and wings, the mantle and scapulars appearing speckled grey-brown. The face was white, the crown shaded, and it was somewhat dark around the eyes. The bill was noticeably long, thin, and needle-like. The legs were very long, straight, and, like the bill, appeared to be dark (the sun was overhead, being midday). The bill and legs do not resemble those of any similar bird depicted in Witherby (e.g. Greenshank, P. 320). I did not note the colour of rump or tail but F.F. remarked later that it appeared to have some white on the upper surface when it took to flight.

While I was photographing it, the bird waded within easy distance for about five minutes, apparently annoyed at being disturbed, but not appearing alarmed. At one stage it waded into the water up to the body in the same manner as that depicted in D. A. Urquhart's photograph of the Marsh Sandpiper at Mangere (*Notornis* VIII, 210, Plate XXXII). When it eventually took to the air, it flew off to the inland end of the pool making rapid wingbeats and calling "chip-chip-chip . . . ." frequently, which agrees with the description of its call in Witherby. The bird alighted in vegetation in a less accessible part of the pond and was not relocated. Subsequent visits by F.F. and M.B. shortly afterwards also failed to relocate it.

The pool, of about 10 acres, is on the property of Mr. R. V. Nowell, three miles from Hawera, and is used for watering his stock. Small numbers of Pied Stilt (*Himantopus himantopus*) are usually found there. It is separated from the coast by 220 yards of lupin-covered black-sand dunes, with a drop of 250 feet of sharp cliff to the sea beach. When first seen, the bird was standing on black sand near the lupins.

Since observing this bird, I have been able to see J. L. Kendrick's movie of the Marsh Sandpiper recorded in *Notornis* X. Its appearance and flight agree with my notes and recollection of the Hawera bird.

— MAURICE G. MACDONALD



### GREENFINCH-LIKE SPARROWS

For several years I have noticed 'greenfinch-like' sparrows (*Passer domesticus*) periodically in my garden at feeding time. Many of the females appeared to be a 'yellowish green' about the head, and over the breast in particular. At first, I dismissed the yellowness of the sparrows as an optical illusion under certain lighting conditions or as contamination by paint. However, as the yellowing appeared seasonally, I decided to seek some other reason for it, perhaps pollen dust. It was soon found that the season of 'yellowing' coincided with the flowering of the Pohutukawa (*Metrocideros excelsa*). It was found that the sparrows have a liking for the nectar, and for the insects that visit the Pohutukawa. In their search for the nectar and insects, the sparrows 'wade' through the numerous stamens and, in so doing, become discoloured by the adhering pollen. The staining of the plumage is slight, but sufficient to be remarkable.

The males, because of their black 'bibs' and darker plumage, do not show the discolouring, although they frequent the flowers as much as the females.

This observation is of interest as it shows how a bird which is a seed- and insect-eater (omnivorous in many respects) can assume the role of a pollinator. In the past, I have frequently observed various finches indulging in nectar feeding. However, I believe that the true pollinators of the Pohutukawa (apart from wind) are the many moths which visit the flowers at dusk, and that the sparrows merely clean up the remains of the 'banquet' of the previous evening. From casual observation it appears to me that Pohutukawa flowers secrete most nectar towards evening and that the anthers dehisce about the same time, thus catering for the nocturnal moths.

— C. McCANN

## LITTLE EGRETS AT GREYMOUTH

On 2nd May, 1964, after I had just discussed the Cattle Egret report with Mr. Jones, Cobden, I visited a popular wading-bird pool at Cobden. I was agreeably surprised to see three Little Egrets, *Egretta garzetta*, and one White Heron, *Egretta alba modesta*, together in one pool. I hurriedly picked up Mr. Jones and took him to the scene. In good light and at close range he studied the birds carefully and said that they were not the same as the bird he had seen at Coal Creek. The White Heron was much bigger than the Cattle Egret and the Little Egrets were slighter and smaller than the Cattle Egret. The Little Egrets were behaving in their usual frantic way and it was amusing to see them dashing around fishing very actively. Two raised their wings at each other as if about to begin sparring and, when one landed alongside a White-faced Heron, *Notophoxyx novaehollandiae*, both raised their feathers noticeably and displayed at each other. Later, the two that seemed to keep together had a further display session.

Unfortunately, I was not able to spend much time observing the birds that day. However, the bills of the birds were noticeably different. Two had black upper mandibles from the tip to nearly the facial mask, the lower mandibles being yellowish green. The other bird had black upper and lower mandibles from the tip back for some distance, then changed to orange on upper and lower mandibles before reaching the facial mask. I saw the last-mentioned bird at close range in flight and its feet and a short anklet above the feet were a greenish colour. Underneath the feet was not noticeably yellow as in a bird seen here previously; more greenish (*Notornis* 9: 4, p. 122). The upper parts of the legs were dark grey, then grey down the front of the legs until the green anklet was reached; the back of the legs turned from dark grey to a greenish colour above the tarsus and this continued down to the greenish anklet. On one occasion I saw a short plume from the nape. I was soon unable to locate more than one Little Egret, my last sighting being on the 10th May.

— P. GRANT



## CATTLE EGRET NEAR MASTERTON

On 25/5/64, R. Stidolph and B. Irons and I visited the dairy farm of Mr. W. Greig near Masterton and identified a "small White Heron" as being a Cattle Egret, *Ardeola ibis*. The bird had been at the farm for a week but when R. Walker (who had been told of the bird by Mr. Greig) had visited the farm he was unlucky enough not to have sighted it.

The day of our visit was overcast but the bird was clearly seen to have a yellow bill. The small dark portion at the tip was not clearly seen because feeding on the muddy fields had somewhat discoloured the area. The legs and feet were a dark greyish colour. No buff coloration was visible — the plumage was pure white. In general appearance it was stockier and shorter than the Little Egret and was considerably smaller than the White Heron.

Feeding characteristics were typical of this species in that it was constantly in close attendance on the dairy herd. Mr. A. Greig said that when the cows were taken in for milking the bird flew over to other cattle in another field.

On 30/5/64, which was bright and sunny, Mr. Irons and



Mr. Hooper of Masterton visited the farm again and took several photographs but were unable to get close enough for a really good shot. However, this time they were able to confirm that the bird had a dark portion at the tip of its bill. The bird was last seen on the farm on about 13/6/64.

The writer believes that this is the first confirmed North Island record and the third for New Zealand; the first being on a farm at Belfast, North Canterbury, on 28/9/63 (*Notornis* 10: 316), and the second in the Irwell district, some 25 miles southwest of Christchurch on the western shore of Lake Ellesmere on 1/6/64 (*Notornis* 10: 383), [and a fourth in Westland — see P. Grant in this issue.—Ed.]

— B. W. BOESON



### BLACK-FRONTED TERNS ON THE WEST COAST

Further to the note by H. R. McKenzie in *Notornis*, March, 1964, recording the Black-fronted Tern near Haast, I now have to report a sighting further south than this on the Westland coast, viz. at Awarua Point at the northern entrance to Big Bay (or Awarua Bay). On 13/5/64 three adults were seen about twenty yards distant, flying into a rain squall. It is not impossible that they breed in this area as there are suitable shingly stretches of beach at many points along the coast. These were the only birds of this species seen along this coast between the Hope River mouth and Big Bay, and none was seen on the beach of Big Bay itself. I recorded none along the coast from Big Bay to Martin's Bay during a trip in May, 1963. Thus Awarua Point remains the southernmost sighting of this species along the west coast so far.

— PETER CHILD



### INFORMATION WANTED

**Fairy Prion.** Would any member who has unrecorded information, however slight, on this species please send it to Mr. P. Harper, 4 Barbara Grove, Moera, Lower Hutt, who is at present writing up a study of it.

**Saddleback.** Mr. P. Skegg, 32 Manawa Road, Remuera, Auckland, is collecting information on the decline of both North and South Island Saddlebacks. He would welcome any unpublished records or knowledge of out-of-the-way references which members may have.

**Spur-winged Plover.** With this species now spreading rapidly through the South Island, it is intended to summarise its status and habits in the near future. Would members please be sure to send in to the Nest Record and Recording Schemes anything they know about its numbers, breeding and general habits in this or previous seasons.—B.D.H.

**Kingfisher.** There is a general impression in some districts that there may be a strong seasonal movement of Kingfishers within New Zealand. Members whose work or daily journeys would enable them to keep regular notes of numbers seen in favoured places are invited to keep such notes and send in an annual summary of them to the Recording Scheme. Were this done in all districts and by many individuals, it should soon be apparent whether Kingfisher movements are national, local, or imaginary ones, and whether further investigation is warranted. — B.D.H.